ARNO®
WERKZEUGE
We have a passion for precision.

GROOVING AND CUT-OFF

08/2016

Tools and Inserts for Grooving and Cut-off

www.arnousa.com

TÜV SÜD ISO 9001
Germany only

ARNO®
WERKZEUGE

Quick, Flexible and Responsive

To have R&D, production and sales, all under one roof

is the perfect way of providing standard and special products.

95 % of the standard stocked items are available from stock in Illinois.

Orders received before 3:30pm Central Time are shipped the same day and can be on your machine the next day.

Arno's competent team of sales engineers is always available for service and support. In many cases we offer on-site assistance.

Find more information at

www.arnousa.com

ARNO®
WERKZEUGE

0

1941
Emil Arnold (*24.7.1904), decides to become self-employed and establishes "Emil Arnold Lehrenbau" in Franziskanergasse 7 in Esslingen.

1962
On April 1st. Karl-Heinz Arnold establishes "Karl-Heinz Arnold Werkzeuge" in his father's company. Purpose: Sales of carbide cutting tools.

1965
Company re-structuring from "Emil Arnold" to "Emil Arnold KG". More focus on manufacturing of special tools and jigs for special purpose machines as well as mass production of toolholders.

1966
Both companies moving to the industrial area of "Ruit Zinsholz", Ostfildern near Stuttgart.

1967
Start of sales for indexable carbide inserts for turning and milling.

1979
Together, in a combined production facility with "Emil Arnold", ARNO starts focusing on market opportunities. After only one year of research and development a mini copy-turning system with a patented insert clamping is introduced.

1981
More developments of own tools, for example the NC-grooving and turning system.

1989
Entering into grinding technology.

Tradition in Precision

“Local family business gains global position as a market leader.”

In 1941 Emil Arnold establishes “Lehrenbau” in Esslingen am Neckar. Initially manufacturing mainly measurement jigs and gauges. Because he always gave his customers exactly what they specified he established himself through the high quality of his products.

Together with his son Karl-Heinz Arnold they put their heart and soul into the company and were always open to new developments. He had a vision to be represented with his cutting tools in all industries all over the world. In 1962 his son forms the company Karl-Heinz Arnold GmbH which under the name ARNO®-Werkzeuge began focussing on sales of carbide tools. Both companies were constantly looking for market opportunities with the customers in mind.

In 1987 Klaus-Michael Arnold joined the company and became Managing Director in 1992. In 2002 Josef Storf became joint Managing Director. In the spirit of the company founder, the product portfolio is expanding and the search for new sales channels are constantly being explored. In 2004 ARNO (UK) Ltd becomes the first overseas sister company, followed by sister companies in Italy, Russia and the USA. Due to the constant developments of the product range and the high level of service provided, today ARNO®-Werkzeuge is globally renowned for its high quality cutting tools.

1995
Certification of Emil Arnold GmbH & Co KG to DIN ISO 9002.
Certification of ARNO®-Werkzeuge to DIN EN ISO 9001.

2002
Expansion of grinding dept. and move to new building.

2004
Setting up sales company in UK.

2006
Setting up sales company in Italy.

2008
Setting up sales company in Russia.

2009
Setting up sales company in USA.
Building of a new sales and logistics center in Ostfildern.

2010
New products are introduced at the AMB exhibition: SA part-off system, the AMS (ARNO®-Mini-System) and the SIM boring bars. Also expansion of milling portfolio with new FTA, Duo-Mill and ROC-Mill systems.

2012
The AKB drill is introduced on the AMB exhibition as well as additional insert geometries for the SHARK-Drill², all of which opening new opportunities for the company.

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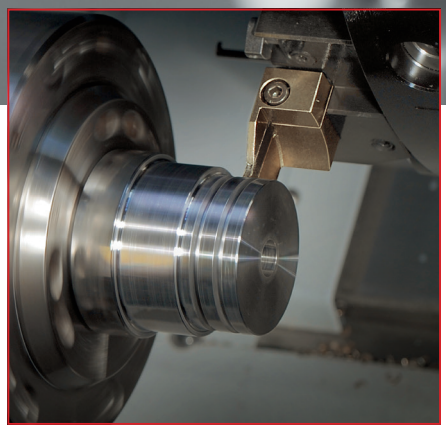
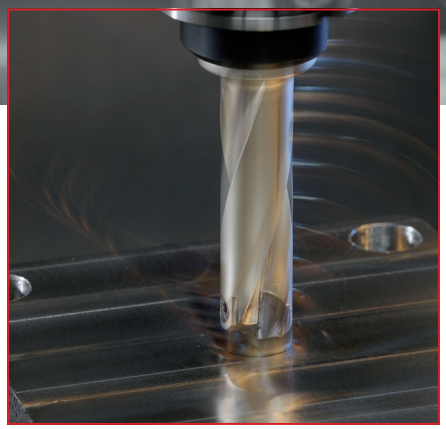


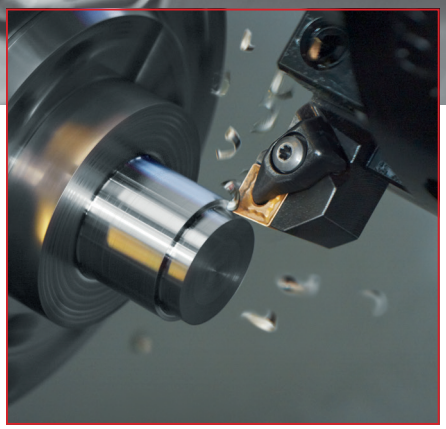
Grooving

Whether it is radial or axial grooving, parting-off, groove turning or internal grooving, you will find the ideal tool from ARNO®-Werkzeuge.



Drilling

From 1 mm to 114 mm diameter you will find a solid carbide drill or a solution with indexable inserts from our extensive product range. (stock is limited to Shark-Cut in USA)



Turning

ARNO®-Werkzeuge offers reliable tools utilizing various inserts for your most demanding internal or external machining applications from fine finishing to heavy roughing.

Strength from experience, competence and development

“For the future you need a partner with vision.”

By working closely with partners inside and outside the company, we are very capable of satisfying individual requirements which often lead to special tooling. These tools are consistently improved and might find their way into our standard portfolio of catalog tooling later.

New materials and expectations of constant improvement of machine time, motivate us to research and develop new tooling and cutting tool materials. That means developing modular tooling systems that are modified for each individual application. Our high performance but still affordable solutions include our extensive range of drilling systems, grooving systems, milling cutters and our huge range of indexable inserts (not just for turning) as well as tool holding and vending solutions.

Our technical support and advice follow any of our high quality tools. Our highly competent team will support you with service even after you have made your decision to purchase.

Milling

Face-mills, square shoulder-mills, chamfer-mills, milling cutters with round inserts, roughing cutters and solid carbide cutters. We have the right cutter for your application.(not avail. in US)

Work Holding Equipment

NC-Machine vice in various executions of number of jaws and widths ensure maximum component clamping for the modern manufacturing. (not available in USA)

Service to Size

Individual Solutions

Despite our wide range of standard tools which will cover a majority of applications, sometimes you may just need a solution for a specific request.
ARNO can offer you a special tool which suits your application exactly. A perfect solution without any compromises.

Overnight Delivery

When urgency is required ARNO is there to help. Place your order for standard tools by 3:30PM Central Time and our tools could be on your machine the next day. For special solutions we need a little longer, but then you will be getting a high quality tool just for your application.

Everything Under One Roof

The high quality of our products is a result of having R&D, manufacturing and sales at one location. This also gives us the opportunity for testing, offering faster response time, better control and better prices.

Experienced External Sales Team

You are never left alone with an ARNO product. Our experienced external ARNO sales team is always available for service and support.

Our Application Engineers

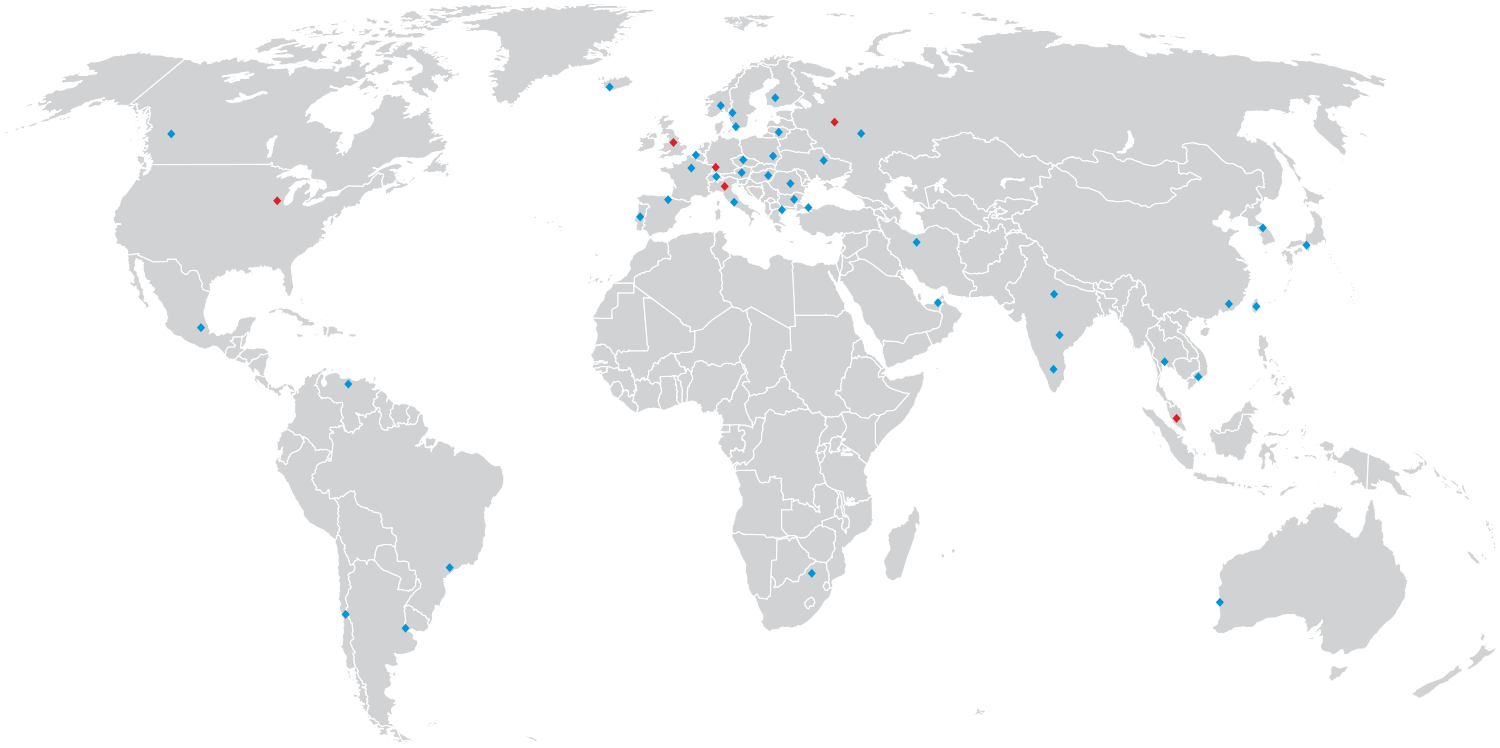
When you have a problem with an application our application engineers will be available to advise you on technical issues.

Ordering Hotline

Wherever you may be in the world you will be able to contact an ARNO representative. Take advantage of our competence, we look forward to being of service.

Globally available – Service where you need it

ARNO-Werkzeuge is represented world wide, it is important to us that we can service you where you need it. Our distributors and sister companies are always local and easy to contact.



◆ ARNO location ◆ Distributor

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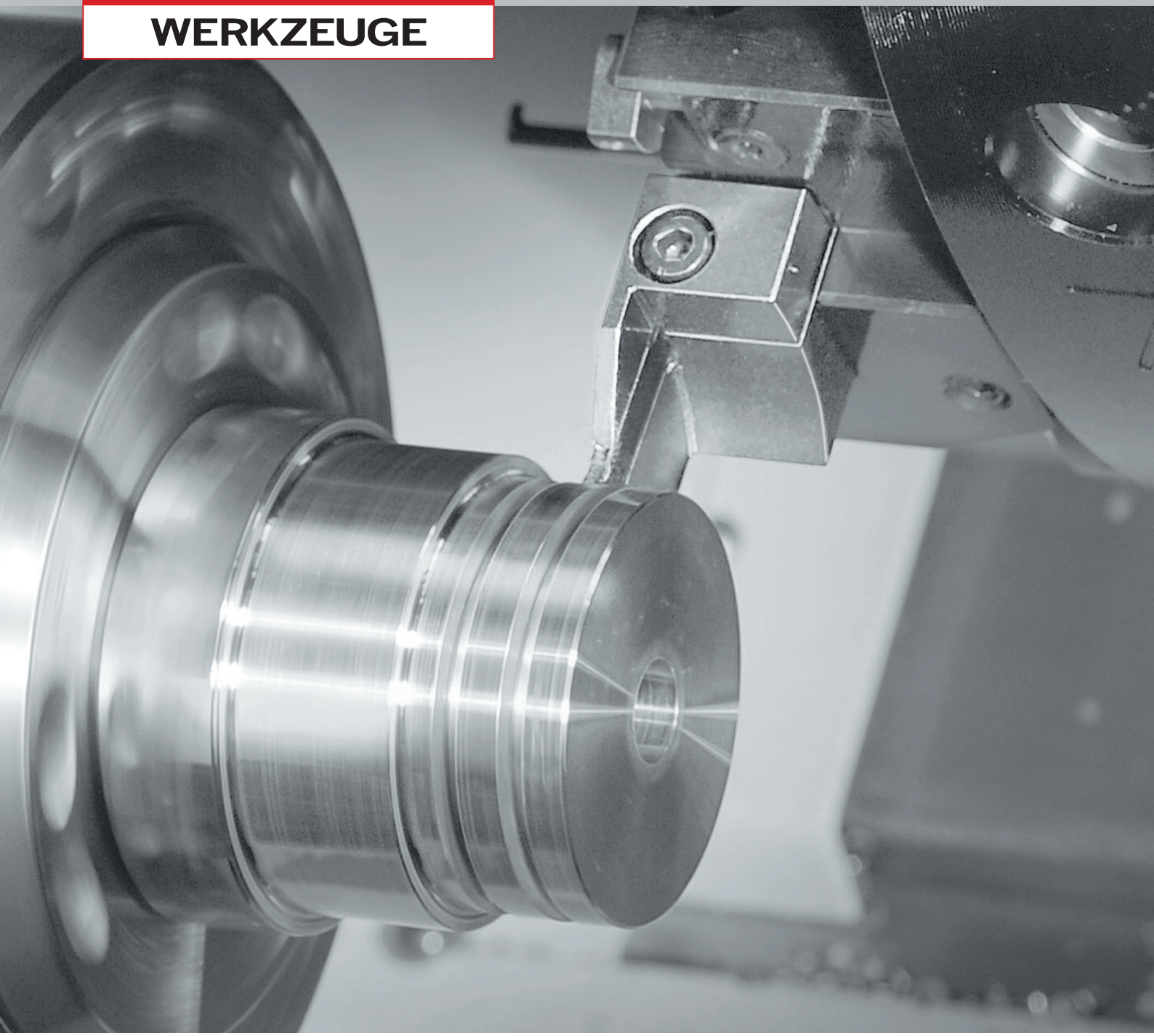

Get into the Groove
ARNO Grooving tools and inserts

Take advantage of ARNO's unique versatility:
A modular grooving system with a single basic tool holder turns into different tool variants by simply changing the support blade and clamp.

Thanks to their stability, ARNO grooving tools offer chip removal in all 3 main cutting directions, enabling combined operations with just one tool.

Precision-ground two or three-edged cutting inserts in various designs, different shapes and types, give the best cutting performance in respect of chip forming, cutting speed and efficiency.


Page 13

SA-Grooving system

Solutions for part-off and grooving up-to 5.5" diameter, with a number of different tooling designs


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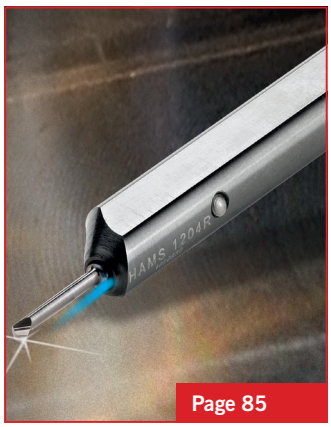
SE-Grooving system

Monoblockholder "SE" for double sided inserts size SE24 with groove width from .079" – .236"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ARNO®-Mini-System

AMS is a modular boring system starting at Dmin .098" with a maximum reach of 1.181"


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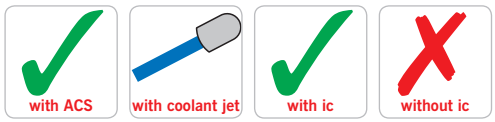
SIM – Boring Bars

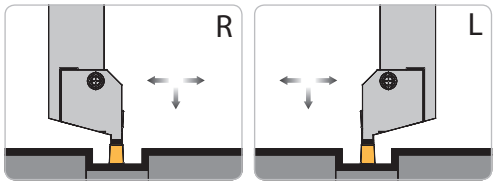
Mini boring system for minimum bore diameter from .264"

Symbol navigator

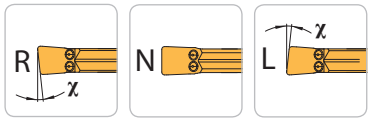
Internal coolant



Right-hand / Left-hand / Upside down



Insert Right-hand / Neutral / Left-hand



Shank sizes

Additional information

SA Cut-off (INCH)

Grooving and Parting off

Solutions for parting off up to diameter 5.510” (140mm) with a number of different tool designs

Monoblock holders
Shank sizes .312” to 1.500”

Blades
in sizes 1.024” (26mm) and 1.260” (32mm)

Modules

Introduction

Monoblock holders
- Shank sizes from .312“ to 1.500“ (8 – 40mm)
- Groove widths from .059“ to .394“ (1.5 to 10mm)
- ACS (Arno Coolant System) holders available

Blades
- Sizes 1.024“ (26mm) and 1.260“ (32mm)
- Groove widths from .059“ to .157“ (1.5 to 4mm)
- ACS blades available (ACS1 and ACS2)

Modules
- Grooving depth of cut .393“ to 2.756“ (10.0 to 70.0mm)
- Groove widths from .059“ to .157“ (1.5 to 4mm)
- ACS modules available (ACS1 and ACS2)

Features

- Monoblock design
- Reliable and user friendly – only one spare part
- Active insert clamping with fixed stop
- Accurate insert positioning – pulling out the insert is not possible
- Double edged inserts
- High productivity
- Directly pressed inserts with dedicated geometries
- Cost efficient and optimum solution for reliable cut-off
- Ground insert for Non-Ferrous materials
- Sharp insert with polished top for better chip flow
- Excellent for machining Aluminum and Plastics
- Main application for Steel and Stainless Steel
- Strong cutting edge for maximum feed rates and cutting depths
- ACS coolant through on most holders

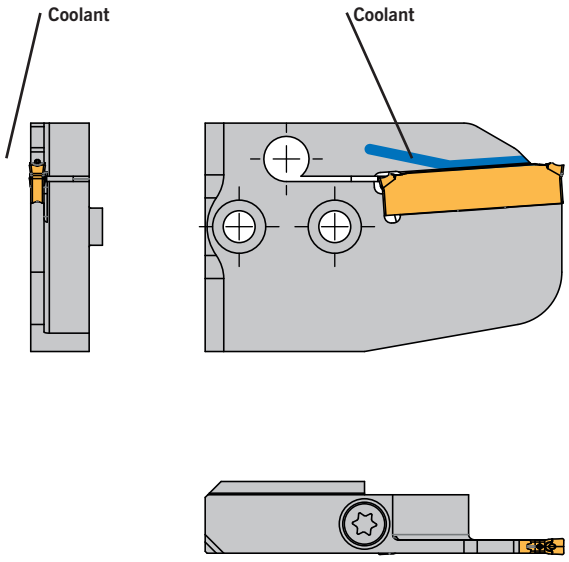
ARNO-ACS cooling system®

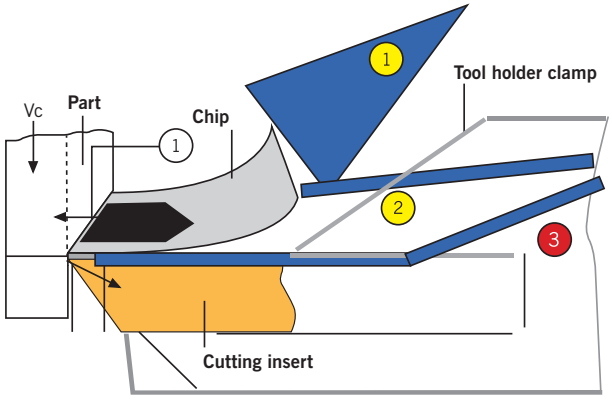
ACS1 – Coolant underneath the chip

The ACS system is a new technology for modules, blades and monoblock holders. It ensures the coolant flow is directed underneath the chip and thereby improves tool life considerably.

The market place has already seen many coolant variations which often loses much of efficiency due to poor accuracy from the spray jet to the cutting edge and especially in applications with a deeper groove depth the desired coolant effect and swarf evacuation suffers from only little or no improvement.
ARNO®-Werkzeuge has realised and solved this problem area by developing the ARNO®-Cooling-System (ACS). This innovative design ensures optimum coolant to the cutting edge during machining. It comes in two variations: ACS1, with one coolant hole and ACS2 with two coolant holes.

ACS1





1 "External coolant" from coolant jet

2 "Internal coolant" through tool or clamp

3 New ACS-coolant through insert seat

ACS2 – 2 is better than 1

The additional coolant hole gets the coolant right to the tip of the cutting edge.

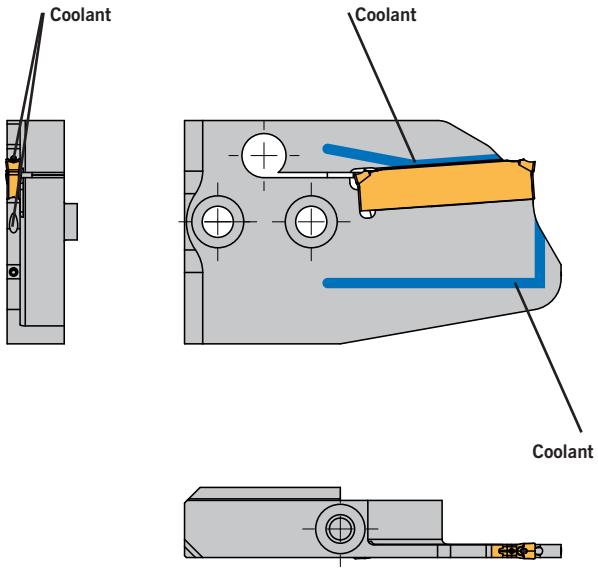
The coolant hole goes through the insert seat and aims directly at the cutting edge, even in the deepest groove the cutting edge is kept cool without any loss of efficiency, as seen in other systems.

The coolant gets underneath the chip and guarantees optimum cutting conditions.

Additional benefits are the reduction of build-up edges and breakouts of the cutting edge.

With the additional coolant hole of the ACS2 system we offer higher cutting parameters and better tool life, especially for difficult to machine materials.

ACS2



Left hand shown

ARNO-ACS cooling system®

Solving the problem of high temperatures at the cutting edge

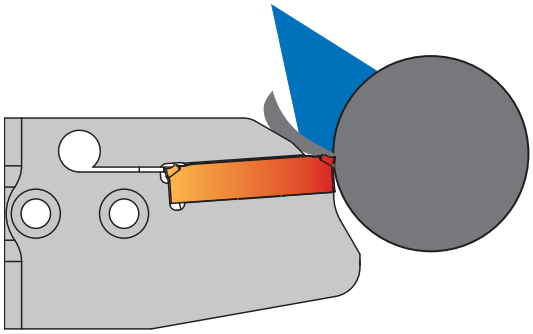
With the ARNO-ACS cooling system® on the SA- (cut-off and grooving) and SE- (grooving and groove turning) systems we have two highly competitive solutions against any competitor's system. Unique to our ACS system is the direct and totally unobstructed coolant flow right to the cutting edge.

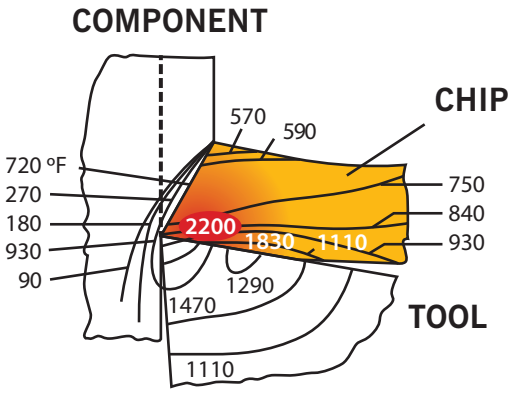
Advantages:
- Maximum speeds and feeds possible
- Reduction of build up edge and thermal cracking by avoiding thermal shocks
- Well controlled chip breaking
- Superb surface finish
- Excellent flatness
- All holders are nickel plated and therefore protected against corrosion
- Reduced set-up time as there is no requirement for adjusting coolant jet

The ACS cooling system is available for double ended inserts from widths .079" to .236" (2-6mm) and groove depths up to 2.067" (52.5mm). By offering 6 carbide grades and 5 chip breakers as well as left and right handed inserts (up to 15° angle), we offer a solution for nearly all materials.

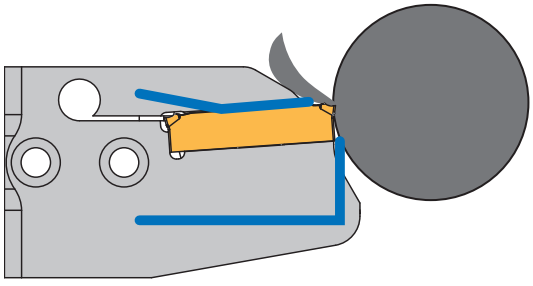
When using our flange mounted holders you can maximize performance based on your machine's capability.

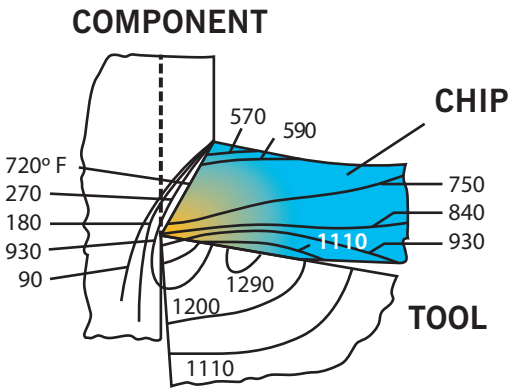
Without ACS – external coolant





With ACS – coolant under the chip





Practical examples

The patented ARNO-ACS cooling system® (ACS) increases tool life significantly due to the new and innovative cooling technology. The cutting edge is kept cool while the chip is guided out of the groove, even in deep grooves. Multiple tests at customers proved that the new ACS tools are increasing productivity significantly.

Cutting trial 1

Nozzle	
Cut-off with ARNO®-ACS2 module **Depth of cut .590" (15mm)** **Cut-off width .118" (3mm)** V_c = 390 f/min f_n = .0047"/rev **Module: MSA-SL-SA3503-65-ACS2** **Insert: SA35-3003N-S1 AM5040**	
ARNO® – without ACS	**120 parts**
ARNO®-ACS	**300 parts**
Information:	• Material: 321 Stainless Steel • Productivity increase more than 100 % • Controlled and process reliable machining

Cutting trial 2

Bushing	
Cut-off with ARNO®-ACS2 module **Depth of cut .315" (8mm)** **Cut-off width .157" (4mm)** V_c = 820 f/min f_n = .0035"/rev **Module: MSA-SL-SA3504-80-ACS2** **Insert: SA35-4004N-ALU AN1015**	
ARNO® – without ACS	**500 parts**
ARNO®-ACS	**1.500 parts**
Information:	• Material: AlCu4PbMgMn (Aluminium-Magnesium alloy) • Productivity increase of around 300 % • Component has a through hole with dia. .965" (24.5mm)

1

Monoblock holders

HSA	2525R	SA	2403	44	ACS1	S1
H = Holder	Shank size	Insert	Insert size	Part-off diameter	ARNO-Cooling-System®	Coolant Connection
S = Grooving	R = Right hand	External	24 – Insert length 24mm (.945")	44mm (1.732")	ACS1 = with one coolant hole	Only applies to European markets
A = External	L = Left hand		03 – Insert width 3mm (.118")		ACS2 = with two coolant holes	

Inserts

SA35	30	03	N	T1	AP	5020
SA = Grooving External	Groove width 3.0mm (.118")	Corner radius R = 0.3mm (.012")	N = Neutral	Geometry	ARNO®-Application area	Grade code (ISO standard)
35 = Insert length			R = Right hand			
			L = Left hand			

Monoblock holders

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Holders for SA-Modules (MSA)

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Indexable inserts

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HSA-U

SWISS STYLE

inch & metric

without ic

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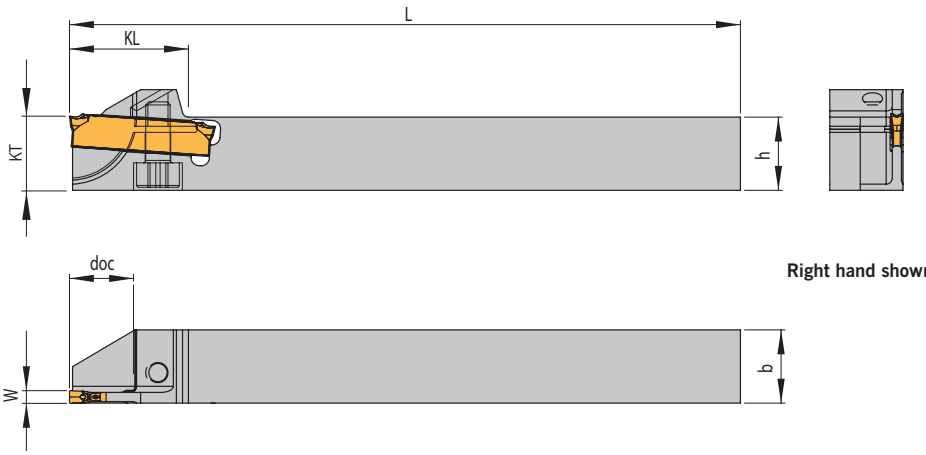
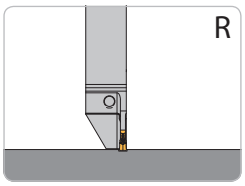
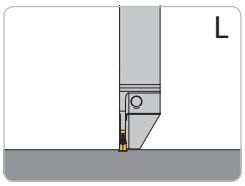


Right hand shown





1

Swiss style monoblock holders (bottom screw)

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	D_R	h	b	L	KL	KT	Insert
HSA 1212U-L-SA16015-20	–	106280	.059	.394	.787	–	.472	.472	4.331	.768	.472	**SA16-15...**
HSA 1212U-R-SA16015-20	–	106282	.059	.394	.787	–	.472	.472	4.331	.768	.472	**SA16-15...**
HSA 1212U-L-SA24015-20	–	101908	.059	.394	.787	–	.472	.472	4.331	.768	.472	**SA 24-15...**
HSA 1212U-R-SA24015-20	–	101910	.059	.394	.787	–	.472	.472	4.331	.768	.472	**SA 24-15...**
HSA 1212U-R-SA2402-06	–	96067	.079	.118	.236	–	.472	.472	4.331	.768	.472	**SA 24-20...**
HSA 1212U-L-SA2402-12	–	97184	.079	.236	.472	–	.472	.472	4.331	.768	.472	**SA 24-20...**
HSA 1212U-R-SA2402-12	–	97182	.079	.236	.472	–	.472	.472	4.331	.768	.472	**SA 24-20...**
HSA 1212U-L-SA2402-20	–	96464	.079	.394	.787	–	.472	.472	4.331	.768	.472	**SA 24-20...**
HSA 1212U-R-SA2402-20	–	96462	.079	.394	.787	–	.472	.472	4.331	.768	.472	**SA 24-20...**
HSA 1616U-L-SA2402-32-.625	**HSA 10U-L-SA2402-D32**	501463	.079	.630	1.260	–	.625	.630	4.331	1.004	.630	**SA 24-20...**
HSA 1616U-R-SA2402-32-.625	**HSA 10U-R-SA2402-D32**	501464	.079	.630	1.260	–	.625	.630	4.331	1.004	.630	**SA 24-20...**

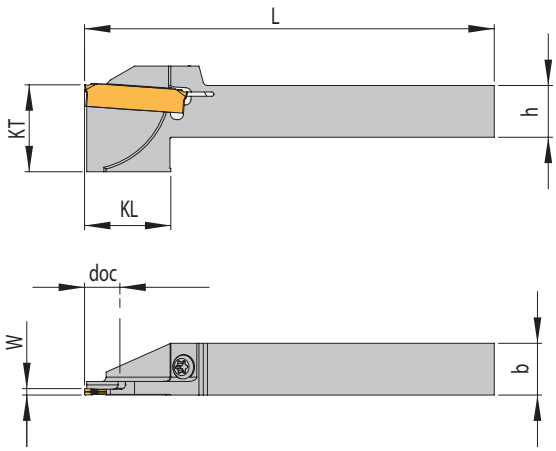
D_{max} = Maximum diameter in solid material

Spare parts

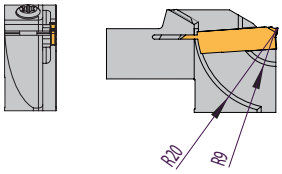
Holder	Screw	Key
HSA 1212U...	DIN912-M4X10-12.9	KP 1111
HSA 1616U...	DIN912-M4x14-12.9	KP 1111

All dimensions in inches

HSA



SWISS STYLE



Right hand shown

metric only

without ic

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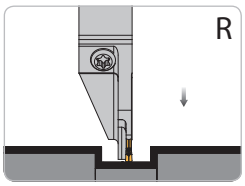

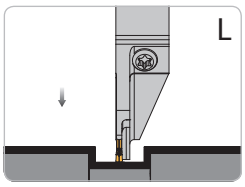

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Swiss style for Traub TNL12

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	h	b	L	KL	KT	Insert
HSA 1212R-SA24015-S1-16	–	**98410**	.059	.315	.630	.472	.472	3.740	.787	.472	**SA 24-15...**

Spare parts

Holder	Screw	Key
HSA 1212... – HSA 24015...	AS 0022	KS 8000

All dimensions in inches

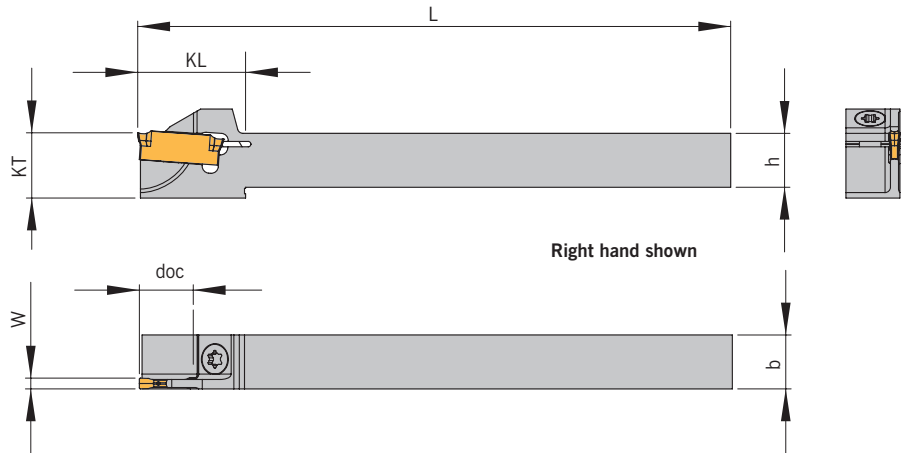
HSA

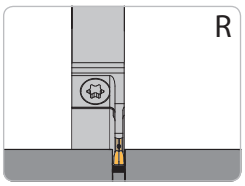
SWISS STYLE

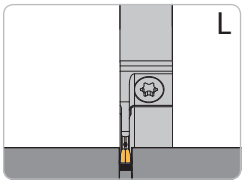
inch & metric

without ic

Page 64–66







1

Swiss style monoblock holders (top screw)

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	D_R	h	b	L	KL	KT	Insert
HSA 0808L-SA16015-12-.312	HSA 05L-SA16015-D12	501707	.059	.236	.472	–	.312	.315	4.331	.630	.394	SA16-15...
HSA 0808R-SA16015-12-.312	HSA 05R-SA16015-D12	501709	.059	.236	.472	–	.312	.315	4.331	.630	.394	SA16-15...
HSA 0808L-SA16015-16-.312	HSA 05L-SA16015-D16	501708	.059	.315	.630	–	.312	.315	4.331	.709	.394	SA16-15...
HSA 0808R-SA16015-16-.312	HSA 05R-SA16015-D16	501710	.059	.315	.630	–	.312	.315	4.331	.709	.394	SA16-15...
HSA 0808L-SA24015-12-.312	HSA 05L-SA24015-D12	501452	.059	.236	.472	–	.312	.315	4.331	.630	.394	SA 24-15...
HSA 0808R-SA24015-12-.312	HSA 05R-SA24015-D12	501454	.059	.236	.472	–	.312	.315	4.331	.630	.394	SA 24-15...
HSA 0808L-SA24015-16-.312	HSA 05L-SA24015-D16	501453	.059	.315	.630	–	.312	.315	4.331	.709	.394	SA 24-15...
HSA 0808R-SA24015-16-.312	HSA 05R-SA24015-D16	501455	.059	.315	.630	–	.312	.315	4.331	.709	.394	SA 24-15...
HSA 1010L-SA16015-20-.375	HSA 06L-SA16015-D20	501711	.059	.394	.787	–	.375	.394	4.331	.787	.472	SA16-15...
HSA 1010R-SA16015-20-.375	HSA 06R-SA16015-D20	501712	.059	.394	.787	–	.375	.394	4.331	.787	.472	SA16-15...
HSA 1010L-SA1602-20-.375	HSA 06L-SA1602-D20	501067	.079	.394	.787	–	.375	.394	4.331	.787	.472	SA 16-20...
HSA 1010R-SA1602-20-.375	HSA 06R-SA1602-D20	501069	.079	.394	.787	–	.375	.394	4.331	.787	.472	SA 16-20...
HSA 1010L-SA24015-20-.375	HSA 06L-SA24015-D20	501456	.059	.394	.787	–	.375	.394	4.331	.787	.472	SA 24-15...
HSA 1010R-SA24015-20-.375	HSA 06R-SA24015-D20	501457	.059	.394	.787	–	.375	.394	4.331	.787	.472	SA 24-15...
HSA 1010L-SA2402-20-.375	HSA 06L-SA2402-D20	501068	.079	.394	.787	–	.375	.394	4.331	.787	.472	SA 24-20...
HSA 1010R-SA2402-20-.375	HSA 06R-SA2402-D20	501070	.079	.394	.787	–	.375	.394	4.331	.787	.472	SA 24-20...
HSA 1212L-SA16015-20	–	105523	.059	.394	.787	–	.472	.472	4.331	–	–	SA16-15...
HSA 1212R-SA16015-20	–	105521	.059	.394	.787	–	.472	.472	4.331	–	–	SA16-15...
HSA 1212L-SA1602-20-.500	HSA 08L-SA1602-D20	92674	.079	.394	.787	–	.500	.500	4.331	–	–	SA 16-20...
HSA 1212R-SA1602-20-.500	HSA 08R-SA1602-D20	92676	.079	.394	.787	–	.500	.500	4.331	–	–	SA 16-20...
HSA 1212L-SA1603-26-.500	HSA 08L-SA1603-D26	109537	.118	.512	1.024	–	.500	.500	4.331	–	–	SA 16-30...
HSA 1212R-SA1603-26-.500	HSA 08R-SA1603-D26	109543	.118	.512	1.024	–	.500	.500	4.331	–	–	SA 16-30...
HSA 1212L-SA24015-20-.500	HSA 08L-SA24015-D20	109538	.059	.394	.787	–	.500	.500	4.331	–	–	SA 24-15...
HSA 1212R-SA24015-20-.500	HSA 08R-SA24015-D20	109544	.059	.394	.787	–	.500	.500	4.331	–	–	SA 24-15...
HSA 1212L-SA24015-26	–	106959	.059	.512	1.024	–	.472	.472	4.331	–	–	SA24-15...
HSA 1212R-SA24015-26	–	106957	.059	.512	1.024	–	.472	.472	4.331	–	–	SA24-15...
HSA 1212L-SA24015-32-.500	HSA 08L-SA24015-D32	109539	.059	.630	1.260	–	.500	.500	4.331	1.024	.630	SA 24-15...
HSA 1212R-SA24015-32-.500	HSA 08R-SA24015-D32	109545	.059	.630	1.260	–	.500	.500	4.331	1.024	.630	SA 24-15...
HSA 1212L-SA2402-20-.500	HSA 08L-SA2402-D20	109540	.079	.394	.787	–	.500	.500	4.331	–	–	SA 24-20...
HSA 1212R-SA2402-20-.500	HSA 08R-SA2402-D20	109546	.079	.394	.787	–	.500	.500	4.331	–	–	SA 24-20...
HSA 1212L-SA2402-26	–	96125	.079	.512	1.024	–	.472	.472	4.331	–	–	SA 24-20...
HSA 1212R-SA2402-26	–	96123	.079	.512	1.024	–	.472	.472	4.331	–	–	SA 24-20...
HSA 1212L-SA2402-32-.500	HSA 08L-SA2402-D32	92678	.079	.630	1.260	–	.500	.500	4.331	1.024	.630	SA 24-20...
HSA 1212R-SA2402-32-.500	HSA 08R-SA2402-D32	92680	.079	.630	1.260	–	.500	.500	4.331	1.024	.630	SA 24-20...
HSA 1212L-SA24025-26-.500	HSA 08L-SA24025-D26	109541	.098	.512	1.024	–	.500	.500	4.331	–	–	SA24-25...
HSA 1212R-SA24025-26-.500	HSA 08R-SA24025-D26	109547	.098	.512	1.024	–	.500	.500	4.331	–	–	SA24-25...
HSA 1212L-SA24025-32-.500	HSA 08L-SA24025-D32	109542	.098	.630	1.260	–	.500	.500	4.331	1.024	.630	SA24-25...
HSA 1212R-SA24025-32-.500	HSA 08R-SA24025-D32	109548	.098	.630	1.260	–	.500	.500	4.331	1.024	.630	SA24-25...

All dimensions in inches

Swiss style monoblock holders (top screw)

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	D_R	h	b	L	KL	KT	Insert
HSA 1616L-SA1602-20-.625	HSA 10L-SA1602-D20	501071	.079	.394	.787	–	.625	.630	4.331	–	–	SA 16-20...
HSA 1616R-SA1602-20-.625	HSA 10R-SA1602-D20	501078	.079	.394	.787	–	.625	.630	4.331	–	–	SA 16-20...
HSA 1616L-SA1602-26-.625	HSA 10L-SA1602-D26	501072	.079	.512	1.024	–	.625	.630	4.331	–	–	SA 16-20...
HSA 1616R-SA1602-26-.625	HSA 10R-SA1602-D26	501079	.079	.512	1.024	–	.625	.630	4.331	–	–	SA 16-20...
HSA 1616L-SA1603-26-.625	HSA 10L-SA1603-D26	501073	.118	.512	1.024	–	.625	.630	4.331	–	–	SA 16-30...
HSA 1616R-SA1603-26-.625	HSA 10R-SA1603-D26	501080	.118	.512	1.024	–	.625	.630	4.331	–	–	SA 16-30...
HSA 1616L-SA24015-32-.625	HSA 10L-SA24015-D32	501198	.059	.630	1.260	–	.625	.630	4.331	–	–	SA 24-15...
HSA 1616R-SA24015-32-.625	HSA 10R-SA24015-D32	501458	.059	.630	1.260	–	.625	.630	4.331	–	–	SA 24-15...
HSA 1616L-SA2402-26-.625	HSA 10L-SA2402-D26	501459	.079	.512	1.024	–	.625	.630	4.331	–	–	SA 24-20...
HSA 1616R-SA2402-26-.625	HSA 10R-SA2402-D26	501460	.079	.512	1.024	–	.625	.630	4.331	–	–	SA 24-20...
HSA 1616L-SA2402-32-.625	HSA 10L-SA2402-D32	501074	.079	.630	1.260	–	.625	.630	4.331	–	–	SA 24-20...
HSA 1616R-SA2402-32-.625	HSA 10R-SA2402-D32	501081	.079	.630	1.260	–	.625	.630	4.331	–	–	SA 24-20...
HSA 1616L-SA24025-32-.625	HSA 10L-SA24025-D32	501461	.098	.630	1.260	–	.625	.630	4.331	–	–	SA 24-25...
HSA 1616R-SA24025-32-.625	HSA 10R-SA24025-D32	501462	.098	.630	1.260	–	.625	.630	4.331	–	–	SA 24-25...
HSA 1616L-SA2403-20-.625	HSA 10L-SA2403-D20	501465	.118	.394	.787	–	.625	.630	4.331	–	–	SA 24-30...
HSA 1616R-SA2403-20-.625	HSA 10R-SA2403-D20	501466	.118	.394	.787	–	.625	.630	4.331	–	–	SA 24-30...
HSA 1616L-SA2403-26-.625	HSA 10L-SA2403-D26	501467	.118	.512	1.024	–	.625	.630	4.331	–	–	SA 24-30...
HSA 1616R-SA2403-26-.625	HSA 10R-SA2403-D26	501468	.118	.512	1.024	–	.625	.630	4.331	–	–	SA 24-30...
HSA 1616L-SA2403-32-.625	HSA 10L-SA2403-D32	501076	.118	.630	1.260	–	.625	.630	4.331	–	–	SA 24-30...
HSA 1616R-SA2403-32-.625	HSA 10R-SA2403-D32	501083	.118	.630	1.260	–	.625	.630	4.331	–	–	SA 24-30...
HSA 2020L-SA1603-26-.750	HSA 12L-SA1603-D26	501469	.118	.512	1.024	–	.750	.787	4.331	–	–	SA16-30...
HSA 2020R-SA1603-26-.750	HSA 12R-SA1603-D26	501470	.118	.512	1.024	–	.750	.787	4.331	–	–	SA16-30...
HSA 2020L-SA2402-20-.750	HSA 12L-SA2402-D20	501471	.079	.394	.787	–	.750	.787	4.331	–	–	SA 24-20...
HSA 2020R-SA2402-20-.750	HSA 12R-SA2402-D20	501472	.079	.394	.787	–	.750	.787	4.331	–	–	SA 24-20...
HSA 2020L-SA2402-32-.750	HSA 12L-SA2402-D32	501473	.079	.630	1.260	–	.750	.787	4.331	1.004	.787	SA 24-20...
HSA 2020R-SA2402-32-.750	HSA 12R-SA2402-D32	501474	.079	.630	1.260	–	.750	.787	4.331	1.004	.787	SA 24-20...
HSA 2020L-SA2403-32-.750	HSA 12L-SA2403-D32	501475	.118	.630	1.260	–	.750	.787	4.331	–	–	SA 24-30...
HSA 2020R-SA2403-32-.750	HSA 12R-SA2403-D32	501476	.118	.630	1.260	–	.750	.787	4.331	–	–	SA 24-30...

D_{max} = Maximum diameter in solid material

Spare parts

Holder	Screw	Key
HSA 0808...	AS 0022-12	KS 8000
HSA 1010... – 2020...	AS 0022-12	KS 8000

1

HSA-S-ACS1

SWISS STYLE

inch & metric

with ACS

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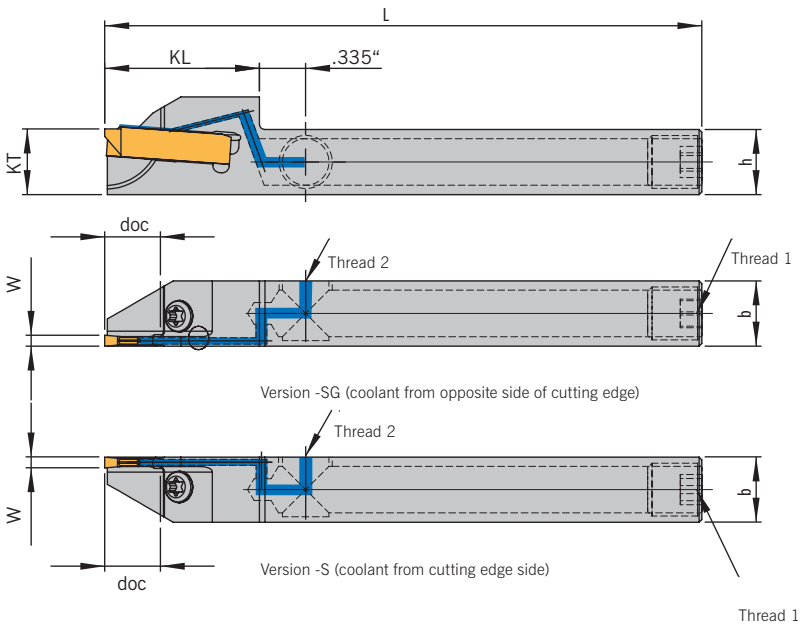
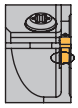
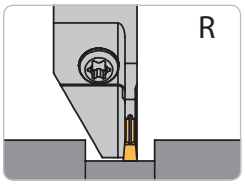
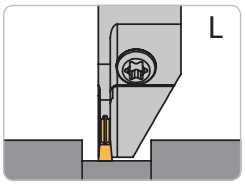




Right hand shown

Left hand shown





Swiss style monoblock holders with Through Coolant (ACS1)
Coolant access from the side, screw clamping from top

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	h	b	L	L_5	AKL	KT	Insert
HSA 1212S-L-SA2402-20-ACS1	–	501729	.079	.394	.787	.472	.472	4.331	.335	1.122	.472	SA 24-20...
HSA 1212S-R-SA2402-20-ACS1	–	501730	.079	.394	.787	.472	.472	4.331	.335	1.122	.472	SA 24-20...
HSA 1212S-L-SA2402-26-ACS1	–	501732	.079	.512	1.024	.472	.472	4.331	.335	1.240	.472	SA 24-20...
HSA 1212S-R-SA2402-26-ACS1	–	501731	.079	.512	1.024	.472	.472	4.331	.335	1.240	.472	SA 24-20...
HSA 1616S-L-SA2402-32-ACS1-.625	HSA 10S-L-SA2402-D32-ACS1	501733	.079	.630	1.260	.625	.630	4.331	.335	1.358	.630	SA 24-20...
HSA 1616S-R-SA2402-32-ACS1-.625	HSA 10S-R-SA2402-D32-ACS1	501734	.079	.630	1.260	.625	.630	4.331	.335	1.358	.630	SA 24-20...
HSA 1616S-L-SA24025-32-ACS1-.625	HSA 10S-L-SA24025-D32-ACS1	501736	.098	.630	1.260	.625	.630	4.331	.335	1.358	.630	SA 24-25...
HSA 1616S-R-SA24025-32-ACS1-.625	HSA 10S-R-SA24025-D32-ACS1	501735	.098	.630	1.260	.625	.630	4.331	.335	1.358	.630	SA 24-25...
HSA 1616S-L-SA2403-32-ACS1-.625	HSA 10S-L-SA2403-D32-ACS1	501737	.118	.630	1.260	.625	.630	4.331	.335	1.358	.630	SA 24-30...
HSA 1616S-R-SA2403-32-ACS1-.625	HSA 10S-R-SA2403-D32-ACS1	501738	.118	.630	1.260	.625	.630	4.331	.335	1.358	.630	SA 24-30...

Spare parts

Holder	Screw	Key
HSA 1212S....-SA24...ACS1	AS 0022	KS 8000
HSA 1616S....-SA24...ACS1...	AS 0022	KS 8000

ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 33 for more information.

All dimensions in inches

HSA-UD-ACS1

SWISS STYLE

metric only

with ACS

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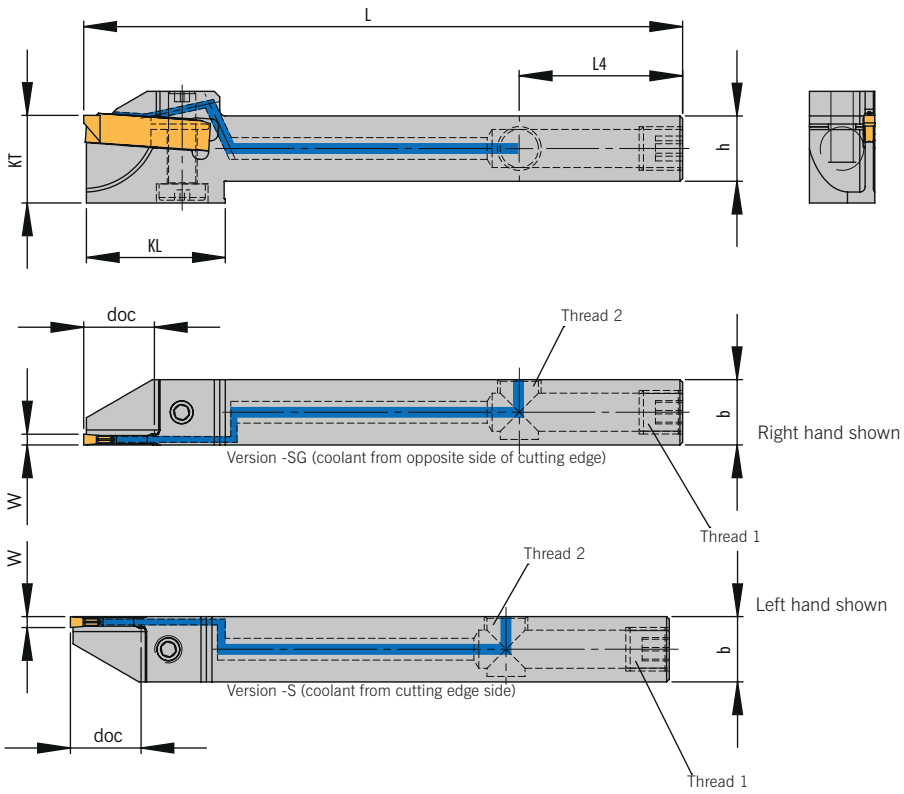

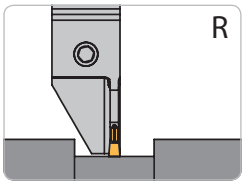

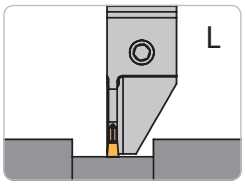

1

Swiss style monoblock holders with Through Coolant (ACS1)
Coolant access from the side, screw clamping from top and bottom

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	h	b	L	L_4	KL	KT	Insert
HSA 1212UD-L-SA2402-26-ACS1	–	501741	.079	.512	1.024	.472	.472	4.331	1.181	1.024	.630	SA 24-20...
HSA 1212UD-R-SA2402-26-ACS1	–	501742	.079	.512	1.024	.472	.472	4.331	1.181	1.024	.630	SA 24-20...

Spare parts

Holder	Screw	Key
HSA 1212UD...	AS 0084	KP 3111

ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 33 for more information.

All dimensions in inches

1

HSA-UD-ACS2

SWISS STYLE

metric only

with ACS

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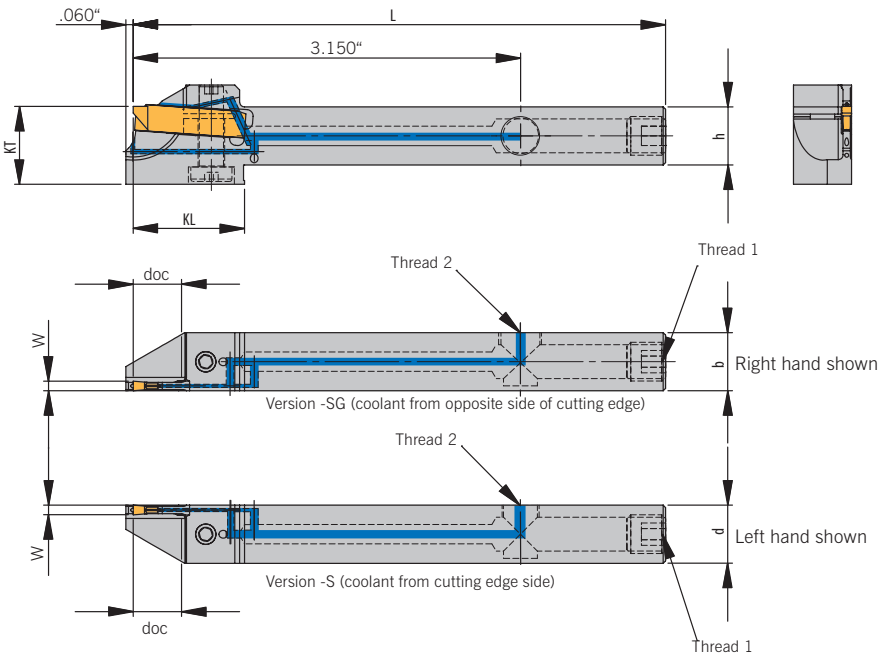
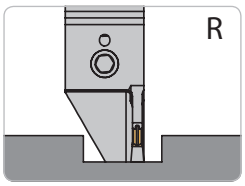
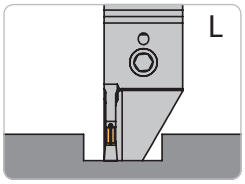






Swiss style monoblock holders with Through Coolant (ACS2)
Coolant access from the side, screw clamping from top and bottom

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	h	b	L	KL	KT	Insert
HSA 1212UD-L-SA2402-20-ACS2	–	**501739**	.079	.512	.787	.472	.472	4.331	.906	.630	**SA 24-20...**
HSA 1212UD-R-SA2402-20-ACS2	–	**501740**	.079	.512	.787	.472	.472	4.331	.906	.630	**SA 24-20...**

Spare parts

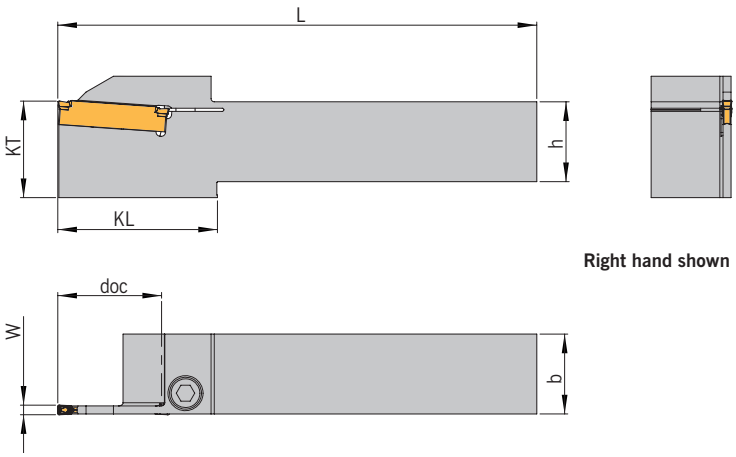
Holder	Screw	Key
HSA 1212UD...-SA24...ACS2	AS 0022	KS 8000

ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 33 for more information.

All dimensions in inches

HSA

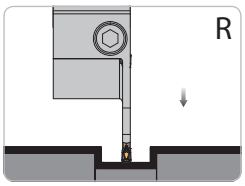


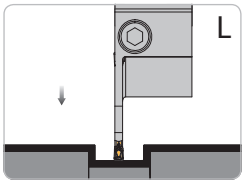
Right hand shown

inch & metric

without ic

Page 64–66





1

Monoblock holders

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	D_R	h	b	L	KL	KT	Insert
HSA 1616L-SA24015-44-.625	HSA 10L-SA24015-D44	501477	.059	.866	1.732	2.402	.625	.630	4.921	1.575	.787	SA 24-15...
HSA 1616R-SA24015-44-.625	HSA 10R-SA24015-D44	501478	.059	.866	1.732	2.402	.625	.630	4.921	1.575	.787	SA 24-15...
HSA 1616L-SA2402-44-.625	HSA 10L-SA2402-D44	501075	.079	.866	1.732	2.402	.625	.630	4.921	1.575	.787	SA 24-20...
HSA 1616R-SA2402-44-.625	HSA 10R-SA2402-D44	501082	.079	.866	1.732	2.402	.625	.630	4.921	1.575	.787	SA 24-20...
HSA 1616L-SA2403-44-.625	HSA 10L-SA2403-D44	501077	.118	.866	1.732	2.402	.625	.630	4.921	1.575	.787	SA 24-30...
HSA 1616R-SA2403-44-.625	HSA 10R-SA2403-D44	501084	.118	.866	1.732	2.402	.625	.630	4.921	1.575	.787	SA 24-30...
HSA 2020L-SA24015-44-.750	HSA 12L-SA24015-D44	501479	.059	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-15...
HSA 2020R-SA24015-44-.750	HSA 12R-SA24015-D44	501186	.059	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-15...
HSA 2020L-SA2402-44-.750	HSA 12L-SA2402-D44	501056	.079	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-20...
HSA 2020R-SA2402-44-.750	HSA 12R-SA2402-D44	501055	.079	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-20...
HSA 2020L-SA24025-44-.750	HSA 12L-SA24025-D44	501480	.098	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-25...
HSA 2020R-SA24025-44-.750	HSA 12R-SA24025-D44	501481	.098	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-25...
HSA 2020L-SA2403-44-.750	HSA 12L-SA2403-D44	501057	.118	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-30...
HSA 2020R-SA2403-44-.750	HSA 12R-SA2403-D44	501062	.118	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-30...
HSA 2020L-SA2404-44-.750	HSA 12L-SA2404-D44	501205	.157	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-40...
HSA 2020R-SA2404-44-.750	HSA 12R-SA2404-D44	501482	.157	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-40...
HSA 2020L-SA3502-52-.750	HSA 12L-SA3502-D52	501058	.079	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-20...
HSA 2020R-SA3502-52-.750	HSA 12R-SA3502-D52	501063	.079	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-20...
HSA 2020L-SA3502-65-.750	HSA 12L-SA3502-D65	501059	.079	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-20...
HSA 2020R-SA3502-65-.750	HSA 12R-SA3502-D65	501064	.079	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-20...
HSA 2020L-SA3503-52-.750	HSA 12L-SA3503-D52	108011	.118	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-30...
HSA 2020R-SA3503-52-.750	HSA 12R-SA3503-D52	108013	.118	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-30...
HSA 2020L-SA3503-65-.750	HSA 12L-SA3503-D65	501061	.118	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-30...
HSA 2020R-SA3503-65-.750	HSA 12R-SA3503-D65	501066	.118	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-30...
HSA 2020L-SA3504-52-.750	HSA 12L-SA3504-D52	108017	.157	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-40...
HSA 2020R-SA3504-52-.750	HSA 12R-SA3504-D52	108015	.157	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-40...
HSA 2020L-SA3504-65-.750	HSA 12L-SA3504-D65	501485	.157	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-40...
HSA 2020R-SA3504-65-.750	HSA 12R-SA3504-D65	501486	.157	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-40...
HSA 2020L-SA3506-65-.750	HSA 12L-SA3506-D65	501487	.236	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-60...
HSA 2020R-SA3506-65-.750	HSA 12R-SA3506-D65	501488	.236	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-60...
HSA 2525L-SA2402-44-1.000	HSA 16L-SA2402-D44	92682	.079	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-20...
HSA 2525R-SA2402-44-1.000	HSA 16R-SA2402-D44	92684	.079	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-20...
HSA 2525L-SA2403-44-1.000	HSA 16L-SA2403-D44	92686	.118	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-30...
HSA 2525R-SA2403-44-1.000	HSA 16R-SA2403-D44	92688	.118	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-30...
HSA 2525L-SA2404-44-1.000	HSA 16L-SA2404-D44	109549	.157	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-40...
HSA 2525R-SA2404-44-1.000	HSA 16R-SA2404-D44	109552	.157	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-40...
HSA 2525L-SA2405-44	–	105283	.197	.866	1.732	2.402	.984	.984	5.906	–	–	SA24-50...
HSA 2525R-SA2405-44	–	105285	.197	.866	1.732	2.402	.984	.984	5.906	–	–	SA24-50...

All dimensions in inches

Monoblock holders

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	D_R	h	b	L	KL	KT	Insert
HSA 2525L-SA3502-52-1.000	HSA 16L-SA3502-D52	92690	.079	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-20...
HSA 2525R-SA3502-52-1.000	HSA 16R-SA3502-D52	92692	.079	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-20...
HSA 2525L-SA3502-65-1.000	HSA 16L-SA3502-D65	92698	.079	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-20...
HSA 2525R-SA3502-65-1.000	HSA 16R-SA3502-D65	92700	.079	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-20...
HSA 2525L-SA3503-52-1.000	HSA 16L-SA3503-D52	92694	.118	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-30...
HSA 2525R-SA3503-52-1.000	HSA 16R-SA3503-D52	92696	.118	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-30...
HSA 2525L-SA3503-65-1.000	HSA 16L-SA3503-D65	92702	.118	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-30...
HSA 2525R-SA3503-65-1.000	HSA 16R-SA3503-D65	92704	.118	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-30...
HSA 2525L-SA3504-52-1.000	HSA 16L-SA3504-D52	109550	.157	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-40...
HSA 2525R-SA3504-52-1.000	HSA 16R-SA3504-D52	109553	.157	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-40...
HSA 2525L-SA3504-65-1.000	HSA 16L-SA3504-D65	108021	.157	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-40...
HSA 2525R-SA3504-65-1.000	HSA 16R-SA3504-D65	108019	.157	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-40...
HSA 2525L-SA3506-65-1.000	HSA 16L-SA3506-D65	109551	.236	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-60...
HSA 2525R-SA3506-65-1.000	HSA 16R-SA3506-D65	109554	.236	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-60...
HSA 2525R-SA3508-65	–	104188	.315	1.280	2.559	3.150	.984	.984	6.693	1.969	1.181	SA 35-80...
HSA 2525L-SA3508-65	–	102062	.315	1.280	2.559	3.150	.984	.984	6.693	1.969	1.181	SA 35-80...
HSA 3225L-SA2403-44-1.250	HSA 86L-SA2403-D44	501085	.118	.866	1.732	2.402	1.250	.984	6.693	–	–	SA 24-30...
HSA 3225R-SA2403-44-1.250	HSA 86R-SA2403-D44	501087	.118	.866	1.732	2.402	1.250	.984	6.693	–	–	SA 24-30...
HSA 3225L-SA2404-44-1.250	HSA 86L-SA2404-D44	501489	.157	.866	1.732	2.402	1.250	.984	6.693	–	–	SA 24-40...
HSA 3225R-SA2404-44-1.250	HSA 86R-SA2404-D44	501490	.157	.866	1.732	2.402	1.250	.984	6.693	–	–	SA 24-40...
HSA 3225L-SA3503-65-1.250	HSA 86L-SA3503-D65	501086	.118	1.280	2.559	3.150	1.250	.984	6.693	1.969	1.260	SA 35-30...
HSA 3225R-SA3503-65-1.250	HSA 86R-SA3503-D65	501088	.118	1.280	2.559	3.150	1.250	.984	6.693	1.969	1.260	SA 35-30...
HSA 3225L-SA3504-65-1.250	HSA 86L-SA3504-D65	501491	.157	1.280	2.559	3.150	1.250	.984	6.693	–	–	SA 35-40...
HSA 3225R-SA3504-65-1.250	HSA 86R-SA3504-D65	501492	.157	1.280	2.559	3.150	1.250	.984	6.693	–	–	SA 35-40...
HSA 3232L-SA3506-65-1.250	HSA 20L-SA3506-D65	501210	.236	1.280	2.559	3.150	1.250	1.260	6.693	–	–	SA 35-60...
HSA 3232R-SA3506-65-1.250	HSA 20R-SA3506-D65	501495	.236	1.280	2.559	3.150	1.250	1.260	6.693	–	–	SA 35-60...
HSA 3232L-SA3508-65-1.250	HSA 20L-SA3508-D65	501493	.315	1.280	2.559	3.150	1.250	1.260	6.693	–	–	SA 35-80...
HSA 3232R-SA3508-65-1.250	HSA 20R-SA3508-D65	501496	.315	1.280	2.559	3.150	1.250	1.260	6.693	–	–	SA 35-80...
HSA 3232L-SA4010-75-1.250	HSA 20L-SA4010-D75	501494	.394	1.476	2.953	3.543	1.250	1.260	6.693	–	–	SA 40-100...
HSA 3232R-SA4010-75-1.250	HSA 20R-SA4010-D75	501497	.394	1.476	2.953	3.543	1.250	1.260	6.693	–	–	SA 40-100...

D_{max} = Maximum diameter in solid material

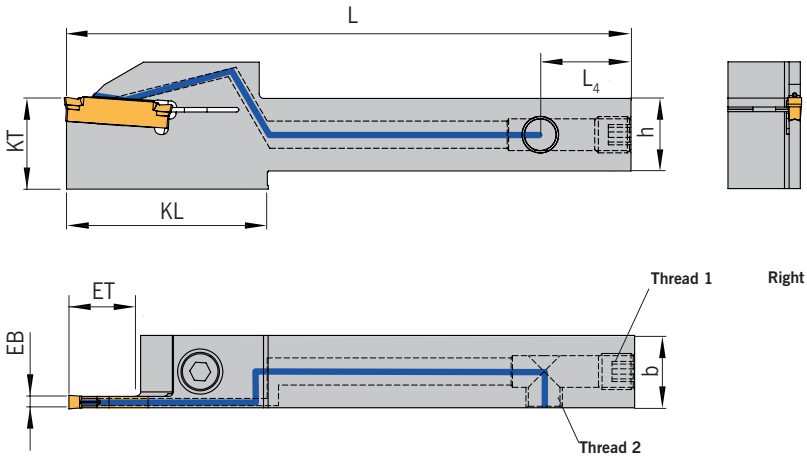
D_R = Maximum diameter for tube material

Spare parts

Holder	Screw	Key
HSA...-SA24...	DIN912 M5X16-12,9	KP 1321
HSA...-SA35...	DIN912 M6X20-12,9	KP 5421

1

HSA-ACS1



inch & metric

with ACS

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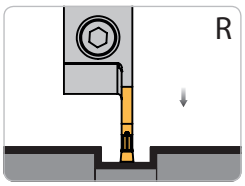
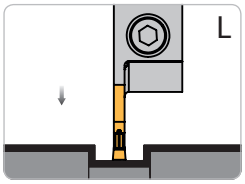




Monoblock holder with Through Coolant (ACS1)

Designation ISO	Designation ANSI	EDP	W	doc	D_{max}	D_R	h	b	L	KL	KT	Insert
HSA 1616L-SA2402-32-ACS1-.625	HSA 10L-SA2402-D32-ACS1	501715	.079	.630	1.260		.625	.630	4.921	1.496	.787	SA 24-20...
HSA 1616R-SA2402-32-ACS1-.625	HSA 10R-SA2402-D32-ACS1	501716	.079	.630	1.260		.625	.630	4.921	1.496	.787	SA 24-20...
HSA 1616L-SA2403-32-ACS1-.625	HSA 10L-SA2403-D32-ACS1	501718	.118	.630	1.260	–	.625	.630	4.921	1.496	.787	SA 24-30...
HSA 1616R-SA2403-32-ACS1-.625	HSA 10R-SA2403-D32-ACS1	501717	.118	.630	1.260	–	.625	.630	4.921	1.496	.787	SA 24-30...
HSA 1616L-SA2403-44-ACS1-.625	HSA 10L-SA2403-D44-ACS1	501719	.118	.866	1.732	2.402	.625	.630	4.921	1.772	.787	SA 24-30...
HSA 1616R-SA2403-44-ACS1-.625	HSA 10R-SA2403-D44-ACS1	501720	.118	.866	1.732	2.402	.625	.630	4.921	1.772	.787	SA 24-30...
HSA 2020L-SA2403-32-ACS1-.750	HSA 12L-SA2403-D32-ACS1	501721	.118	.630	1.260	–	.750	.787	4.921	–	–	SA 24-30...
HSA 2020R-SA2403-32-ACS1-.750	HSA 12R-SA2403-D32-ACS1	501722	.118	.630	1.260	–	.750	.787	4.921	–	–	SA 24-30...
HSA 2020L-SA2403-44-ACS1-.750	HSA 12L-SA2403-D44-ACS1	501724	.118	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-30...
HSA 2020R-SA2403-44-ACS1-.750	HSA 12R-SA2403-D44-ACS1	501723	.118	.866	1.732	2.402	.750	.787	4.921	–	–	SA 24-30...
HSA 2525L-SA2403-44-ACS1-1.000	HSA 16L-SA2403-D44-ACS1	109516	.118	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-30...
HSA 2525R-SA2403-44-ACS1-1.000	HSA 16R-SA2403-D44-ACS1	109533	.118	.866	1.732	2.402	1.000	1.000	5.906	–	–	SA 24-30...
HSA 2020L-SA3503-52-ACS1-.750	HSA 12L-SA3503-D52-ACS1	501725	.118	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-30...
HSA 2020R-SA3503-52-ACS1-.750	HSA 12R-SA3503-D52-ACS1	501726	.118	1.024	2.047	2.677	.750	.787	5.906	1.732	1.181	SA 35-30...
HSA 2020L-SA3503-65-ACS1-.750	HSA 12L-SA3503-D52-ACS1	501728	.118	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-30...
HSA 2020R-SA3503-65-ACS1-.750	HSA 12R-SA3503-D52-ACS1	501727	.118	1.280	2.559	3.150	.750	.787	5.906	1.969	1.181	SA 35-30...
HSA 2525L-SA3503-52-ACS1-1.000	HSA 16L-SA3503-D52-ACS1	109536	.118	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-30...
HSA 2525R-SA3503-52-ACS1-1.000	HSA 16R-SA3503-D52-ACS1	109534	.118	1.024	2.047	2.677	1.000	1.000	5.906	1.732	1.181	SA 35-30...
HSA 2525L-SA3503-65-ACS1-1.000	HSA 16L-SA3503-D65-ACS1	109532	.118	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-30...
HSA 2525R-SA3503-65-ACS1-1.000	HSA 16R-SA3503-D65-ACS1	109535	.118	1.280	2.559	3.150	1.000	1.000	5.906	1.969	1.181	SA 35-30...

Spare parts

Holder	Screw	Key
HSA...-SA24...-ACS1	DIN912 M5X16-12,9	KP 1321
HSA...-SA35...-ACS1	DIN912 M6X20-12,9	KP 5421

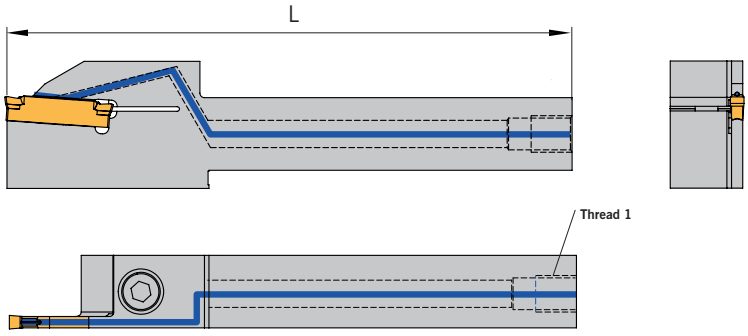
ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 33 for more information.

All dimensions in inches

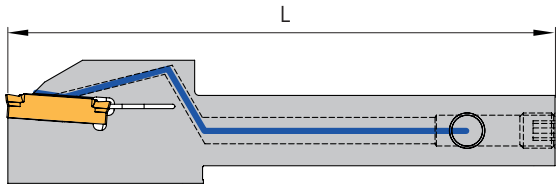
ARNO® SpecialDesign

Monoblock holder with Through Coolant – access from the back



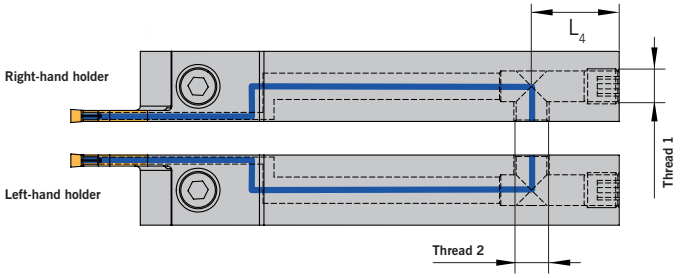
From holder	Thread 1			L
	1/16 NPT	1/8 NPT	1/4 NPT	

Monoblock holder with Through Coolant – access from the side

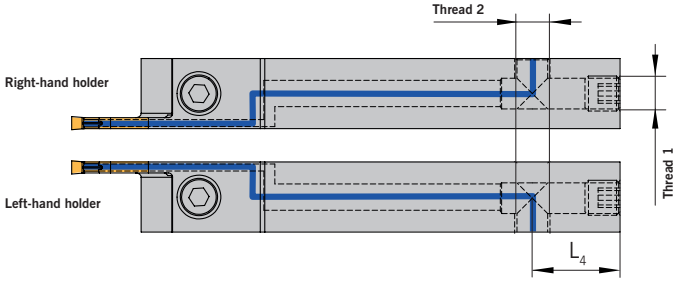


Please select:

Design S – Thread 2 is on the same side as the cutting edge



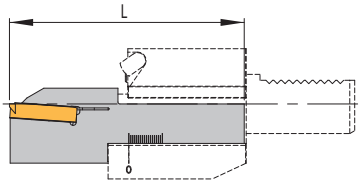
Design SG – Thread 2 is on the opposite side of the cutting edge



From holder	Thread 1		Thread 2		L_4	L
	1/8 NPT	1/4 NPT	1/8 NPT	1/4 NPT		

with ACS

This custom holder will be produced at the same price as the standard holder.



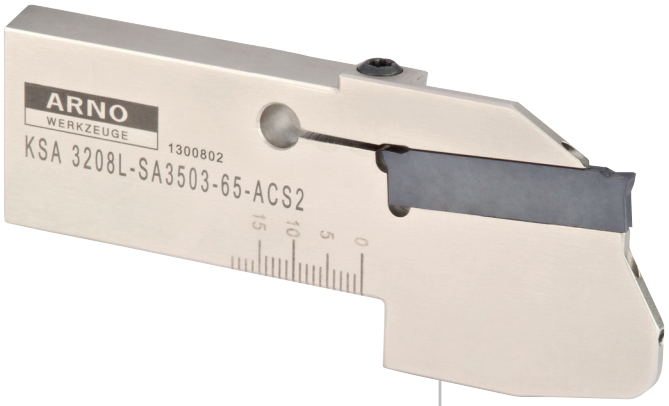
Remark for VDI holder Form C

When using VDI holders Form C, please set overall length (L) according to chart below:

Designation	L
HSA 1616L-SA2403-32-ACS1-..	3.622
HSA 1616R-SA2403-32-ACS1-..	
HSA 1616L-SA2403-44-ACS1-..	3.898
HSA 1616R-SA2403-44-ACS1-..	
HSA 2020L-SA2403-32-ACS1-..	3.780
HSA 2020R-SA2403-32-ACS1-..	
HSA 2020L-SA2403-44-ACS1-..	4.055
HSA 2020R-SA2403-44-ACS1-..	
HSA 2020L-SA3503-52-ACS1-..	4.449
HSA 2020R-SA3503-52-ACS1-..	
HSA 2020L-SA3503-65-ACS1-..	4.685
HSA 2020R-SA3503-65-ACS1-..	
HSA 2525L-SA2403-44-ACS1-..	4.547
HSA 2525R-SA2403-44-ACS1-..	
HSA 2525L-SA3503-52-ACS1-..	5.039
HSA 2525R-SA3503-52-ACS1-..	
HSA 2525L-SA3503-65-ACS1-..	5.276
HSA 2525R-SA3503-65-ACS1-..	

1

Blades



KSA	3208L	SA	3503	65	ACS2
K = Blade	Blade height 32mm	Insert	Insert size	Part-off diameter	ARNO-Cooling-System®
S = Grooving	Blade thickness 8mm	External	35 – Insert length 35mm (1.378")	65mm (2.559")	ACS1 = with one coolant hole
A = External	L = Left hand		03 – Groove width 3mm (.118")		ACS2 = with two coolant holes
	R = Right hand				

Inserts

SA35	30	03	N	T1	AP	5020
SA = Grooving External	Groove width 3.0mm (.118")	Corner radius R = 0.3mm (.012")	N = Neutral	Geometry	ARNO®-Application area	Grade code (ISO standard)
35 = Insert length			R = Right-hand			
			L = Left-hand			

Part-off blades

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Clamping blocks

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Indexable inserts

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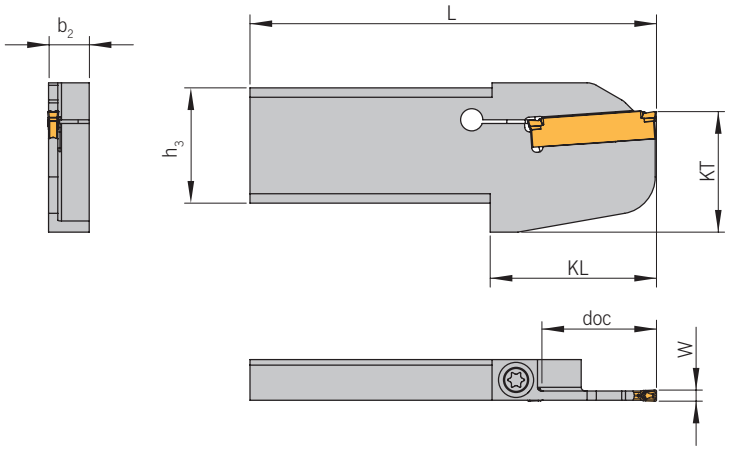
KSA



Left hand shown

without ic

Page 64–66

R L R-ÜK L-ÜK

1

Blades

Designation	EDP	W	doc	D_{max}	D_R	h_3	b_2	L	KL	KT	Insert
KSA 2608L-SA24015-20	96585	.059	.394	.787	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608R-SA24015-20	96587	.059	.394	.787	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608L-SA24015-20-ÜK	96591	.059	.394	.787	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608R-SA24015-20-ÜK	96589	.059	.394	.787	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608L-SA24015-32	96599	.059	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608R-SA24015-32	96597	.059	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608L-SA24015-32-ÜK	96593	.059	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608R-SA24015-32-ÜK	96595	.059	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608L-SA24015-44	96601	.059	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608R-SA24015-44	96603	.059	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608L-SA24015-44-ÜK	96607	.059	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608R-SA24015-44-ÜK	96605	.059	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-15...
KSA 2608L-SA2402-32	92598	.079	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608R-SA2402-32	92604	.079	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608L-SA2402-32-ÜK	92600	.079	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608R-SA2402-32-ÜK	92602	.079	.630	1.260	–	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608L-SA2402-44	92582	.079	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608R-SA2402-44	92588	.079	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608L-SA2402-44-ÜK	92584	.079	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608R-SA2402-44-ÜK	92586	.079	.866	1.732	2.402	1.024	.315	4.331	–	–	SA 24-20...
KSA 2608L-SA2403-26	97400	.118	.512	1.024	–	1.024	.315	4.331	–	–	SA 24-30...
KSA 2608R-SA2403-26	97402	.118	.512	1.024	–	1.024	.315	4.331	–	–	SA 24-30...
KSA 2608L-SA3502-65	92566	.079	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-20...
KSA 2608R-SA3502-65	92568	.079	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-20...
KSA 2608L-SA3502-65-ÜK	92572	.079	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-20...
KSA 2608R-SA3502-65-ÜK	92570	.079	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-20...
KSA 2608L-SA3503-65	91835	.118	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-30...
KSA 2608R-SA3503-65	91837	.118	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-30...
KSA 2608L-SA3503-65-ÜK	91841	.118	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-30...
KSA 2608R-SA3503-65-ÜK	91839	.118	1.280	2.559	3.150	1.024	.315	4.331	1.772	1.142	SA 35-30...
KSA 2611L-SA3503-65	91843	.118	1.280	2.559	3.150	1.024	.433	4.331	1.772	1.142	SA 35-30...
KSA 2611R-SA3503-65	91847	.118	1.280	2.559	3.150	1.024	.433	4.331	1.772	1.142	SA 35-30...
KSA 2611L-SA3503-65-ÜK	91845	.118	1.280	2.559	3.150	1.024	.433	4.331	1.772	1.142	SA 35-30...
KSA 2611R-SA3503-65-ÜK	91849	.118	1.280	2.559	3.150	1.024	.433	4.331	1.772	1.142	SA 35-30...
KSA 3208L-SA2402-44	92596	.079	.866	1.732	2.402	1.260	.315	4.331	–	–	SA 24-20...
KSA 3208R-SA2402-44	92590	.079	.866	1.732	2.402	1.260	.315	4.331	–	–	SA 24-20...
KSA 3208L-SA2402-44-ÜK	92594	.079	.866	1.732	2.402	1.260	.315	4.331	–	–	SA 24-20...
KSA 3208R-SA2402-44-ÜK	92592	.079	.866	1.732	2.402	1.260	.315	4.331	–	–	SA 24-20...
KSA 3208L-SA3502-65	92580	.079	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	SA 24-20...

All dimensions in inches

Blades - continued

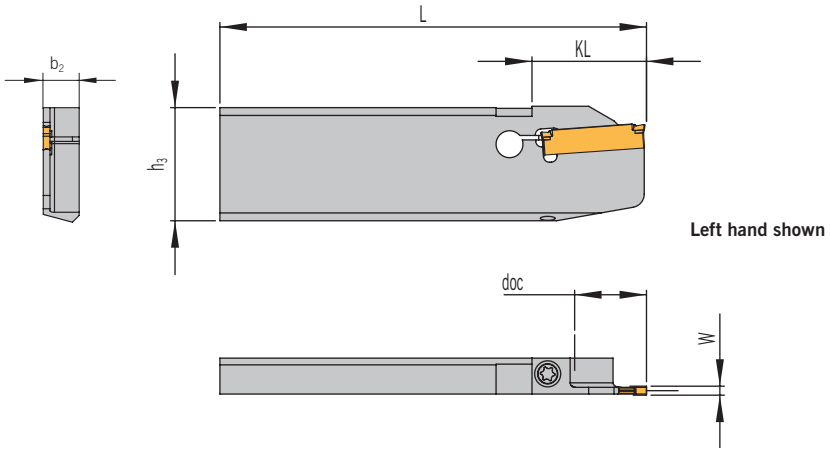
Designation	EDP	W	doc	D_{max}	D_R	h_3	b_2	L	KL	KT	Insert
KSA 3208R-SA3502-65	92578	.079	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-20...**
KSA 3208L-SA3502-65-ÜK	92574	.079	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-20...**
KSA 3208R-SA3502-65-ÜK	92576	.079	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-20...**
KSA 3208L-SA3503-65	91851	.118	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-30...**
KSA 3208R-SA3503-65	91855	.118	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-30...**
KSA 3208L-SA3503-65-ÜK	91853	.118	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-30...**
KSA 3208R-SA3503-65-ÜK	91857	.118	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-30...**
KSA 3208L-SA3504-65	96466	.157	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-40...**
KSA 3208R-SA3504-65	96468	.157	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-40...**
KSA 3208L-SA3504-65-ÜK	96472	.157	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-40...**
KSA 3208R-SA3504-65-ÜK	96470	.157	1.280	2.559	3.150	1.260	.315	4.331	1.772	1.280	**SA 35-40...**
KSA 3211L-SA3503-65	91859	.118	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-30...**
KSA 3211R-SA3503-65	91863	.118	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-30...**
KSA 3211L-SA3503-65-ÜK	91861	.118	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-30...**
KSA 3211R-SA3503-65-ÜK	91865	.118	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-30...**
KSA 3211L-SA3504-65	96480	.157	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-40...**
KSA 3211R-SA3504-65	96478	.157	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-40...**
KSA 3211L-SA3504-65-ÜK	96474	.157	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-40...**
KSA 3211R-SA3504-65-ÜK	96476	.157	1.280	2.559	3.150	1.260	.433	4.331	1.772	1.280	**SA 35-40...**

D_{max} = Maximum diameter in solid material
D_R = Maximum diameter for tube material

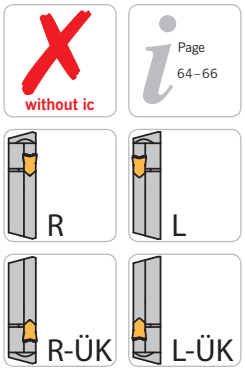
Spare parts

Blade	Screw	Key
KSA 260895 R/L-SA35...	AS 0022	T5215-IP
KSA ...08 R/L-SA24...	AS 0022	T5215-IP
KSA ...08 R/L-SA35...	AS 0045	T5220-IP
KSA ...11 R/L-SA35...	SA5T	T5220-IP

KSA



Left hand shown



1

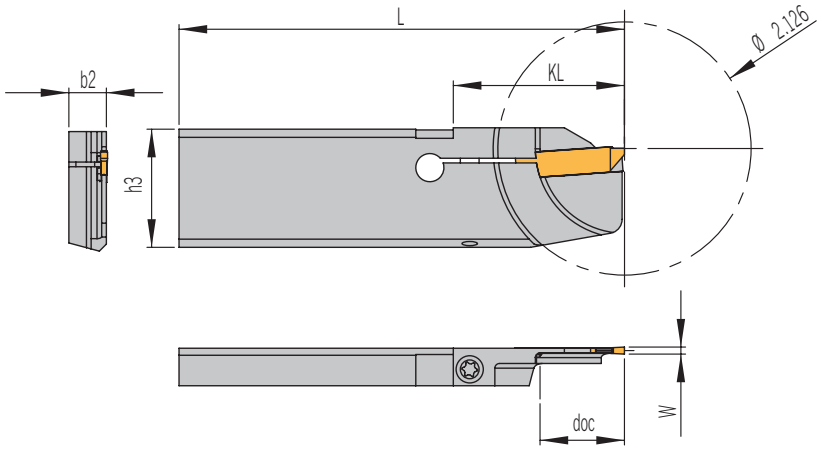
Blades – machine specific
Emco – Index – Traub

Designation	EDP	W	doc	D_{max}	D_R	h_3	b_2	L	KL	KT	Insert
KSA 260895L-SA1602-20	92841	.079	.394	.787	–	1.024	.315	3.740	–	–	SA 16-20...
KSA 260895R-SA1602-20	92843	.079	.394	.787	–	1.024	.315	3.740	–	–	SA 16-20...
KSA 260895L-SA24015-20	96610	.059	.394	.787	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895R-SA24015-20	96612	.059	.394	.787	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895L-SA24015-20-ÜK	96615	.059	.394	.787	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895R-SA24015-20-ÜK	96614	.059	.394	.787	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895L-SA24015-32	96617	.059	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895R-SA24015-32	96619	.059	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895L-SA24015-32-ÜK	96623	.059	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895R-SA24015-32-ÜK	96621	.059	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895L-SA24015-44	96631	.059	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895R-SA24015-44	96629	.059	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895L-SA24015-44-ÜK	96625	.059	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895R-SA24015-44-ÜK	96627	.059	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-15...
KSA 260895L-SA2402-32	92845	.079	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-20...
KSA 260895R-SA2402-32	92847	.079	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-20...
KSA 260895L-SA2403-32	96075	.118	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-30...
KSA 260895R-SA2403-32	96077	.118	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-30...
KSA 260895L-SA2403-32-ÜK	96081	.118	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-30...
KSA 260895R-SA2403-32-ÜK	96079	.118	.630	1.260	–	1.024	.315	3.740	–	–	SA 24-30...
KSA 260895L-SA2403-44	96069	.118	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-30...
KSA 260895R-SA2403-44	95570	.118	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-30...
KSA 260895L-SA2403-44-ÜK	96071	.118	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-30...
KSA 260895R-SA2403-44-ÜK	96073	.118	.866	1.732	2.402	1.024	.315	3.740	–	–	SA 24-30...
KSA 320895L-SA2402-44	92849	.079	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-20...
KSA 320895R-SA2402-44	92851	.079	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-20...
KSA 320895L-SA2402-44-ÜK	92855	.079	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-20...
KSA 320895R-SA2402-44-ÜK	92853	.079	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-20...
KSA 320895L-SA2403-44	92857	.118	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-30...
KSA 320895R-SA2403-44	92859	.118	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-30...
KSA 320895L-SA2403-44-ÜK	92863	.118	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-30...
KSA 320895R-SA2403-44-ÜK	92861	.118	.866	1.732	2.402	1.260	.315	3.740	–	–	SA 24-30...

D_{max} = Maximum diameter in solid material
D_R = Maximum diameter for tube material

All dimensions in inches

KSA



without ic

Page 64–66

R

1

Blades – machine specific
Traub TNK36 / TNL32 / TNL26K and Index MS18C

Designation	EDP	W	doc	D_{max}	D_R	h_3	b_2	L	KL	KT	Insert
KSA 260895R-SA24015-S1-36	**101571**	.059	.709	1.417	–	1.024	.315	3.740	–	–	**SA 24-15...**
KSA 260895R-SA2402-S1-36	**101573**	.079	.709	1.417	–	1.024	.315	3.740	–	–	**SA 24-20...**

D_{max} = Maximum diameter in solid material
D_R = Maximum diameter for tube material

Spare parts

Blade	Screw	Key
KSA 260895...	AS 0022	T5215-IP

KSA-N

without ic

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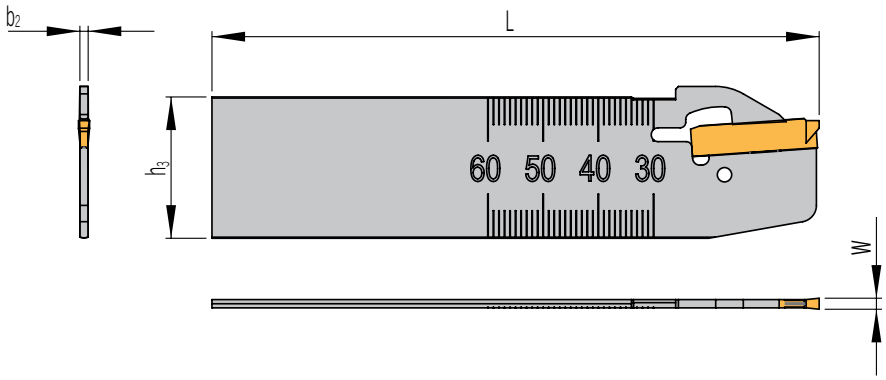


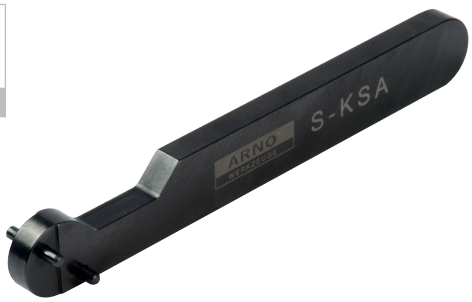
1

Blades - self clamping

Designation	EDP	W	h_3	b_2	L	Insert
KSA 2602N	97818	.079	1.024	.059	4.331	SA24E-2002... / SA24-20...
KSA 2603N	97820	.118	1.024	.098	4.331	SA24E-3003... / SA24-30...
KSA 3202N	97822	.079	1.260	.059	4.331	SA24E-2002... / SA24-20...
KSA 3203N	97824	.118	1.260	.098	4.331	SA24E-3003... / SA24-30...
KSA 3203N-SA35	102569	.118	1.260	.098	5.906	SA35-30...
KSA 3204N-SA35	102571	.157	1.260	.138	5.906	SA35-40...
KSA 26025N	106268	.098	1.024	.079	4.331	SA24E-2503... / SA24-25...
KSA 32025N	104675	.098	1.260	.079	4.331	SA24E-2503... / SA24-25...

Spare parts

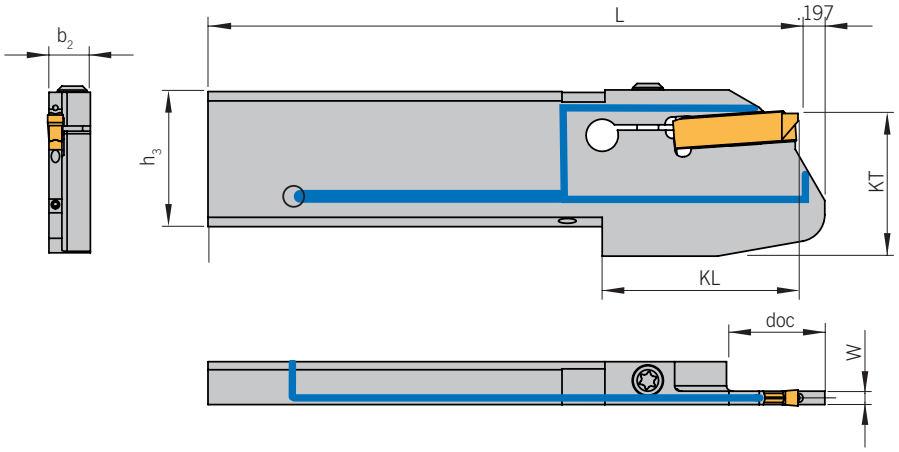
Blade	Key
KSA ...N	S-KSA



Remark: For assembly instructions please see page 82.

All dimensions in inches

KSA-ACS2



with ACS

Page 64–66

L

1

Blade with Through Coolant ACS2

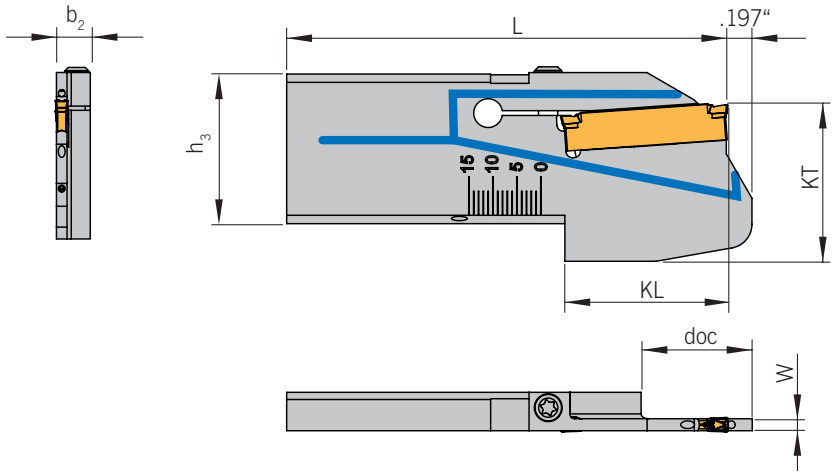
Designation	EDP	W	doc	D_{max}	D_R	h_3	b_2	L	KL	KT	Insert
KSA 2608L-SA2403-44-ACS2	101062	.118	.866	1.732	2.402	1.024	.315	4.331	1.437	–	**SA 24-30...**

D_{max} = Maximum diameter in solid material
D_R = Maximum diameter for tube material

Spare parts

Blade	Screw	Key
KSA...08...-SA24...	AS 0022	T5215-IP

KSA-ACS2



with ACS

Page 64–66

L

LX

1

Blades with Through Coolant ACS2 for VDI flange mounted holders

Designation	EDP	W	doc	D_{max}	D_R	h_3	b_2	L	KL	KT	Insert
KSA 3208L-SA2403-44-ACS2*	**104437**	.118	.866	1.732	–	1.260	.315	3.209	.925	1.280	**SA 24-30...**
KSA 3208LX-SA2403-44-ACS2**	**104431**	.118	.866	1.732	–	1.260	.315	3.209	.925	1.280	**SA 24-30...**
KSA 3208L-SA3503-65-ACS2*	**104435**	.118	1.280	2.559	–	1.260	.315	3.622	1.339	1.280	**SA 35-30...**
KSA 3208LX-SA3503-65-ACS2**	**104433**	.118	1.280	2.559	–	1.260	.315	3.622	1.339	1.280	**SA 35-30...**

D_{max}= Maximum diameter in solid material

***The cut-off blade fits on the flange mounted holders HVDI-30R-7-38-KSA-32L and HVDI-30L-7-60-KSA-32L (see separate catalog).**

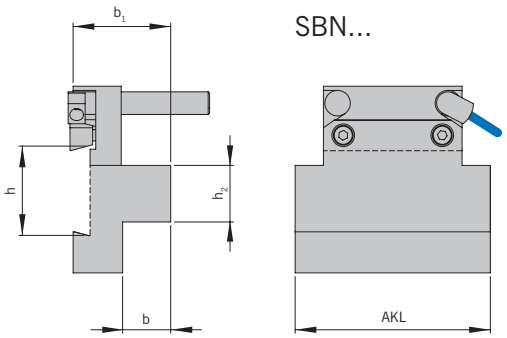
****The cut-off blade fits on the flange mounted holders HVDI-30L-7-38-KSA-32LX and HVDI-30R-7-60-KSA-32LX (see separate catalog).**

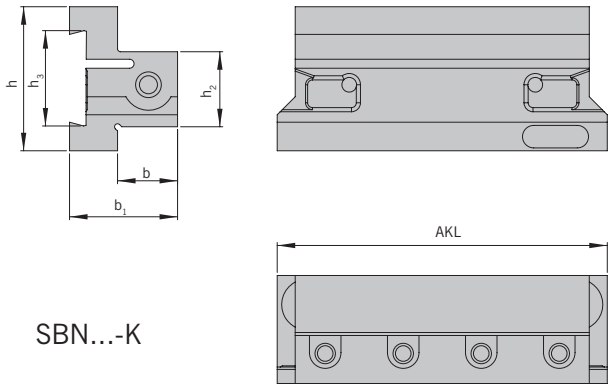
Spare parts

Blade	Screw	Key
KSA 3208...-ACS2	AS 0022	T5215-IP

All dimensions in inches

SBN



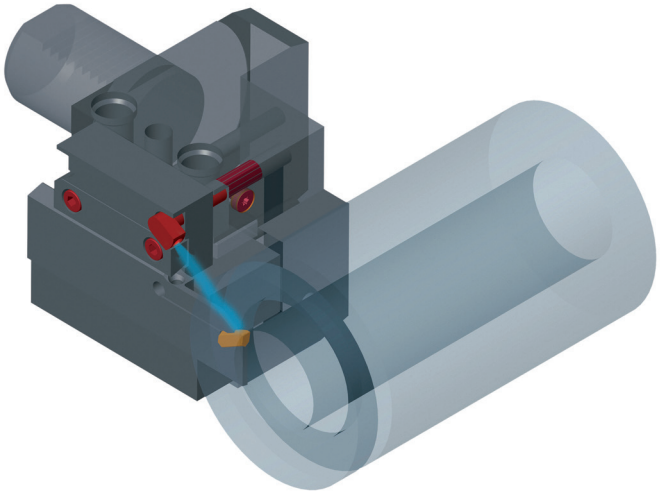


Clamping blocks for blades

Designation	EDP	h_2	b	h_3	AKL	b_1	h	Insert
SBN 2020-26 K	**22598**	20	20,0	26	90	33,0	39	**KSA 26...**
SBN 2520-32 K	**22599**	25	20,0	32	110	36,0	48	**KSA 32...**
SBN 3229-32 K	**22600**	32	29,0	32	120	44,5	48	**KSA 32...**
SBN-16-26*	**68456**	16	13,0	26	54	30,5	55	**KSA 26...**
SBN-16-32*	**68337**	16	13,0	32	54	30,5	61	**KSA 32...**
SBN-20-26*	**68333**	20	17,0	26	69	64,5	66	**KSA 26...**
SBN-20-32*	**68339**	20	17,0	32	69	34,5	66	**KSA 32...**
SBN-25-26*	**92706**	25	21,0	26	84	41,5	76	**KSA 26...**
SBN-25-32*	**92708**	25	21,0	32	84	41,5	76	**KSA 32...**
SBN-32-32*	**68343**	32	23,5	32	99	44,0	80	**KSA 32...**

***Clamping block with coolant jet**
Remark: The tool should be setup to center height ± .004".

SBN clamping block with radial and axial adjustable coolant jet



All dimensions in inches

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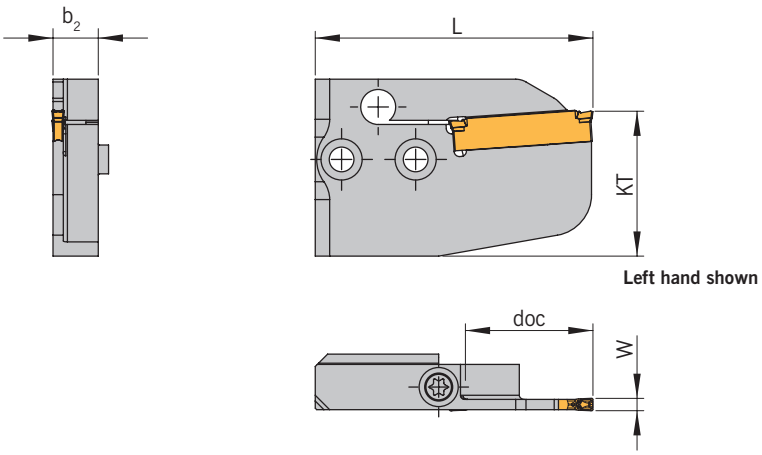
Modules

MSA	SL	SA	3503	65	ACS2
M = Module	Connection (S = Standard) Version	Insert	Insert sizes	Part-off diameter 65mm (2.559")	ARNO-Cooling-System®
S = Grooving	R = Right hand	External	35 – Insert length 35mm (1.378")		ACS1 = with one coolant hole
A = External	L = Left hand		03 – Insert width 3mm (.118")		ACS2 = with two coolant holes

Inserts

SA35	30	03	N	T1	AP	5020
SA = Grooving External	Groove width 3.0mm (.118")	Corner radius R = 0.3mm (.012")	N = Neutral	Geometry	ARNO®-Application area	Grade code (ISO standard)
35 = Insert length			R = Right-hand			
			L = Left-hand			

MSA



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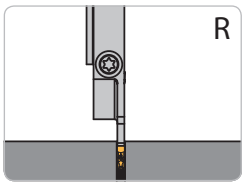

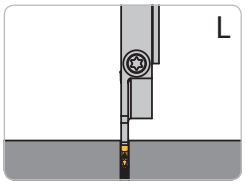

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Modules for inserts SA24 and SA35

Designation	EDP	W	doc	D_{max}	D_R	b_2	L	KT	Insert
MSA-SL-SA24015-32	96508	.059	.630	1.260	1.890	.433	2.047	1.378	SA 24-15...
MSA-SR-SA24015-32	96510	.059	.630	1.260	1.890	.433	2.047	1.378	SA 24-15...
MSA-SL-SA24015-44	96514	.059	.866	1.732	2.402	.433	2.244	1.378	SA 24-15...
MSA-SR-SA24015-44	96512	.059	.866	1.732	2.402	.433	2.244	1.378	SA 24-15...
MSA-SL-SA2402-32	91800	.079	.630	1.260	1.890	.433	2.047	1.378	SA 24-20...
MSA-SR-SA2402-32	91796	.079	.630	1.260	1.890	.433	2.047	1.378	SA 24-20...
MSA-SL-SA2402-44	91810	.079	.866	1.732	2.402	.433	2.244	1.378	SA 24-20...
MSA-SR-SA2402-44	91804	.079	.866	1.732	2.402	.433	2.244	1.378	SA 24-20...
MSA-SL-SA2403-32	91802	.118	.630	1.260	1.890	.433	2.047	1.378	SA 24-30...
MSA-SR-SA2403-32	91798	.118	.630	1.260	1.890	.433	2.047	1.378	SA 24-30...
MSA-SL-SA2403-44	91808	.118	.866	1.732	2.402	.433	2.244	1.378	SA 24-30...
MSA-SR-SA2403-44	91806	.118	.866	1.732	2.402	.433	2.244	1.378	SA 24-30...
MSA-SL-SA2404-44	96011	.157	.866	1.732	2.402	.433	2.244	1.378	SA 24-40...
MSA-SR-SA2404-44	96013	.157	.866	1.732	2.402	.433	2.244	1.378	SA 24-40...
MSA-SL-SA3502-52	91816	.079	1.024	2.047	2.677	.433	2.657	1.378	SA 35-20...
MSA-SR-SA3502-52	91812	.079	1.024	2.047	2.677	.433	2.657	1.378	SA 35-20...
MSA-SL-SA3502-65	91824	.079	1.280	2.559	3.150	.433	2.657	1.378	SA 35-20...
MSA-SR-SA3502-65	91820	.079	1.280	2.559	3.150	.433	2.657	1.378	SA 35-20...
MSA-SL-SA3502-105	97041	.079	2.067	4.134	4.134	.433	3.465	1.378	SA 35-20...
MSA-SR-SA3502-105	95944	.079	2.067	4.134	4.134	.433	3.465	1.378	SA 35-20...
MSA-SL-SA3503-52	91818	.118	1.024	2.047	2.677	.433	2.657	1.378	SA 35-30...
MSA-SR-SA3503-52	91814	.118	1.024	2.047	2.677	.433	2.657	1.378	SA 35-30...
MSA-SL-SA3503-65	91826	.118	1.280	2.559	3.150	.433	2.657	1.378	SA 35-30...
MSA-SR-SA3503-65	91822	.118	1.280	2.559	3.150	.433	2.657	1.378	SA 35-30...
MSA-SL-SA3503-105	93225	.118	2.067	4.134	4.134	.433	3.465	1.378	SA 35-30...
MSA-SR-SA3503-105	95946	.118	2.067	4.134	4.134	.433	3.465	1.378	SA 35-30...
MSA-SL-SA3503-125	95614	.118	2.461	4.921	4.921	.433	3.839	1.909	SA 35-30...
MSA-SR-SA3503-125	97045	.118	2.461	4.921	4.921	.433	3.839	1.909	SA 35-30...
MSA-SR-SA3503-140	95908	.118	2.756	5.512	5.512	.433	4.154	1.909	SA 35-30...
MSA-SL-SA3504-52	96015	.157	1.024	2.047	2.677	.433	2.657	1.378	SA 35-40...
MSA-SR-SA3504-52	96017	.157	1.024	2.047	2.677	.433	2.657	1.378	SA 35-40...
MSA-SL-SA3504-65	96019	.157	1.280	2.559	3.150	.433	2.657	1.378	SA 35-40...
MSA-SR-SA3504-65	96021	.157	1.280	2.559	3.150	.433	2.657	1.378	SA 35-40...
MSA-SL-SA3504-105	97043	.157	2.067	4.134	4.134	.433	3.465	1.378	SA 35-40...
MSA-SR-SA3504-105	95948	.157	2.067	4.134	4.134	.433	3.465	1.378	SA 35-40...

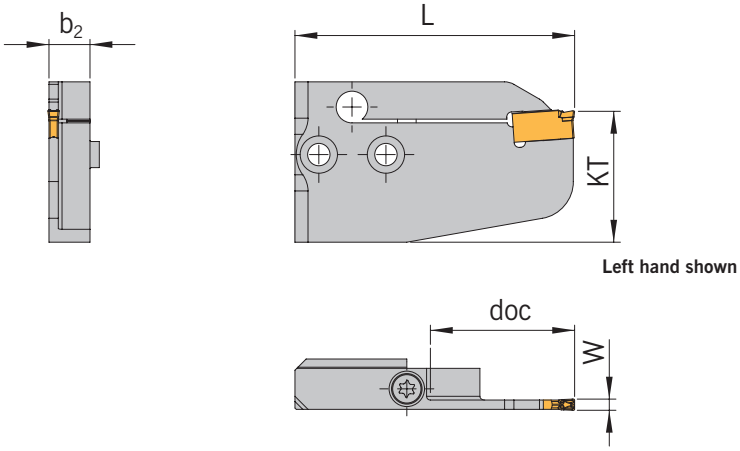
D_{max} = Maximum diameter in solid material, D_R = Maximum diameter for tube material

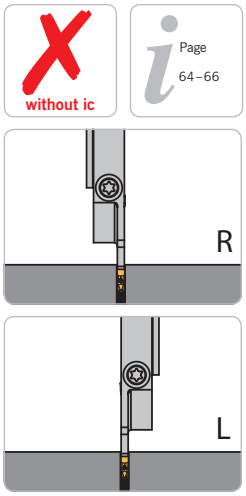
When using cut-off modules for diameter 4.134" (105mm) or bigger, we recommend using a torque wrench at 2.21ft-lbs (3Nm).

All modules fit on NC-Holders with a "standard" connection (e.g. 72525R-1.000). Please refer to separate catalog for more information.

All dimensions in inches

MSA





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Modules for inserts SA17 (single sided)

Designation	EDP	W	doc	D_{max}	D_R	b_2	L	KT	Insert
MSA-SL-SA1703-80	**91915**	.118	1.575	3.150	3.150	.433	2.953	1.378	**SA 17-30...**
MSA-SR-SA1703-80	**91917**	.118	1.575	3.150	3.150	.433	2.953	1.378	**SA 17-30...**
MSA-SL-SA1703-105	**106065**	.118	2.067	4.134	4.134	.433	3.465	1.378	**SA17-30...**
MSA-SL-SA1704-80	**96023**	.157	1.575	3.150	3.150	.433	2.953	1.378	**SA 17-40...**
MSA-SR-SA1704-80	**96025**	.157	1.575	3.150	3.150	.433	2.953	1.378	**SA 17-40...**
MSA-SL-SA1704-105	**98836**	.157	2.067	4.134	4.134	.433	3.465	1.378	**SA 17-40...**
MSA-SR-SA1704-105	**98838**	.157	2.067	4.134	4.134	.433	3.465	1.378	**SA 17-40...**

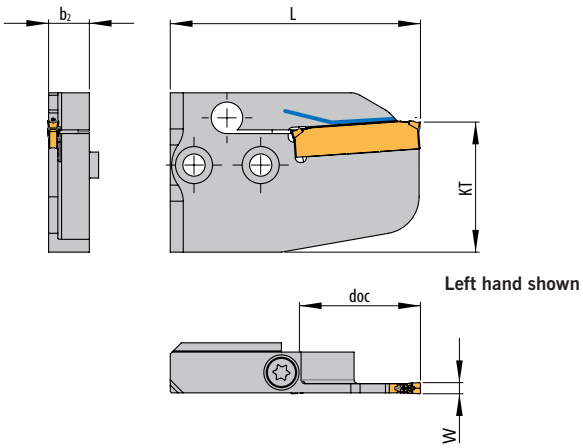
D_{max} = Maximum diameter in solid material, D_R = Maximum diameter for tube material
When using cut-off modules for diameter 4.134" (105mm) or bigger, we recommend using a torque wrench at 2.21ft-lbs (3Nm).
All modules fit on NC-Holders with a "standard" connection (e.g. 72525R-1.000). Please refer to separate catalog for more information.

Spare parts

Module	Screw	Key
MSA-S R/L...	SA5T	T5220-IP

All dimensions in inches

MSA-ACS1



Left hand shown

with ACS

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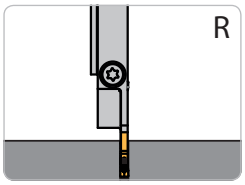

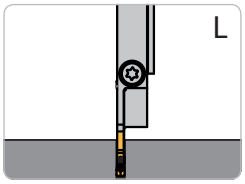

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Modules with Through Coolant ACS1

Designation	EDP	W	doc	D_{max}	D_R	b_2	L	KT	Insert
MSA-SL-SA2402-44-ACS1	109447	.079	.866	1.732	2.402	.433	2.244	1.378	SA 24-20...
MSA-SR-SA2402-44-ACS1	109448	.079	.866	1.732	2.402	.433	2.244	1.378	SA 24-20...
MSA-SL-SA3502-65-ACS1	109442	.079	1.280	2.559	3.150	.433	2.657	1.378	SA 35-20...
MSA-SR-SA3502-65-ACS1	109441	.079	1.280	2.559	3.150	.433	2.657	1.378	SA 35-20...
MSA-SL-SA3503-65-ACS1	97783	.118	1.280	2.559	3.150	.433	2.657	1.378	SA 35-30...
MSA-SR-SA3503-65-ACS1	97785	.118	1.280	2.559	3.150	.433	2.657	1.378	SA 35-30...
MSA-SL-SA3504-105-ACS1	107754	.157	2.067	4.134	4.134	.433	3.465	1.378	SA 35-40...
MSA-SL-SA3506-105-ACS1	104198	.236	2.067	4.134	4.134	.433	3.465	1.378	SA 35-60...

D_{max} = Maximum diameter in solid material, D_R = Maximum diameter for tube material

When using cut-off modules for diameter 4.134" (105mm) or bigger, we recommend using a torque wrench at 2.21ft-lbs (3Nm).

All modules fit on reinforced monoblock ACS holders. Please refer to page 52 for more information.

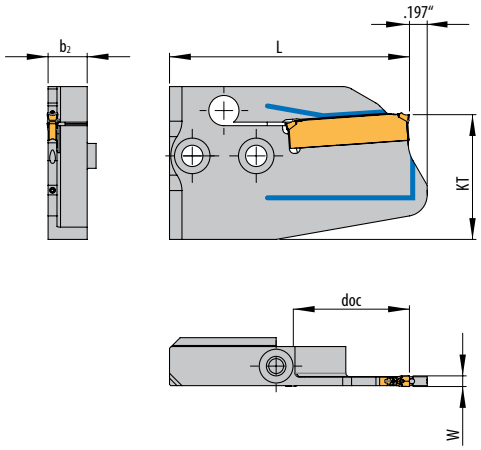
All modules also fit on ARNO flange mounted holders for maximum rigidity. Please refer to separate catalog for more information.

Spare parts

Module	Screw	Key
MSA-S R/L...	SA5T	T5220-IP

All dimensions in inches

MSA-ACS2



Left hand shown

with ACS

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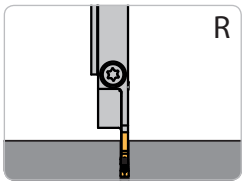
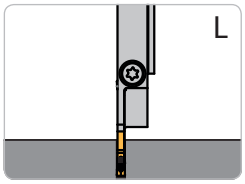




Modules with Through Coolant ACS2

Designation	EDP	W	doc	D_{max}	D_R	b_2	L	KT	Insert
MSA-SL-SA2402-44-ACS2	109443	.079	.866	1.732	2.402	.433	2.244	1.378	SA 24-20...
MSA-SR-SA2402-44-ACS2	109444	.079	.866	1.732	2.402	.433	2.244	1.378	SA 24-20...
MSA-SL-SA2403-32-ACS2	104108	.118	.630	1.260	1.890	.433	2.047	1.378	SA 24-30...
MSA-SR-SA2403-32-ACS2	104110	.118	.630	1.260	1.890	.433	2.047	1.378	SA 24-30...
MSA-SL-SA2403-44-ACS2	98283	.118	.866	1.732	2.402	.433	2.244	1.378	SA 24-30...
MSA-SR-SA2403-44-ACS2	98281	.118	.866	1.732	2.402	.433	2.244	1.378	SA 24-30...
MSA-SL-SA3503-52-ACS2	101913	.118	1.024	2.047	2.677	.433	2.657	1.378	SA 35-30...
MSA-SR-SA3503-52-ACS2	101915	.118	1.024	2.047	2.677	.433	2.657	1.378	SA 35-30...
MSA-SL-SA3503-65-ACS2	97864	.118	1.280	2.559	3.150	.433	2.657	1.378	SA 35-30...
MSA-SR-SA3503-65-ACS2	98277	.118	1.280	2.559	3.150	.433	2.657	1.378	SA 35-30...
MSA-SL-SA3503-69-ACS2	101769	.118	1.358	2.717	3.150	.433	2.736	1.378	SA 35-30...
MSA-SL-SA3503-80-ACS2	102519	.118	1.575	3.150	3.150	.433	2.953	1.378	SA 35-30...
MSA-SR-SA3503-80-ACS2	102521	.118	1.575	3.150	3.150	.433	2.953	1.378	SA 35-30...
MSA-SL-SA3503-105-ACS2	98014	.118	2.067	4.134	4.134	.433	3.465	1.378	SA 35-30...
MSA-SR-SA3503-105-ACS2	98275	.118	2.067	4.134	4.134	.433	3.465	1.378	SA 35-30...
MSA-SL-SA3504-65-ACS2	102050	.157	1.280	2.559	3.150	.433	2.657	1.378	SA 35-40...
MSA-SR-SA3504-65-ACS2	102052	.157	1.280	2.559	3.150	.433	2.657	1.378	SA 35-40...
MSA-SL-SA3504-105-ACS2	106088	.157	2.067	4.134	4.134	.433	3.465	1.378	SA 35-40...
MSA-SR-SA3504-105-ACS2	106090	.157	2.067	4.134	4.134	.433	3.465	1.378	SA 35-40...

D_{max} = Maximum diameter in solid material, D_R = Maximum diameter for tube material

When using cut-off modules for diameter 4.134" (105mm) or bigger, we recommend using a torque wrench at 2.21ft-lbs (3Nm).

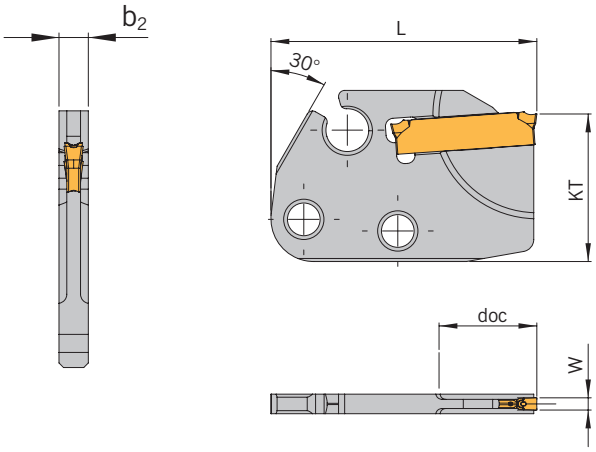
All modules fit on reinforced monoblock ACS holders. Please refer to page 52 for more information.

All modules also fit on ARNO flange mounted holders for maximum rigidity. Please refer to separate catalog for more information.

Spare parts

Module	Screw	Key
MSA-S R/L...	SA5T	T5220-IP

MSA-IN



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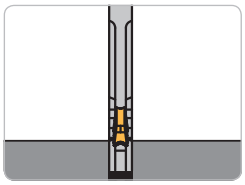

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Modules in neutral design for multi spindle machines

Designation	EDP	W	doc	D_{max}	D_R	b_2	L	KT	Insert
MSA-IN-SA1602-20	93008	.079	.394	.787	–	.126	1.398	.945	SA 16-20...
MSA-IN-SA1602-26	100826	.079	.512	1.024	–	.126	1.280	.945	SA 16-20...
MSA-IN-SA16015-L43,5-12	106061	.059	.236	.472	–	.126	1.713	.945	SA 16-15...
MSA-IN-SA16015-L43,5-16	106063	.059	.315	.630	–	.126	1.713	.945	SA 16-15...
MSA-IN-SA24015-20	96440	.059	.394	.787	–	.126	1.713	.945	SA 24-15...
MSA-IN-SA24015-32	96442	.059	.630	1.260	–	.126	1.713	.945	SA 24-15...
MSA-IN-SA2402-20	95559	.079	.394	.787	–	.126	1.713	.945	SA 24-20...
MSA-IN-SA2402-26	100824	.079	.512	1.024	–	.126	1.713	.945	SA 24-20...
MSA-IN-SA2402-32	93006	.079	.630	1.260	–	.126	1.713	.945	SA 24-20...
MSA-IN-SA2402-L54-26	103778	.079	.512	1.024	–	.126	2.126	.945	SA 24-20...
MSA-IN-SA2403-32	93067	.118	.630	1.260	–	.126	1.713	.945	SA 24-30...
MSA-IN-SA3503-52	98294	.118	1.024	2.047	–	.126	2.146	.945	SA 24-30...

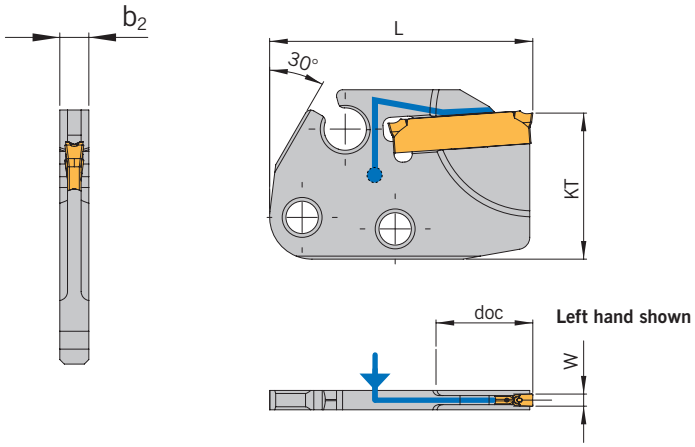
D_{max} = Maximum diameter in solid material, D_R = Maximum diameter for tube material

Neutral modules can be mounted on both sides.

Modules are not supplied with screws.

All dimensions in inches

MSA-IL/R..-ACS1



with ACS

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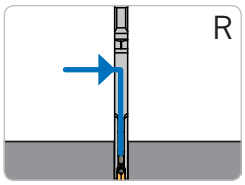

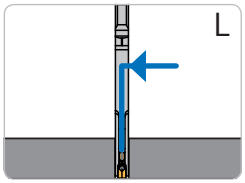

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Modules with Through Coolant ACS1 for multi spindle machines

Designation	EDP	W	doc	D_{max}	D_R	b_2	L	KT	Insert
MSA-IR-SA1602-L37-20-ACS1	106975	.079	.394	.787	–	.126	1.457	.945	SA 16-20...
MSA-IR-SA1602-L41-20-ACS1	105946	.079	.394	.787	–	.126	1.614	.945	SA 16-20...
MSA-IR-SA1602-L43,5-26-ACS1	106981	.079	.433	.866	–	.126	1.791	.945	SA 16-20...
MSA-IR-SA1602-L45,5-22-ACS1	106979	.079	.512	1.024	–	.126	1.713	.945	SA 16-20...
MSA-IR-SA2402-L45,5-32-ACS1	106983	.079	.630	1.260	–	.126	1.791	.945	SA 24-20...
MSA-IR-SA2402-L48,5-42-ACS1	106985	.079	.827	1.654	–	.126	1.909	.945	SA 24-20...
MSA-IR-SA2402-L44-46-ACS1	108738	.079	.906	1.811	–	.126	1.732	.945	SA 24-20...
MSA-IR-SA2403-L45,5-32-ACS1	106987	.118	.630	1.260	–	.126	1.791	.945	SA 24-30...
MSA-IR-SA2403-L48,5-42-ACS1	106989	.118	.827	1.654	–	.126	1.909	.945	SA 24-30...
MSA-IR-SA3502-L55-52-ACS1	106991	.079	1.024	2.047	–	.126	2.165	.945	SA 35-20...
MSA-IR-SA3503-L55-52-ACS1	106993	.118	1.024	2.047	–	.126	2.165	.945	SA 35-30...
MSA-IL-SA1602-L37-20-ACS1	106995	.079	.394	.787	–	.126	1.457	.945	SA 16-20...
MSA-IL-SA1602-L41-20-ACS1	105944	.079	.394	.787	–	.126	1.614	.945	SA 16-20...
MSA-IL-SA1602-L43,5-26-ACS1	107001	.079	.433	.866	–	.126	1.791	.945	SA 16-20...
MSA-IL-SA1602-L45,5-22-ACS1	106999	.079	.512	1.024	–	.126	1.713	.945	SA 16-20...
MSA-IL-SA2402-L45,5-32-ACS1	107003	.079	.630	1.260	–	.126	1.791	.945	SA 24-20...
MSA-IL-SA2402-L48,5-42-ACS1	107005	.079	.827	1.654	–	.126	1.909	.945	SA 24-20...
MSA-IL-SA2402-L44-46-ACS1	108818	.079	.906	1.811	–	.126	1.732	.945	SA 24-20...
MSA-IL-SA2403-L45,5-32-ACS1	107007	.118	.630	1.260	–	.126	1.791	.945	SA 24-30...
MSA-IL-SA2403-L48,5-42-ACS1	107009	.118	.827	1.654	–	.126	1.909	.945	SA 24-30...
MSA-IL-SA3502-L55-52-ACS1	107011	.079	1.024	2.047	–	.126	2.165	.945	SA 35-20...
MSA-IL-SA3503-L55-52-ACS1	107013	.118	1.024	2.047	–	.126	2.165	.945	SA 35-30...

Information: Modules fit flange mounted holders for Tornos / Göltenbodt and Index machines which can be found in the catalog “ARNO-ACS cooling system”.

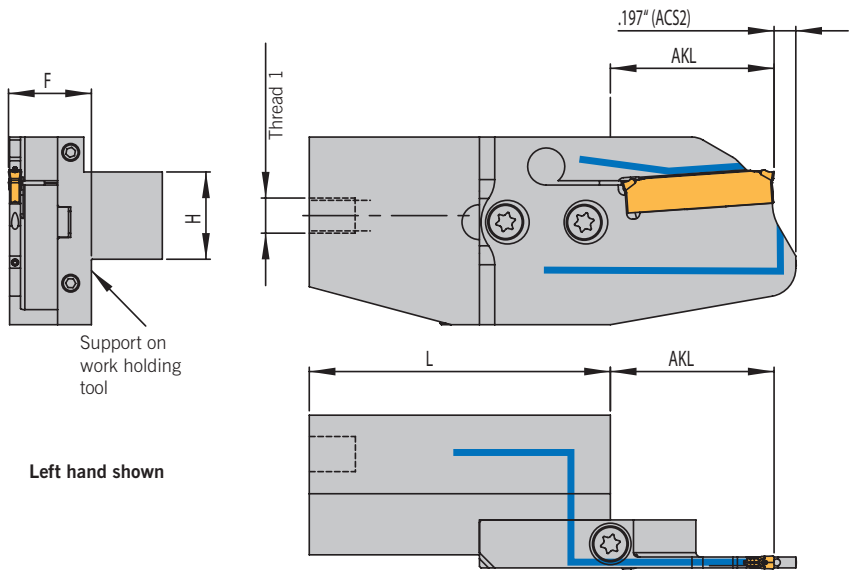
Spare parts

Module	Screw	Key
MSA-I R/L...	AS 0049 / AS 0050	T5220-IP

All dimensions in inches

1

HSA 7...

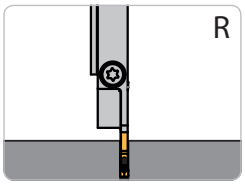


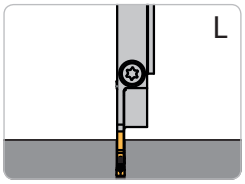
Left hand shown

inch & metric

with ACS

Page 64–66





Tool holders for SA Modules (MSA-S R/L) with Through Coolant ACS

Designation	EDP	H	L	Thread 1
HSA 71629L-ACS-.625	501713	.625	2.126	–
HSA 71629R-ACS-.625	501714	.625	2.126	–
HSA 72032L-ACS-.750	105683	.750	2.717	–
HSA 72032R-ACS-.750	105685	.750	2.717	–
HSA 72536L-ACS-1.000	105687	1.000	3.307	–
HSA 72536R-ACS-1.000	105689	1.000	3.307	–

Module	AKL	F
MSA-..-..-32	.866	.748
MSA-..-..-44	1.063	
MSA-..-..-52	1.476	
MSA-..-..-65	1.476	
MSA-..-..-80	1.772	
MSA-..-..-105	2.283	
MSA-..-..-125	2.677	
MSA-..-..-140	2.972	

inch & metric

with ACS

Remark: Holders HSA-7... are supplied without modules.
Suitable modules can be found on pages 48 and 49.

Tool holders for SA Modules (MSA-S R/L) without Through Coolant ACS

Designation	EDP	H	L	Thread 1
HSA 72032L-.750	105675	.750	4.134	–
HSA 72032R-.750	105677	.750	4.134	–
HSA 72536L-1.000	105679	1.000	4.724	–
HSA 72536R-1.000	105681	1.000	4.724	–

Module	AKL	F
MSA-..-..-32	.866	.748
MSA-..-..-44	1.063	
MSA-..-..-52	1.476	
MSA-..-..-65	1.476	
MSA-..-..-80	1.772	
MSA-..-..-105	2.283	
MSA-..-..-125	2.677	
MSA-..-..-140	2.972	

inch & metric

without IC

Remark: Holders HSA-7... are supplied without modules.
Suitable modules can be found on pages 46 and 47.

All dimensions in inches

Monoblock with ACS - examples




Please refer to catalog “ARNO-ACS COOLING SYSTEM” - Pages 22 and 28 for more information.

Blades with ACS - examples


Please refer to catalog “ARNO-ACS COOLING SYSTEM” - Chapter 3 for more information.

Modules MSA -S with ACS - examples




Please refer to catalog “ARNO-ACS COOLING SYSTEM” - Chapter 3 for more information.

Modules MSA -I... with ACS - examples


Please refer to catalog “ARNO-ACS COOLING SYSTEM” - Chapter 3 for more information.

1

F1

Very soft cutting geometry

- For low to medium strength materials with low built-up edge tendency
- Suitable for thin-walled components

T1

Excellent chip control and formation

- For Steel and Stainless Steel
- Universal geometry
- Also suitable for thin wall machining

S1

Soft cutting geometry

- Especially for Stainless Steel
- Problem solver for Steel machining

M1

Geometry with small negative chamfer

- For medium to high strength materials
- Suitable for all Steels (Stainless and Cast)
- First choice where cutting conditions are solid

ALU

Ground and polished geometry with a sharp edge

- First choice for Aluminum and Non-Ferrous materials as well as Plastics
- Periphery ground insert
- High positive design
- Polished chip breaker

Coated

AP5020

PVD Coated:
Good wear resitance grade for longer tool life and reliability of cutting edges. Makes this grade suitable for more wear resistant materials at higher cutting speeds.

Material application: Steel and Stainless Steel, also suitable for High Temperature Alloys and Non-Ferrous materials.

AP5030

PVD Coated:
A universal grade slightly tougher than AP5020 for tougher machining conditions, especially when machining Steel components. First choice for steel.

Material application: Steel and Stainless Steel.

AM5040

PVD Coated:
A tough but universal grade for low to medium cutting speeds, with excellent resistance to chipping of the cutting edge, makes this the perfect grade for very demading applications.

Material application: Stainless Steel and Steel

AP2220

CVD Coated:
A harder grade for low to medium cutting speed.

Material application: Steel and Stainless Steel, also suitable for High Temperature Alloys and Non-Ferrous materials.

AP2240

CVD Coated:
AP2240 is the ideal combination of high toughness and heat resistance. Combined with a strong cutting edge it offers extended tool life and improved process reliability.

Material application: Steel and Cast Iron, also suitable for Stainless Steel

Uncoated

AN1015

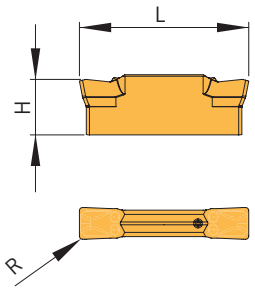
Roughing - Finishing applications.

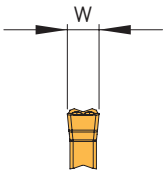
The precision ground cutting edges with a highly polished chip breaker from provides excellent chip flow with a high resistance to build-up edge (b.u.e.).

Material application: Aluminum Alloys and Non-Ferrous materials. Also first choice in Plastics.

1

SA16





						EDP					
						coated					uncoated
Designation	W	H	L	R	χ	AM5040	AP2220	AP2240	AP5020	AP5030	AN1015
SA16-1502N-S1	.059	.217	.630	.008	0°				104623		
SA16-1501R-S1-15*	.059	.217	.630	.004	15°				106891		
SA16-2001L-S1-12*	.079	.217	.630	.004	12°	100902					
SA16-2001R-S1-12*	.079	.217	.630	.004	12°	100905					
SA16-2001L-T1-15*	.079	.217	.630	.004	15°				97838		
SA16-2001R-T1-15*	.079	.217	.630	.004	15°				97840		
SA16-2002N-F1	.079	.217	.630	.008	0°		87870		87263		
SA16-2002N-S1	.079	.217	.630	.008	0°	97828			96152		
SA16-2002N-T1	.079	.217	.630	.008	0°		87872		87261		
SA16-3002L-S1-12*	.118	.217	.630	.008	12°	100915					
SA16-3002R-S1-12*	.118	.217	.630	.008	12°	100917					
SA16-3003L-M1	.118	.217	.630	.012	6°		90213		90217		
SA16-3003R-M1	.118	.217	.630	.012	6°		90211		90215		
SA16-3003L-S1	.118	.217	.630	.012	6°	97980					
SA16-3003R-S1	.118	.217	.630	.012	6°	97982					
SA16-3003L-T1	.118	.217	.630	.012	6°		90221		90225		
SA16-3003R-T1	.118	.217	.630	.012	6°		90219		90223		
SA16-3003N-M1	.118	.217	.630	.012	0°		87874		87265		
SA16-3003N-S1	.118	.217	.630	.012	0°	97836			96154		
SA16-3003N-T1	.118	.217	.630	.012	0°		87876		87267		

Remark: When using left or right handed inserts the holder may need modification.

***Ground version**

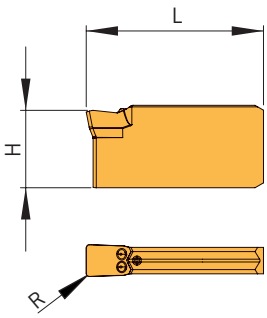
● Main application

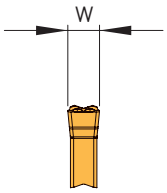
○ Secondary application

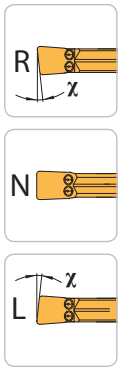
P	○	●		●		
M	●	○		○		
K		●				
N				○		
S				○		
H						

All dimensions in inches

SA17







1

					EDP				
					coated				uncoated
Designation	W	H	L	R	AM5040	AP2220	AP5020	AP5030	AN1015
SA17-2002N-ALU*	.079	.295	.659	.008					104509
SA17-2001L-ALU-15*	.079	.295	.659	.004					104511
SA17-2001R-ALU-15*	.079	.295	.659	.004					104513
SA17-3003N-ALU*	.118	.295	.659	.012					104503
SA17-3002L-ALU-15*	.118	.295	.659	.008					104505
SA17-3002R-ALU-15*	.118	.295	.659	.008					104507
SA17-3003N-M1	.118	.295	.659	.012		91977	91974		
SA17-3003N-T1	.118	.295	.659	.012			94808		
SA17-4004N-M1	.157	.295	.659	.016		96691	96693		
SA17-4004N-S1	.157	.295	.659	.016	101890				

Remark: When using left or right handed inserts the holder may need modification.

***Ground version**

The SA17 inserts are single sided.

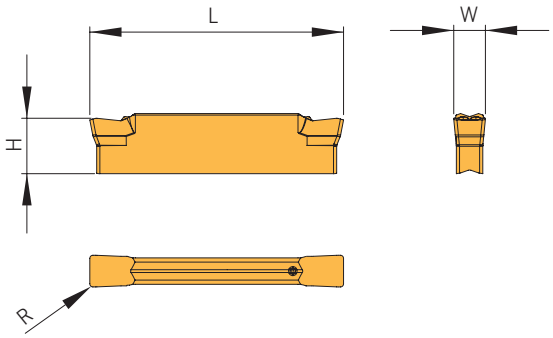
● Main application

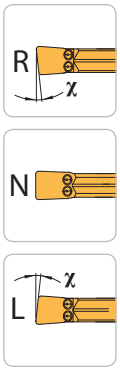
○ Secondary application

P	○	●	●		
M	●	○	○		
K		●			
N			○		
S			○		
H					

All dimensions in inches

SA24





						EDP					
						coated					uncoated
Designation	W	H	L	R	χ	AM5040	AP2220	AP2240	AP5020	AP5030	AN1015
SA24-15005L-T1-15*	.059	.217	.945	.002	15°				105844		
SA24-15005R-T1-15*	.059	.217	.945	.002	15°				105846		
SA24-1500L-S1-15*	.059	.217	.945	.000	15°				105936		
SA24-1500R-S1-15*	.059	.217	.945	.000	15°				105938		
SA24-1501L-S1-15*	.059	.217	.945	.004	15°				105942		
SA24-1501R-S1-15*	.059	.217	.945	.004	15°				105940		
SA24-1502N-S1	.059	.217	.945	.008	0°				97008		
SA24-1502N-T1	.059	.217	.945	.008	0°				102755		
SA24-2000R-T1-15*	.079	.217	.945	.000	15°				101917		
SA24-2001L-S1-12*	.079	.217	.945	.004	12°	100907					
SA24-2001L-S1-15*	.079	.217	.945	.004	15°				97846		
SA24-2001L-T1-15*	.079	.217	.945	.004	15°				97947		
SA24-2001R-S1-12*	.079	.217	.945	.004	12°	100909					
SA24-2001R-S1-15*	.079	.217	.945	.004	15°				97848		
SA24-2001R-T1-15*	.079	.217	.945	.004	15°				97949		
SA24-2002L-S1-8*	.079	.217	.945	.008	8°				97842		
SA24-2002R-S1-8*	.079	.217	.945	.008	8°				97844		
SA24-2002N-F1	.079	.217	.945	.008	0°		87878		87271		
SA24-2002N-M1	.079	.217	.945	.008	0°		96000	106886	91759		
SA24-2002N-S1	.079	.217	.945	.008	0°	97830		104398	91769	97006	
SA24-2002N-T1	.079	.217	.945	.008	0°		87880	104400	87269		
SA24-2502L-S1	.098	.217	.945	.008	6°	105962			105948		
SA24-2502L-S1-8*	.098	.217	.945	.008	8°				105954		
SA24-2502L-T1	.098	.217	.945	.008	6°				105956		
SA24-2502R-S1	.098	.217	.945	.008	6°	105960			105950		
SA24-2502R-S1-8*	.098	.217	.945	.008	8°				105952		
SA24-2502R-T1	.098	.217	.945	.008	6°				105958		
SA24-2503N-M1	.098	.217	.945	.012	0°				104625		
SA24-2503N-S1	.098	.217	.945	.012	0°	102081			102079	106285	
SA24-2503N-T1	.098	.217	.945	.012	0°				102083	106287	

Remark: When using left or right handed inserts the holder may need modification.

*** Ground version**

● Main application

○ Secondary application

P	○	●	●	●	●	
M	●	○	○	○	○	
K		●	●			
N				○		
S				○		
H						

All dimensions in inches

						EDP					
						coated					uncoated
Designation	W	H	L	R	χ	AM5040	AP2220	AP2240	AP5020	AP5030	AN1015
SA24-3002L-S1-12*	.118	.217	.945	.008	12°	100919					
SA24-3002L-T1-15*	.118	.217	.945	.008	15°				108833		
SA24-3002R-S1-12*	.118	.217	.945	.008	12°	100921					
SA24-3003L-M1	.118	.217	.945	.012	6°		90229	104416	90233		
SA24-3003L-S1	.118	.217	.945	.012	6°	97984					
SA24-3003L-T1	.118	.217	.945	.012	6°		90237		90241		
SA24-3003R-M1	.118	.217	.945	.012	6°		90227	104414	90231		
SA24-3003R-S1	.118	.217	.945	.012	6°	97986					
SA24-3003R-T1	.118	.217	.945	.012	6°		90235		90239		
SA24-3003N-M1	.118	.217	.945	.012	0°		87882	104402	87273		
SA24-3003N-S1	.118	.217	.945	.012	0°	97834		104404	96156	106289	
SA24-3003N-T1	.118	.217	.945	.012	0°		87884	104406	87275	106291	
SA24-4004N-M1	.157	.217	.945	.016	0°		92074		92072		
SA24-4004N-S1	.157	.217	.945	.016	0°	97988					
SA24-4004N-T1	.157	.217	.945	.016	0°				100932		
SA24-5005N-M1	.197	.295	.945	.020	0°				100938		
SA24-5005N-S1	.197	.295	.945	.020	0°				100940		
SA24-5005N-T1	.197	.295	.945	.020	0°				100936		
SA24-2001L-ALU-15*	.079	.217	.945	.004	15°						101593
SA24-2001R-ALU-15*	.079	.217	.945	.004	15°						101595
SA24-2002N-ALU*	.079	.217	.945	.008	0°						94833
SA24-3002L-ALU-15*	.118	.217	.945	.008	15°						102070
SA24-3002R-ALU-15*	.118	.217	.945	.008	15°						102072
SA24-3003N-ALU*	.118	.217	.945	.012	0°						102068

Remark: When using left or right handed inserts the holder may need modification.

***Ground version**

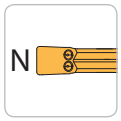
● Main application

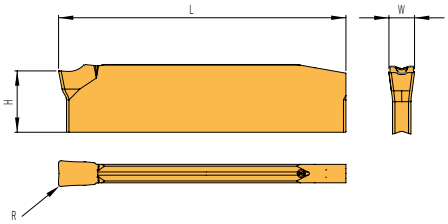
○ Secondary application

P	○	●	●	●	●	
M	●	○	○	○	○	
K		●	●			
N				○		
S				○		
H						

All dimensions in inches

SA24E (single sided)





1

Designation	W	H	L	R	EDP coated AM5040	AP2220	AP2240	AP5020	AP5030	EDP uncoated AN1015
SA24E-2002N-S1	.079	.217	.919	.008				97281		
SA24E-3003N-S1	.118	.217	.919	.012				97279		

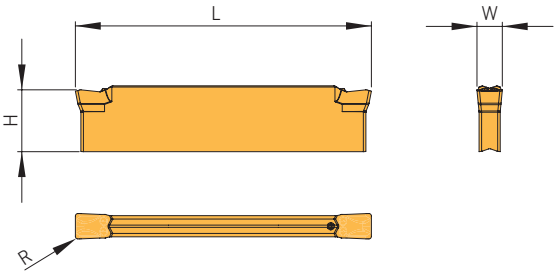
Remark: When using left or right handed inserts the holder may need modification.

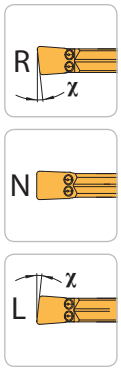
● Main application
○ Secondary application

P				●		
M				○		
K						
N				○		
S				○		
H						

All dimensions in inches

SA35





						EDP					
						coated					uncoated
Designation	W	H	L	R	χ	AM5040	AP2220	AP2240	AP5020	AP5030	AN1015
SA35-2001L-S1-12*	.079	.295	1.378	.004	12°	100911					
SA35-2001R-S1-12*	.079	.295	1.378	.004	12°	100913					
SA35-2002L-M1	.079	.295	1.378	.008	6°				101048		
SA35-2002N-F1	.079	.295	1.378	.008	0°		87886		87279		
SA35-2002N-M1	.079	.295	1.378	.008	0°				91753		
SA35-2002N-S1	.079	.295	1.378	.008	0°	97832		109418	96158		
SA35-2002N-T1	.079	.295	1.378	.008	0°		87888		87277		
SA35-2002R-M1	.079	.295	1.378	.008	6°				101050		
SA35-3002L-S1-12*	.118	.295	1.378	.008	12°	100923					
SA35-3002R-S1-12*	.118	.295	1.378	.008	12°	100925					
SA35-3003L-M1	.118	.295	1.378	.012	6°		90245	104420	90249		
SA35-3003L-S1	.118	.295	1.378	.012	6°				101054		
SA35-3003L-T1	.118	.295	1.378	.012	6°		90253		90257		
SA35-3003N-M1	.118	.295	1.378	.012	0°	97428	87890	104408	87283		
SA35-3003N-S1	.118	.295	1.378	.012	0°	97004		104410	91763	96432	
SA35-3003N-T1	.118	.295	1.378	.012	0°		87892	104412	87281		
SA35-3003R-M1	.118	.295	1.378	.012	6°		90243	104418	90247		
SA35-3003R-S1	.118	.295	1.378	.012	6°				101052		
SA35-3003R-T1	.118	.295	1.378	.012	6°		90251		90255		
SA35-4004N-M1	.157	.295	1.378	.016	0°		92078	108741	92076		
SA35-4004N-S1	.157	.295	1.378	.016	0°	97990					
SA35-4004N-T1	.157	.295	1.378	.016	0°				100934		
SA35-6006N-M1	.236	.295	1.378	.024	0°				96992		
SA35-2000L-ALU-15*	.079	.295	1.378	.000	15°						105695
SA35-2000R-ALU-15*	.079	.295	1.378	.000	15°						105697
SA35-2001L-ALU-15*	.079	.295	1.378	.004	15°						102200
SA35-2001R-ALU-15*	.079	.295	1.378	.004	15°						102202
SA35-2002N-ALU*	.079	.295	1.378	.008	0°						102108
SA35-3002L-ALU-6*	.118	.295	1.378	.008	6°						501188
SA35-3002R-ALU-6*	.118	.295	1.378	.008	6°						501189
SA35-3002L-ALU-15*	.118	.295	1.378	.008	15°						98128
SA35-3002R-ALU-15*	.118	.295	1.378	.008	15°						98126
SA35-3003N-ALU*	.118	.295	1.378	.012	0°						94835
SA35-4004N-ALU*	.157	.295	1.378	.016	0°						102106

Remark: When using left or right handed inserts the holder may need modification.

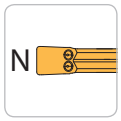
***Ground version**

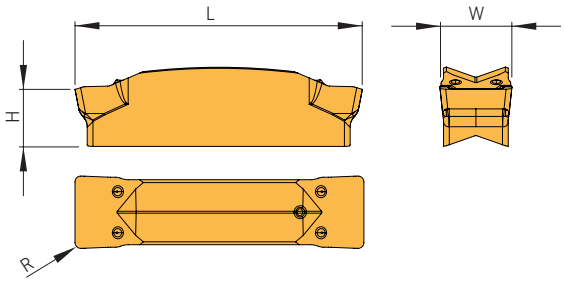
● Main application
○ Secondary application

P	○	●	●	●	●	
M	●	○	○	○	○	
K		●	●			○
N				○		●
S				○		○
H						

All dimensions in inches

SA35/SA40





1

Designation	W	H	L	R	EDP coated AM5040	AP2220	AP5020	AP5030	EDP uncoated AN1015
SA35-8008N-M1	.315	.315	1.378	.031			96981		
SA40-10008N-M1	.394	.335	1.575	.031			96994		

● Main application
○ Secondary application

P		●	
M		○	
K			
N		○	
S		○	
H			

All dimensions in inches

Item	EDP
Screw	
AS 0022	62489
AS 0045	91590
AS 0084	106529
DIN912 M5X16-12,9	92150
DIN912 M6X20-12,9	92152
SA5T	22572
Key	
KP 3111	19648
KP 1321	19647
KP 5421	19650
KS 8000	68824
S-KSA	97826
T5215-IP	96113
T5220-IP	91592

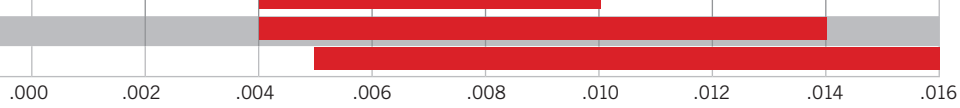
Cut-off

ISO	Material		Tensile strength (N/mm²)	Cutting speed Vc (f/min) coated AM5040	AP2220	AP2240	AP5020	AP5030	uncoated AN1015
P	Unalloyed steel and cast steel	< 0.15 % C/hardened and tempered	350	390 – 660	430 – 820	430 – 820	390 – 720	390 – 660	–
		0.15 - 0.45 % C/hardened and tempered	650	260 – 490	360 – 590	360 – 620	260 – 490	260 – 490	–
		> 0.45 % C/hardened and tempered	1000	200 – 460	230 – 490	230 – 560	200 – 460	200 – 460	–
	Low alloyed steel and cast steel	annealed	600	260 – 520	390 – 620	390 – 660	260 – 560	260 – 560	–
		hardened and tempered	900	200 – 430	360 – 490	360 – 590	200 – 430	200 – 430	–
			1200	200 – 390	230 – 430	230 – 490	200 – 390	200 – 390	–
	High alloyed steel	annealed	700	260 – 460	300 – 460	300 – 560	260 – 460	260 – 460	–
	High alloyed tool steel and cast steel	hardened	1100	160 – 390	230 – 430	230 – 520	160 – 390	160 – 390	–
	Stainless steel	ferritic, annealed	700	200 – 520	360 – 660	390 – 660	200 – 560	200 – 560	–
	Cast steel	martensitic, hardened and tempered	1000	160 – 330	200 – 430	200 – 330	160 – 330	160 – 330	–
M	Stainless steel	ferritic/martensitic, annealed	450 – 600	200 – 520	330 – 660	330 – 560	200 – 590	200 – 560	–
		martensitic/austenitic, heat treated	600 – 900	160 – 300	390 – 490	200 – 300	160 – 300	160 – 300	–
K	Cast iron	pearlitic/ferritic	500 – 700	–	330 – 520	330 – 660	–	–	390 – 520
		pearlitic/martensitic	700 – 850	–	360 – 590	300 – 590	–	–	330 – 490
			800 – 1100	–	430 – 660	260 – 490	–	–	300 – 460
	Cast iron with nodular graphite	ferritic	550	–	330 – 520	330 – 520	–	–	430 – 560
		pearlitic	800	–	390 – 720	230 – 460	–	–	300 – 430
	Malleable cast iron	ferritic	450	–	300 – 590	330 – 660	–	–	460 – 660
		pearlitic	750	–	–	260 – 490	–	–	390 – 520
N	Aluminum alloys long chipping	not heat treatable	200	–	–	–	330 – 1640	–	980 – 1640
		heat treatable, heat treated	350	–	–	–	330 – 980	–	660 – 980
	Casted aluminum alloys	≤ 12 % Si, heat treated	250	–	–	–	330 – 1640	–	330 – 1640
		≤ 12 % Si, heat treatable, heat treated	300	–	–	–	330 – 980	–	330 – 980
		≤ 12 % Si, not heat treatable	450	–	–	–	330 – 660	–	330 – 660
	Copper and copper alloys (Brass/Bronze)	Lead alloys, Pb > 1 %	400	–	–	–	330 – 1640	–	820 – 1640
		Brass, Bronze	300	–	–	–	330 – 1640	–	660 – 1640
		Aluminum bronze	500	–	–	–	330 – 980	–	490 – 980
		Copper and electrolyte copper	200	–	–	–	330 – 980	–	490 – 980
	Non-ferrous materials	Duroplastice	–	–	–	–	260 – 590	–	260 – 590
		Re-inforced plastics	–	–	–	–	200 – 490	–	200 – 490
		Hard rubber	–	–	–	–	330 – 720	–	330 – 660
S	High temperature resistant alloys	Fe-alloyed, annealed	700	–	–	–	70 – 160	–	100 – 150
		Fe-alloyed, heat treated	950	–	–	–	70 – 130	–	70 – 110
		Ni- or Co-alloyed, annealed	800	–	–	–	50 – 80	–	50 – 80
		Ni- or Co-alloyed, casting	1100	–	–	–	30 – 70	–	30 – 70
		Ni- or Co-alloyed, heat treated	1200	–	–	–	30 – 70	–	30 – 70
	Titanium alloys	Pure titanium	500 – 700	–	–	–	160 – 390	–	200 – 390
	Alpha- and Beta-alloys	heat treated	700 – 1000	–	–	–	100 – 160	–	100 – 160
H	Hardened steel	hardened	55 HRC	–	–	–	–	–	–
			60 HRC	–	–	–	–	–	–
	Hard cast iron	casting	41 HRC	–	–	–	–	–	–
	Hardened cast iron	hardened	55 HRC	–	–	–	–	–	–

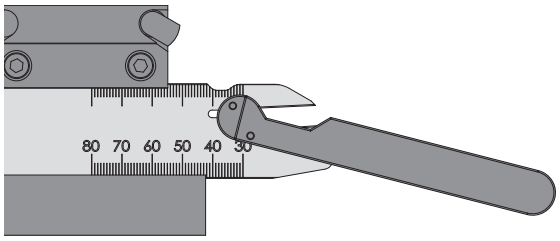
Recommended cutting data are approximate starting parameters, they may need adjustment for individual machining applications.

Application recommendations

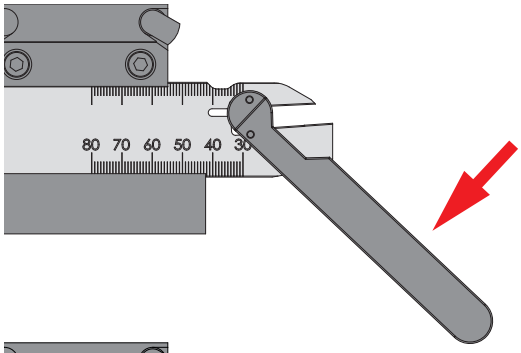
Geometry	Groove width W	Feed rate (in./rev.)
S1	.059	
F1	.079	
T1/S1	.079	
M1	.079	
ALU	.079	
T1/S1	.118	
M1	.118	
ALU	.118	
M1	.157	
T1/S1	.197	
M1	.197	
M1	.236	
M1	.315	
M1	.394	



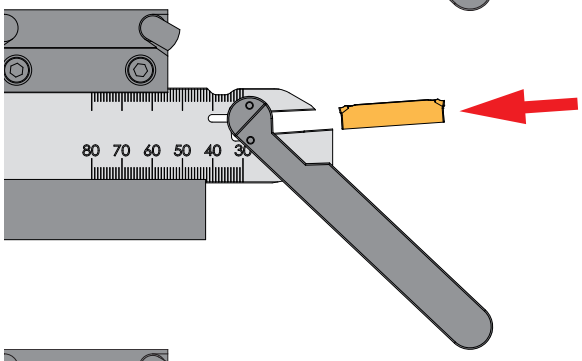
KSA mounting instructions ...-N



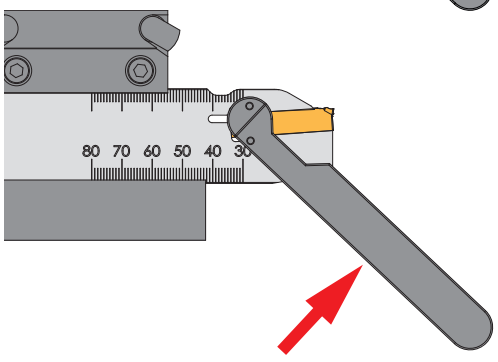
Place the mounting wrench in the hole and top opening (from either side).



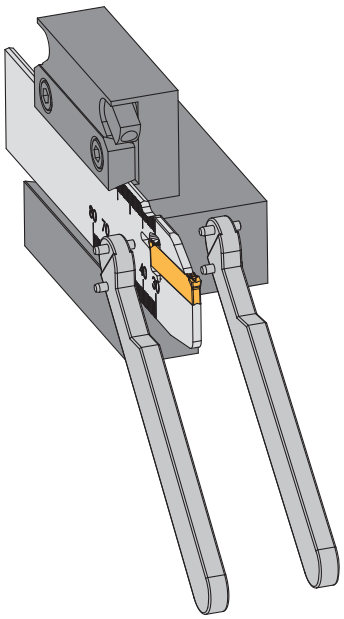
The insert seat is opened by moving the mounting wrench in the direction of the arrow.



Place the cutting insert in position against the stop by lightly pressing in.

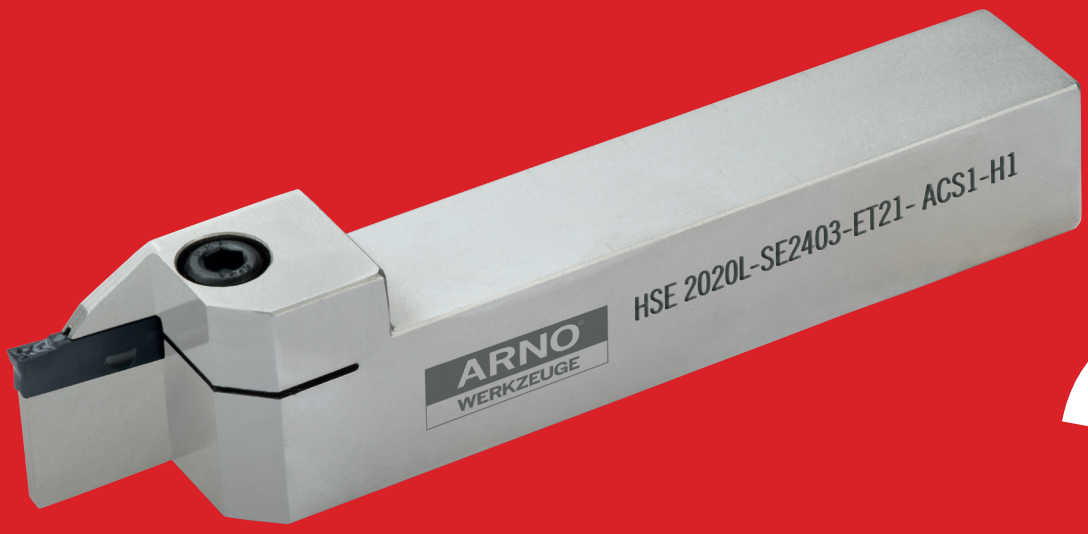


Move the mounting wrench upwards. The clamp closes against the cutting insert and secures it in place.



This tool design allows the mounting wrench to be located on either side of the blade for easy accessibility.

SE Grooving (INCH)



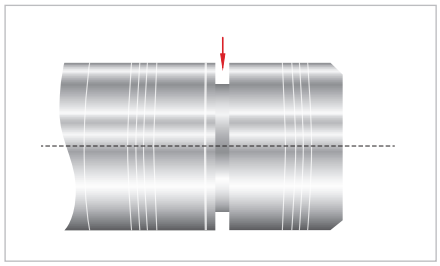
2

SE grooving holders for double sided inserts

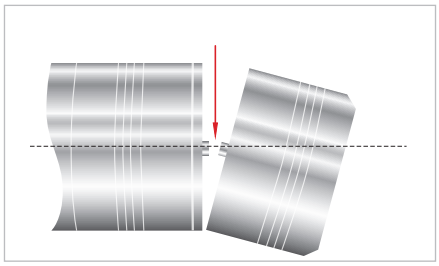
Monoblock holders
Shank sizes .625” to 1.000”

2

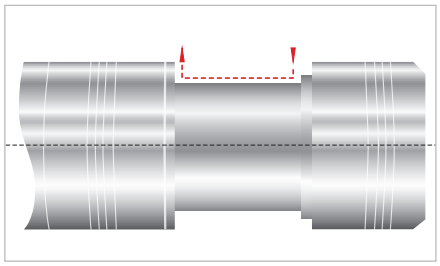
Grooving



Cut-off



Profiling (copy turning)



ARNO® SE Grooving System

The ARNO® SE radial grooving system with through tool coolant ACS1 (ARNO Cooling-System 1)

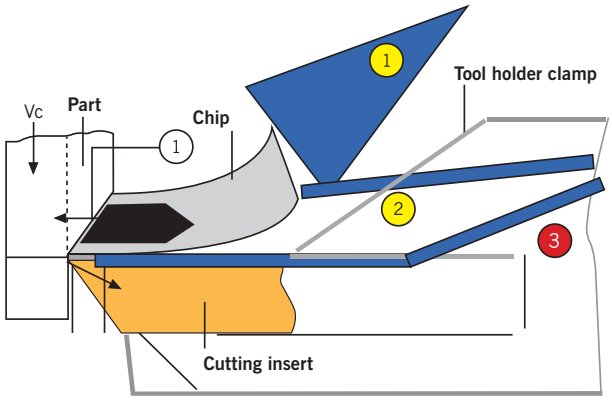
Available in groove widths from .079” – .236” (2–6mm) and groove depths of .472” or .827” (12 and 21mm)

The “double V” insert seat design guarantees an accurate and secure location. In combination with a fixed stop it ensures precise insert repeatability.

The inserts are available in 3 geometries and 5 grades:

- M2 sintered geometry is especially designed for grooving, turning and copy turning in Steel and Stainless Steel materials.
- T1 sintered geometry is for machining Steel and Cast Iron materials.
- ALU high precision ground geometry is available for non-ferrous materials (Aluminums - Plastics).

All tool holders are offered with ACS1 through tool coolant.



1 ”External coolant” from coolant jet

2 ”Internal coolant” through tool or clamp

3 New ACS-coolant through insert seat

Introduction

Monoblock holder HSE for double edged inserts SE24

- **Inserts with groove width from .079" to .236" (2mm-6mm)**
- **3 different geometries and 5 carbide grades available**
- **Square shank sizes from .625" to 1.000" (or 16–25mm)**
- **For grooving, cut-off and profiling (using M2 geometry)**
- **Available in .472" and .827" grooving depths**

All tool holders are offered with ARNO's ACS1 through tool coolant.

Features

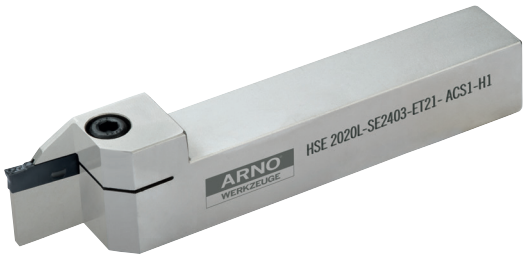
- **Monoblock design**
  – Reliable and user friendly – only one spare part
- **Active insert clamping with fixed stop**
  – Accurate insert positioning – pulling out the insert is not possible
- **Double edged inserts**
  – High productivity
- **Directly pressed inserts with dedicated geometries**
  – Cost efficient and optimum solution for reliable cut-off
- **Ground insert for Non-Ferrous materials**
  – Sharp insert with polished top for better chip flow, excellent for machining Aluminum and Plastics
- **Main application for Steel and Stainless Steel**
- **Strong cutting edge for maximum feed rates and cutting depths**
- **ACS Through Coolant on all holders**

Monoblock holders

HSE	2020L	SE	2403	ET21	ACS1	H1
H = Holder	Shank size	Insert	Insert size	Part-off diameter	ARNO-Cooling-System®	Coolant Connection
S = Grooving	R = Right hand	External	24 – Insert length 24mm (.945")	21mm (.827")	ACS1 = with one coolant hole	Only applies to European markets
E = External	L = Left hand		03 – Insert width 3mm (.118")		ACS2 = with two coolant holes	UN = Coolant inlet for VDI flange mounted holders

Inserts

SE24	30	03	N	M2	AP	5020
SE = Grooving External	Groove width 3mm (.118")	Corner radius R = 0.3mm (.012")	N = Neutral	Geometry	ARNO®-Application area	Grade code (ISO standard)
35 = Insert length			R = Right hand			
			L = Left hand			



HSE Monoblock holders ACS1

Page 72 – 75

SE-Inserts

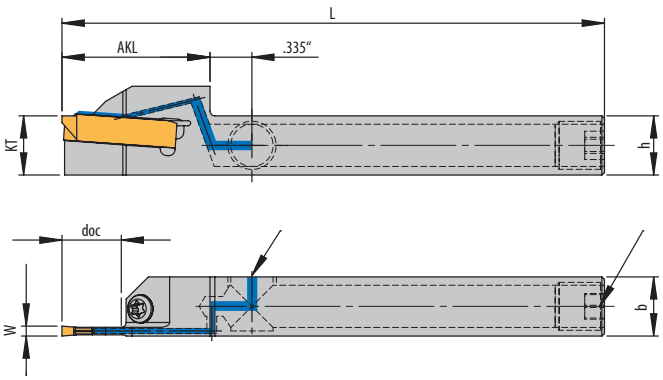
Page 79

HSE-S-ACS1

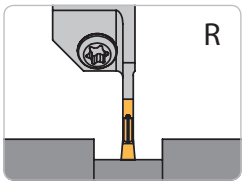
SWISS STYLE

inch & metric

with ACS



Right hand shown



2

Swiss style monoblock holders with Through Coolant (ACS1)
Right hand, screw clamping from top

Designation ISO	Designation ANSI	EDP	W	doc	h	b	L	L_5	AKL	KT	Insert
HSE 1212S-R-SE2402-ET12-ACS1	–	501700	.079	.472	.472	.472	4.331	.335	1.181	.472	SE 24-20...
HSE 1212S-R-SE2403-ET12-ACS1	–	501701	.118	.472	.472	.472	4.331	.335	1.181	.472	SE 24-30...
HSE 1616S-R-SE2402-ET12-ACS1-.625	HSE 10S-R-SE2402-T12-ACS1	501703	.079	.472	.625	.630	4.331	.335	1.181	.630	SE 24-20...
HSE 1616S-R-SE2403-ET12-ACS1-.625	HSE 10S-R-SE2403-T12-ACS1	501702	.118	.472	.625	.630	4.331	.335	1.181	.630	SE 24-30...

Spare parts

Holder	Screw	Key
HSE 1212S....-SE24...ACS1	AS 0022	KS 8000
HSE 1616S....-SE24...ACS1	AS 0022	KS 8000

ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 76 for more information.

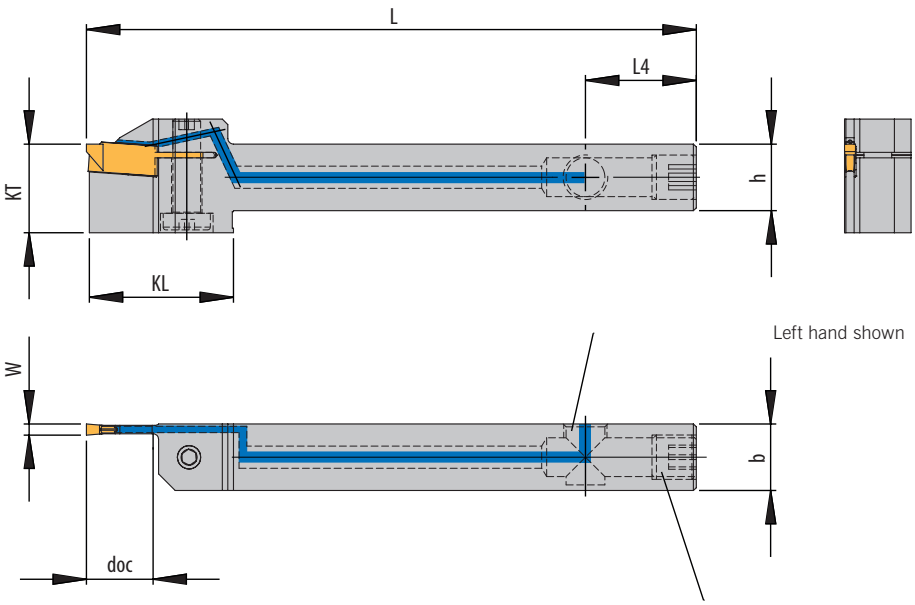
All dimensions in inches

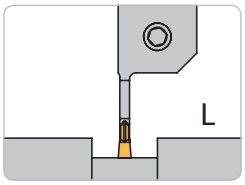
HSE-UD-ACS1

SWISS STYLE

metric only

with ACS





2

Swiss style monoblock holders with Through Coolant (ACS1)
Left hand, screw clamping from top and bottom

Designation ISO	Designation ANSI	EDP	W	doc	h	b	L	L_4	KL	KT	Insert
HSE 1212UD-L-SE2402-ET12-ACS1	–	**501704**	.079	.472	.472	.472	4.331	.787	1.024	.630	**SE 24-20...**
HSE 1212UD-L-SE2403-ET12-ACS1	–	**501705**	.118	.472	.472	.472	4.331	.787	1.024	.630	**SE 24-30...**

Spare parts

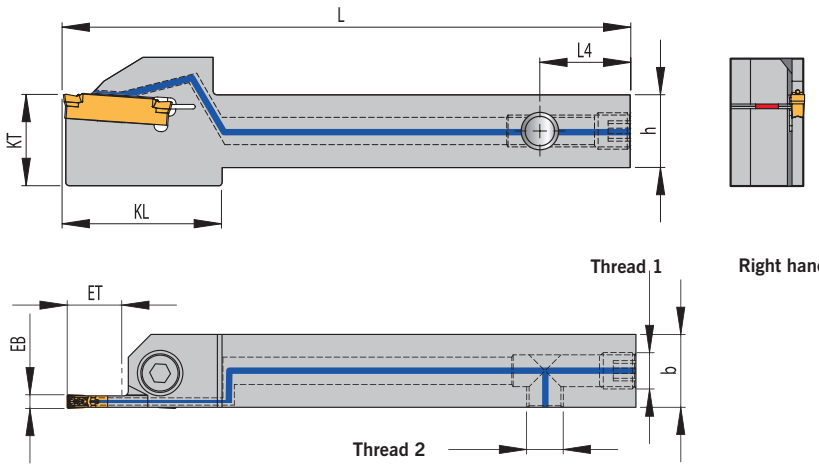
Holder	Screw	Key
HSE 1212UD....-SE24...ACS1	AS 0084	KP 3111

ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 76 for more information.

All dimensions in inches

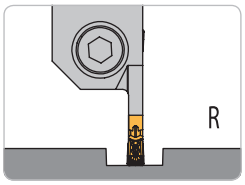
HSE-ACS1

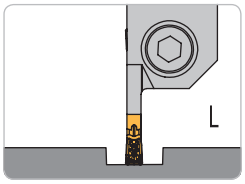


Right hand shown

inch & metric

with ACS





2

Monoblock holders with Through Coolant (ACS1)
Lathe style, doc .472" (12mm)

Designation ISO	Designation ANSI	EDP	W	doc	h	b	L	L_4	KL	KT	Insert
HSE 1616L-SE2402-ET12 ACS1-.625	HSE 10L-SE2402-T12 ACS1	501688	.079	.472	.625	.630	4.921	–	1.378	.787	SE 24-20...
HSE 1616R-SE2402-ET12 ACS1-.625	HSE 10R-SE2402-T12 ACS1	501689	.079	.472	.625	.630	4.921	–	1.378	.787	SE 24-20...
HSE 1616L-SE2403-ET12 ACS1-.625	HSE 10L-SE2403-T12 ACS1	501695	.118	.472	.625	.630	4.921	–	1.378	.787	SE 24-30...
HSE 1616R-SE2403-ET12 ACS1-.625	HSE 10R-SE2403-T12 ACS1	501694	.118	.472	.625	.630	4.921	–	1.378	.787	SE 24-30...
HSE 1616L-SE2404-ET12 ACS1-.625	HSE 10L-SE2404-T12 ACS1	501696	.157	.472	.625	.630	4.921	–	1.378	.787	SE 24-40...
HSE 1616R-SE2404-ET12 ACS1-.625	HSE 10R-SE2404-T12 ACS1	501697	.157	.472	.625	.630	4.921	–	1.378	.787	SE 24-40...
HSE 2020L-SE2402-ET12 ACS1-.750	HSE 12L-SE2402-T12 ACS1	501646	.079	.472	.750	.787	4.921	–	–	–	SE 24-20...
HSE 2020R-SE2402-ET12 ACS1-.750	HSE 12R-SE2402-T12 ACS1	501656	.079	.472	.750	.787	4.921	–	–	–	SE 24-20...
HSE 2020L-SE2403-ET12 ACS1-.750	HSE 12L-SE2403-T12 ACS1	501648	.118	.472	.750	.787	4.921	–	–	–	SE 24-30...
HSE 2020R-SE2403-ET12 ACS1-.750	HSE 12R-SE2403-T12 ACS1	501658	.118	.472	.750	.787	4.921	–	–	–	SE 24-30...
HSE 2020L-SE2404-ET12 ACS1-.750	HSE 12L-SE2404-T12 ACS1	501650	.157	.472	.750	.787	4.921	–	–	–	SE 24-40...
HSE 2020R-SE2404-ET12 ACS1-.750	HSE 12R-SE2404-T12 ACS1	501660	.157	.472	.750	.787	4.921	–	–	–	SE 24-40...
HSE 2020L-SE2405-ET12 ACS1-.750	HSE 12L-SE2405-T12 ACS1	501652	.197	.472	.750	.787	4.921	–	–	–	SE 24-50...
HSE 2020R-SE2405-ET12 ACS1-.750	HSE 12R-SE2405-T12 ACS1	501662	.197	.472	.750	.787	4.921	–	–	–	SE 24-50...
HSE 2020L-SE2406-ET12 ACS1-.750	HSE 12L-SE2406-T12 ACS1	501654	.236	.472	.750	.787	4.921	–	–	–	SE 24-60...
HSE 2020R-SE2406-ET12 ACS1-.750	HSE 12R-SE2406-T12 ACS1	501664	.236	.472	.750	.787	4.921	–	–	–	SE 24-60...
HSE 2525L-SE2403-ET12 ACS1-1.000	HSE 16L-SE2403-T12 ACS1	109500	.118	.472	1.000	1.000	5.906	–	–	–	SE 24-30...
HSE 2525R-SE2403-ET12 ACS1-1.000	HSE 16R-SE2403-T12 ACS1	109508	.118	.472	1.000	1.000	5.906	–	–	–	SE 24-30...
HSE 2525L-SE2404-ET12 ACS1-1.000	HSE 16L-SE2404-T12 ACS1	109502	.157	.472	1.000	1.000	5.906	–	–	–	SE 24-40...
HSE 2525R-SE2404-ET12 ACS1-1.000	HSE 16R-SE2404-T12 ACS1	109510	.157	.472	1.000	1.000	5.906	–	–	–	SE 24-40...
HSE 2525L-SE2405-ET12 ACS1-1.000	HSE 16L-SE2405-T12 ACS1	109504	.197	.472	1.000	1.000	5.906	–	–	–	SE 24-50...
HSE 2525R-SE2405-ET12 ACS1-1.000	HSE 16R-SE2405-T12 ACS1	109512	.197	.472	1.000	1.000	5.906	–	–	–	SE 24-50...
HSE 2525L-SE2406-ET12 ACS1-1.000	HSE 16L-SE2406-T12 ACS1	109506	.236	.472	1.000	1.000	5.906	–	–	–	SE 24-60...
HSE 2525R-SE2406-ET12 ACS1-1.000	HSE 16R-SE2406-T12 ACS1	109514	.236	.472	1.000	1.000	5.906	–	–	–	SE 24-60...

ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 76 for more information.

All dimensions in inches

Monoblock holders with Through Coolant (ACS1)
Lathe style, doc .827" (21mm)

inch & metric

with ACS

Designation ISO	Designation ANSI	EDP	W	doc	h	b	L	L_4	KL	KT	Insert
HSE 1616L-SE2402-ET21 ACS1-.625	HSE 10L-SE2402-T21 ACS1	501691	.079	.827	.625	.630	4.921	–	1.378	.787	SE 24-20...
HSE 1616R-SE2402-ET21 ACS1-.625	HSE 10R-SE2402-T21 ACS1	501690	.079	.827	.625	.630	4.921	–	1.378	.787	SE 24-20...
HSE 1616L-SE2403-ET21 ACS1-.625	HSE 10L-SE2403-T21 ACS1	501692	.118	.827	.625	.630	4.921	–	1.378	.787	SE 24-30...
HSE 1616R-SE2403-ET21 ACS1-.625	HSE 10R-SE2403-T21 ACS1	501693	.118	.827	.625	.630	4.921	–	1.378	.787	SE 24-30...
HSE 1616L-SE2404-ET21 ACS1-.625	HSE 10L-SE2404-T21 ACS1	501699	.157	.827	.625	.630	4.921	–	1.378	.787	SE 24-40...
HSE 1616R-SE2404-ET21 ACS1-.625	HSE 10R-SE2404-T21 ACS1	501698	.157	.827	.625	.630	4.921	–	1.378	.787	SE 24-40...
HSE 2020L-SE2402-ET21 ACS1-.750	HSE 12L-SE2402-T21 ACS1	501647	.079	.827	.750	.787	4.921	–	–	–	SE 24-20...
HSE 2020R-SE2402-ET21 ACS1-.750	HSE 12R-SE2402-T21 ACS1	501657	.079	.827	.750	.787	4.921	–	–	–	SE 24-20...
HSE 2020L-SE2403-ET21 ACS1-.750	HSE 12L-SE2403-T21 ACS1	501649	.118	.827	.750	.787	4.921	–	–	–	SE 24-30...
HSE 2020R-SE2403-ET21 ACS1-.750	HSE 12R-SE2403-T21 ACS1	501659	.118	.827	.750	.787	4.921	–	–	–	SE 24-30...
HSE 2020L-SE2404-ET21 ACS1-.750	HSE 12L-SE2404-T21 ACS1	501651	.157	.827	.750	.787	4.921	–	–	–	SE 24-40...
HSE 2020R-SE2404-ET21 ACS1-.750	HSE 12R-SE2404-T21 ACS1	501661	.157	.827	.750	.787	4.921	–	–	–	SE 24-40...
HSE 2020L-SE2405-ET21 ACS1-.750	HSE 12L-SE2405-T21 ACS1	501653	.197	.827	.750	.787	4.921	–	–	–	SE 24-50...
HSE 2020R-SE2405-ET21 ACS1-.750	HSE 12R-SE2405-T21 ACS1	501663	.197	.827	.750	.787	4.921	–	–	–	SE 24-50...
HSE 2020L-SE2406-ET21 ACS1-.750	HSE 12L-SE2406-T21 ACS1	501655	.236	.827	.750	.787	4.921	–	–	–	SE 24-60...
HSE 2020R-SE2406-ET21 ACS1-.750	HSE 12R-SE2406-T21 ACS1	501665	.236	.827	.750	.787	4.921	–	–	–	SE 24-60...
HSE 2525L-SE2403-ET21 ACS1-1.000	HSE 16L-SE2403-T21 ACS1	109501	.118	.827	1.000	1.000	5.906	–	–	–	SE 24-30...
HSE 2525R-SE2403-ET21 ACS1-1.000	HSE 16R-SE2403-T21 ACS1	109509	.118	.827	1.000	1.000	5.906	–	–	–	SE 24-30...
HSE 2525L-SE2404-ET21 ACS1-1.000	HSE 16L-SE2404-T21 ACS1	109503	.157	.827	1.000	1.000	5.906	–	–	–	SE 24-40...
HSE 2525R-SE2404-ET21 ACS1-1.000	HSE 16R-SE2404-T21 ACS1	109511	.157	.827	1.000	1.000	5.906	–	–	–	SE 24-40...
HSE 2525L-SE2405-ET21 ACS1-1.000	HSE 16L-SE2405-T21 ACS1	109505	.197	.827	1.000	1.000	5.906	–	–	–	SE 24-50...
HSE 2525R-SE2405-ET21 ACS1-1.000	HSE 16R-SE2405-T21 ACS1	109513	.197	.827	1.000	1.000	5.906	–	–	–	SE 24-50...
HSE 2525L-SE2406-ET21 ACS1-1.000	HSE 16L-SE2406-T21 ACS1	109507	.236	.827	1.000	1.000	5.906	–	–	–	SE 24-60...
HSE 2525R-SE2406-ET21 ACS1-1.000	HSE 16R-SE2406-T21 ACS1	109515	.236	.827	1.000	1.000	5.906	–	–	–	SE 24-60...

Please refer to catalog "ARNO-ACS COOLING SYSTEM" - chapter 3 for suitable flange mounted holders.

2

Spare parts

Holder	Screw	Key
HSE 1616...-SE24...ACS1...	DIN912 M5X16-12,9	KP 1321
HSE 2020...-SE24...ACS1...	DIN912 M5X16-12,9	KP 1321
HSE 2525...-SE24...ACS1...	DIN912 M5X16-12,9	KP 1321

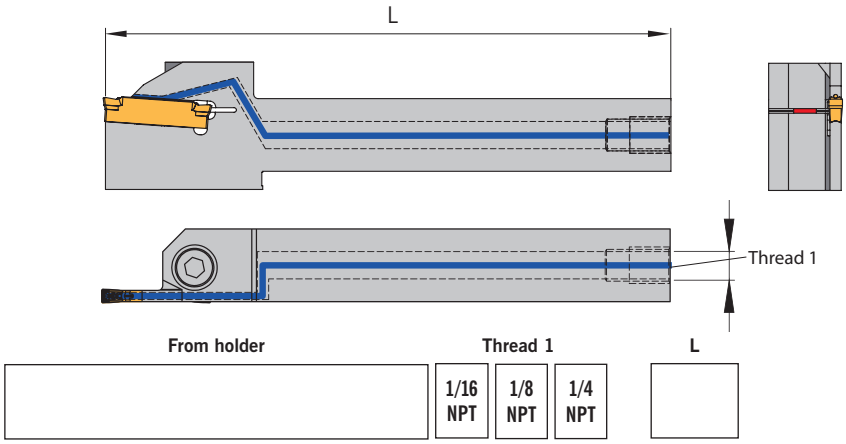
ARNO® SpecialDesign

Please specify *Thread 1* and *Thread 2* as well as Version *-S* or *-SG* when ordering.
Please refer to special order form on page 76 for more information.

All dimensions in inches

Monoblock holders with Through Coolant – access via the back

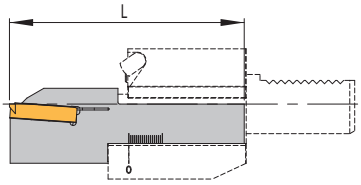
ARNO® SpecialDesign



From holder	Thread 1			L
	1/16 NPT	1/8 NPT	1/4 NPT	

with ACS

This custom holder will be produced at the same price as the standard holder.



Remark for VDI holder Form C

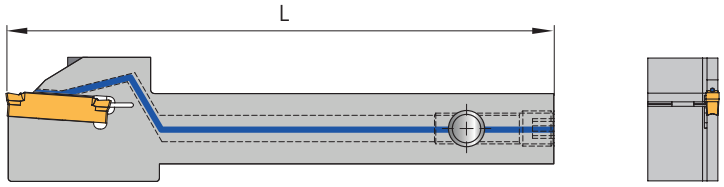
When using VDI holders Form C, please set overall length (L) according to chart below:

doc .472" (12mm)	L
HSE 1616L-SE2402...ACS1	3.543
HSE 1616R-SE2402...ACS1	
HSE 1616L-SE2403...ACS1	
HSE 1616R-SE2403...ACS1	
HSE 1616L-SE2404...ACS1	
HSE 1616R-SE2404...ACS1	
HSE 2020L-SE2402...ACS1	3.701
HSE 2020R-SE2402...ACS1	
HSE 2020L-SE2403...ACS1	
HSE 2020R-SE2403...ACS1	
HSE 2020L-SE2404...ACS1	
HSE 2020R-SE2404...ACS1	
HSE 2020L-SE2405...ACS1	
HSE 2020R-SE2405...ACS1	
HSE 2020L-SE2406...ACS1	
HSE 2020R-SE2406...ACS1	
HSE 2525L-SE2403...ACS1	4.213
HSE 2525R-SE2403...ACS1	
HSE 2525L-SE2404...ACS1	
HSE 2525R-SE2404...ACS1	
HSE 2525L-SE2405...ACS1	
HSE 2525R-SE2405...ACS1	
HSE 2525L-SE2406...ACS1	
HSE 2525R-SE2406...ACS1	

doc .827" (21mm)	L
HSE 1616L-SE2402...ACS1	3.898
HSE 1616R-SE2402...ACS1	
HSE 1616L-SE2403...ACS1	
HSE 1616R-SE2403...ACS1	
HSE 1616L-SE2404...ACS1	
HSE 1616R-SE2404...ACS1	
HSE 2020L-SE2402...ACS1	4.055
HSE 2020R-SE2402...ACS1	
HSE 2020L-SE2403...ACS1	
HSE 2020R-SE2403...ACS1	
HSE 2020L-SE2404...ACS1	
HSE 2020R-SE2404...ACS1	
HSE 2020L-SE2405...ACS1	
HSE 2020R-SE2405...ACS1	
HSE 2020L-SE2406...ACS1	
HSE 2020R-SE2406...ACS1	
HSE 2525L-SE2403...ACS1	4.567
HSE 2525R-SE2403...ACS1	
HSE 2525L-SE2404...ACS1	
HSE 2525R-SE2404...ACS1	
HSE 2525L-SE2405...ACS1	
HSE 2525R-SE2405...ACS1	
HSE 2525L-SE2406...ACS1	
HSE 2525R-SE2406...ACS1	

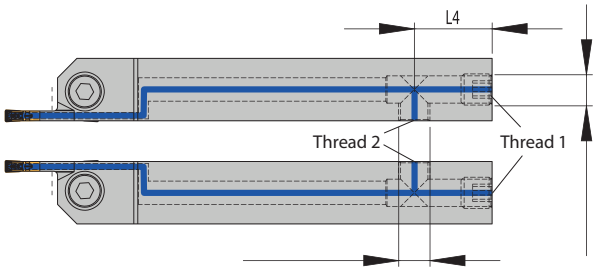
2

Monoblock holders with Through Coolant – access via the side

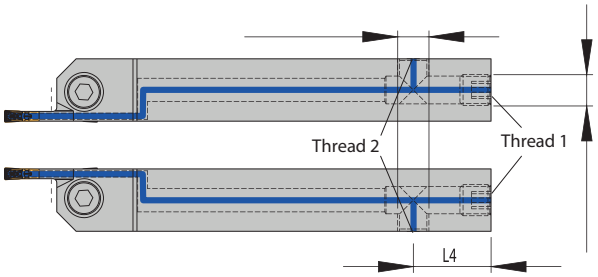


Please select:

Design S – Thread 2 is on the same side as the cutting edge



Design SG – Thread 2 is on the opposite side of the cutting edge



From holder	Thread 1		Thread 2		L_4	L
	1/8 NPT	1/4 NPT	1/8 NPT	1/4 NPT		

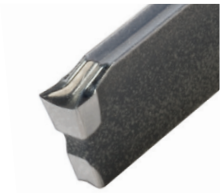
Please refer to catalog "ARNO-ACS COOLING SYSTEM" - chapter 3 for suitable flange mounted holders.

All dimensions in inches

M2

First choice for grooving and turning

- Main application areas are Steel and Stainless Steel
- Strong cutting edge for maximum feed rate and cutting depth



ALU

Ground and polished geometry with a sharp edge

- First choice for Aluminum and Non-Ferrous materials as well as Plastics
- Periphery ground insert
- High positive design
- Polished chip breaker

T1

Excellent chip control and formation

- For Steel and Stainless Steel
- Universal geometry
- Also suitable for thin wall machining

Coated

AP5020

PVD Coated:
Good wear resitance grade for longer tool life and reliability of cutting edges. Makes this grade suitable for more wear resistant materials at higher cutting speeds.

Material application: Steel and Stainless Steel, also suitable for High Temperature Alloys and Non-Ferrous materials.

AP5030

PVD Coated:
A universal grade slightly tougher than AP5020 for tougher machining conditions, especially when machining Steel components. First choice for steel.

Material application: Steel and Stainless Steel

AM5040

PVD Coated:
A tough but universal grade for low to medium cutting speeds, with excellent resistance to chipping of the cutting edge, makes this the perfect grade for very demading applications.

Material application: Stainless Steel and Steel

AP2240

CVD Coated:
AP2240 is the ideal combination of high toughness and heat resistance. Combined with a strong cutting edge it offers extended tool life and improved process reliability.

Material application: Steel and Cast Iron, also suitable for Stainless Steel

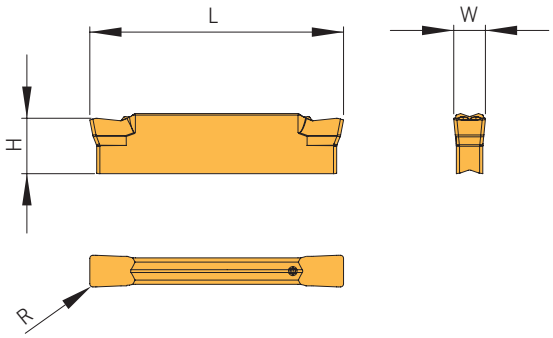
Uncoated

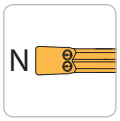
AN1015

Roughing - Finishing applications. The precision ground cutting edges with a highly polished chip breaker from provides excellent chip flow with a high resistance to build-up edge (b.u.e.).

Material application: Aluminum Alloys and Non-Ferrous materials. Also first choice in Plastics.

SE24..





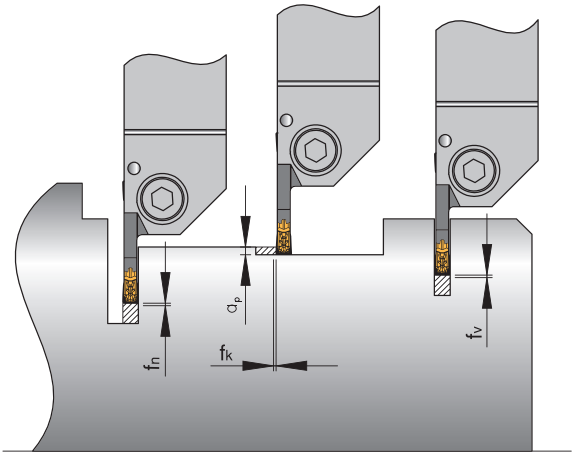
						EDP				
						coated				uncoated
Designation	W	H	L	R	χ	AM5040	AP2240	AP5020	AP5030	AN1015
SE24-2002N-M2	.079	.217	.945	.008	0°	106246		106244		
SE24-2002N-T1	.079	.217	.945	.008	0°		108845	108847		
SE24-3002N-M2	.118	.217	.945	.008	0°	106248		106250		
SE24-3003N-M2	.118	.217	.945	.012	0°	106254		106252		
SE24-3003N-T1	.118	.217	.945	.012	0°		108846	108849	108853	
SE24-4004N-M2	.157	.217	.945	.016	0°	106256		106258		
SE24-4004N-T1	.157	.217	.945	.016	0°			108851		
SE24-5004N-M2	.197	.295	.945	.016	0°	106266		106260		
SE24-5005N-T1	.197	.295	.945	.020	0°			108852		
SE24-6008N-M2	.236	.295	.945	.031	0°	106264		106262		
SE24-2002N-ALU*	.079	.217	.945	.008	0°					108854
SE24-3003N-ALU*	.118	.217	.945	.012	0°					108856

*** Ground version**

● Main application
○ Secondary application

P	○	●	●	●	
M	●	○	○	○	
K		●			○
N			○		●
S			○		○
H					

Max. feed rate and depth of cut



f_v (in./rev.) = **Feed rate into solid**
f_n (in./rev.) = **Feed rate for re-grooving**
f_k (in./rev.) = **Feed rate for turning (profiling)**
doc (in.) = **Depth of cut**

2

Geometry M2

	Insert				
	SE24-20....	SE24-30....	SE24-40....	SE24-50....	SE24-60....
f_v in/rev	.002–.005	.003–.007	.005–.009	.005–.012	.006–.014
f_n in/rev	.002–.008	.003–.012	.005–.014	.006–.016	.008–.018
f_k in/rev	.002–.006	.003–.009	.005–.012	.006–.016	.008–.018
doc $_{max}$	.008–.028	.010–.049	.016–.071	.024–.098	.031–.118

Geometry T1

	Insert			
	SE24-20....	SE24-30....	SE24-40....	SE24-50....
f_v in/rev	.001–.005	.002–.008	.004–.009	.005–.012
f_n in/rev	.001–.008	.002–.010	.004–.012	.006–.016
f_k in/rev	.002–.008	.003–.012	.005–.016	.006–.020
doc $_{max}$	.008–.028	.010–.049	.016–.071	.024–.098

Geometry ALU

	Insert	
	SE24-20....	SE24-30....
f_v in/rev	.001–.006	.001–.008
f_n in/rev	.001–.008	.001–.010
f_k in/rev	.002–.008	.003–.012
doc $_{max}$	.008–.039	.010–.059

Recommended cutting data are approximate starting parameters, they may need adjustment for individual machining applications.

ISO	Material		Tensile strength (N/mm²)	Cutting speed V_c (f/min) coated AM5040	AP2240	AP5020	AP5030	uncoated AN1015
P	Unalloyed steel and cast steel	< 0.15 % C/hardened and tempered	350	390 – 660	430 – 820	390 – 720	390 – 660	–
		0.15 - 0.45 % C/hardened and tempered	650	260 – 490	360 – 620	260 – 490	260 – 490	–
		> 0.45 % C/hardened and tempered	1000	200 – 460	230 – 560	200 – 460	200 – 460	–
	Low alloyed steel and cast steel	annealed	600	260 – 520	390 – 660	260 – 560	260 – 560	–
		hardened and tempered	900	200 – 430	360 – 590	200 – 430	200 – 430	–
			1200	200 – 390	230 – 490	200 – 390	200 – 390	–
	High alloyed steel	annealed	700	260 – 460	300 – 560	260 – 460	260 – 460	–
	High alloyed tool steel and cast steel	hardened	1100	160 – 390	230 – 520	160 – 390	160 – 390	–
	Stainless steel	ferritic, annealed	700	200 – 520	390 – 660	200 – 560	200 – 560	–
	Cast steel	martensitic, hardened and tempered	1000	160 – 330	200 – 330	160 – 330	160 – 330	–
M	Stainless steel	ferritic/martensitic, annealed	450 – 600	200 – 520	330 – 560	200 – 590	200 – 560	–
		martensitic/austenitic, heat treated	600 – 900	160 – 300	200 – 300	160 – 300	160 – 300	–
K	Cast iron	pearlitic/ferritic	500 – 700	–	330 – 660	–	–	390 – 520
		pearlitic/martensitic	700 – 850	–	300 – 590	–	–	330 – 490
			800 – 1100	–	260 – 490	–	–	300 – 460
	Cast iron with nodular graphite	ferritic	550	–	330 – 520	–	–	430 – 560
		pearlitic	800	–	230 – 460	–	–	300 – 430
	Malleable cast iron	ferritic	450	–	330 – 660	–	–	460 – 660
		pearlitic	750	–	260 – 490	–	–	390 – 520
N	Aluminum alloys long chipping	not heat treatable	200	–	–	330 – 1640	–	980 – 1640
		heat treatable, heat treated	350	–	–	330 – 980	–	660 – 980
	Casted aluminum alloys	≤ 12 % Si, heat treated	250	–	–	330 – 1640	–	330 – 1640
		≤ 12 % Si, heat treatable, heat treated	300	–	–	330 – 980	–	330 – 980
		≤ 12 % Si, not heat treatable	450	–	–	330 – 660	–	330 – 660
	Copper and copper alloys (Brass/Bronze)	Lead alloys, Pb > 1 %	400	–	–	330 – 1640	–	820 – 1640
		Brass, Bronze	300	–	–	330 – 1640	–	660 – 1640
		Aluminum bronze	500	–	–	330 – 980	–	490 – 980
		Copper and electrolyte copper	200	–	–	330 – 980	–	490 – 980
	Non-ferrous materials	Duroplastics	–	–	–	260 – 590	–	260 – 590
		Re-inforced plastics	–	–	–	200 – 490	–	200 – 490
		Hard rubber	–	–	–	330 – 720	–	330 – 660
S	High temperature resistant alloys	Fe-alloyed, annealed	700	–	–	70 – 160	–	100 – 150
		Fe-alloyed, heat treated	950	–	–	70 – 130	–	70 – 110
		Ni- or Co-alloyed, annealed	800	–	–	50 – 80	–	50 – 80
		Ni- or Co-alloyed, casting	1100	–	–	30 – 70	–	30 – 70
		Ni- or Co-alloyed, heat treated	1200	–	–	30 – 70	–	30 – 70
	Titanium alloys	Pure titanium	500 – 700	–	–	160 – 390	–	200 – 390
	Alpha- and Beta-alloys	heat treated	700 – 1000	–	–	100 – 160	–	100 – 160
H	Hardened steel	hardened	55 HRC	–	–	–	–	–
			60 HRC	–	–	–	–	–
	Hard cast iron	casting	41 HRC	–	–	–	–	–
	Hardened cast iron	hardened	55 HRC	–	–	–	–	–

Recommended cutting data are approximate starting parameters, they may need adjustment for individual machining applications.

Item	EDP
Screw	
AS 0022	62489
AS 0084	106529
DIN912 M5X16-12,9	92150
Key	
KS 8000	68824
KP 3111	19648
KP 1321	19647

General

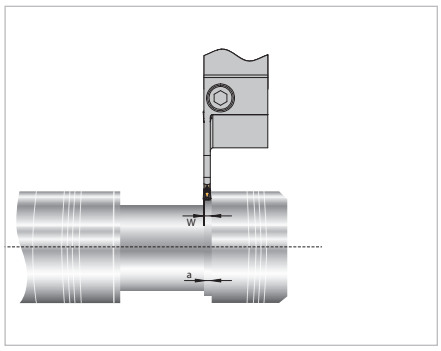
1) Select the correct tool for the application. Tools should have minimum overhang to reduce vibrations and increase tool life.

When selecting inserts, consider:
- Cut-off width
- Chip breaker for the material
- Approach angle and corner radius

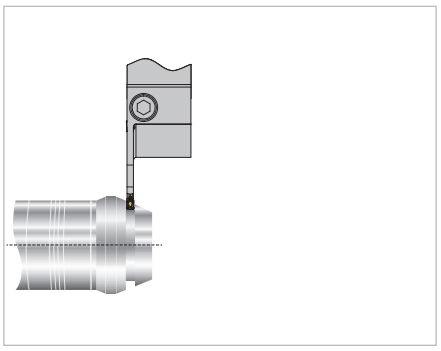
2) Select insert width as narrow as possible and as wide as necessary. By reducing the insert width, the cutting forces are reduced and less material is wasted (especially in mass production).

If possible, use neutral inserts for better chip control and tool life.

Recommendations for grooving

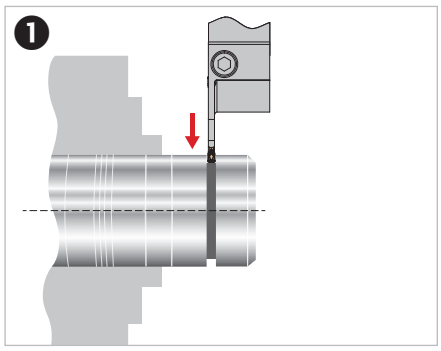


- When grooving with an axial displacement the width “a” should be a minimum of 70 % of the groove width “s”.

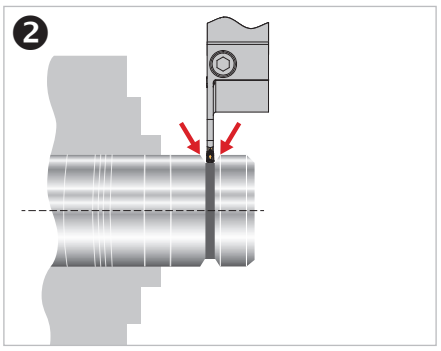


- When grooving into an angled surface reduce feed rate by 20 – 50 % until in full cut.

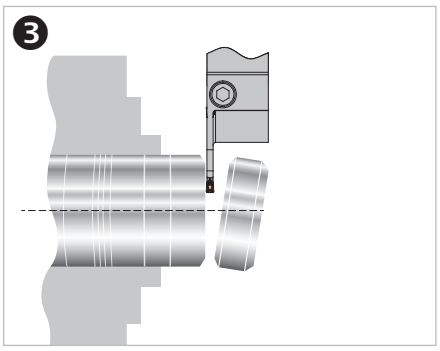
Chamfering and Cut-off



1. Pre-grooving



2. Chamfering

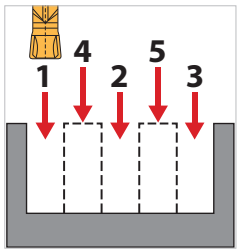


3. Cut-off

Machining of external grooves

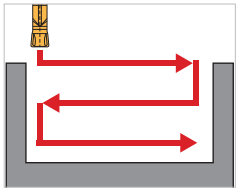
The most popular ways of producing wide grooves between two shoulders are: Multiple plunge grooving, Groove turning, Ramping and Pocketing.

Multiple plunge grooving



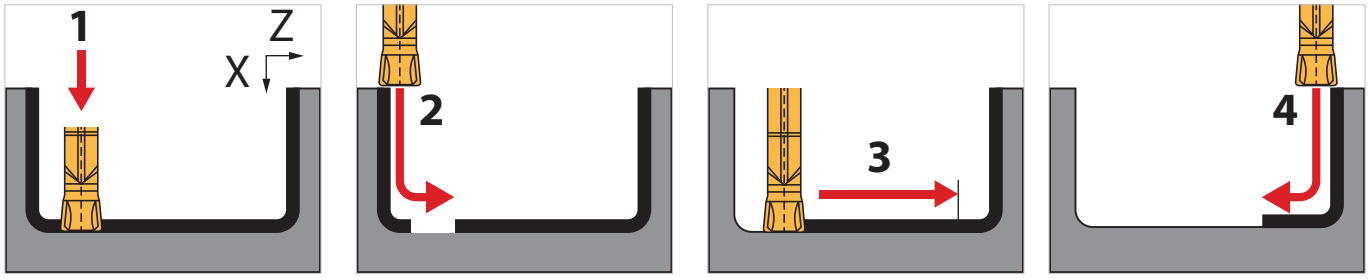
First the full grooves are machined. Grooves 1, 2 and 3, afterwards 4 and 5. This protects the corner radius and the chip is directed to the center of the chip breaker. Widths of groove 4 and 5 should be 60–80% of insert width (W).

Groove turning



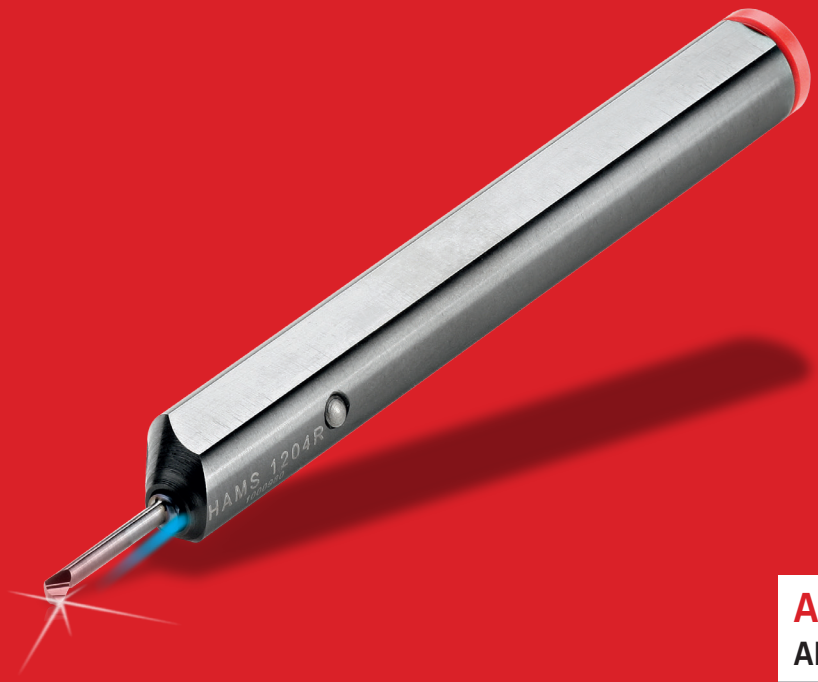
The groove depth (doc) depends on the width of the insert, material and the edge length of the inserts.
General rule:
doc max. = W x 0.7
doc min. = Corner radius "r"

Groove finishing machining



1) Be careful when finishing. As the radius of the insert moves mainly in the Z-axis which can produce very thin chips, that can lead to vibration and poor surface finishes.

2) When using the machine path shown (1-4), axial and radial depths of cut should be between .020" and .040" (0.5–1.0mm).



AMS (INCH)

ARNO® Mini-System

3

ARNO® Mini-System

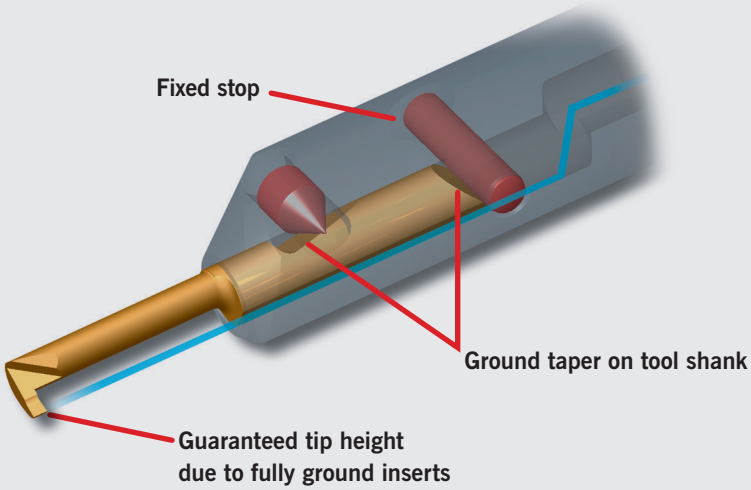
Minimum Diameter from .028” (0.7mm)
Depth up to 1.969” (50mm)

Introduction

AMS is a modular boring system starting at D_{min} .028" with a maximum reach of 1.969" (depending on application). With the ground taper on the tool shank and the fixed stop in the sleeve the length remains accurately constant and guaranteed cutting edge repeatability is achieved. The cone of the threaded pin ensures secure tool locking and reduces cutting edge vibrations. Through tool coolant ensures longer tool life and better chip evacuation.

Features

- Boring from diameter .028" (0.7mm)
- Groove width starting at .031" (0.8mm)
- Full radius grooving starting at R .020" (0.5mm)
- Back turning and chamfering
- Pre-grooving and chamfering
- Center chamfering
- Copying
- Threading from M3 metric thread
- Face grooving starting at Ø .0197" (5mm)
- Through tool coolant on all round shank holders



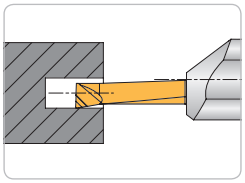
Holders

HAMS	16	06	R
H = Holder	Shank diameter .630" (16mm)	Insert shank diameter .236" (6mm)	Version
A = ARNO®			R = Right hand
M = Mini			L = Left hand
S = Grooving			

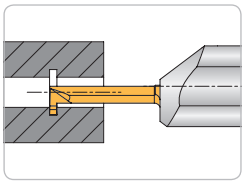
Inserts

AMS	D	25	08	06	01	100	40R
A = ARNO®	D = Turning	D_{min} = .098" (2.5mm)	Groove width W = .031" (0.8mm)	Groove depth doc = .024" (0.6mm)	Radius R = .004" (0.1mm)	Maximum reach AKL = .394" (10mm)	Shank diameter .157" (4mm)
M = Mini	D20 = Turning						R = Right hand
S = Grooving	S = Grooving						L = Left hand
	472 = Cir-clip 471/472						
	K = Copying						
	K45 = Copying 45°						
	V = Pre-grooving						
	ZF = Center chamfering						
	F = Chamfering						
	R = Back turning						
	G = Threading						
	GV = Threading (full profile)						
	WF = Whitworth thread						
	TR = Trapezoidal thread						
	UN = American UN thread						
	A = Face grooving						

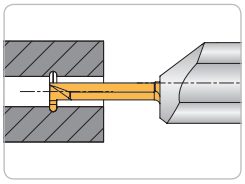
Program overview holders and inserts



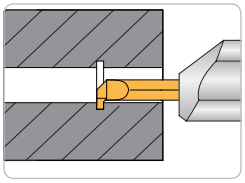
Turning 95°
Page 92



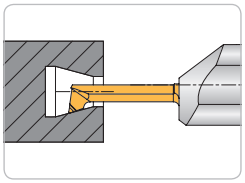
Grooving
Page 94



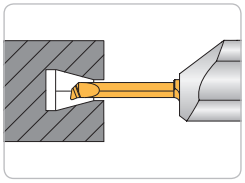
Radius grooving
Page 95



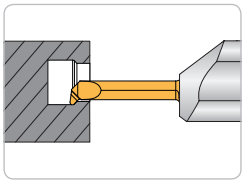
Cir-clip DIN 471/472
Page 96



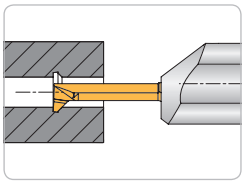
Copying
Page 97



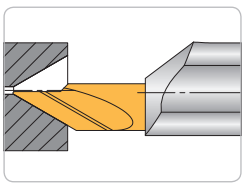
Copying – Reinforced execution
Page 98



Copying 45°
Page 99

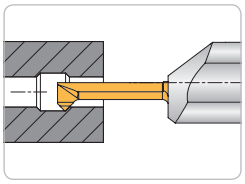


Pre-grooving and chamfering
Page 100

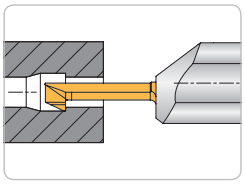


Center chamfering 45°/60°
Page 101

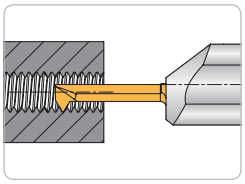
Program overview holders and inserts



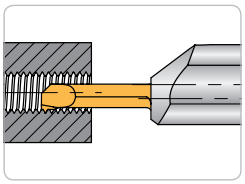
Chamfering 45°
Page 102



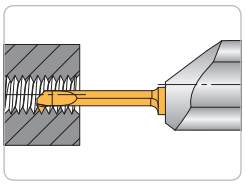
Back turning
Page 103



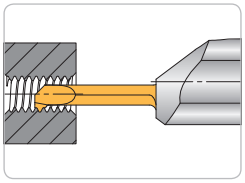
Threading 60° – Metric partial profile
Page 104



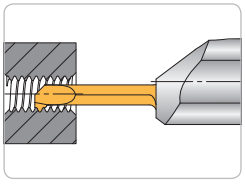
Threading 60° – Metric full profile
Page 105



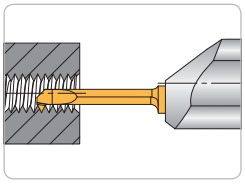
Whitworth thread 55° – Partial profile
Page 106



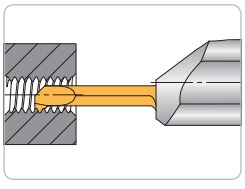
Whitworth pipe thread 55° DIN ISO 228 – Full profile
Page 107



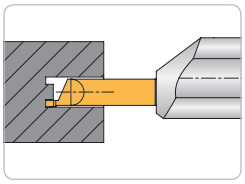
Whitworth pipe thread 55° BSW – Full profile
Page 108



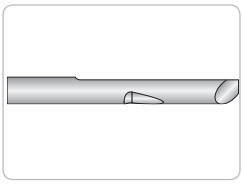
Trapezoidal 30° DIN ISO 103 – Partial profile
Page 109



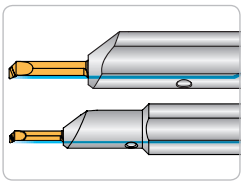
American standard thread 60° UN – Full profile
Page 110



Axial grooving
Page 111

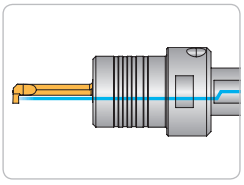


Blanks for special profiles
Page 112

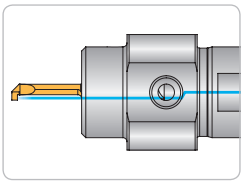


Holders – Standard / Offset
Page 113

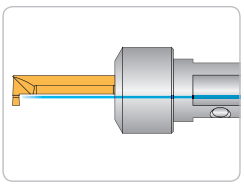
Specific holders - machine-/application- specific



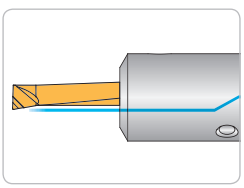
Hydraulic holders for lathes
Page 114



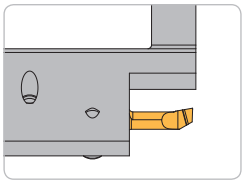
Finishing holders for STAR lathes
Page 115



Holders for swiss style machines (round shank)
Page 116

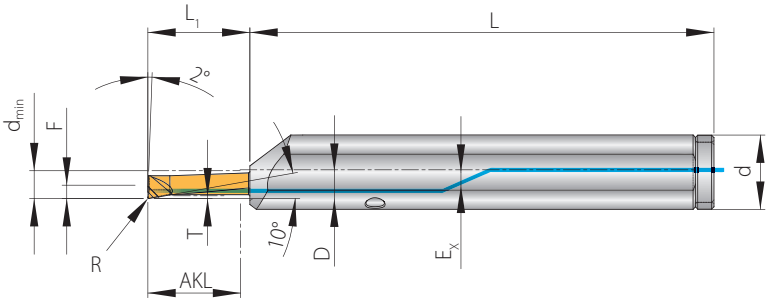


Holders for finishing applications
Page 117



Holders for swiss style and multi spindle machines (square shank)
Page 118

Turning



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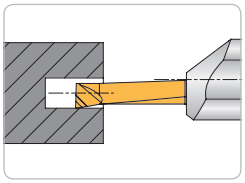
Page 120–123



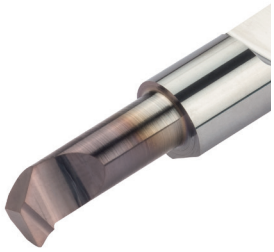
T = Depth
R = Radius
F = F-Dimension

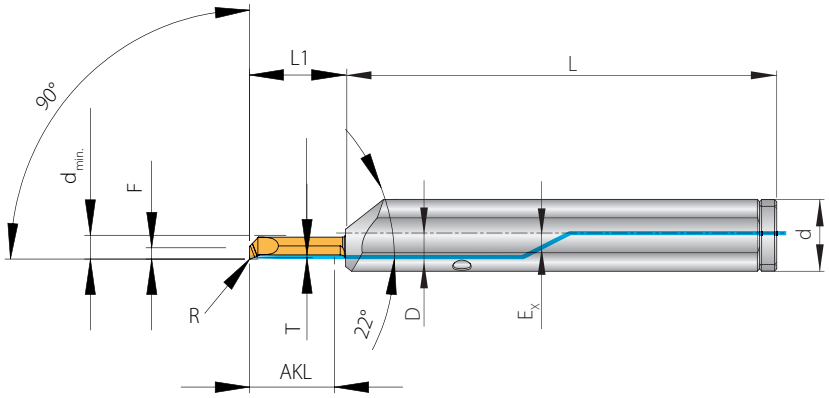
Insert								Holder						
d_{min}	AKL	T	W	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.028	.079	.002	–	.002	**AMS-D-07005005-020.40R**	104713	.012	.157	.500	3.937	.157	.093	**HAMS 1204R-.500**	500995
.079	.236	.006	–	.001	**AMS-D-20015002-060.40R**	106114	.035	.157	.500	3.937	.315	.093	**HAMS 1204R-.500**	500995
	.394				**AMS-D-20015002-100.40R**	106116					.472		**HAMS 1204R-.500**	500995
.087	.236	.016	–	.004	**AMS-D-220401-060.40R**	108739	.041	.157	.500	3.937	.315	.093	**HAMS 1204R-.500**	500995
.098	.394	.016	–	.004	**AMS-D-250401-100.40R**	87308	.045	.157	.500	3.937	.472	.093	**HAMS 1204R-.500**	500995
	.591				**AMS-D-250401-150.40R**	87306					.669		**HAMS 1204R-.500**	500995
	.787				**AMS-D-250401-200.40R**	87310					.866		**HAMS 1204R-.500**	500995
.118	.394	.016	–	.004	**AMS-D-300401-100.40R**	87314	.055	.157	.500	3.937	.472	.093	**HAMS 1204R-.500**	500995
	.591				**AMS-D-300401-150.40R**	87312					.669		**HAMS 1204R-.500**	500995
	.787				**AMS-D-300401-200.40R**	87316					.866		**HAMS 1204R-.500**	500995
.154	.394	.024	–	.008	**AMS-D-390602-100.40R**	87320	.075	.157	.500	3.937	.472	.093	**HAMS 1204R-.500**	500995
	.591				**AMS-D-390602-150.40R/L**	87318					.669		**HAMS 1204R-.500**	500995
	.787				**AMS-D-390602-200.40R/L**	87322					.866		**HAMS 1204R-.500**	500995
.157	.984	.006	–	.002	**AMS-D-40015005-250.40R/L**	106140	.075	.157	.500	3.937	1.063	.093	**HAMS 1204R-.500**	500995
	.984	.012		.004	**AMS-D-400301-250.40R**	105030					1.063		**HAMS 1204R-.500**	500995
.232	.394	.031	–	.008	**AMS-D-590802-100.60R**	87326	.114	.236	.625	4.724	.472	.110	**HAMS 1606R-.625**	500996
	.591			.004	**AMS-D-590801-150.60R**	104811					.669		**HAMS 1606R-.625**	500996
	.787			.008	**AMS-D-590802-200.60R/L**	87324					.866		**HAMS 1606R-.625**	500996
	.787			.016	**AMS-D-590804-200.60R**	104387					.866		**HAMS 1606R-.625**	500996
	1.181			.008	**AMS-D-590802-300.60R/L**	87328					1.260		**HAMS 1606R-.625**	500996
.236	1.654	.020	–	.006	**AMS-D-6005015-420.60R**	105032	.114	.236	.625	4.724	1.732	.110	**HAMS 1606R-.625**	500996
.311	.394	.039	–	.008	**AMS-D-791002-100.80R**	87332	.154	.315	.625	4.724	.472	.110	**HAMS 1608R-.625**	501430
	.984				**AMS-D-791002-250.80R/L**	87330					1.063		**HAMS 1608R-.625**	501430
.323	1.181	.016	–	.008	**AMS-D-820402-300.80R**	105277	.154	.315	.625	4.724	1.260	.110	**HAMS 1608R-.625**	501430
.402	.787	.039	–	.008	**AMS-D-1021002-200.100R**	105279	.193	.394	.750	4.724	.866	.110	**HAMS 2010R-.750**	501745
	1.181				**AMS-D-1021002-300.100R**	105281					1.260		**HAMS 2010R-.750**	501745

3

All dimensions in inches

Turning





with ic

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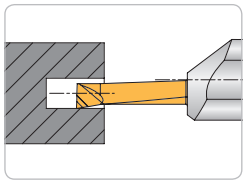


T = Depth
R = Radius
F = F-Dimension

Insert								Holder						
d_{min}	AKL	T	W	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.118	.591	.006	–	.008	**AMS-D20-3001502-150.40R**	106132	.051	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.157	.591	.012	–	.008	**AMS-D20-400302-150.40R**	106134	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.197	.394	.020	–	.008	**AMS-D20-500502-100.60R**	106228	.091	.236	.625	4.724	.472	.110	**HAMS 1606R-.625**	500996
.197	.591	.020	–	.008	**AMS-D20-500502-150.60R**	106130	.091	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996

3

Spare parts

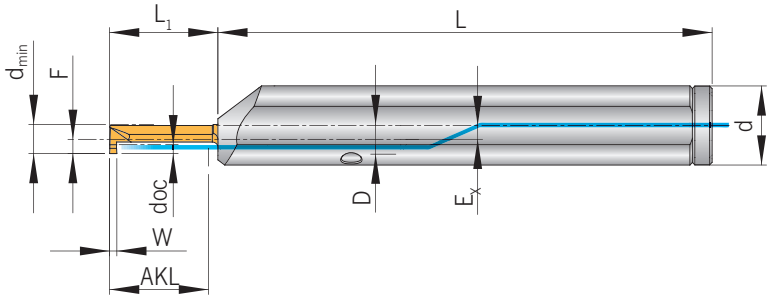
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L / 1608 R/L	AS 0044	KVR16
HAMS 2010 R	AS 0044	KVR20

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Grooving



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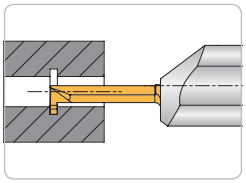


W = Groove width
doc = Groove depth
F = F-Dimension

Insert								Holder						
d_{min}	AKL	W + .0012	doc	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.098	.394	.031	.024	–	AMS-S-25080600-100.40R	87336	.045	.157	.500	3.937	.472	.093	HAMS 1204R-.500	500995
	.591			–	AMS-S-25080600-150.40R	87334					.669		HAMS 1204R-.500	500995
	.787			–	AMS-S-25080600-200.40R	87338					.866		HAMS 1204R-.500	500995
.118	.394	.031	.024	–	AMS-S-30080600-100.40R	87342	.055	.157	.500	3.937	.472	.093	HAMS 1204R-.500	500995
	.591			–	AMS-S-30080600-150.40R	87340					.669		HAMS 1204R-.500	500995
	.787			–	AMS-S-30080600-200.40R	87344					.866		HAMS 1204R-.500	500995
.154	.394	.039	.031	–	AMS-S-39100800-100.40R	87348	.055	.157	.500	3.937	.472	.093	HAMS 1204R-.500	500995
	.591			–	AMS-S-39100800-150.40R/L	87346					.669		HAMS 1204R-.500	500995
	.787			–	AMS-S-39100800-200.40R	87350					.866		HAMS 1204R-.500	500995
.232	.787	.039	.071	–	AMS-S-59101800-200.60R	108816	.114	.236	.625	4.724	.866	.110	HAMS 1606R-.625	500996
	.394	.059		–	AMS-S-59151800-100.60R	87354					.472		HAMS 1606R-.625	500996
	.787			–	AMS-S-59151800-200.60R	87352					.866		HAMS 1606R-.625	500996
	1.181			–	AMS-S-59151800-300.60R	87356					1.260		HAMS 1606R-.625	500996
.272	.591	.079	.098	–	AMS-S-69202500-150.80R/L	105223	.154	.315	.625	4.724	.669	.110	HAMS 1608R-.625	501430
.311	.394	.071	.098	–	AMS-S-79182500-100.80R	87360	.154	.315	.625	4.724	.472	.110	HAMS 1608R-.625	501430
	.984			–	AMS-S-79182500-250.80R	87358					1.063		HAMS 1608R-.625	501430

Spare parts

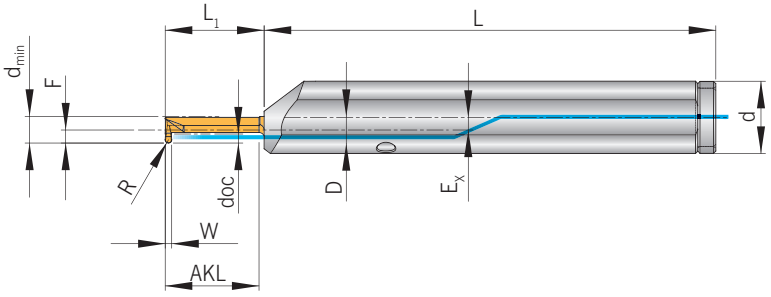
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L / 1608 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Radius grooving



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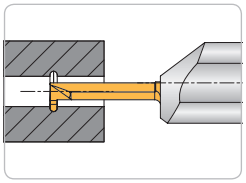


W = Groove width
doc = Groove depth
R = Radius
F = F-Dimension

Insert								Holder						
d_{min}	AKL	W + .0012	doc	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_X	Designation	EDP (RH only)
	.394			.020	AMS-S-39100805-100.40R	87364					.472		HAMS 1204R-.500	500995
.154	.591	.039	.031	.020	AMS-S-39100805-150.40R/L	87362	.075	.157	.500	3.937	.669	.093	HAMS 1204R-.500	500995
	.787			.020	AMS-S-39100805-200.40R	87366					.866		HAMS 1204R-.500	500995
	.394			.030	AMS-S-59151875-100.60R	87370					.472		HAMS 1606R-.625	500996
.232	.787	.059	.071	.030	AMS-S-59151875-200.60R	87368	.114	.236	.625	4.724	.866	.110	HAMS 1606R-.625	500996
	1.181			.030	AMS-S-59151875-300.60R	87372					1.260		HAMS 1606R-.625	500996
.323	.787	.079	.079	.039	AMS-S-82202010-200.80R	106136	.154	.315	.625	4.724	.866	.110	HAMS 1608R-.625	501430

3

Spare parts

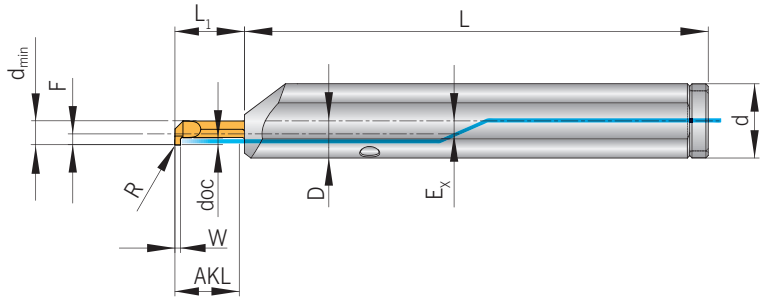
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L / 1608 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Cir-clip DIN 471/472



with ic

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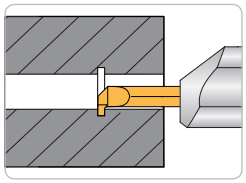


doc = Groove depth
R = Radius
F = F-Dimension

Insert								Holder						
d_{min}	AKL	W ± .001	doc	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_X	Designation	EDP (RH only)
.161	.591	.039	.043	.002	AMS-472-41099110-150.40R	105231	.075	.157	.500	3.937	.669	.093	HAMS 1204R-.500	500995
		.047			AMS-472-41119110-150.40R	105233							HAMS 1204R-.500	500995
		.055			AMS-472-41139110-150.40R	105235							HAMS 1204R-.500	500995
		.067			AMS-472-41169110-150.40R	105237							HAMS 1204R-.500	500995
.240	.591	.039	.059	.002	AMS-472-61099150-150.60R	105239	.114	.236	.625	4.724	.669	.110	HAMS 1606R-.625	500996
		.047			AMS-472-61119150-150.60R	105241							HAMS 1606R-.625	500996
		.055			AMS-472-61139150-150.60R	105243							HAMS 1606R-.625	500996
		.067			AMS-472-61169150-150.60R	105245							HAMS 1606R-.625	500996
		.076			AMS-472-61194150-150.60R	105247							HAMS 1606R-.625	500996
.331	.787	.047	.079	.002	AMS-472-84119200-200.80R	105249	.154	.315	.625	4.724	.866	.110	HAMS 1608R-.625	501430
		.055	.079		AMS-472-84139200-200.80R	105251							HAMS 1608R-.625	501430
		.067	.098		AMS-472-84169250-200.80R	105253							HAMS 1608R-.625	501430
		.076	.098		AMS-472-84194250-200.80R	105255							HAMS 1608R-.625	501430
		.088	.118		AMS-472-84224300-200.80R	105257							HAMS 1608R-.625	501430
		.108	.138		AMS-472-84274350-200.80R	105259							HAMS 1608R-.625	501430
		.129	.138		AMS-472-84328350-200.80R	105261							HAMS 1608R-.625	501430
.409	.984	.055	.138	.002	AMS-472-104139350-250.100R	105263	.193	.394	.750	4.724	1.063	.110	HAMS 2010R-.750	501745
		.067			AMS-472-104169350-250.100R	105265							HAMS 2010R-.750	501745
		.076			AMS-472-104194350-250.100R	105267							HAMS 2010R-.750	501745
		.088			AMS-472-104224350-250.100R	105269							HAMS 2010R-.750	501745
		.108			AMS-472-104274350-250.100R	105271							HAMS 2010R-.750	501745
		.129			AMS-472-104328350-250.100R	105273							HAMS 2010R-.750	501745

3

Spare parts

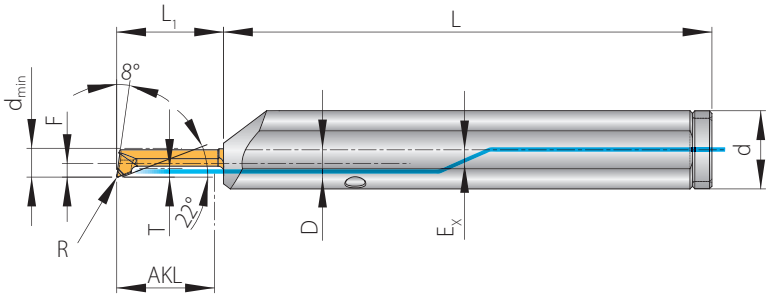
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L / 1608 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Copying



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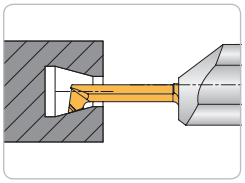


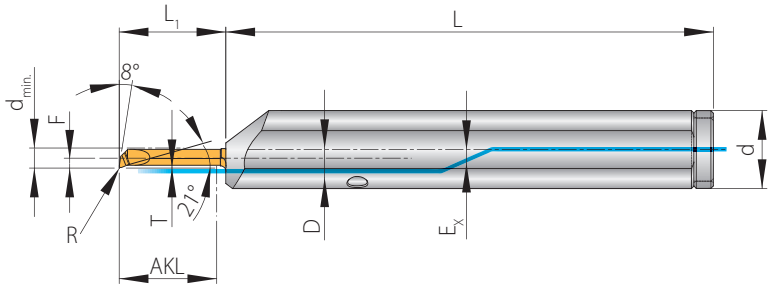
T = Depth
R = Radius
F = F-Dimension

Insert									Holder						
d_{min}	AKL	T	W	R	Designation	EDP (RH only)	F		D	d	L	L_1	E_x	Designation	EDP (RH only)
.059	.236	.006	–	.004	AMS-K-1501501-060.40R	104677	.051		.157	.500	3.937	.276	.093	HAMS 1204R-.500	500995
	.394	.004			AMS-K-20015005-100.40R/L	106168						.433		HAMS 1204R-.500	500995
.079	.236	.012	–	.002	AMS-K-2003005-060.40R	106152	.035		.157	.500	3.937	.276	.093	HAMS 1204R-.500	500995
	.394	.012			AMS-K-2003005-100.40R	106154						.433		HAMS 1204R-.500	500995
.087	.591	.008	–	.004	AMS-K-220201-150.40R	106156	.037		.157	.500	3.937	.630	.093	HAMS 1204R-.500	500995
	.394				AMS-K-250401-100.40R	87380						.472		HAMS 1204R-.500	500995
.098	.591	.016	–	.004	AMS-K-250401-150.40R	87378	.045		.157	.500	3.937	.669	.093	HAMS 1204R-.500	500995
	.787				AMS-K-250401-200.40R	87382						.866		HAMS 1204R-.500	500995
	.394				AMS-K-300401-100.40R	87386						.472		HAMS 1204R-.500	500995
.118	.591	.016	–	.004	AMS-K-300401-150.40R	87384	.055		.157	.500	3.937	.669	.093	HAMS 1204R-.500	500995
	.787				AMS-K-300401-200.40 R/L	87388						.866		HAMS 1204R-.500	500995
	.394				AMS-K-390802-100.40R	87392						.472		HAMS 1204R-.500	500995
.154	.591	.031	–	.008	AMS-K-390802-150.40R/L	87390	.075		.157	.500	3.937	.669	.093	HAMS 1204R-.500	500995
	.787				AMS-K-390802-200.40R/L	87394						.866		HAMS 1204R-.500	500995
	.787	.051		.016	AMS-K-391304-200.40R	104920						.866		HAMS 1204R-.500	500995
	.472			.016	AMS-K-400604-120.40R	104922						.551		HAMS 1204R-.500	500995
.157	.591	.024	–		AMS-K-400604-150.40R	104924	.075		.157	.500	3.937	.669	.093	HAMS 1204R-.500	500995
	.787			.008	AMS-K-400602-200.40R	101168						.866		HAMS 1204R-.500	500995
	.394				AMS-K-500502-100.60R/L	106164						.472		HAMS 1606R-.625	500996
	.591				AMS-K-500502-150.60R	106176						.669		HAMS 1606R-.625	500996
.197	.787	.020	–	.008	AMS-K-500502-200.60R	106158	.091		.236	.625	4.724	.866	.110	HAMS 1606R-.625	500996
	.984				AMS-K-500502-250.60R/L	104681						1.024		HAMS 1606R-.625	500996
	1.181				AMS-K-500502-300.60R	101170						1.220		HAMS 1606R-.625	500996
.236	1.654	.020	–	.006	AMS-K-6005015-420.60R	104687	.091		.236	.625	4.724	1.732	.110	HAMS 1606R-.625	500996
.283	1.772	.020	–	.008	AMS-K-720502-450.80R	106122	.136		.315	.625	4.724	1.850	.110	HAMS 1608R-.625	501430
.315	1.969	.020	–	.008	AMS-K-800502-500.80R	104689	.154		.315	.625	4.724	2.047	.110	HAMS 1608R-.625	501430
.350	.787	.154	–	.008	AMS-K-893902-200.80R	106178	.154		.315	.625	4.724	.866	.110	HAMS 1608R-.625	501430
	1.181				AMS-K-893902-300.80R	106180						1.260		HAMS 1608R-.625	501430
.425	.984	.193	–	.008	AMS-K-1084902-250.100R	106182	.193		.394	.750	4.724	1.063	.110	HAMS 2010R-.750	501745
	1.378				AMS-K-1084902-350.100R	106184						1.457		HAMS 2010R-.750	501745

3

All dimensions in inches

Copying – Reinforced execution



with ic

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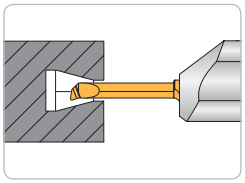


T = Depth
R = Radius
F = F-Dimension

Insert								Holder						
d_{min}	AKL	T	W	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.118	.394	.008	–	.008	AMS-K-300202-100.40R/L	106172	.051	.157	.500	3.937	.472	.093	HAMS 1204R-.500	500995
	.591				AMS-K-300202-150.40R	101166					.669		HAMS 1204R-.500	500995
.126	.394	.008	–	.006	AMS-K-3202015-100.40R	106118	.057	.157	.500	3.937	.472	.093	HAMS 1204R-.500	500995
.157	.394	.012	–	.008	AMS-K-400302-100.40R/L	106174	.075	.157	.500	3.937	.472	.093	HAMS 1204R-.500	500995
	.984			.004	AMS-K-400301-250.40R	104679	.059				1.063		HAMS 1204R-.500	500995

3

Spare parts

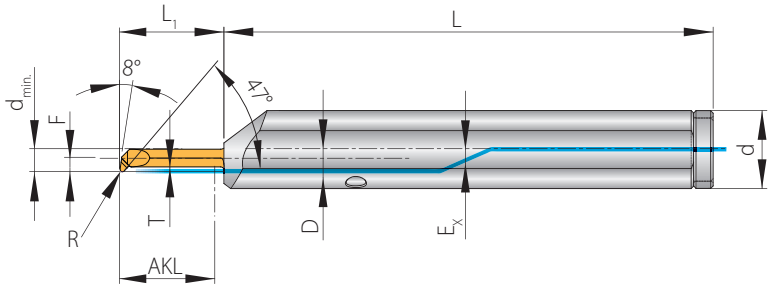
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Copying 45°



with ic

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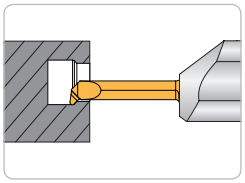


T = Depth
R = Radius
F = F-Dimension

Insert								Holder						
d_{min}	AKL	T	W	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.154	.787	.024	–	.006	AMS-K45-3906015-200.40R	106927	.075	.157	.500	3.937	.866	.093	HAMS 1204R-.500	500995
	.787	.051	–	.016	AMS-K45-391304-200.40R	105072					.866		HAMS 1204R-.500	500995
.157	.472	.024	–	.016	AMS-K45-400604-120.40R	105074	.075	.157	.500	3.937	.551	.093	HAMS 1204R-.500	500995
	.591				AMS-K45-400604-150.40R	105076					.669		HAMS 1204R-.500	500995
	.787	.031		.006	AMS-K45-4008015-200.40R	106124					.866		HAMS 1204R-.500	500995
.197	.984	.039	–	.006	AMS-K45-5010015-250.60R	106126	.096	.236	.625	4.724	1.063	.110	HAMS 1606R-.625	500996
.232	1.181	.071	–	.006	AMS-K45-5918015-300.60R	106128	.114	.236	.625	4.724	1.260	.110	HAMS 1606R-.625	500996
.272	.394	.114	–	.008	AMS-K45-692902-100.60R	109432	.114	.236	.625	4.724	.472	.110	HAMS 1606R-.625	500996
	.591				AMS-K45-692902-150.60R	109433					.669		HAMS 1606R-.625	500996
	.787				AMS-K45-692902-200.60R	109434					.866		HAMS 1606R-.625	500996
.350	.591	.154	–	.008	AMS-K45-893902-150.80R*	109435	.154	.315	.625	4.724	.669	.110	HAMS 1608R-.625	501430
	.787				AMS-K45-893902-200.80R*	109436					.866		HAMS 1608R-.625	501430
	1.181				AMS-K45-893902-300.80R*	109437					1.260		HAMS 1608R-.625	501430

Spare parts

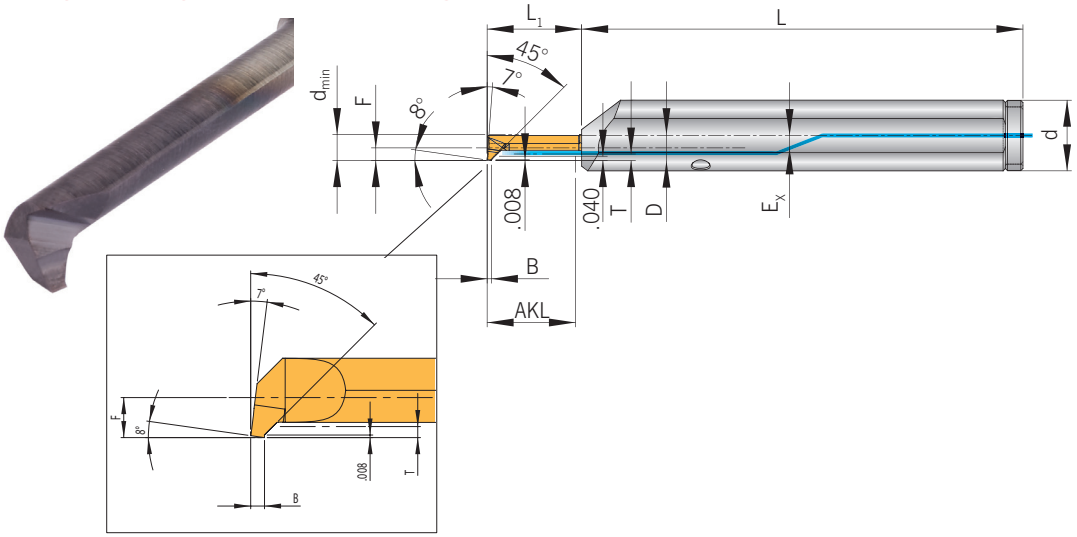
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L / 1608 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Pre-grooving and chamfering



with ic

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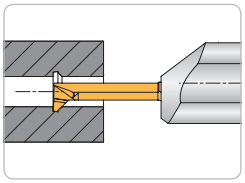


B = Width
T = Depth
F = F-Dimension

Insert								Holder						
d_{min}	AKL	$B^{+.0012}$	T	Designation	EDP (RH only)	F		D	d	L	L_1	E_X	Designation	EDP (RH only)
.197	.787	.039	.031	AMS-V-50100800-200.60R	87374	.094		.236	.625	4.724	.866	.110	HAMS 1606R-.625	500996
.232	.787			AMS-V-59100800-200.60R	87376	.114							HAMS 1606R-.625	500996

3

Spare parts

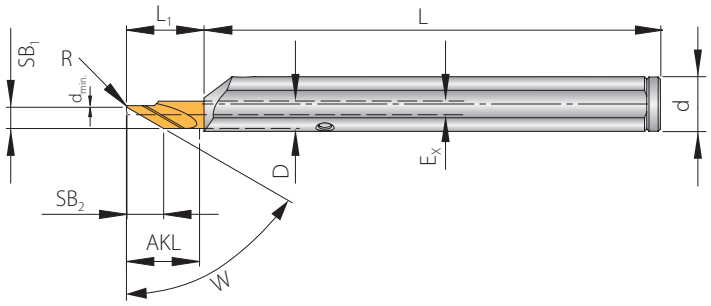
Holder	Screw	Coolant seal ring
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Center chamfering 45°/60°



with ic

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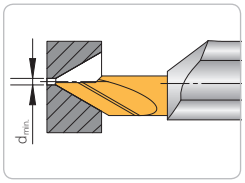


SB_1 = Cutting width
SB_2 = Cutting depth
R = Radius
W = Angle (degree)
F = F-Dimension

Insert									Holder						
d_{min}	SB_1	SB_2	W	AKL	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_X	Designation	EDP (RH only)
.039	.177	.177	45°	.591	.008	AMS-ZF45-104502-150.60R/L	106272	.079	.236	.625	4.724	.669	.110	HAMS 1606R-.625	500996
		.311	60°			AMS-ZF60-108002-150.60R/L	106274					.669		HAMS 1606R-.625	500996

3

Spare parts

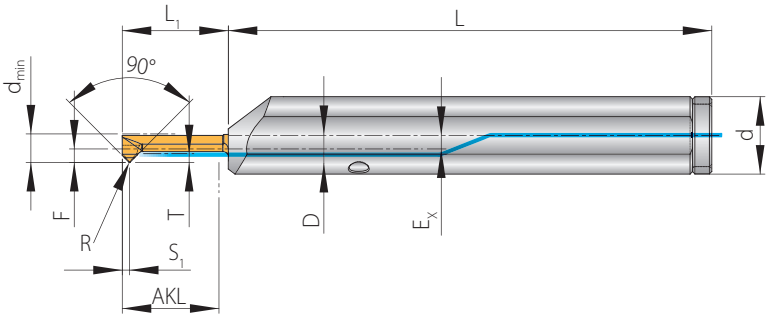
Holder	Screw	Coolant seal ring
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Chamfering 45°



with ic

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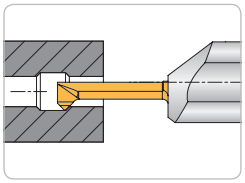


T = Depth
R = Radius
S_1 = S-Dimension
F = F-Dimension

Insert								Holder						
d_{min}	AKL	T	S_1	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.098	.591	.016	.039	.004	**AMS-F-250401-150.40R**	87406	.045	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.118	.591	.016	.039	.004	**AMS-F-300401-150.40R**	87408	.055	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.154	.591	.031	.047	.008	**AMS-F-390802-150.40R**	87410	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.232	.787	.071	.079	.008	**AMS-F-591802-200.60R**	87412	.114	.236	.625	4.724	.866	.110	**HAMS 1606R-.625**	500996

3

Spare parts

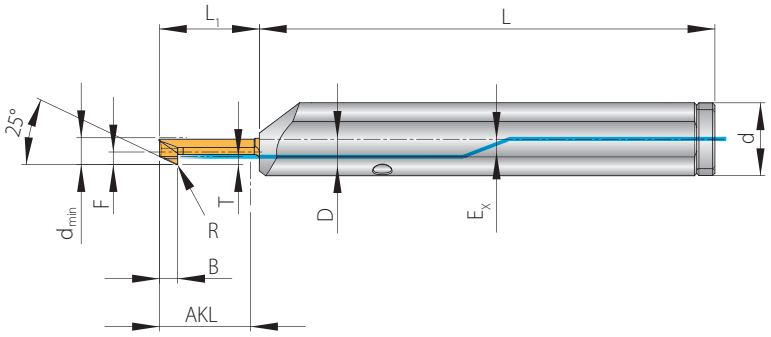
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Back turning



with ic

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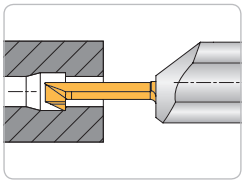


B= Width
T= Depth
R= Radius
F= F-Dimension

Insert								Holder						
d_{min}	AKL	B	T	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_X	Designation	EDP (RH only)
.154	.591	.157	.039	.008	**AMS-R-39401002-150.40R**	87402	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.232	.787	.157	.079	.008	**AMS-R-59402002-200.60R**	87404	.114	.236	.625	4.724	.866	.110	**HAMS 1606R-.625**	500996

3

Spare parts

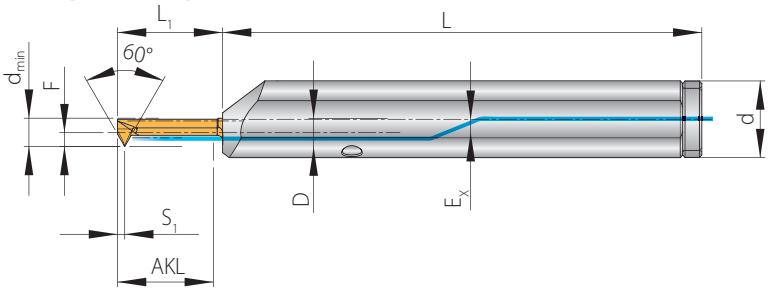
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Threading 60° – Metric partial profile



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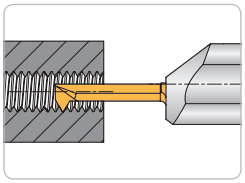


S_1 = S-Dimension
F = F-Dimension

MF – ISO-Metric – Fine

Insert								Holder						
d_{min}	AKL	Thread Type	P Pitch (mm)	S_1	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.091	.197	–	0,2–0,5	.018	**AMS-G-MF020050-050.40R**	109421	.043	.157	.500	3.937	.256	.093	**HAMS 1204R-.500**	500995
.118	.591	M4	0,5–0,7	.028	**AMS-G-MF050070-150.40R**	108855	.055	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.157	.591	M5	0,5–1,0	.028	**AMS-G-MF050100-150.40R**	108857	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.236	.787	M8	0,5–1,5	.031	**AMS-G-MF050150-200.60R**	108858	.114	.236	.625	4.724	.866	.110	**HAMS 1606R-.625**	500996

3

Spare parts

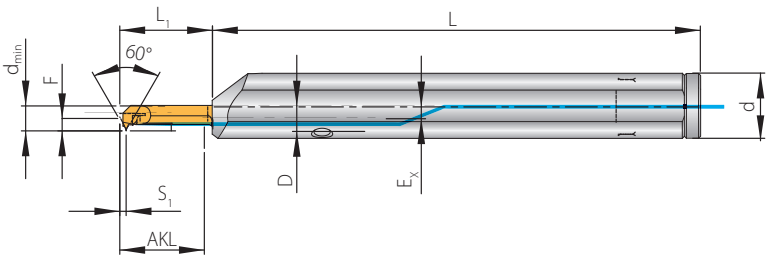
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Threading 60° – Metric full profile



with ic

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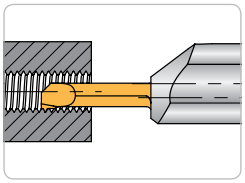


S_1 = S-Dimension
F = F-Dimension

M – ISO-Metric MF – ISO-Metric – Fine

Insert								Holder						
d_{min}	AKL	Thread Type	P Pitch (mm)	S_1	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.189	.787	M6	1,0	.028	**AMS-GV-M100-200.60R***	108843	.114	.236	.625	4.724	.866	.110	**HAMS 1606R-.625**	500996
.197	.591	M6	1,0	.028	**AMS-GV-M100-150.40R***	108848	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.236	.787	M8	1,25	.031	**AMS-GV-M125-200.60R***	108850	.114	.236	.625	4.724	.866	.110	**HAMS 1606R-.625**	500996
		M12	1,5	.039	**AMS-GV-M150-200.60R***	108844							**HAMS 1606R-.625**	500996
.157	.591	MF	0,5	.016	**AMS-GV-MF050-150.40R**	106230	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
			0,6		**AMS-GV-MF060-150.40R**	106232							**HAMS 1204R-.500**	500995
.161	.591	MF	0,7	.020	**AMS-GV-MF070-150.40R**	106234	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.165	.591	MF	0,75	.020	**AMS-GV-MF075-150.40R**	106236	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.213	.591	MF	0,5	.016	**AMS-GV-MF050-150.60R**	106238	.098	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.220	.591	MF	0,75	.020	**AMS-GV-MF075-150.60R**	106240	.102	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.224	.591	M100	1,0	.028	**AMS-GV-M100-150.60R**	106242	.102	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996

Spare parts

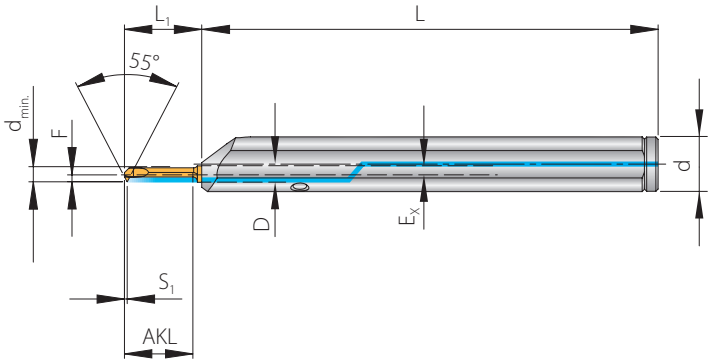
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Whitworth thread 55° – Partial profile



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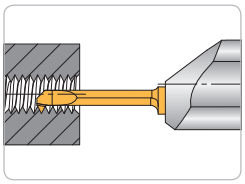


S_1 = S-Dimension
F = F-Dimension

WF – Whitworth – Fine

Insert								Holder						
d_{min}	AKL	Thread Type	P Pitch (mm)	S_1	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.130	.591	WF	0,25–1,0	.024	**AMS-G-WF33025100-150.40R**	106220	.059	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.169	.591	WF	0,25–1,0	.024	**AMS-G-WF43025100-150.40R**	106222	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.236	.591	WF	0,5–1,5	.031	**AMS-G-WF60050150-150.60R**	106224	.114	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996

3

Spare parts

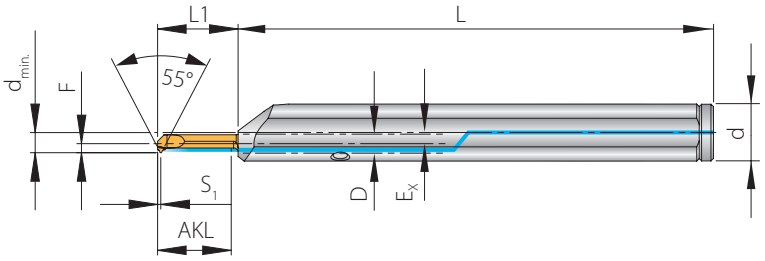
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Whitworth pipe thread 55° DIN ISO 228 – Full profile



with ic

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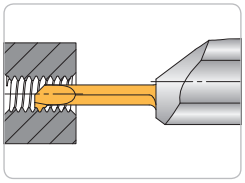


S_1 = S-Dimension
F = F-Dimension

Insert									Holder						
d_{min}	AKL	Thread Type	P Pitch (mm)	TPI	S_1	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.157	.591	W228	1.27	20	.028	**AMS-GV-W228/20-150.40R**	106226	.075	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.433	.591	1/4"-19 BSP	1.33	19	.037	**AMS-GV-W228/19-150.60R**	108869	.114	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996

3

Spare parts

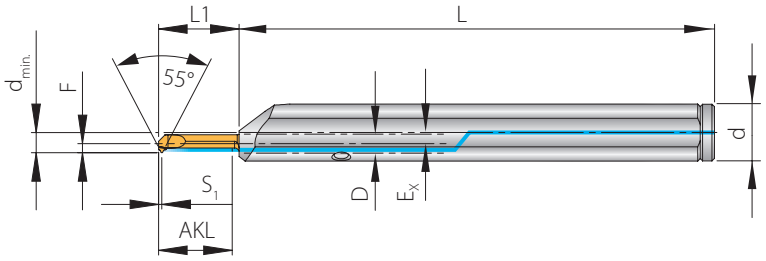
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Whitworth pipe thread 55° BSW – Full profile



with ic

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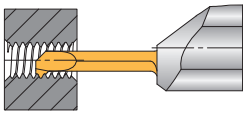


S_1 = S-Dimension
F = F-Dimension

Insert								Holder						
d_{min}	AKL	Thread Type	TPI	S_1	Designation	EDP (RH only)	F	D	d	L	L_1	E_X	Designation	EDP (RH only)
.134	.591	3/16“-24 BSW	24	.030	**AMS-GV-BSW24-150.40R***	108840	.051	.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.134	.591	3/16“-24 BSW	24	.030	**AMS-GV-BSW24-150.60R***	108841	.012	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.173	.591	7/32“-28 BSF	28	.026	**AMS-GV-BSW28-150.60R***	108842	.047	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.256	.591	5/16“-22 BSF	22	.035	**AMS-GV-BSW22-150.60R***	108839	.114	.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996

3

Spare parts

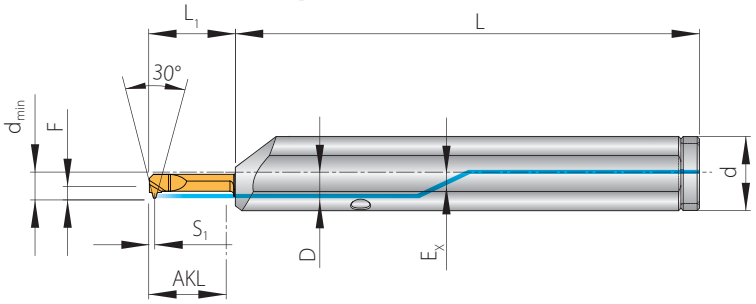
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Trapezoidal 30° DIN ISO 103 – Partial profile



with ic

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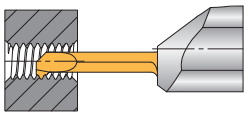


S_1 = S-Dimension
F = F-Dimension

Insert								Holder						
d_{min}	AKL	Thread Type	P Pitch (mm)	S_1	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.256	.787	TR 8x1.5	1,5	.033	**AMS-G-TR103/1.5R-200.60R***	108835	.114	.236	.625	4.724	.866	.110	**HAMS 1606R-.625**	500996
.276	.787	TR 9x2.0	2,0	.051	**AMS-G-TR103/2.0R-200.60R***	108836	.114	.236	.625	4.724	.866	.110	**HAMS 1606R-.625**	500996
.276	.787	TR 9x2.0	2,0	.051	**AMS-G-TR103/2.0R-200.80R***	108837	.102	.315	.625	4.724	.866	.110	**HAMS 1608R-.625**	501430
.315	.787	TR 11x3.0	3,0	.055	**AMS-G-TR103/3.0R-200.80R***	108838	.142	.315	.625	4.724	.866	.110	**HAMS 1608R-.625**	501430

3

Spare parts

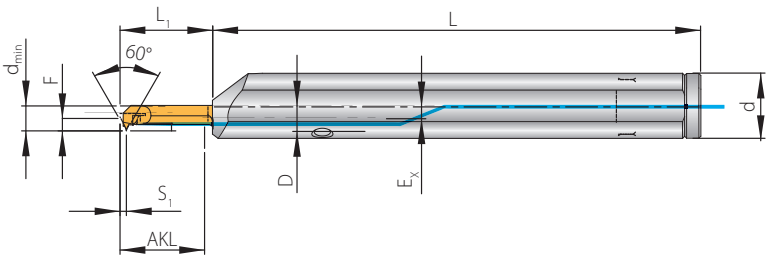
Holder	Screw	Coolant seal ring
HAMS 1606 R/L	AS 0044	KVR16
HAMS 1608 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

American standard thread 60° UN – Full profile



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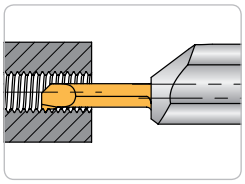


S_1 = S-Dimension
F = F-Dimension

Insert									Holder						
d_{min}	AKL	Thread Type	TPI	S_1	Designation	EDP (RH only)	F		D	d	L	L_1	E_X	Designation	EDP (RH only)
.102	.591	No.6-32 UNC	32	.024	**AMS-GV-UN32-150.40R***	108867	.018		.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.102	.591	No.6-32 UNC	32	.024	**AMS-GV-UN32-150.60R***	108868	.022		.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.142	.591	No.10-24 UNC	24	.030	**AMS-GV-UN24-150.40R***	108863	.055		.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.142	.591	No.10-24 UNC	24	.030	**AMS-GV-UN24-150.60R***	108864	.016		.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.173	.591	No.12-28 UNF	28	.026	**AMS-GV-UN28-150.40R***	108866	.075		.157	.500	3.937	.669	.093	**HAMS 1204R-.500**	500995
.189	.591	1/4“-20 UNC	20	.035	**AMS-GV-UN18-150.60R***	108861	.059		.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.209	.591	1/4“-27 UNS	27	.030	**AMS-GV-UN27-150.60R***	108865	.075		.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.244	.591	5/16“-18 UNC	18	.039	**AMS-GV-UN20-150.60R***	108862	.114		.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996
.299	.591	3/8“-16 UNC	16	.041	**AMS-GV-UN16-150.60R***	108860	.114		.236	.625	4.724	.669	.110	**HAMS 1606R-.625**	500996

3

Spare parts

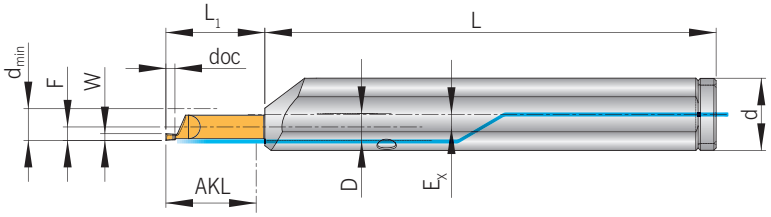
Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

All dimensions in inches

Axial grooving



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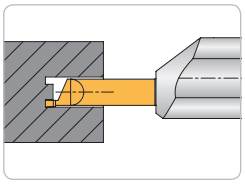

W = Groove width
doc = Groove depth
R = Radius
F = F-Dimension

Insert								Holder						
d_{min}	AKL	$W^{+.0012}$	doc	R	Designation	EDP (RH only)	F	D	d	L	L_1	E_x	Designation	EDP (RH only)
.197	.295	.028	.043	–	AMS-A-50071100-075.40R*	109495	.075	.157	.500	3.937	.382	.093	HAMS 1204R-.500	500995
	.295	.030	.043	.002	AMS-A-5007711005-075.40R	108740					.382		HAMS 1204R-.500	500995
	.295	.031	.047	–	AMS-A-50081200-075.40R*	109496					.382		HAMS 1204R-.500	500995
	.295	.035	.051	–	AMS-A-50091300-075.40R*	109497					.382		HAMS 1204R-.500	500995
	.295	.039	.059	–	AMS-A-50101500-075.40R*	109498					.394		HAMS 1204R-.500	500995
	.295	.047	.059	–	AMS-A-50121500-075.40R	87424					.394		HAMS 1204R-.500	500995
	.394	.079	.197	.002	AMS-A-502050005-100.40R/L	105229					.472		HAMS 1204R-.500	500995
	.591	.047	.059	–	AMS-A-50121500-150.40R	87426					.669		HAMS 1204R-.500	500995
.236	.394	.038	.059	–	AMS-A-60097500-100.60R	108826	.094	.236	.625	4.724	.472	.110	HAMS 1606R-.625	500996
	.394	.047			AMS-A-60121500-100.60R	87428							HAMS 1606R-.625	500996
	.709	.047			AMS-A-60121500-180.60R	87430					.787		HAMS 1606R-.625	500996
.276	.394	.059	.079	–	AMS-A-70152000-100.60R	87432	.114	.236	.625	4.724	.472	.110	HAMS 1606R-.625	500996
	.787				AMS-A-70152000-200.60R	87434					.866		HAMS 1606R-.625	500996
.315	.394	.059	.118	.006	AMS-A-801530015-100.80R	105225	.079	.315	.625	4.724	.472	.110	HAMS 1608R-.625	501430
.354	.394	.059	.079	–	AMS-A-90152000-100.80R	87436	.150	.315	.625	4.724	.472	.110	HAMS 1608R-.625	501430
	.984				AMS-A-90152000-250.80R	87438					1.063		HAMS 1608R-.625	501430

Spare parts

Holder	Screw	Coolant seal ring
HAMS 1204 R/L	AS 0043	KVR12
HAMS 1606 R/L	AS 0044	KVR16

ARNO® SpecialDesign

For custom AMS inserts please see page 119.

3

All dimensions in inches

Blanks for special profiles

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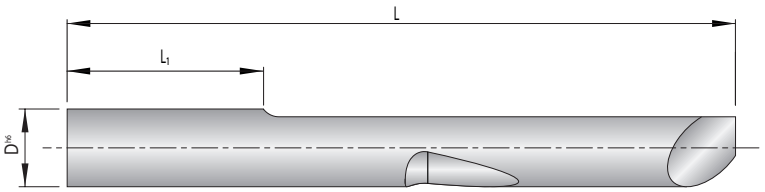
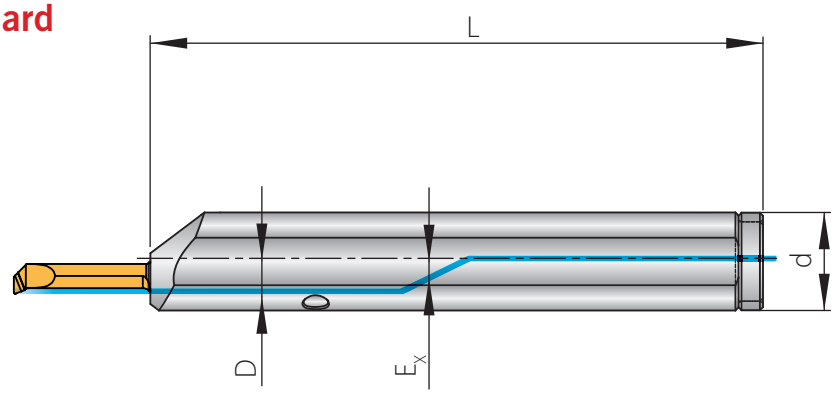


D = Ø Profile side
L_1 = Maximum work length
Left hand shown

Blanks R/L				
Designation	**EDP**	**D^{h6}**	**L**	**L_1**
H-AMS-100-40R	**97584**	.157	1.354	.472
H-AMS-100-60R	**97598**	.236	1.598	.472
H-AMS-100-80R	**97614**	.315	1.591	.472
H-AMS-150-40R	**97588**	.157	1.551	.669
H-AMS-200-40R	**97592**	.157	1.748	.866
H-AMS-200-60R	**97604**	.236	1.992	.866
H-AMS-300-60R	**97606**	.236	2.386	1.260
H-AMS-400-40R	**97596**	.157	2.535	1.654
H-AMS-500-80L	**97624**	.315	3.165	2.047
H-AMS-600-60R/L	**97612 / 97610**	.236	3.567	2.441

All dimensions in inches

Holders – Standard



with ic

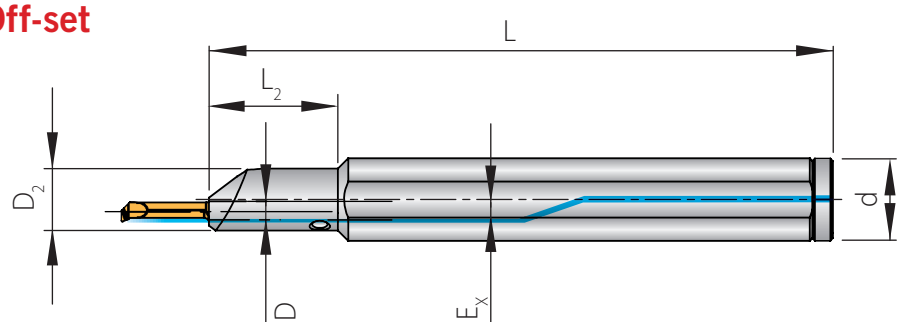
Page 120–123

Right hand shown

Holder					
Designation	EDP	D	d	L	Ex
HAMS 1204R-.500	500995	.157	.500	3.937	.093
HAMS 1204L	95962	.157	.472		
HAMS 1206R	103756	.236			
HAMS 1206L	103754	.236			
HAMS 1606R-.625	500996	.236	.625	3.937	.093
HAMS 1606L-.625	501685	.236			
HAMS 1608R-.625	501430	.315			
HAMS 1608L-.625	501747	.315			
HAMS 2010R-.750	501745	.394	.750	4.724	.110

Remark: Holders only, see pages 92 to 111 for inserts. Measurement “D” shows the shank size and needs to match the insert.

Holders – Off-set



with ic

Page 120–123

Right hand shown

Holder							
Designation	EDP	D	D_2	d	L	L_2	E_x
HAMS 1604R	106085	.157	.472	.630	4.724	.984	.093
HAMS 1604L	106083						

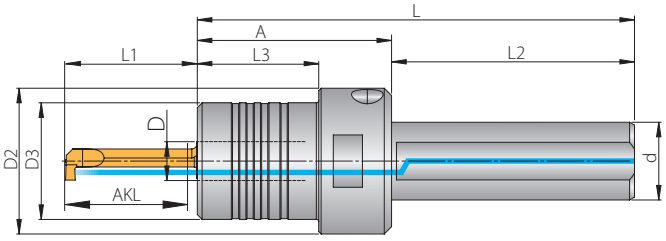
Remark: Holders only, see pages 92 to 111 for inserts. Measurement “D” shows the shank size and needs to match the insert.

Spare parts

Holder	Screw	Coolant seal ring
HAMS 1204R/L / 1206R/L	AS 0043	KVR12
HAMS 1604R/L	AS 0043	KVR16
HAMS 1606R/L / 1608R/L	AS 0044	KVR16
HAMS 2010R	AS 0044	KVR20

All dimensions in inches

Hydraulic holders



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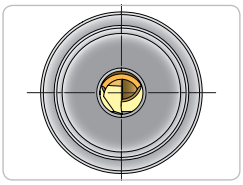
Page 120–123



AKL = Maximum work length
L_1 = Overhang
D = Shank diameter

Maximum work length		
D	AKL	L_1
.157	.079	.157
.157	.197	.256
.157	.236	.315
.157	.295	.394
.157	.394	.472
.157	.591	.669
.157	.787	.866
.236	.394	.472
.236	.709	.787
.236	.787	.866
.236	1.181	1.260
.236	1.575	1.654
.236	1.969	2.047
.315	.394	.472
.315	.984	1.063
.315	1.181	1.260
.315	1.654	1.732
.315	1.772	1.850
.315	1.969	2.047

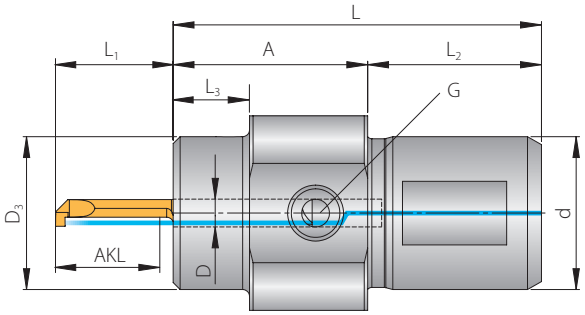
Holder								
Designation	EDP	D	D_2	D_3	d	L	L_2	L_3
HAMS 1604R-HYD.	106213	.157	1.181	.709	.630	3.248	1.969	.709
HAMS 1606R-HYD.	106215	.236		.787		3.543		.984
HAMS 1608R-HYD.	106217	.315		.945		3.543		.984

Remark: Holders only, see pages 92 to 111 for inserts. Measurement “D” shows the shank size and needs to match the insert.

3

All dimensions in inches

Holders for STAR lathes



with ic
Page 120–123

AKL = Maximum work length
L_1 = Overhang
D = Shank diameter

Maximum work length		
D	AKL	L_1
.157	.079	.157
.157	.197	.256
.157	.236	.315
.157	.295	.394
.157	.394	.472
.157	.591	.669
.157	.787	.866
.236	.394	.472
.236	.709	.787
.236	.787	.866
.236	1.181	1.260
.236	1.575	1.654
.236	1.969	2.047

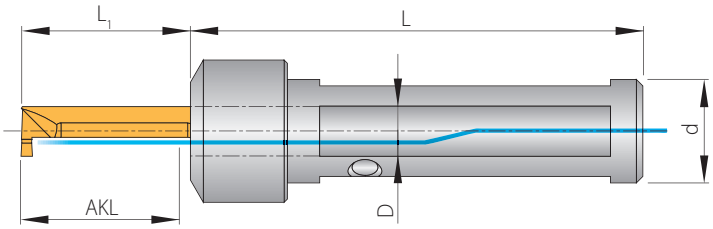
Holder									
Designation	EDP	D	D_2 (mm)	D_3 (mm)	d (mm)	L	A	L_2 (mm)	G
HAMS 2204-A28-SR	106971	.157	28 x 50	22	22	2.087	1.102	25	M8x1
HAMS 2206-A33-SR	106973	.236				2.283	1.299		
HAMS 2204-A50-S2-SR	109450	.157	28 x 50	22	22	2.953	1.969	25	$G^1/_8$
HAMS 2206-A50-S2-SR	109451	.236				2.953	1.969		

Remark: Holders only, see pages 92 to 111 for inserts. Measurement “D” shows the shank size and needs to match the insert.

3

All dimensions in inches

Holders for swiss style machines



with ic

Page 120–123

AKL = Maximum work length
L_1 = Overhang
D = Shank diameter

Maximum work length		
D	AKL	L_1
.157	.079	.157
.157	.197	.256
.157	.236	.315
.157	.295	.394
.157	.394	.472
.157	.591	.669
.157	.787	.866
.236	.394	.472
.236	.709	.787
.236	.787	.866
.236	1.181	1.260
.236	1.575	1.654
.236	1.969	2.047
.315	.394	.472
.315	.984	1.063
.315	1.181	1.260
.315	1.654	1.732
.315	1.772	1.850
.315	1.969	2.047

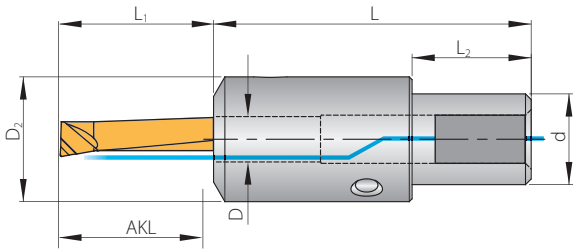
Holder						
Designation	EDP	D	d (mm or inch)	L	Connection	Machine
HAMS 3/4"04-CR	92084	.157	3/4"	3.937	G 1/8"	CITIZEN
HAMS 3/4"06-CR	92086	.236				
HAMS 3/4"08-CR	92088	.315				
HAMS 1"04-CR	92090	.157	1"	3.937	G 1/4"	CITIZEN
HAMS 1"06-CR	92092	.236				
HAMS 1"08-CR	92094	.315				
HAMS 1604-SR	92096	.157	16	2.756	G 1/8"	STAR
HAMS 1606-SR	92098	.236				
HAMS 1608-SR	92100	.315				
HAMS 2204-SR G1/4"	91357	.157	22	4.331	G 1/4"	STAR
HAMS 2206-SR G1/4"	91359	.236				
HAMS 2204-SR	92102	.157	22	4.331	G 1/8"	STAR
HAMS 2206-SR	92104	.236				
HAMS 2208-SR	92106	.315				
HAMS 2004-TOR	92108	.157	20	3.543	G 1/8"	TORNOS, TSUGAMI, HANWA
HAMS 2006-TOR	92110	.236				
HAMS 2008-TOR	92112	.315				
HAMS 2504-TOR	92114	.157	25	3.937	G 1/8"	TORNOS, TSUGAMI, HANWA
HAMS 2506-TOR	92116	.236				
HAMS 2508-TOR	92118	.315				
HAMS 2804-TR	92120	.157	28	4.724	G 1/4"	TRAUB
HAMS 2806-TR	92122	.236				

Remark: Holders only, see pages 92 to 111 for inserts. Measurement "D" shows the shank size and needs to match the insert.

Holders with 2 flats = CITIZEN, TORNOS, TRAUB, TSUGAMI and HANWA.
Holders with 4 flats = STAR

All dimensions in inches

Holders for finishing operations



with ic

Page 120–123

AKL= Maximum work length
L_1 = Overhang
D = Shank diameter

Maximum work length		
D	AKL	L_1
.157	.295	.394
.157	.394	.472
.157	.591	.669
.157	.787	.866
.236	.394	.472
.236	.709	.787
.236	.787	.866
.236	1.181	1.260
.315	.394	.472
.315	.984	1.063

Holder						
Designation	EDP	D	d (mm)	D_2 (mm)	L	L_2
HAMS 1604-AR	92626	.157	16	22	2.205	.827
HAMS 1606-AR	92628	.236				
HAMS 1608-AR	92630	.315				

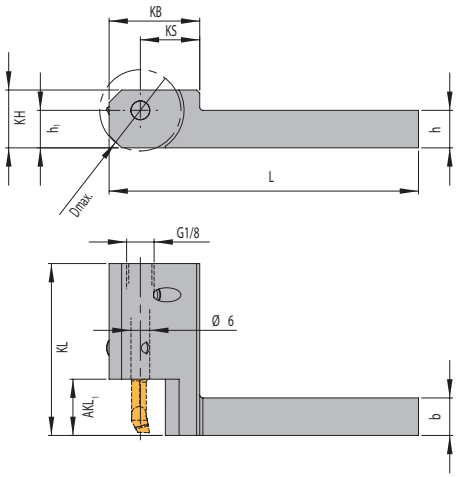
Remark: Holders only, see pages 92 to 111 for inserts. Measurement “D” shows the shank size and needs to match the insert.

3

All dimensions in inches

Holder for swiss machines and multi-spindle lathes

Page 120–123



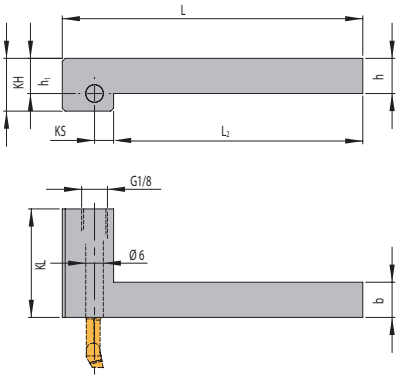
Holder											
Designation	EDP	h x b (mm)	L	KB	KS	KL	AKL	KH	h_1	D_{max}	Connection
HAMS 121206-R	104909	12 x 12	3.898	1.142	.748	2.165	.709	.728	.472	1.024	G 1/8"

Information: Please use AMS-... .60R for these holders.

3

Holder for swiss machines on counter spindle

Page 120–123



Holder									
Designation	EDP	h x b (mm)	L	L_2	KS	KL	KH	h_1	Connection
HAMS 121206-R-GS	105673	12x12	4.035	3.346	.256	1.457	.709	.472	G 1/8"

Information: Please use AMS-... .60R for these holders.

All dimensions in inches

ARNO® SpecialDesign

Do you need a custom tool?

**Should your application require a special tool, we can quote that too.
As the manufacturer, we can offer special AMS inserts accurately and quickly.
Please tell us the standard inserts and the dimensions you would like to have changed.**

Standard AMS insert: _____

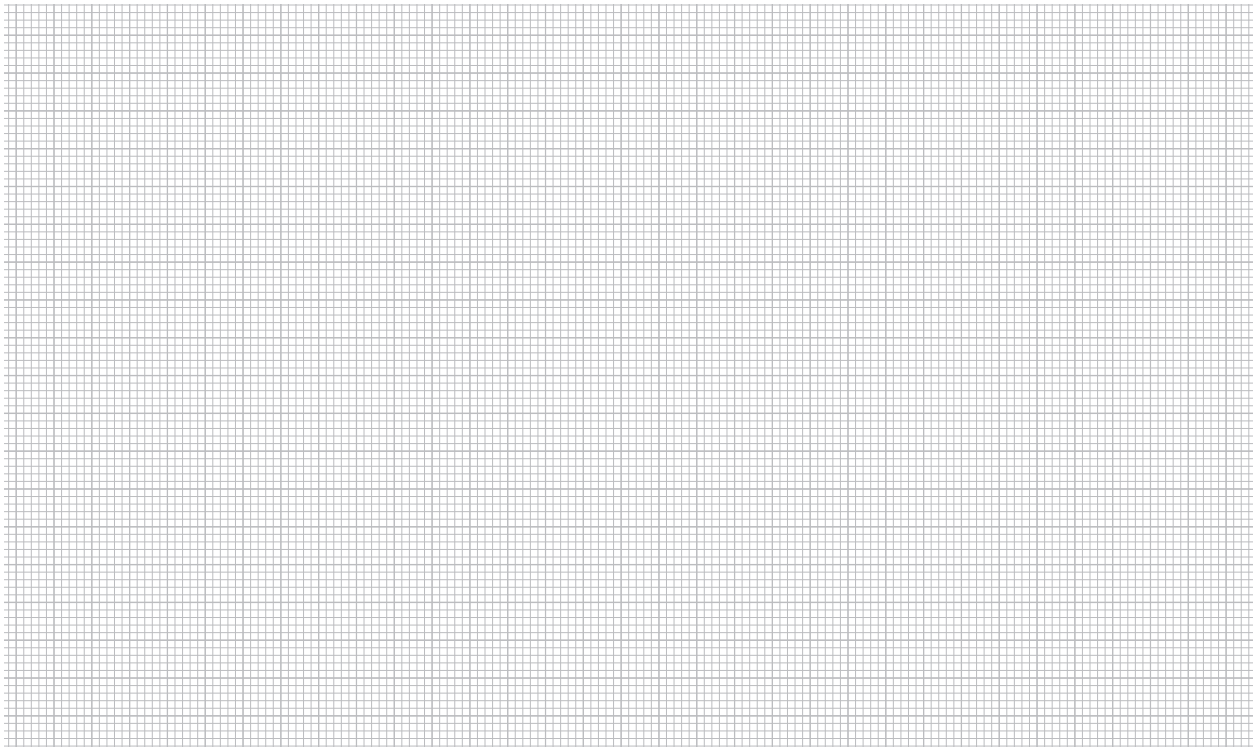
Change these dimensions: _____

_____

_____

_____

Sketch:



Company: _____

Address: _____

Contact: _____

E-Mail: _____

Phone: _____

Grade description

AMS - Coated

PVD Coated:
Universal grade with high heat and oxidation resistance.

Material application: Steel, Stainless Steel and Cast materials

Spare parts and accessories

Item	EDP
Screw	
AS 0043	91719
AS 0044	91721
Coolant seal ring	
KVR 12	81437
KVR 16	81439
KVR 20	70537

Grooving coated

ISO	Material		Tensile strength (N/mm²)	Cutting speed V_c (f/min) AMS
P	Unalloyed steel and cast steel	< 0.15 % C/hardened and tempered	350	70 – 590
		0,15–0,45 % C/hardened and tempered	650	70 – 590
		> 0,45 % C/hardened and tempered	1000	70 – 590
	Low alloyed steel and cast steel	annealed	600	50 – 520
		hardened and tempered	900	50 – 520
			1200	50 – 520
	High alloyed steel	annealed	700	70 – 390
	High alloyed tool steel and cast steel	hardened	1100	70 – 390
	Stainless steel	ferritic, annealed	700	70 – 300
	Cast steel	martensitic, hardened and tempered	1000	70 – 590
M	Stainless steel	austenitic and austenitic/	450 – 600	70 – 300
		ferritic, chilled	600 – 900	50 – 260
K	Cast iron	pearlitic/ferritic	500 – 700	70 – 460
		pearlitic/martensitic	700 – 850	70 – 460
			800 – 1100	70 – 460
	Cast iron with nodular graphite	ferritic	550	70 – 430
		pearlitic	800	70 – 430
	Malleable cast iron	ferritic	450	70 – 390
		pearlitic	750	70 – 390
N	Aluminum alloys long chipping	not heat treatable	200	70 – 1640
		heat treatable, heat treated	350	70 – 1640
	Casted aluminum alloys	≤ 12 % Si, heat treated	250	70 – 1640
		≤ 12 % Si, heat treatable, heat treated	300	70 – 1640
		≤ 12 % Si, not heat treatable	450	70 – 1640
	Copper and copper alloys (Brass/Bronze)	Lead alloys, Pb > 1 %	400	70 – 1970
		Brass, Bronze	300	70 – 1970
		Aluminum bronze	500	70 – 1970
		Copper and electrolyte copper	200	70 – 1970
	Non-ferrous materials	Duroplastice	–	–
		Re-inforced plastics	–	–
		Hard rubber	–	–
S	High temperature resistant alloys	Fe-alloyed, annealed	700	50 – 250
		Fe-alloyed, heat treated	950	50 – 250
		Ni- or Co-alloyed, annealed	800	50 – 130
		Ni- or Co-alloyed, casting	1100	50 – 130
		Ni- or Co-alloyed, heat treated	1200	50 – 130
	Titanium alloys	Pure titanium	500 – 700	–
	Alpha- and Beta-alloys	heat treated	700 – 1000	–
H	Hardened steel	hardened	55 HRC	–
			60 HRC	–
	Hard cast iron	casting	41 HRC	–
	Hardened cast iron	hardened	55 HRC	–

Recommended cutting data are approximate starting parameters, they may need adjustment for individual machining applications.

Recommended cutting data – Threading – Number of passes

Pitch		Number of passes					
V_c f/min		360 – 460	260 – 360	210 – 260	230 – 300	260 – 330	660 – 820
Pitch (mm)	TPI	Steel strength (N/mm²)			Stainless steel	Cast	Aluminum
		400–700	700–1.000	> 1.000			
0,5	48	6	7	7	8	7	6
0,75	32	8	9	9	10	9	8
0,8	32	8	9	10	10	9	8
1	24	10	11	12	12	12	10
1,25	20	12	14	15	15	14	12
1,5	16	15	17	18	18	17	15
1,75	14	17	19	21	21	18	17
2	12	19	22	25	25	20	18
2,5	10	22	26	31	31	22	20
3,0–3,5	8	28	32	38	38	24	22

The above mentioned data shows general recommendations for the above materials.
For hardened materials we recommend to reduce the cutting speed and increase the number of passes.

When experiencing cutting edge breakage we suggest to increase the number of passes.
When experiencing edge wear, please reduce the number of passes.

Remark: 1) The chip thickness should be constant with every pass.
2) At higher cutting depths reduce the in-feed in order to obtain constant cutting forces.

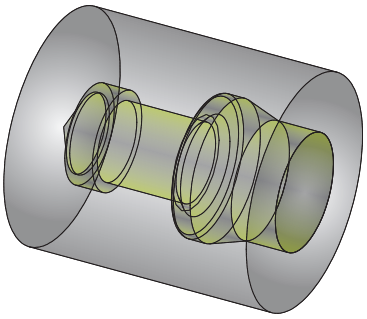
Material and application

ISO	Material	Max. depth of cut a_p (in)
P	Steel	.020
M	Stainless steel	.012
K	Cast	.012
N	Non-ferrous, Aluminum	.039

Application	Feed rate range (in/rev)
Grooving	.0004 – .0008
Boring, turning and copying	.0008 – .002
Pre-grooving, chamfering and back turning	.0008 – .002
Axial groove turning	.0008 – .002

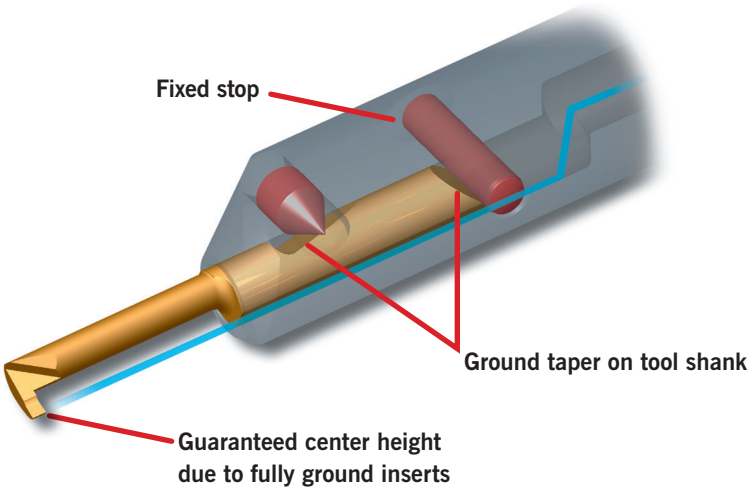
Application example

Application Material H13 (1.2343) with 800 N/mm²	Solution	Recommended cutting data	
		Revolution n (rev/min)	Feed rate range f (in/rev)
Pre-machining, drilling Ø 10 mm	SC10L-0023SP-05	3800	.0012
Pre-machining, drilling Ø 6 mm	SPC0060-0300 VHM / TiAlN	4200	.004
Turning to core diameter for M8	AMS-D-590802-200.60R	4200	.0016
Relief groove, thread	AMS-S-59151800-200.60R	4200	.0008
Thread M8	AMS-G-M8-200.60R	1640	.049 (1.25mm)
Turning, Form	AMS-K-591802-200.60R	3800	.0008 – .0016



3

Assembly of ARNO® Mini-System



With the ground taper on the tool shank and the fixed stop in the sleeve the length remains accurately constant and guaranteed cutting edge repeatability is achieved. The cone of the threaded pin ensures secure tool locking and reduces cutting edge vibrations.

ARNO®
WERKZEUGE

Quick, Flexible and Responsive

To have R&D, production and sales, all under one roof

is the perfect way of providing standard and special products.

95 % of the standard stocked items are available from stock in Illinois.

Orders received before 3:30pm Central Time are shipped the same day and can be on your machine the next day.

Arno's competent team of sales engineers is always available for service and support. In many cases we offer on-site assistance.

Find more information at

www.arnousa.com

SIM – Boring bars (INCH)

4

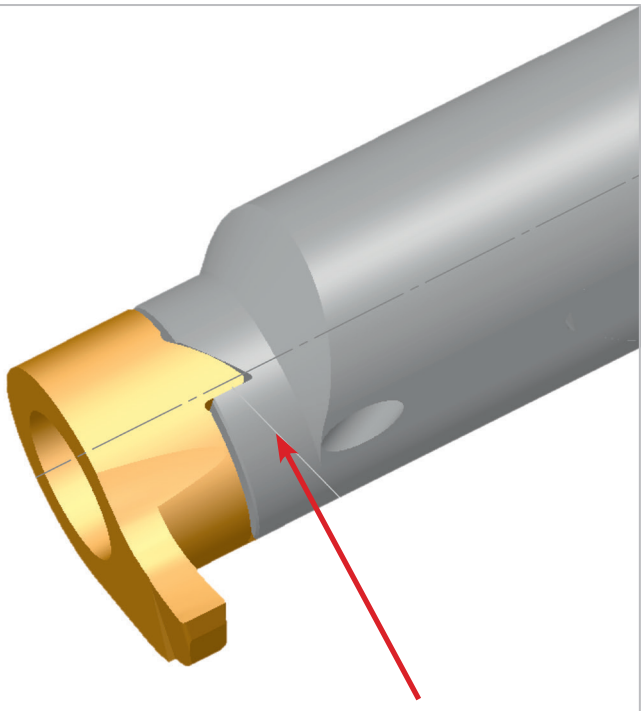
Modular internal grooving system

4

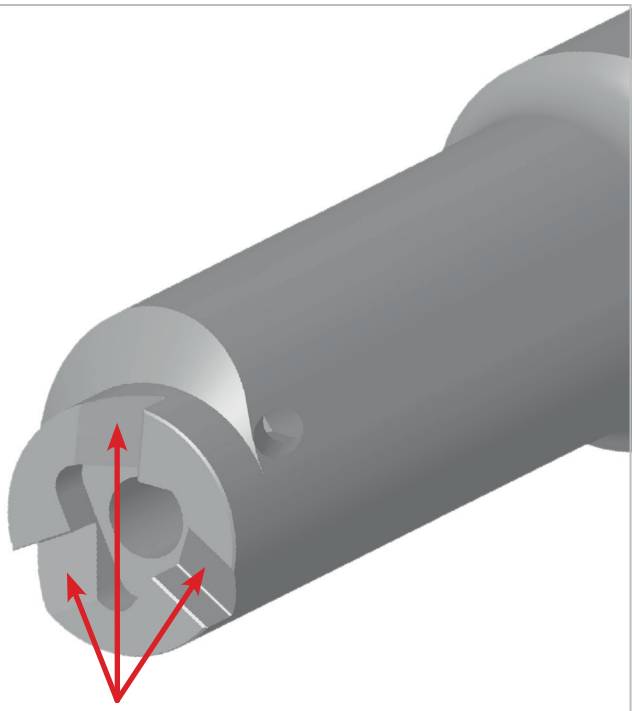
SIM – Boring bars

Mini boring system with minimum bore diameter from .264” (6.7mm)

Advantages of the patented location



Right angled location flat
Optimum transfer of cutting forces due to right angled location locking the insert into position.



3-point location
3-point location guarantees high repeatability and positioning of the insert.

Introduction

The ARNO SIM system is a modular internal grooving system in with a minimum bore of Dmin .264" (6.7mm). Holders are available with steel or carbide shanks (with brazed steel head) and screw on carbide insert. Inserts of different geometries and applications fit the same holder within their connection size (A to Z).

Features

- Vibration damped carbide shank with brazed on steel head
- Shank has two location flats
- Through tool coolant
- Highest rigidity due to oval shaped shaft
- Reach into the bore up to 3.150" (80mm)
- Depth of cut up to .177" (4.5mm)
- Groove widths from .020" – .197" (0.5 – 5mm)
- Easy insert replacement
- Application areas:
  – Radius grooving
  – Cir-clip grooving DIN 471/472
  – Copying
  – Pre-grooving
  – Chamfering
  – Threading
- Inserts available with PVD coating
- Holders offered in steel and carbide shanks
- Custom solutions on request

Boring bars

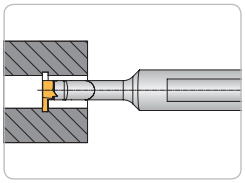
HSIMD	40	16	S	R
HSIM = Holder SIM D = Size (Z, A, B, C, D)	Maximum reach 40mm (1.575”)	Shank diameter 16 mm	Version S = Steel otherwise carbide shank	Version R = Right hand L = Left hand

4

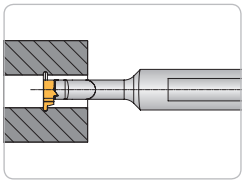
Inserts

SIM097A	V	20	30	01	W	R/L	AP	5020
SIM097 Insert A = Size (Z, A, B, C, D)	V = Radius K = Copying F = Chamfering G = Threading VF = Pre-grooving and chamfering R30 = Back turning 071-164 = Cir-clip 471/472	Groove width W = 2.0mm (.079”)	Groove depth doc = 3.0mm (.118”)	Corner radius R = 0.1mm (.004”)	Location	Version R = Right hand L = Left hand	ARNO® Application area	Grade code (by ISO standard)

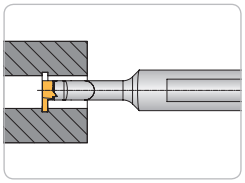
Program overview boring bars and inserts



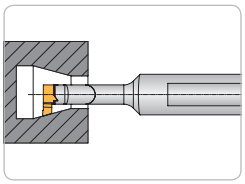
Grooving
Page 131



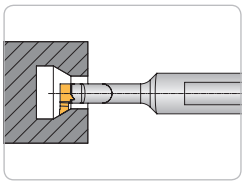
Radius grooving
Page 132



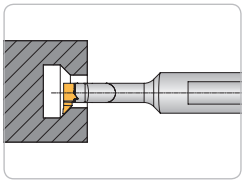
Cir-clip DIN 471/472
Page 133



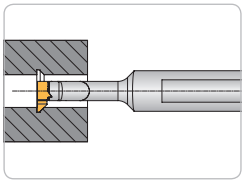
Copying 15°
Page 134



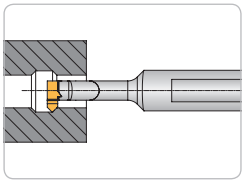
Copying 30°
Page 135



Copying 45°
Page 136

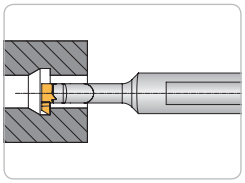


Pre-grooving and chamfering
Page 137

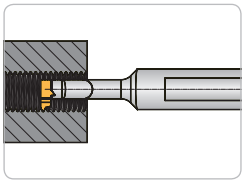


Chamfering 45°
Page 138

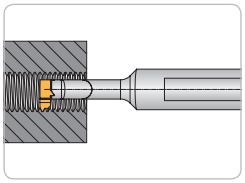
Program overview boring bars and inserts



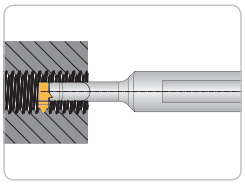
Back turning
Page 139



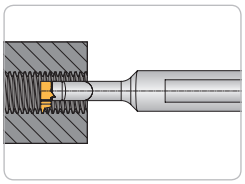
Threading 60° Metric partial profile
Page 140



Threading 60° Metric full profile
Page 141



Whitworth pipe thread 55° DIN ISO 228-Full profile
Page 142



Trapezoidal 30° DIN ISO 103-Partial profile
Page 143

Grooving

metric only

with ic

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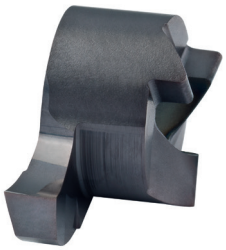

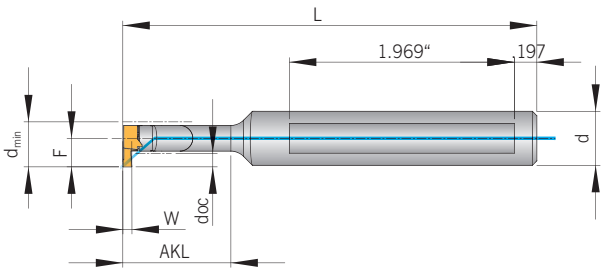

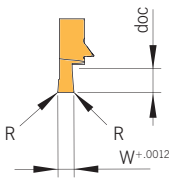

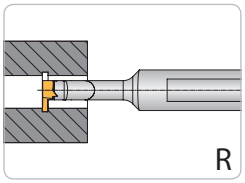

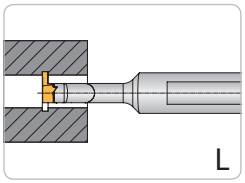

*) = Steel boring bar W = Groove width doc = Groove depth R = Radius

Insert								Boring bar				
d_{min}	doc	W	R	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.264	.039	.020	.002	SIM067Z-0510005W R/L	100992	100994	.152	Z	.472	.394	3.130	HSIMZ-1012S R/L*	100966
		.039	.002	SIM067Z-1010005W R/L	100996	100998				.709	3.445	HSIMZ-1812 R/L	101422
		.059	.002	SIM067Z-1510005W R/L	101000	101002				.787	3.524	HSIMZ-2012S R/L*	100968
		.079	.004	SIM067Z-201001W R/L	101004	101006				1.024	3.760	HSIMZ-2612 R/L	101426
.303	.079	.020	.002	SIM077Z-0520005W R/L	101013	101011	.191			1.024	3.760	HSIMZ-2612S R/L*	100974
		.039	.002	SIM077Z-1020005W R/L	101019	101021				1.417	4.154	HSIMZ-3612 R/L	101428
		.059	.002	SIM077Z-1520005W R/L	101027	101029							
		.079	.004	SIM077Z-202001W R/L	101035	101037							
.307	.047	.079	.004	SIM078A-201201W R	–	–	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
.382	.118	.039	.002	SIM097A-1030005W R/L	84722	85090				.591	3.268	HSIMA-1512 R/L	87776
		.059	.002	SIM097A-1530005W R/L	84726	85094				.945	3.622	HSIMA-2412 R/L	87782
		.059	.008	SIM097A-153002W R	–	106302				.945	3.622	HSIMA-2412S R/L*	84515
		.079	.004	SIM097A-203001W R/L	84730	85098				1.260	3.937	HSIMA-3212 R/L	84481
		.098	.004	SIM097A-253001W R/L	84734	85102				1.890	4.528	HSIMA-4812 R/L	84487
		.118	.008	SIM097A-303002W R/L	84738	85106							
.461	.039	.028	–	SIM117B-071000W R/L	86462	86468	.299	B	.472				
	.118	.028	.002	SIM117B-0730005W R	105982	105984				.551	3.150	HSIMB-1412S R/L*	87843
	.138	.039	.002	SIM117B-1035005W R/L	84742	85110				1.142	3.740	HSIMB-2912S R/L*	84517
		.059	.002	SIM117B-1535005W R/L	84746	85114				1.654	4.331	HSIMB-4212 R/L	84489
		.079	.004	SIM117B-203501W R/L	84750	85118				2.205	4.724	HSIMB-5612 R/L	84495
		.098	.004	SIM117B-253501W R/L	84754	85122							
		.118	.008	SIM117B-303502W R/L	84758	85126							
.539	.157	.039	.002	SIM137C-1040005W R/L	84762	85137	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
		.059	.002	SIM137C-1540005W R/L	84780	85141				1.339	3.937	HSIMC-3416S R/L*	84523
		.079	.004	SIM137C-204001W R/L	84784	85145				1.772	4.331	HSIMC-4516 R/L	84497
		.098	.004	SIM137C-254001W R/L	84788	85149				2.520	5.118	HSIMC-6416 R/L	84503
		.118	.008	SIM137C-304002W R/L	84792	85153							
.618	.177	.079	.004	SIM157D-204501W R/L	84796	85157	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
		.098	.004	SIM157D-254501W R/L	84800	85161				1.575	5.118	HSIMD-4016S R/L	84525
		.118	.008	SIM157D-304502W R/L	84804	85165				1.575	5.118	HSIMD-4016 R/L*	91725
		.138	.008	SIM157D-354502W R/L	84808	85169				2.205	5.118	HSIMD-5616 R/L	84505
		.157	.008	SIM157D-404502W R/L	84812	85173				3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

4

Radius grooving

metric only

with ic

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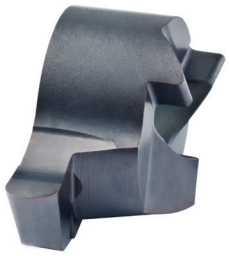

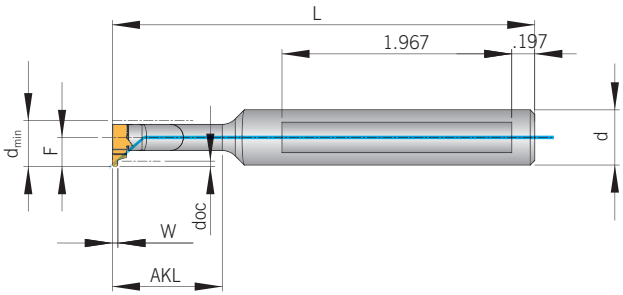

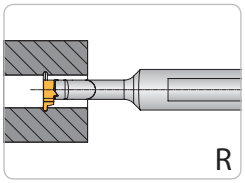

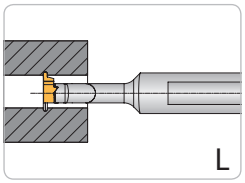

*) = Steel boring bar W = Groove width (mm) doc = Groove depth (mm) R = Radius

Insert								Boring bar					
					EDP (RH only)								
d_{min}	doc	W	R	Designation	AK1020	AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.382	.039	.031	.016	SIM097A-V-081004 R/L	87070	87074	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
		.047	.024	SIM097A-V-121006 R/L	87078	87082				.591	3.268	HSIMA-1512 R/L	87776
		.071	.035	SIM097A-V-181009 R/L	87084	87090				.945	3.622	HSIMA-2412 R/L	87782
										.945	3.622	HSIMA-2412S R/L*	84515
										1.260	3.937	HSIMA-3212 R/L	84481
										1.890	4.528	HSIMA-4812 R/L	84487
.461	.098	.031	.016	SIM117B-V-082504 R/L	87094	87098	.299	B	.472				
		.039	.020	SIM117B-V-102505 R/L						.551	3.150	HSIMB-1412S R/L*	87843
		.047	.024	SIM117B-V-122506 R/L	87106	87100				1.142	3.740	HSIMB-2912S R/L*	84517
		.071	.035	SIM117B-V-182509 R/L	87110	87112				1.654	4.331	HSIMB-4212 R/L	84489
		.079	.039	SIM117B-V-202510 R/L	87120	87118				2.205	4.724	HSIMB-5612 R/L	84495
		.118	.059	SIM117B-V-302515 R/L	87126	87128							
.539	.157	.047	.024	SIM137C-V-124006 R/L	87134	87136	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
		.071	.035	SIM137C-V-184009 R/L	87144	87142				1.339	3.937	HSIMC-3416S R/L*	84523
		.079	.039	SIM137C-V-204010 R/L	87150	87152				1.772	4.331	HSIMC-4516 R/L	84497
		.087	.043	SIM137C-V-224011 R/L	87160	87158				2.520	5.118	HSIMC-6416 R/L	84503
		.118	.059	SIM137C-V-304015 R/L	87166	87168							
.618	.177	.071	.035	SIM157D-V-184509 R/L	87174	87176	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
		.087	.043	SIM157D-V-224511 R/L	87184	87182				1.575	5.118	HSIMD-4016S R/L*	84525
		.118	.059	SIM157D-V-304515 R/L	87190	87192				1.575	5.118	HSIMD-4016 R/L	91725
		.157	.079	SIM157D-V-404520 R/L	87198	87200				2.205	5.118	HSIMD-5616 R/L	84505
										3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

All dimensions in inches

Cir-clip DIN 471/472

metric only

with ic

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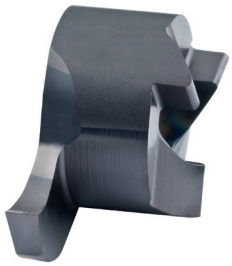
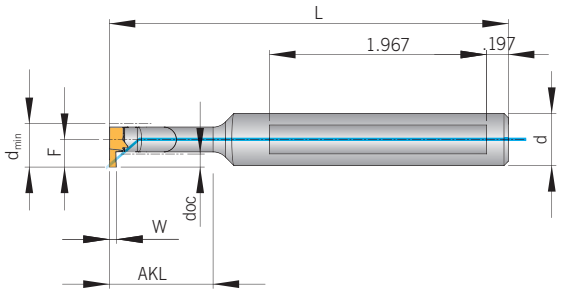
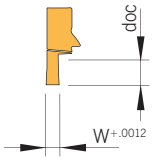
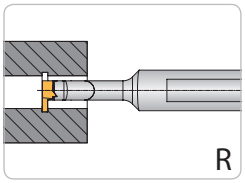
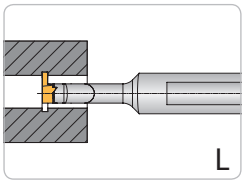










*) = Steel boring bar W = Groove width (mm) doc = Groove depth (mm)

Insert								Boring bar			
d_{min}	doc	W	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.382	.039	.029	SIM097A-071000W R/L	86414	86420	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
	.039	.033	SIM097A-081000W R/L	86422	86424				.591	3.268	HSIMA-1512 R/L	87776
	.118	.037	SIM097A-093000W R/L	86431	86434				.945	3.622	HSIMA-2412 R/L	87782
	.118	.047	SIM097A-113000W R/L	86438	86444				.945	3.622	HSIMA-2412S R/L*	84515
	.118	.055	SIM097A-133000W R/L	86446	86452				1.260	3.937	HSIMA-3212 R/L	84481
	.118	.067	SIM097A-163000W R/L	86454	86458				1.890	4.528	HSIMA-4812 R/L	84487
.461	.039	.029	SIM117B-071000W R/L	86462	86468	.299	B	.472				
	.039	.033	SIM117B-081000W R/L	86470	86476				.551	3.150	HSIMB-1412S R/L*	87843
	.138	.037	SIM117B-093500W R/L	86478	86482				1.142	3.740	HSIMB-2912S R/L*	84517
	.138	.047	SIM117B-113500W R/L	86486	86493				1.654	4.331	HSIMB-4212 R/L	84489
	.138	.055	SIM117B-133500W R/L	86495	86499				2.205	4.724	HSIMB-5612 R/L	84495
	.138	.067	SIM117B-163500W R/L	86505	86507							
.539	.039	.029	SIM137C-071000W R/L	86511	86515	.348	C	.630				
	.039	.033	SIM137C-081000W R/L	86521	86523				.630	3.228	HSIMC-1616S R/L*	87847
	.157	.037	SIM137C-094000W R/L	86527	86531				1.339	3.937	HSIMC-3416S R/L*	84523
	.157	.047	SIM137C-114000W R/L	86535	86541				1.772	4.331	HSIMC-4516 R/L	84497
	.157	.055	SIM137C-134000W R/L	86545	86547				2.520	5.118	HSIMC-6416 R/L	84503
	.157	.067	SIM137C-164000W R/L	86553	86555							
.618	.039	.029	SIM157D-071000W R/L	86561	86563	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
	.039	.033	SIM157D-081000W R/L	86571	86569				1.575	5.118	HSIMD-4016S R/L*	84525
	.177	.037	SIM157D-094500W R/L	86577	86579				1.575	5.118	HSIMD-4016 R/L	91725
	.177	.047	SIM157D-114500W R/L	86587	86585				2.205	5.118	HSIMD-5616 R/L	84505
	.177	.055	SIM157D-134500W R/L	86591	86597				3.150	5.906	HSIMD-8016 R/L	84511
	.177	.067	SIM157D-164500W R/L	86605	86599							

Minimum order quantity for all standard inserts: 2 pieces

4

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

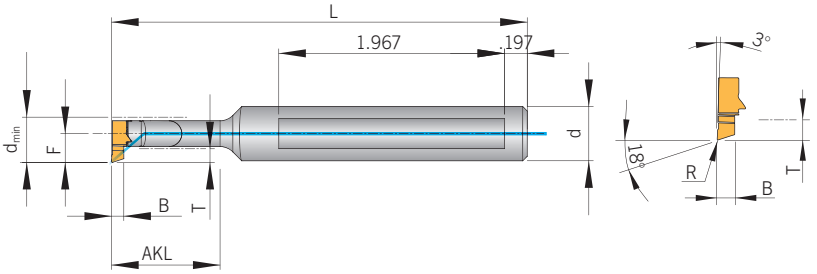
All dimensions in inches

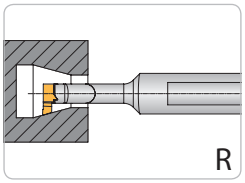
Copying 15°

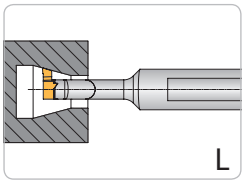
metric only

with ic

Page 146-150







*) = Steel boring bar B = Groove width (mm) T = Groove depth (mm) R = Radius

Insert								Boring bar				
d_{min}	T	B	R	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.264	.039	.087	.008	SIM067Z-K18-02 R/L	101119	101139	.152	Z	.472	.394	3.130	HSIMZ-1012S R/L*	100966
										.709	3.445	HSIMZ-1812 R/L	101422
										.787	3.524	HSIMZ-2012S R/L*	100968
			.016	SIM067Z-K18-04 R/L	101121	101143				1.024	3.760	HSIMZ-2612 R/L	101426
										1.024	3.760	HSIMZ-2612S R/L*	100974
										1.417	4.154	HSIMZ-3612 R/L	101428
.382	.118	.106	.008	SIM097A-K18-02 R/L	87451	87513	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
										.591	3.268	HSIMA-1512 R/L	87776
										.945	3.622	HSIMA-2412 R/L	87782
										.945	3.622	HSIMA-2412S R/L*	84515
										1.260	3.937	HSIMA-3212 R/L	84481
										1.890	4.528	HSIMA-4812 R/L	84487
.461	.138	.146	.008	SIM117B-K18-02 R/L	87467	87529	.299	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
										1.142	3.740	HSIMB-2912S R/L*	84517
										1.654	4.331	HSIMB-4212 R/L	84489
										2.205	4.724	HSIMB-5612 R/L	84495
.539	.157	.146	.008	SIM137C-K18-02 R/L	87481	87547	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
										1.339	3.937	HSIMC-3416S R/L*	84523
										1.772	4.331	HSIMC-4516 R/L	84497
										2.520	5.118	HSIMC-6416 R/L	84503
.618	.177	.185	.008	SIM157D-K18-02 R/L	87497	87563	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
										1.575	5.118	HSIMD-4016S R/L*	84525
										1.575	5.118	HSIMD-4016 R/L	91725
										2.205	5.118	HSIMD-5616 R/L	84505
										3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
Z	AS 0030	T5107-IP	0.44	M 2,0
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

All dimensions in inches

Copying 30°

metric only

with ic

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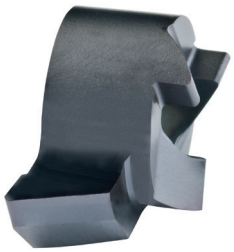

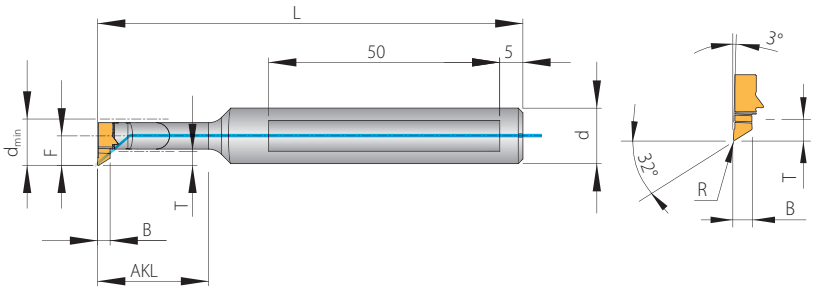

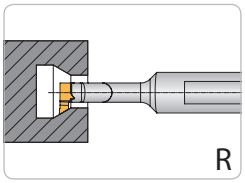

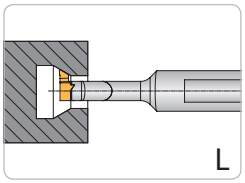

*) = Steel boring bar B = Groove width (mm) T = Groove depth (mm) R = Radius

Insert								Boring bar				
d_{min}	T	B	R	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.382	.118	.106	.008	SIM097A-K32-02 R/L	87455	87517	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
										.591	3.268	HSIMA-1512 R/L	87776
										.945	3.622	HSIMA-2412 R/L	87782
										.945	3.622	HSIMA-2412S R/L*	84515
										1.260	3.937	HSIMA-3212 R/L	84481
										1.890	4.528	HSIMA-4812 R/L	84487
.461	.138	.146	.008	SIM117B-K32-02 R/L	87471	87535	.299	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
										1.142	3.740	HSIMB-2912S R/L*	84517
										1.654	4.331	HSIMB-4212 R/L	84489
										2.205	4.724	HSIMB-5612 R/L	84495
.539	.157	.146	.008	SIM137C-K32-02 R/L	87485	87549	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
										1.339	3.937	HSIMC-3416S R/L*	84523
										1.772	4.331	HSIMC-4516 R/L	84497
										2.520	5.118	HSIMC-6416 R/L	84503
.618	.177	.185	.008	SIM157D-K32-02 R/L	87501	87565	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
										1.575	5.118	HSIMD-4016S R/L*	84525
										1.575	5.118	HSIMD-4016 R/L	91725
										2.205	5.118	HSIMD-5616 R/L	84505
										3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

4

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

All dimensions in inches

Copying 45°

metric only

with ic

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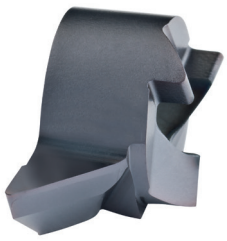
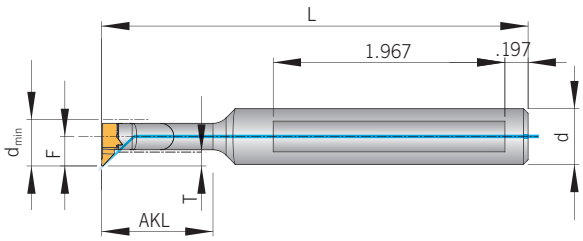
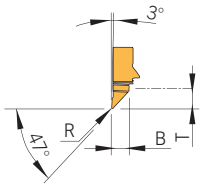
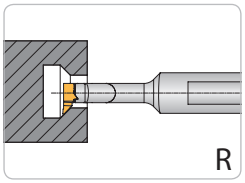
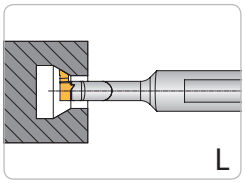










*) = Steel boring bar B = Groove width (mm) T = Groove depth (mm) R = Radius

Insert								Boring bar				
d_{min}	T	B	R	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.382	.118	.106	.008	SIM097A-K47-02 R/L	87459	87521	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
										.591	3.268	HSIMA-1512 R/L	87776
										.945	3.622	HSIMA-2412 R/L	87782
										.945	3.622	HSIMA-2412S R/L*	84515
										1.260	3.937	HSIMA-3212 R/L	84481
										1.890	4.528	HSIMA-4812 R/L	84487
.461	.138	.146	.008	SIM117B-K47-02 R/L	87475	87537	.299	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
										1.142	3.740	HSIMB-2912S R/L*	84517
										1.654	4.331	HSIMB-4212 R/L	84489
										2.205	4.724	HSIMB-5612 R/L	84495
.539	.157	.146	.008	SIM137C-K47-02 R/L	87489	87555	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
										1.339	3.937	HSIMC-3416S R/L*	84523
										1.772	4.331	HSIMC-4516 R/L	84497
										2.520	5.118	HSIMC-6416 R/L	84503
.618	.177	.185	.008	SIM157D-K47-02 R/L	87505	87571	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
										1.575	5.118	HSIMD-4016S R/L*	84525
										1.575	5.118	HSIMD-4016 R/L	91725
										2.205	5.118	HSIMD-5616 R/L	84505
										3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

4

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

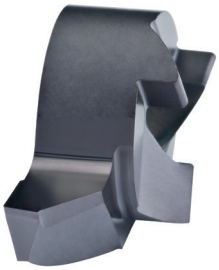
All dimensions in inches

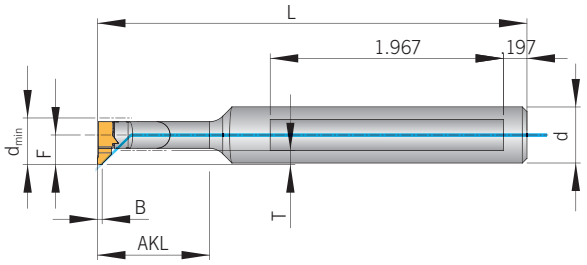
Pre-grooving and chamfering

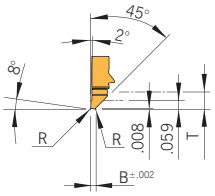
metric only

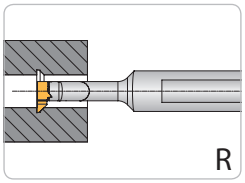
with ic

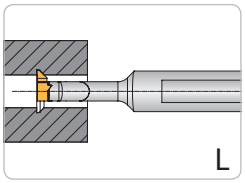
Page 146-150











*) = Steel boring bar B = Groove width (mm) T = Groove depth (mm) R = Radius

Insert								Boring bar				
d_{min}	T	B	R	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.382	.118	.039	.004	SIM097A-VF-0810-45 R/L	87901	87917	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
										.591	3.268	HSIMA-1512 R/L	87776
										.945	3.622	HSIMA-2412 R/L	87782
										.945	3.622	HSIMA-2412S R/L*	84515
										1.260	3.937	HSIMA-3212 R/L	84481
										1.890	4.528	HSIMA-4812 R/L	84487
.461	.138	.039	.004	SIM117B-VF-0810-45 R/L	87905	87945	.299	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
										1.142	3.740	HSIMB-2912S R/L*	84517
										1.654	4.331	HSIMB-4212 R/L	84489
										2.205	4.724	HSIMB-5612 R/L	84495
.539	.157	.059	.004	SIM137C-VF-0815-45 R/L	87909	87949	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
										1.339	3.937	HSIMC-3416S R/L*	84523
										1.772	4.331	HSIMC-4516 R/L	84497
										2.520	5.118	HSIMC-6416 R/L	84503
.618	.177	.059	.004	SIM157D-VF-0815-45 R/L	87913	87953	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
										1.575	5.118	HSIMD-4016S R/L*	84525
										1.575	5.118	HSIMD-4016 R/L	91725
										2.205	5.118	HSIMD-5616 R/L	84505
										3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

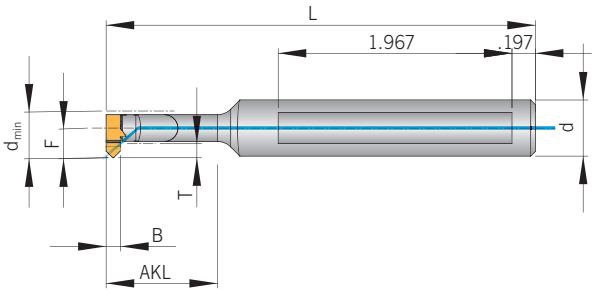
All dimensions in inches

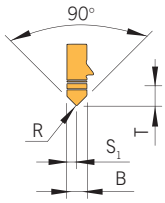
Chamfering 45°

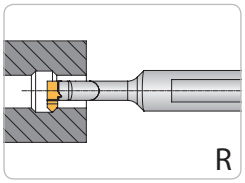
metric only

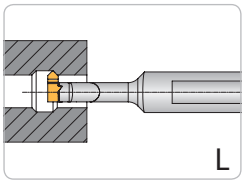
with ic

Page 146-150









*) = Steel boring bar B = Groove width (mm) T = Groove depth (mm) R = Radius

Insert									Boring bar				
d_{min}	T	B	R	S_1	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.264	.039	.087	.008	.043	SIM067Z-F45-02 R/L	101127	101147	.152	Z	.472	.394	3.130	HSIMZ-1012S R/L*	100966
											.709	3.445	HSIMZ-1812 R/L	101422
											.787	3.524	HSIMZ-2012S R/L*	100968
											1.024	3.760	HSIMZ-2612 R/L	101426
											1.024	3.760	HSIMZ-2612S R/L*	100974
											1.417	4.154	HSIMZ-3612 R/L	101428
.382	.118	.118	.008	.059	SIM097A-F45-02 R/L	87638	87642	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
											.591	3.268	HSIMA-1512 R/L	87776
											.945	3.622	HSIMA-2412 R/L	87782
											.945	3.622	HSIMA-2412S R/L*	84515
											1.260	3.937	HSIMA-3212 R/L	84481
											1.890	4.528	HSIMA-4812 R/L	84487
.461	.138	.157	.008	.079	SIM117B-F45-02 R/L	87646	87650	.299	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
											1.142	3.740	HSIMB-2912S R/L*	84517
											1.654	4.331	HSIMB-4212 R/L	84489
											2.205	4.724	HSIMB-5612 R/L	84495
.539	.157	.157	.008	.079	SIM137C-F45-02 R/L	87654	87658	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
											1.339	3.937	HSIMC-3416S R/L*	84523
											1.772	4.331	HSIMC-4516 R/L	84497
											2.520	5.118	HSIMC-6416 R/L	84503
.618	.177	.197	.008	.098	SIM157D-F45-02 R/L	87662	87666	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
											1.575	5.118	HSIMD-4016S R/L*	84525
											1.575	5.118	HSIMD-4016 R/L	91725
											2.205	5.118	HSIMD-5616 R/L	84505
											3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
Z	AS 0030	T5107-IP	0.44	M 2,0
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

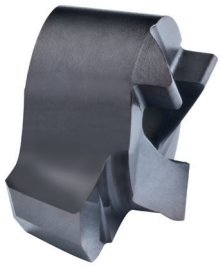
All dimensions in inches

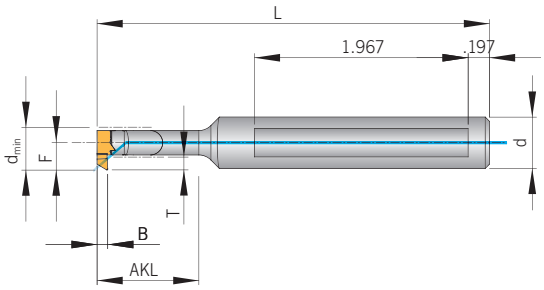
Back turning

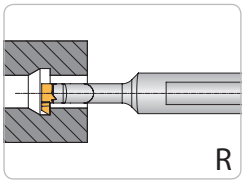
metric only

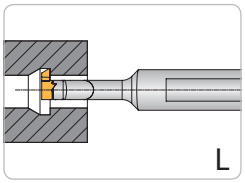
with ic

Page 146-150









*) = Steel boring bar B = Groove width (mm) T = Groove depth (mm) R = Radius

Insert								Boring bar				
d_{min}	T	B	R	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.264	.039	.099	.004	SIM067Z-R30-01 R/L	106016	106020	.152	Z	.472	.394	3.130	HSIMZ-1012S R/L*	100966
										.709	3.445	HSIMZ-1812 R/L	101422
										.787	3.524	HSIMZ-2012S R/L*	100968
										1.024	3.760	HSIMZ-2612 R/L	101426
										1.024	3.760	HSIMZ-2612S R/L*	100974
										1.417	4.154	HSIMZ-3612 R/L	101428
.382	.118	.098	.008	SIM097A-R30-02 R/L	87447	87509	.250	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
										.591	3.268	HSIMA-1512 R/L	87776
										.945	3.622	HSIMA-2412 R/L	87782
										.945	3.622	HSIMA-2412S R/L*	84515
										1.260	3.937	HSIMA-3212 R/L	84481
										1.890	4.528	HSIMA-4812 R/L	84487
.461	.138	.138	.008	SIM117B-R30-02 R/L	87463	87525	.299	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
										1.142	3.740	HSIMB-2912S R/L*	84517
										1.654	4.331	HSIMB-4212 R/L	84489
										2.205	4.724	HSIMB-5612 R/L	84495
.539	.157	.138	.008	SIM137C-R30-02 R/L	87477	87541	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
										1.339	3.937	HSIMC-3416S R/L*	84523
										1.772	4.331	HSIMC-4516 R/L	84497
										2.520	5.118	HSIMC-6416 R/L	84503
.618	.177	.177	.008	SIM157D-R30-02 R/L	87493	87557	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
										1.575	5.118	HSIMD-4016S R/L*	84525
										1.575	5.118	HSIMD-4016 R/L	91725
										2.205	5.118	HSIMD-5616 R/L	84505
										3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
Z	AS 0030	T5107-IP	0.44	M 2,0
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

Threading 60° Metric partial profile

metric only

with ic

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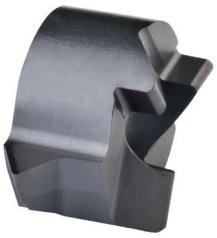

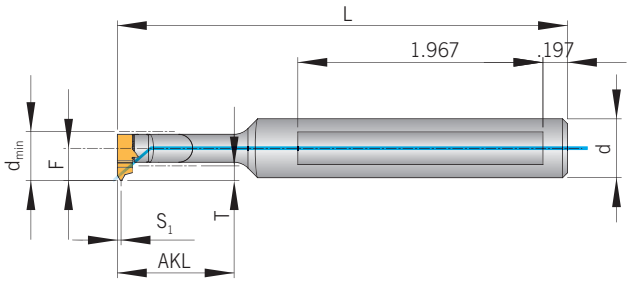

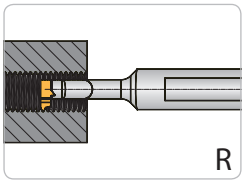

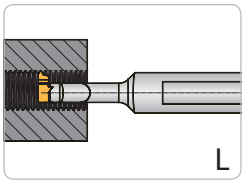

*) = Steel boring bar T = Groove depth (mm) M – ISO-Metric MF – ISO-Metric – Fine

Insert									Boring bar				
d_{min}	Thread Type	P Pitch (mm)	S_1	T	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
											.394	3.130	HSIMZ-1012S R/L*	100966
											.709	3.445	HSIMZ-1812 R/L	101422
.264	M	1,25	.031	.039	SIM067Z-G-M125 R/L	101135	101151	.152	Z	.472	.787	3.524	HSIMZ-2012S R/L*	100968
	MF	0,5–1,00	.031		SIM067Z-G-MF050100 R/L	101131	101155				1.024	3.760	HSIMZ-2612 R/L	101426
											1.024	3.760	HSIMZ-2612S R/L*	100974
											1.417	4.154	HSIMZ-3612 R/L	101428
											.472	3.150	HSIMA-1212S R/L*	87839
	MF	0,5–0,75	.031		SIM080A-G-MF050075 R/L	89982	89988				.591	3.268	HSIMA-1512 R/L	87776
.315	MF	1,0–1,25	.031	.071	SIM080A-G-MF100125 R/L	89994	89990	.191	A	.472	.945	3.622	HSIMA-2412 R/L	87782
	M	1,5–1,75	.039		SIM080A-G-M150175 R/L	89998	90002				.945	3.622	HSIMA-2412S R/L*	84515
											1.260	3.937	HSIMA-3212 R/L	84481
											1.890	4.528	HSIMA-4812 R/L	84487
	MF	0,5–0,75	.031		SIM107B-G-MF050075 R/L	90006	90012				.551	3.150	HSIMB-1412S R/L*	87843
	MF	1,0–1,25	.031		SIM107B-G-MF100125 R/L	90041	90047				1.142	3.740	HSIMB-2912S R/L*	84517
.421	MF	1,5–1,75	.039	.118	SIM107B-G-MF150175 R/L	90049	90055	.268	B	.472	1.654	4.331	HSIMB-4212 R/L	84489
	M	2,0	.051		SIM107B-G-M200 R/L	90057	90063				2.205	4.724	HSIMB-5612 R/L	84495
	M	2,5	.055		SIM107B-G-M250 R/L	90071	90065							
	MF	0,5–0,75	.031		SIM137C-G-MF050075 R/L	90073	90079				.630	3.228	HSIMC-1616S R/L*	87847
	MF	1,0–1,25	.031		SIM137C-G-MF100125 R/L	90081	90087				1.339	3.937	HSIMC-3416S R/L*	84523
.539	MF	1,5–1,75	.039	.165	SIM137C-G-MF150175 R/L	90095	90089	.348	C	.630	1.772	4.331	HSIMC-4516 R/L	84497
	M	2,0	.051		SIM137C-G-M200 R/L	90097	90103				2.520	5.118	HSIMC-6416 R/L	84503
	M	2,5	.055		SIM137C-G-M250 R/L	90109	90105							
	MF	1,0–1,25	.031		SIM157D-G-MF100125 R/L	90113	90119				.709	4.252	HSIMD-1816S R/L*	87851
	MF	1,5–1,75	.039		SIM157D-G-MF150175 R/L	90127	90121				1.575	5.118	HSIMD-4016S R/L*	84525
.618	MF	2,00	.051	.185	SIM157D-G-MF200 R/L	90129	90135	.398	D	.630	1.575	5.118	HSIMD-4016 R/L	91725
	M	2,50	.055		SIM157D-G-M250 R/L	90143	90137				2.205	5.118	HSIMD-5616 R/L	84505
											3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
Z	AS 0030	T5107-IP	0.44	M 2,0
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

All dimensions in inches

Threading 60° Metric full profile

metric only

with ic

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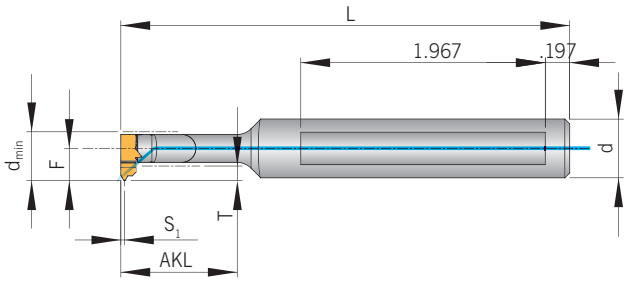

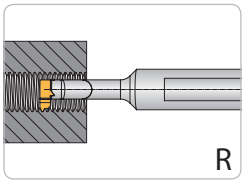

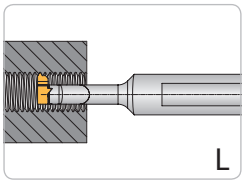

*) = Steel boring bar T = Groove depth (mm) M – ISO-Metric MF – ISO-Metric – Fine

Insert										Boring bar				
d_{min}	Thread Type	P Pitch (mm)	S_1	T	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.315	M	1,5	.039	.071	SIM080A-GV-M150 R/L	96561	96567	.191	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
											.591	3.268	HSIMA-1512 R/L	87776
											.945	3.622	HSIMA-2412 R/L	87782
											.945	3.622	HSIMA-2412S R/L*	84515
											1.260	3.937	HSIMA-3212 R/L	84481
											1.890	4.528	HSIMA-4812 R/L	84487
.421	MF	1,0	.031	.118	SIM107B-GV-MF100 R/L	89854	89858	.268	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
	MF	1,5	.039		SIM107B-GV-MF150 R/L	89866	89862				1.142	3.740	HSIMB-2912S R/L*	84517
	M	2,0	.051		SIM107B-GV-M200 R/L	89870	89876				1.654	4.331	HSIMB-4212 R/L	84489
	M	2,5	.055		SIM107B-GV-M250 R/L	89884	89878				2.205	4.724	HSIMB-5612 R/L	84495
	M	3,0	.063		SIM107B-GV-M300 R/L	89886	89892							
.539	MF	1,0	.031	.165	SIM137C-GV-MF100 R/L	89894	89900	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
	MF	1,5	.039		SIM137C-GV-MF150 R/L	89902	89908				1.339	3.937	HSIMC-3416S R/L*	84523
	M	2,0	.051		SIM137C-GV-M200 R/L	89916	89910				1.772	4.331	HSIMC-4516 R/L	84497
	M	2,5	.055		SIM137C-GV-M250 R/L	89920	89922				2.520	5.118	HSIMC-6416 R/L	84503
.618	MF	1,0	.031	.185	SIM157D-GV-MF100 R/L	89926	89930	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
	MF	1,5	.039		SIM157D-GV-MF150 R/L	89934	89938				1.575	5.118	HSIMD-4016S R/L*	84525
	MF	2,0	.051		SIM157D-GV-MF200 R/L	89946	89944				1.575	5.118	HSIMD-4016 R/L	91725
	M	2,5	.055		SIM157D-GV-M250 R/L	89952	89954				2.205	5.118	HSIMD-5616 R/L	84505
	M	3,0	.063		SIM157D-GV-M300 R/L	89962	89960				3.150	5.906	HSIMD-8016 R/L	84511
	M	3,5	.071		SIM157D-GV-M350 R/L	89968	89970							
	M	4,0	.079		SIM157D-GV-M400 R/L	89980	89974							

Minimum order quantity for all standard inserts: 2 pieces

4

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

All dimensions in inches

Whitworth pipe thread 55° DIN ISO 228-Full profile

metric only

with ic

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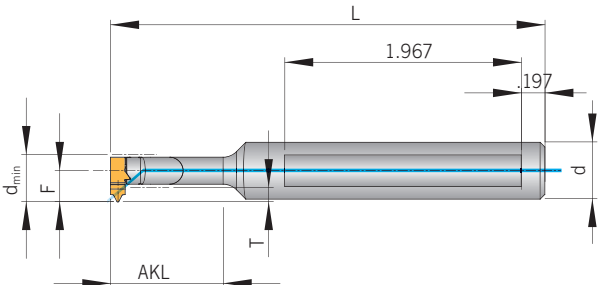

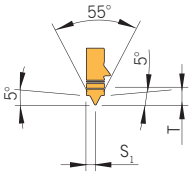

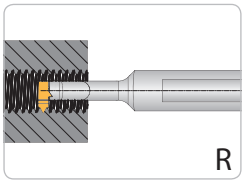

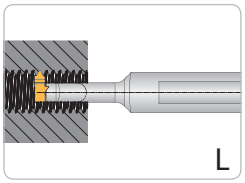

*) = Steel boring bar T = Groove depth (mm)

.26Insert											Boring bar				
d_{min}	Thread Type	P Pitch	TPI	S_1	T	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.421	W228	.053	.748	.051	.118	SIM107B-GV-W228/19 R/L	89822	89826	.268	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
		.071	.551	.063		SIM107B-GV-W228/14 R/L	89830	89834				1.142	3.740	HSIMB-2912S R/L*	84517
												1.654	4.331	HSIMB-4212 R/L	84489
												2.205	4.724	HSIMB-5612 R/L	84495
.618	W228								.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
		.071	.551	.063		SIM157D-GV-W228/14 R/L	89838	89842				1.575	5.118	HSIMD-4016S R/L*	84525
		.091	.433	.079	.185	SIM157D-GV-W228/11 R/L	89846	89850				1.575	5.118	HSIMD-4016 R/L	91725
												2.205	5.118	HSIMD-5616 R/L	84505
												3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

4

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
B	AS 0032	T5109-IP	1.62	M 3,0
D	AS 0034	T5115-IP	3.69	M 4,0

All dimensions in inches

Trapezoidal 30° DIN ISO 103-Partial profile

metric only

with ic

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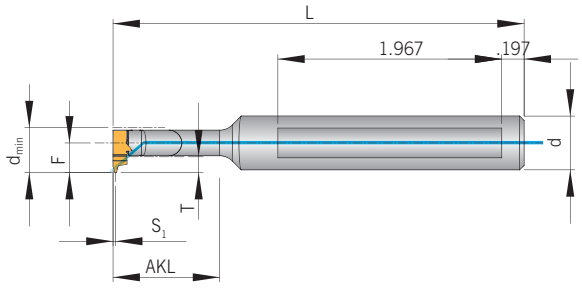
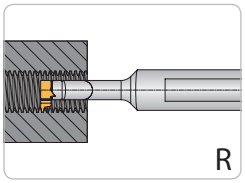
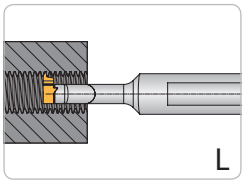






*) = Steel boring bar

T = Groove depth (mm)

Insert									Boring bar				
d_{min}	Thread Type	P Pitch (mm)	S_1	T	Designation	EDP (RH only) AK1020	EDP (RH only) AP5020	F	Size	d	AKL	L	Designation	EDP (RH only)
.323	TR103	.059	.024	.075	SIM082A-G-TR103/1,5 R/L	91388	91408	.191	A	.472	.472	3.150	HSIMA-1212S R/L*	87839
.343	TR103	.079	.039	.094	SIM087A-G-TR103/2,0 R/L	91390	91404	.191	A	.472	.591	3.268	HSIMA-1512 R/L	87776
.343	TR103	.118	.047	.094	SIM087A-G-TR103/3,0 R/L	91396	91398	.191	A	.472	.945	3.622	HSIMA-2412 R/L	87782
.343	TR103	.118	.047	.094	SIM087A-G-TR103/3,0 R/L	91396	91398	.191	A	.472	.945	3.622	HSIMA-2412S R/L*	84515
.343	TR103	.118	.047	.094	SIM087A-G-TR103/3,0 R/L	91396	91398	.191	A	.472	1.260	3.937	HSIMA-3212 R/L	84481
.343	TR103	.118	.047	.094	SIM087A-G-TR103/3,0 R/L	91396	91398	.191	A	.472	1.890	4.528	HSIMA-4812 R/L	84487
.421	TR103	.059	.024	.118	SIM107B-G-TR103/1,5 R/L	89684	89690	.268	B	.472	.551	3.150	HSIMB-1412S R/L*	87843
.421	TR103	.079	.039	.118	SIM107B-G-TR103/2,0 R/L	89692	89698	.268	B	.472	1.142	3.740	HSIMB-2912S R/L*	84517
.421	TR103	.118	.047	.118	SIM107B-G-TR103/3,0 R/L	89700	89706	.268	B	.472	1.654	4.331	HSIMB-4212 R/L	84489
.421	TR103	.157	.063	.118	SIM107B-G-TR103/4,0 R/L	89708	89714	.268	B	.472	2.205	4.724	HSIMB-5612 R/L	84495
.539	TR103	.157	.063	.165	SIM137C-G-TR103/4,0 R/L	89716	89772	.348	C	.630	.630	3.228	HSIMC-1616S R/L*	87847
.539	TR103	.197	.079	.165	SIM137C-G-TR103/5,0 R/L	89780	89774	.348	C	.630	1.339	3.937	HSIMC-3416S R/L*	84523
.539	TR103	.197	.079	.165	SIM137C-G-TR103/5,0 R/L	89780	89774	.348	C	.630	1.772	4.331	HSIMC-4516 R/L	84497
.539	TR103	.197	.079	.165	SIM137C-G-TR103/5,0 R/L	89780	89774	.348	C	.630	2.520	5.118	HSIMC-6416 R/L	84503
.618	TR103	.079	.039	.185	SIM157D-G-TR103/2,0 R/L	89782	89788	.398	D	.630	.709	4.252	HSIMD-1816S R/L*	87851
.618	TR103	.118	.047	.185	SIM157D-G-TR103/3,0 R/L	89792	89794	.398	D	.630	1.575	5.118	HSIMD-4016S R/L*	84525
.618	TR103	.157	.063	.185	SIM157D-G-TR103/4,0 R/L	89798	89804	.398	D	.630	1.575	5.118	HSIMD-4016 R/L	91725
.618	TR103	.197	.079	.185	SIM157D-G-TR103/5,0 R/L	89812	89806	.398	D	.630	2.205	5.118	HSIMD-5616 R/L	84505
.618	TR103	.236	.087	.185	SIM157D-G-TR103/6,0 R/L	89814	89820	.398	D	.630	3.150	5.906	HSIMD-8016 R/L	84511

Minimum order quantity for all standard inserts: 2 pieces

4

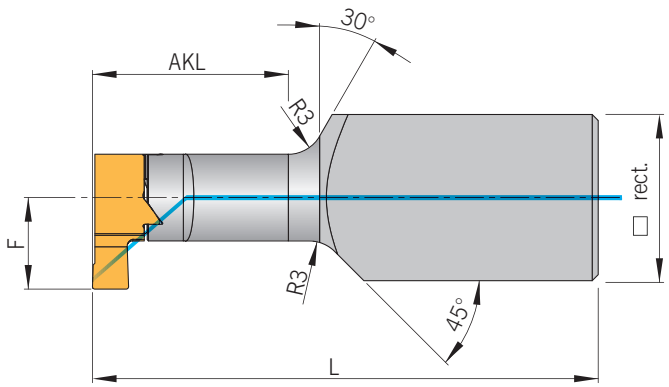
Spare parts

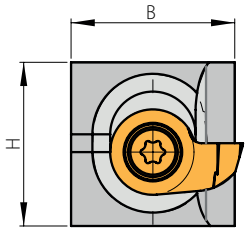
Connection size	Screw	Key	Ft-lbs	Thread size
A	AS 0031	T5108-IP	0.96	M 2,5
B	AS 0032	T5109-IP	1.62	M 3,0
C	AS 0033	T5110-IP	2.51	M 3,5
D	AS 0034	T5115-IP	3.69	M 4,0

All dimensions in inches

Rectangular holders

metric only





Square holders						
F	Size	H x B	AKL	L	Designation	EDP
.398	D	.472 x .787	1.260	3.937	**HSIMD-321220 SL**	95705

Spare parts

Connection size	Screw	Key	Ft-lbs	Thread size
D	AS 0034	T5115-IP	3.69	M 4,0

4

All dimensions in inches

Grade description

Coated

AP5020

PVD Coated:
Universal grade with high heat and oxidation resistance.

Material application: Steel, Stainless Steel and Cast Materials

Uncoated

AK1020

Uncoated fine grain carbide.
Base grade for material specific semi standard coatings.

Material application: Aluminum and Non-Ferrous materials

Spare parts and accessories

Item	EDP
Screw	
AS 0030	96689
AS 0031	84400
AS 0032	84402
AS 0033	84404
AS 0034	84406
Key	
T5107-IP	78487
T5108-IP	78479
T5109-IP	85202
T5110-IP	85204
T5115-IP	78481

Grooving

Grooving, turning and copying

ISO	Material		Tensile strength (N/mm²)	Cutting speed Vc (f/min) coated AP5020	Cutting speed Vc (f/min) uncoated AK1020
P	Unalloyed steel and cast steel	< 0.15 % C/hardened and tempered	350	70 – 590	70 – 430
		0.15 - 0.45 % C/hardened and tempered	650	70 – 590	70 – 430
		> 0.45 % C/hardened and tempered	1000	70 – 590	70 – 430
	Low alloyed steel and cast steel	annealed	600	50 – 520	50 – 360
		hardened and tempered	900	50 – 520	50 – 360
			1200	50 – 520	50 – 360
	High alloyed steel	annealed	700	70 – 390	70 – 280
	High alloyed tool steel and cast steel	hardened	1100	70 – 390	70 – 280
	Stainless steel	ferritic, annealed	700	70 – 300	70 – 200
	Cast steel	martensitic, hardened and tempered	1000	70 – 590	70 – 200
M	Stainless steel	austenitic and austenitic/	450 – 600	50 – 260	50 – 230
		ferritic, chilled	600 – 900	50 – 260	70 – 360
K	Cast iron	pearlitic/ferritic	500 – 700	70 – 520	70 – 360
		pearlitic/martensitic	700 – 850	70 – 520	70 – 360
			800 – 1100	70 – 520	70 – 360
	Cast iron with nodular graphite	ferritic	550	70 – 490	70 – 360
		pearlitic	800	70 – 490	70 – 360
	Malleable cast iron	ferritic	450	70 – 490	70 – 390
		pearlitic	750	70 – 490	70 – 390
N	Aluminum alloys long chipping	not heat treatable	200	70 – 1640	70 – 1970
		heat treatable, heat treated	350	70 – 1640	70 – 1970
	Casted aluminum alloys	≤ 12 % Si, heat treated	250	70 – 1640	70 – 1970
		≤ 12 % Si, heat treatable, heat treated	300	70 – 1640	70 – 1970
		≤ 12 % Si, not heat treatable	450	70 – 1640	70 – 1970
	Copper and copper alloys (Brass/Bronze)	Lead alloys, Pb > 1 %	400	70 – 1970	50 – 1640
		Brass, Bronze	300	70 – 1970	50 – 1640
		Aluminum bronze	500	70 – 1970	50 – 1640
		Copper and electrolyte copper	200	70 – 1970	50 – 1640
	Non-ferrous materials	Duroplastice	–	–	–
		Re-inforced plastics	–	–	–
		Hard rubber	–	–	–
S	High temperature resistant alloys	Fe-alloyed, annealed	700	50 – 250	50 – 100
		Fe-alloyed, heat treated	950	50 – 250	50 – 100
		Ni- or Co-alloyed, annealed	800	50 – 130	50 – 130
		Ni- or Co-alloyed, casting	1100	50 – 130	50 – 130
		Ni- or Co-alloyed, heat treated	1200	50 – 130	50 – 130
	Titanium alloys	Pure titanium	500 – 700	–	–
	Alpha- and Beta-alloys	heat treated	700 – 1000	–	–
H	Hardened steel	hardened	55 HRC	–	–
			60 HRC	–	–
	Hard cast iron	casting	41 HRC	–	–
	Hardened cast iron	hardened	55 HRC	–	–

Recommended cutting data are approximate starting parameters, they may need adjustment for individual machining applications.

Grooving

Threading

ISO	Material		Tensile strength (N/mm²)	Cutting speed Vc (f/min) coated AP5020	Cutting speed Vc (f/min) uncoated AK1020
P	Unalloyed steel and cast steel	< 0.15 % C/hardened and tempered	350	260 – 490	260 – 360
		0.15 - 0.45 % C/hardened and tempered	650	260 – 490	260 – 360
		> 0.45 % C/hardened and tempered	1000	200 – 390	200 – 300
	Low alloyed steel and cast steel	annealed	600	230 – 430	230 – 330
		hardened and tempered	900	230 – 390	230 – 300
			1200	230 – 380	230 – 280
	High alloyed steel	annealed	700	200 – 360	200 – 260
	High alloyed tool steel and cast steel	hardened	1100	160 – 300	160 – 230
	Stainless steel	ferritic, annealed	700	160 – 260	160 – 230
	Cast steel	martensitic, hardened and tempered	1000	160 – 260	160 – 230
M	Stainless steel	austenitic and austenitic/	450 – 600	230 – 390	230 – 300
		ferritic, chilled	600 – 900	130 – 300	130 – 210
K	Cast iron	pearlitic/ferritic	500 – 700	–	–
		pearlitic/martensitic	700 – 850	260 – 390	260 – 330
			800 – 1100	–	–
	Cast iron with nodular graphite	ferritic	550	260 – 330	260 – 300
		pearlitic	800	260 – 330	260 – 300
	Malleable cast iron	ferritic	450	230 – 490	230 – 360
		pearlitic	750	–	–
N	Aluminum alloys long chipping	not heat treatable	200	330 – 790	330 – 790
		heat treatable, heat treated	350	260 – 560	260 – 560
	Casted aluminum alloys	≤ 12 % Si, heat treated	250	–	–
		≤ 12 % Si, heat treatable, heat treated	300	–	–
		≤ 12 % Si, not heat treatable	450	–	–
	Copper and copper alloys (Brass/Bronze)	Lead alloys, Pb > 1 %	400	330 – 820	330 – 820
		Brass, Bronze	300	260 – 660	260 – 660
		Aluminum bronze	500	–	–
		Copper and electrolyte copper	200	330 – 820	330 – 820
	Non-ferrous materials	Duroplastice	–	–	–
		Re-inforced plastics	–	–	–
		Hard rubber	–	–	–
S	High temperature resistant alloys	Fe-alloyed, annealed	700	–	–
		Fe-alloyed, heat treated	950	–	–
		Ni- or Co-alloyed, annealed	800	–	–
		Ni- or Co-alloyed, casting	1100	–	–
		Ni- or Co-alloyed, heat treated	1200	–	–
	Titanium alloys	Pure titanium	500 – 700	–	–
	Alpha- and Beta-alloys	heat treated	700 – 1000	–	–
H	Hardened steel	hardened	55 HRC	–	–
			60 HRC	–	–
	Hard cast iron	casting	41 HRC	–	–
	Hardened cast iron	hardened	55 HRC	–	–

Recommended cutting data are approximate starting parameters, they may need adjustment for individual machining applications.

Recommended cutting data – Threading – Number of passes

Pitch		Number of passes					
V_c f/min		360 – 460	260 – 360	210 – 260	230 – 300	260 – 330	660 – 820
(mm)	TPI	Steel strength (N/mm²)			Stainless steel	Cast	Aluminium
		400–700	700–1.000	> 1.000			
0,8	32	8	9	10	10	9	8
1	24	10	11	12	12	12	10
1,25	20	12	14	15	15	14	12
1,5	16	15	17	18	18	17	15
1,75	14	17	19	21	21	18	17
2	12	19	22	25	25	20	18
2,5	10	22	26	31	31	22	20
3,0–3,5	8	28	32	38	38	24	22

The above mentioned data shows general recommendations for the above materials.
For hardened materials we recommend to reduce the cutting speed and increase the number of passes.

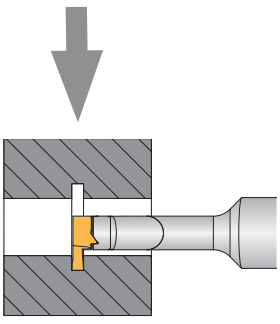
When experiencing cutting edge breakage we suggest to increase the number of passes.
When experiencing edge wear, please reduce the number of passes.

Remark: The chip thickness should be constant with every pass. At higher cutting depths reduce the in-feed in order to obtain constant cutting forces.

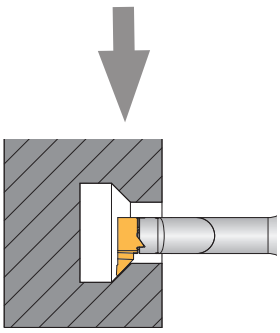
4

SIM – Boring bars – Feed rate

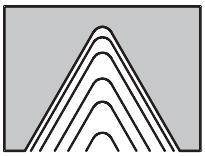
f (in./rev.) **.0004–.002**



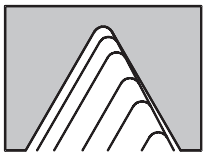
f (in./rev.) **.0012–.004**



Threading



Radial infeed
Radial infeed is the simplest and quickest method. The feed is perpendicular to the turning axis and both flanks of the insert perform the cutting operation. Radial infeed is recommended when the pitch is smaller than 2 mm, for material with short chips, for workhardened materials and stainless steel.



Flank infeed
Infeed at an angle of 3° – 5° to the flank of the thread. Mainly used on NC-machines. Excellent chip control, therefore very suitable for internal threads and long chipping materials. Thread pitch above 2 mm.

Alternating flank infeed
Use of alternate flank infeed is recommended especially in large pitches and for long chipping materials. This method divides the work equally on both flanks, resulting in equal wear on both edges. Alternate flank infeed requires more complicated programming and is not available on all lathes.

4

Calculation of helix angle β

$$\beta = \frac{P\ (mm)}{D\ (mm)} \times 18.23$$

Example internal thread M10. Pitch 1.5 mm:

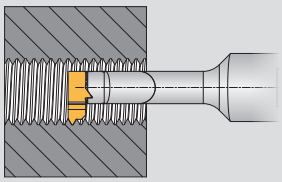
$$\beta = \frac{1.5\ mm}{9.03\ mm} \times 18.23 = 3.03^\circ \text{ helix angle}$$

β = Helix angle (degree)

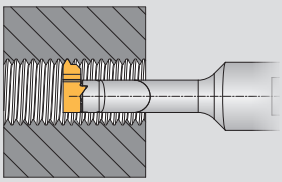
P = Pitch (mm)

D = Edge diameter (mm)

ISO – Internal thread



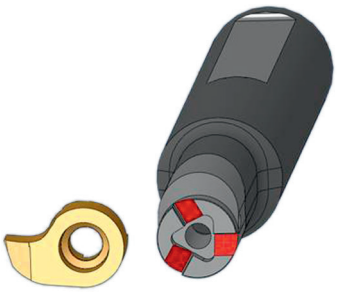
Holder and inserts in right hand version

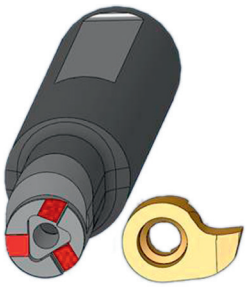


Holder and inserts in left hand version

Assembly guide

Left hand boring bar
Left hand insert





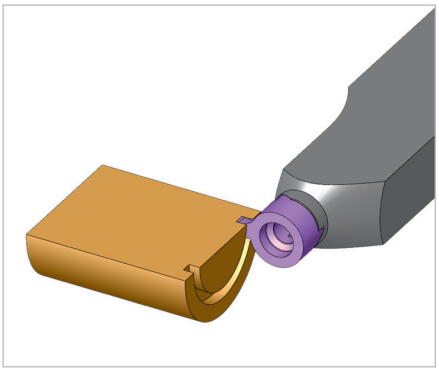
Right hand boring bar
Right hand insert

The 3-point location ensures accurate repeatability of the cutting edge height. However, always be aware of the edge height. When machining small components small differences can cause big problems.

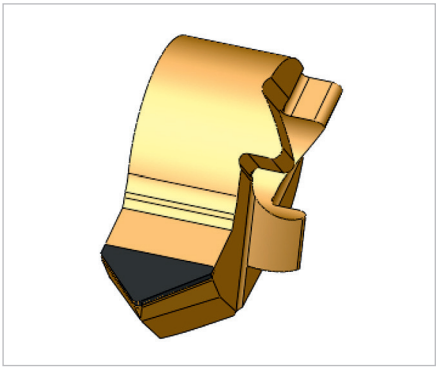
Suggestions:
- Always select smallest possible insert width, thereby the swarf remains flexible and evacuates the bore easier. To avoid swarf clogging we recommend grooving in steps or inserting a swarf release cut.
- Recommended coolant pressure = 75PSI (5bar)
- Clean insert pocket with compressed air when changing the insert.

4

Solutions



Special holder
Special design for face grooving



Special insert
CBN brazed especially for hard turning

INFORMATION

Information

ISO	W-Nr.	Germany DIN	Belgium NBN	France AFNOR	Great Britain B.S.	Italy UNI
			Structural and constructional steels			
P	1.0401	C15	–	AF37C12	080A15	C15
	1.0402	C22	C25-1	AF42C20	055M15	C20
	1.0501	C35	C35-1	1C35	080A32	C35
	1.0503	C45	C45-1	1C45	060A47	C45
	1.0535	C55	C55-1	1C55	070M55	C55
	1.0601	C60	C60-1	1C60	060A62	C60
	1.0715	9SMn28	–	S250	230M07	CF9SMn28
	1.0718	9SMnPb28	–	S250Pb	–	CF9SMnPb28
	1.0722	10SPb20	–	10PbF2	–	CF10SPb20
	1.0726	10SPb2035S20	–	35MF6	212M36	–
	1.0736	9SMn36	–	S300	–	CF9SMn36
	1.0737	9SMnPb36	–	S300Pb	–	CF9SMnPb36
	1.1141	Ck15	C16-2	XC12	040A15	C15
	1.1157	40Mn4	–	35M5	150M36	–
	1.1158	C25E	C25-2	2C25	–	C25
	1-1167	36Mn5	–	35M5	150M36	–
	1.1170	28Mn6	28Mn6	20M5	–	C28Mn
	1.1183	Cf35	C36	XC38H1TS	080A35	C36
	1.1191	C45E	C45-2	2C45	080M46	C45
	1.1203	C55E	C55-2	2C55	060A57	C55
	1.1213	Cf53	C53	XC48H1TS	070M55	C53
	1.1221	C60E	C60-2	2C60	060A62	C60
	1.1274	Ck101	–	XC100	–	C100
	1.3401	X120Mn12	–	Z120M12	–	GX120Mn12
	1.3505	100Cr6	–	100C6	2S135	100Cr6
	1.5415	16Mo3	16Mo3	15D3	1503-243B	16Mo3
	1.5423	16Mo5	16Mo5	–	–	16Mo5KG
	1.5622	14Ni6	18Ni6	16N6	–	14Ni6KG
	1.5662	X8Ni9	10Ni36	9Ni490	1501-510	X10Ni9
	1.5680	X12Ni5	12Ni20	Z18N5	–	–
	1.5752	14NiCr14	13NiCr12	12NC15	655H13	–
	1.6511	36CrNiMo4	–	36CrNiMo4	817M37	38NiCrMo4
	1.6523	21NiCrMo2	–	20NCD2	805H20	20NiCrMo2
	1.6546	40NiCrMo2-2	40NiCrMo2	40NCD2	3111-Type7	40NiCrMo2
	1.6582	34CrNiMo6	35CrNiMo6	34CrNiMo8	816M40	35NiCrMo6KB
	1.6587	17CrNiMo6	17CrNiMo7	18NCD6	–	–
	1.6657	14NiCrMo13-4	14NiCrMo13	16NCD13	832H13	15NiCrM13
	1.7015	15Cr3	15Cr2	12C3	523M15	–
	1.7033	34Cr4	34Cr4	32C4	530A32	34Cr4
	1.7035	41Cr4	41Cr4	41Cr4	530A40	41Cr4
	1.7045	42Cr4	–	42C4TS	530A40	41Cr4
	1.7131	16MnCr5	16MnCr5	16MC4	527M17	16MnCr5
	1.7176	55Cr3	55Cr3	55C3	525A58	55Cr3
	1.7218	25CrMo4	25CrMo4	25CD4	708A25	25CrMo4
	1.7220	34CrMo4	34CrMo4	34CrMo4	708A37	34CrMo4KB
	1.7223	41CrMo4	41CrMo4	42CD4TS	708M40	41CrMo4
	1.7225	42CrMo4	42CrMo4	42CD4	708A42	38CrMo4KB
	1.7262	15CrMo5	–	12CD4	–	–
	1.7335	13CrMo4-5	14CrMo45	15CD3,5	620-440	14CrMo3
	1.7361	32CrMo12	32CrMo12	30CD12	722M24	32CrMo12
	1.7380	10CrMo9-10	–	12CD9.10	1501-622/515	12CrMo910
	1.7715	14MoV6-3	13MoCrV6	–	1503-660-460	–
	1.8159	51CrV4	50CrV4	50CV4	735A51	50CrV4
	1.8509	41CrAlMo7	41CrAlMo7	40CAD6.12	905M39	41CrAlMo7
	1.8523	39CrMoV13-9	39CrMoV13	–	897M39	–
			Tool steels			
P	1.1545	C105W1	–	C105E2U	–	C100KU
	1.1663	C125W	–	C120E3U	–	C120KU
	1.2067	102Cr6	–	100Cr6	–	–
	1.2080	X210Cr12	–	X200Cr12	BD3	X205Cr12KU
	1.2344	X40CrMoV5-1	–	X40CrMoV5	BH13	X40CrMoV511KU
	1.2363	X100CrMoV5-1	–	X100CrMoV5	BA2	X100CrMoV51KU
	1.2419	105WCr6	–	105WCr5	–	107WCr5KU
	1.2436	X210CrW12	–	X210CrW12-1	–	X215CrW121KU
	1.2542	45WCrV17	–	45WCrV8	BS1	45WCrV8KU
	1.2581	X30WCrV9-3	–	X30WCrV9	BH21	X30WCrV93KU
	1.2601	X165CrMoV12	–	–	–	X165CrMoW12KU
	1.2713	55NiCrMoV6	–	55NiCrMoV7	BH224/5	–
	1.2833	100V1	–	C105E2UV1	BW2	102V2KU
	1.3243	S6-5-2-5	–	Z85WDKCV06-05-04-02	BM35	HS6-5-2-5
	1.3255	S18-1-2-5	–	HS18-1-1-5	BT4	HS18-1-1-5
	1.3343	S6-5-2	–	HS6-5-2	BM2	HS6-5-2
	1.3348	S2-9-2	–	HS2-9-2	–	HS2-9-2
	1.3355	S18-0-1	–	HS18-0-1	BT1	HS18-0-1

ISO	Japan JIS	Sweden SS	Russia GOST	Spain UNE	USA AISI/SAE/ASTM
			Structural and constructional steels		
P	S15C	1350	–	F.111	M1015
	S20C	1450	20	1C22	M1020
	S35C	1572	35	F.113	1035
	S45C	1672	45	F.114	1045
	S55C	1655	55	–	1055
	S58C	–	60	–	1060
	SUM22	1912	–	F.2111-11SMn28	1213
	SUM22L	1914	–	F.2112-11SMnPb28	12L13
	–	–	–	F.2122-10SPb20	11L08
	–	1957	–	F.210.G	1140
	SUM25	–	–	F.2113-12SMn35	1215
	–	1926	–	F.2114-12SMnPb35	12L14
	S15	1370	15	F.1110-C15k	1015
	–	–	40G	–	1035
	S25C	–	25	F.1120-C25k	1025
	SMn438	2120	35G2	F.1203-36Mn6	1335
	SCMn1	–	30G	28Mn6	1330
	S35C	1572	35	–	1035
	S45C	1672	45	F.1140-C45k	1045
	S55C	1655	55	F.1150-C55k	1055
	S50C	1674	50	–	1050
	S58C	1665	60	–	1060
	SUP4	1870	–	–	1095
	SCMnH1	2183	110G13L	F.8251-AM-X120Mn12	A128
	SUJ2	2258	SchCh15	F.1310-100Cr6	52100
	–	2912	–	F.2601-16Mo3	A204Gr.A
	SB450M	–	–	F.2602-16Mo5	4520
	–	–	–	F.2641-15Ni6	A350-LF5
	SL9N53	–	–	F.2645-X8Ni09	A353
	–	–	–	–	2515
	SNC815	–	–	–	3310
	–	–	40ChN2MA	F.1280-35NiCrMo4	4340
	SNCM220	2506	–	F.1522-20NiCrMo2	8620
	SNCM240	–	38ChGNM	F.1204-40NiCrMo2	8740
	SNCM447	2541	38Ch2N2MA	F.1272-40NiCrMo7	4337
	–	–	–	F.1560-14NiCrMo13	–
	–	–	–	F.1560-14NiCrMo13	9310
	SCr415	–	15Ch	–	5015
	SCr430	–	35Ch	F.8221-35Cr4	5132
	SCr440	–	40Ch	F.1211-41Cr4DF	5140
	SCr440	2245	40Ch	F.1202-42Cr4	5140
	–	2173	18ChG	F.1516-16MnCr5	5115
	SUP9	2253	50ChGA	F.1431-55Cr3	5155
	SCM420	2225	20ChM	F.8372-AM26CrMo4	4130
	SCM432	2234	AS38ChGM	F.8331-AM34CrMo4	4135
	SCM440	2244	40ChFA	F.8332-AM42CrMo4	4140
	SCM440	2244	–	F.8332-AM42CrMo4	4140
	SCM415	–	–	F.1551-12CrMo4	–
	SFVA12	2216	12ChM	F.2613-14CrMo45	A182-F11
	–	2240	–	F.124.A	–
	SFVAF22A	2218	12Ch8	TU.H	A182F22
	–	–	–	F.2621-13MoCrV6	–
	SUP10	2230	50ChGFA	F.1430-51CrV4	6145
	SACM645	2940	38ChMJuA	F.1740-41CrAlMo7	A355Cl.A
	–	–	–	–	–
			Tool steels		
P	SK3	1880	U10A-1	F.515	W110
	SK2	–	U13-1	F.5123-C120	W112
	SUJ2	–	Ch	F.5230-100Cr6	L1
	SKD1	–	Ch12	F.5212-X210Cr12	D3
	SKD61	2242	4Ch5MF1S	F.5318-X40CrMoV5	H13
	SKD12	2260	–	F.5227-X100CrMoV5	A2
	SKD2	2140	–	F.5233-105WCr5	–
	–	2312	–	F.5213-X210CrW12	–
	–	2710	5ChW2SF	F.5241-45WCrSi8	S1
	SKD5	–	3Ch2W8F	F.5323-X30WCrV9	H21
	–	–	–	F.5211-X160CrMoV12	–
	SKT4	–	5ChNM	F.520S	L6
	SKS43	–	–	–	W210
	SKH55	2733	R6M5K5	F.5613-6-5-2-5	–
	SKH3	–	–	F.5530-18-1-1-5	T4
	SKH51	2722	R6M5	F.5603-6-5-2	M2
	–	2782	–	F.5607-2-9-2	M7
	SKH2	–	R18	F.5520-18-0-1	T1

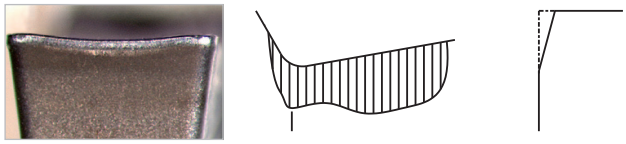
ISO	W-Nr.	Germany DIN	Belgium NBN	France AFNOR	Great Britain B.S.	Italy UNI
Stainless and heat resisting steels						
P	1.4000	X6Cr13	–	Z8C12	403S17	X6Cr13
	1.4001	X7Cr14	–	Z8C13FF	403S17	X6Cr13
	1.4006	X12Cr13	–	Z10C13	410S21	X12Cr13
	1.4016	X6Cr17	–	Z8C17	430S17	X8Cr17
	1.4027	GX20Cr14	–	Z20C13M	ANC1B	–
	1.4034	X46Cr13	–	Z44C14	–	X40Cr14
	1.4057	X20CrNi172	–	Z15CN16-02	431S29	X16CrNi16
	1.4104	X12CrMoS17	–	Z13CF17	–	X10CrS17
	1.4113	X6CrMo17-1	–	–	434S17	X8CrMo17
	1.4313	X4CrNi134	–	Z4CND13.4M	425C11	GX6CrNi1304
	1.4408	GX5CrNiMo19-11	–	–	316C16	–
	1.4718	X45CrSi9-3	–	Z45CS9	401S45	X45CrSi8
	1.4724	X10CrAl13	–	Z13C13	–	X10CrAl12
	1.4742	X10CrAl18	–	Z12CAS18	–	–
	1.4747	X80CrNiSi20	–	Z80CNS20-02	443S65	X80CrSiNi20
	1.4762	X10CrAl24	–	Z12CAS25	–	–
M	1.4301	X5CrNi1810	–	Z4Cn19-10FF	304S11	X5CrNi1810
	1.4305	X10CrNiS189	–	Z8CNF19-09	303S22	X10CrNiS1809
	1.4306	X2CrNi19-11	–	Z1CN18-12	304S11	X3CrNi1811
	1.4308	GX5CrNi19-10	–	Z6CN18.10M	304C15	–
	1.4310	X12CrNi177	–	Z11CN17-08	301S21	X12CrNi1707
	1.4311	X2CrNiN18-10	–	Z3CN18-07Az	304S61	X2CrNiN1811
	1.4401	X5CrNiMo17122	–	Z3CND17-11-01	316S13	X5CrNiMo1712
	1.4429	X2CrNiMoN17-13-3	–	Z3CND17-12Az	316S63	X2CrNiMoN1713
	1.4435	X2CrNiMo18-14-3	–	Z3CND17-12-03	316S11	X2CrNiMo1713
	1.4438	X2CrNiMo18164	–	Z2CND19-15-04	317S12	X2CrNiMo1816
	1.4460	X4CrNiMoN2752	–	Z5CND27-05Az	–	–
	1.4541	X6CrNiTi18-10	–	Z6CNT18-10	321S31	X6CrNiTi1811
	1.4550	X6CrNiNb18-10	–	Z6CNNb18-10	347S20	X6CrNiNb1811
	1.4571	X6CrNiMoTi17-12-2	–	Z6CNDT17-12	320S18	X6CrNiMoTi1712
	1.4581	GX5CrNiMoNb1810	–	Z4CNDNb18.12M	318C17	GX6CrNiMoNb2011
	1.4583	X10CrNiMoNb18-12	–	–	–	X6CrNiMoNb1713
	1.4828	X15CrNiSi20-12	–	Z9CN24-13	309S24	X16CrNi2314
	1.4845	X12CrNi25-21	–	Z8CN25-20	310S16	X6CrNi2521
	1.4864	X12NiCrSi36-16	–	Z20NCS33-16	NA17	–
	1.4865	GX40NiCrSi38-18	-	–	330C11	GX50NiCr3919
	1.4871	X53CrMnNiN21-9	–	Z53CMNS21-09Az	349S54	X53CrMnNiN219
	1.4878	X12CrNiTi18-9	–	Z6CNT18-10	321S51	–
Cast materials						
K	–	GG10	–	Ft10D	–	G10
	–	GG15	–	Ft15D	Grade150	G15
	–	GG20	–	Ft20D	Grade220	G20
	–	GG25	–	Ft15D	Grade260	G25
	–	GG30	–	Ft30D	Grade300	G30
	–	GG35	–	Ft35D	Grade350	G35
	–	GG40	–	Ft40D	Grade400	–
	–	GGG40	–	FGS400-12	420/12	GS400-12
	–	GGG40.3	–	FGS370-17	370/17	GS042/15
	–	GGG50	–	FGS500-7	500/7	GS500/7
	–	GGG60	–	FGS600-3	600/3	GS600/3
	–	GGG70	–	FGS700-2	700/2	GS700/2
	–	GGGNiMn137	–	S-NM137	S-NiMn137	–
	–	GGGNiCr202	–	S-NC202	S-NiCr202	–

ISO	Japan JIS	Sweden SS	Russia GOST	Spain UNE	USA AISI/SAE/ASTM
			Stainless and heat resisting steels		
P	SUS403	2301	08Ch13	F.3110-X6Cr13	403
	SUS410S	2301	08Ch13	F.8401-AM-X12Cr13	410S
	SUS410	2302	12Ch13	F.3401-X10Cr13	410
	SUS430	2320	12Ch17	F.3113-X6Cr17	430
	SCS2	–	20Ch13L	–	–
	–	–	40Ch13	F.3405-X45Cr13	–
	SUS431	2321	20Ch17N2	F.3427-X19CrNi172	431
	SUS430F	2383	–	F.3117-X10CrS17	430F
	SUS434	2325	–	F.3116-X6CrMo171	434
	SCS5	–	–	–	–
	SCS14	2385	07Ch18N10G2S2M2L	F.8414-AM-X7CrNiMo2010	CF-8M
	SUH1	–	40Ch9S2	F.3220-X4SCrSi09-03	HNV3
	–	–	10Ch13SJu	F.3152-X10CrAl13	–
	SUH21	–	15Ch18SJu	F.3153-X10CrAl18	–
	SUH4	–	–	F.3222-X80CrSiNi20-02	HNV6
	–	–	–	F.3154-X10CrAl24	–
M	SUS304	2332	08Ch18N10	F.3504-X5CrNi1810	304
	SUS303	2346	–	F.3508-X10CrNiS18-09	303
	SCS19	2352	03Ch18N11	F.3503-X2CrNi1810	304L
	SCS13	2333	07Ch18N9L	–	CF-8
	SUS301	2331	–	F.3517-X12CrNi177	301
	SUS304LN	2371	–	F.3541-X2CrNiN1810	304LN
	SUS316	2347	–	F.3534-X5CrNiMo17122	316
	–	2375	–	F.3543-X2CrNiMoN17313	316LN
	SUS316L	2353	03Ch17N14M3	F.3533-X2CrNiMo17132	316L
	SUS317L	2367	–	F.3539-X2CrNiMo18164	317L
	SUS329J1	2324	–	F.3309-X8CrNiMo27-05	329
	SUS321	2337	06Ch18N10T	F.3523-X6CrNiTi1810	321
	SUS347	2338	08Ch18N12B	F.3524-X6CrNiNb1810	347
	SUS316Ti	2353	10Ch17N13M2T	F.3535-X6CrNiMoTi17122	316Ti
	SCS22	–	–	–	–
	–	–	–	–	318
	SUH309	–	20Ch20N14S2	F.3312-X15CrNiSi20-12	309
	SUH310	2361	20Ch23N18	–	310S
	SUH330	–	–	F.3313-X12CrNiSi36-16	330
	SCH15	–	–	–	–
	SUH35	–	55Ch20G9AN4	F.3217-X53CrMnNiN21-09	EV8
	SUS321	–	–	–	321
			Cast materials		
K	FC10	0110-00	Sc10	FG10	A48-20B
	FC15	0115-00	Sc15	FG15	A48-25B
	FC20	0120-00	Sc20	FG20	A48-30B
	FC25	0125-00	Sc25	FG25	A48-40B
	FC30	0130-00	Sc30	FG30	A48-45B
	FC35	0135-00	Sc35	FG35	A48-50B
	–	0140-00	Sc40	Ft40D	A48-60B
	FCD40	0717-02	VC42-12	–	60-40-18
	–	0717-15	VC42-12	–	–
	FCD50	0727-02	VC50-2	–	65-45-12
	FCD60	0732-03	VC60-2	–	80-55-06
	FCD70	0737-01	VC70-2	–	100-70-03
	–	–	–	–	–
	–	–	–	–	A439TypeD-2

Hardness comparison

Tensile strength N/mm²	Vickers HV	Brinell HB	Rockwell HRC	Shore „SH“
700	200		–	28
740	210		–	29
770	220		–	30
810	230		19,2	31
840	240		21,2	33
880	250		23,0	34
910	260		24,7	35
950	270		26,1	36
980	280		27,6	37
1020	290		29,0	39
1050	300		30,0	40
1090	310		31,5	41
1120	320		32,9	42
1150	330		33,8	43
1190	340		34,9	44
1230	350		36,0	45
1260	360	359	37,0	46
1300	370	368	38,0	47
1330	380	373	38,9	48
1370	390	385	39,8	49
1400	400	393	40,7	50
1440	410	400	41,5	51
1470	420	407	42,3	52
1510	430	416	43,2	53
1540	440	423	44,0	54
1580	450	429	44,8	55
1610	460	435	45,5	56
1650	470	441	46,3	57
1680	480	450	47,0	58
1720	490	457	47,7	59
1750	500	465	48,3	60
1790	510	474	49,0	61
1820	520	482	49,6	62
1860	530	489	50,3	63
1890	540	496	50,9	64
1930	550	503	51,5	65
1960	560	511	52,1	66
2000	570	520	52,7	67
2030	580	527	53,3	68
2070	590	533	53,8	69
2100	600	533	54,4	70
2140	610	543	54,9	71
2170	620	549	55,4	72
2210	630	555	55,9	73
2240	640	561	56,4	74
2280	650	568	56,9	75
2310	660	574	57,4	75
2350	670	581	57,9	76
2380	680	588	58,7	77
2410	690	595	58,9	78
2450	700	602	59,3	79
2480	710	609	59,8	80
2520	720	616	60,2	81
2550	730	622	60,7	82
2590	740	627	61,1	83
2630	750	633	61,5	83
2660	760	639	61,9	84
2700	770	644	62,3	85
2730	780	650	62,7	86
2770	790	656	63,1	86
2800	800	661	63,5	87
2840	810	666	63,9	87
2870	820	670	64,3	88
2910	830	677	64,6	89
2940	840	682	65,0	89
2980	850	–	65,3	90
3010	860	–	65,7	90
3050	870	–	66,0	91
3080	880	–	66,3	91
3120	890	–	66,6	92
3150	900	–	66,9	92
3190	910	–	67,2	–
3220	920	–	67,5	–
3260	930	–	67,7	–
3290	940	–	68,0	–

Flank Wear

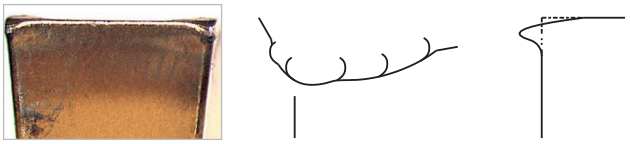


Abrasion on the flank, normal wear after a certain machining time.

Reasons:
- Cutting speed too high
- Carbide grade with insufficient wear resistance
- Insufficient amount of coolant flow

Solution:
- Reduce cutting speed
- Select more wear resistant carbide grade
- Improve coolant supply

Plastic Deformation

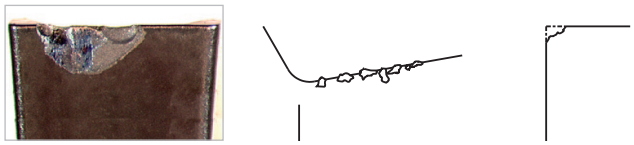


High machining temperature and simultaneous mechanical stress may lead to plastic deformation.

Reasons:
- Machining temperature too high, resulting in softening of substrate
- Wear/heat resistance of carbide grade too low
- Incorrect coolant supply

Solution:
- Reduce cutting speed
- Choose carbide grade with higher wear resistance
- Provide better cooling

Edge Chipping

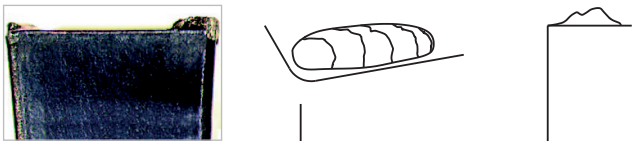


Chipping can occur through excessive mechanical stress at the cutting edge.

Reasons:
- Grade too hard (high wear resistance)
- Vibrations
- Feed rate too high or excessive depth of cut

Solution:
- Use tougher grade
- Use negative cutting edge geometry with chip groove
- Reduce overhang; check center height
- Increase stability of cutting edge

Built-Up Edge

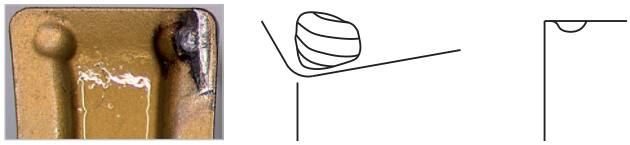


Built-up edge occurs when the chip is not evacuated properly due to insufficient cutting temperature.

Reasons:
- Cutting speed too low
- Rake angle too small
- Wrong cutting material
- Lack of coolant/lubrication

Solution:
- Increase cutting speed
- Enlarge rake angle
- Apply TiN-coating
- Use a coolant emulsion with higher concentration

Cratering

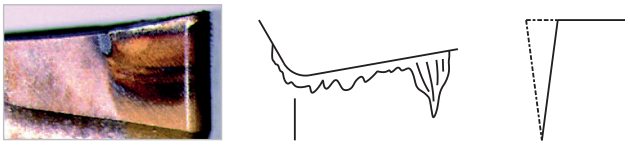


The hot chip which is being evacuated causes cratering at the rake face of the cutting edge.

Reasons:
- Cutting speed and/or feed rate too high
- Rake angle too shallow
- Grade with insufficient wear resistance
- Incorrect coolant supply

Solution:
- Reduce cutting speed and/or feed rate
- Increase coolant quantity and/or pressure, optimize coolant supply
- Use grade which is more resistant to cratering

Notching



Notch at the maximum depth of cut.

Reasons:
- Oxidation of the cutting edge
- Excessive heat on the cutting edge

Solution:
- Use varying depths of cut
- Reduce cutting speed
- Improve coolant supply

Calculation units

D	Diameter	(inch)	n	Spindle revolution	(rev/min)
l	Length	(inch)	Q	Chip removal rate	($inch^3$/min)
v_c	Cutting speed	(f/min)	P_c	Net Power	(HP)
k_c	Specific cutting force	($N/inch^2$)	f_n	Feed rate per revolution	(inch/rev)
a_p	Depth of cut	(inch)			

Formulas

Cutting speed

$$v_c = \frac{\pi \cdot D \cdot n}{12}$$

Revolutions

$$n = \frac{v_c \cdot 12}{\pi \cdot D}$$

Chip removal rate

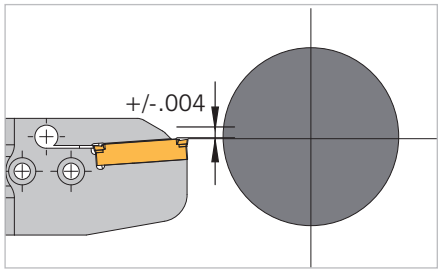
$$Q = v_c \cdot a_p \cdot f_n \cdot 12$$

Power

$$P_c = \frac{a_p \cdot f_n \cdot k_c \cdot v_c}{33 \cdot 10^3}$$

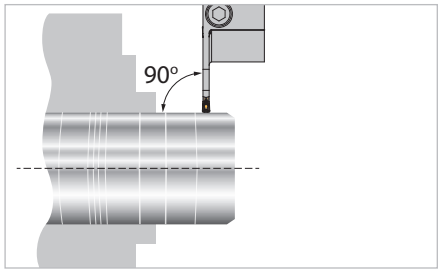
i

Edge height



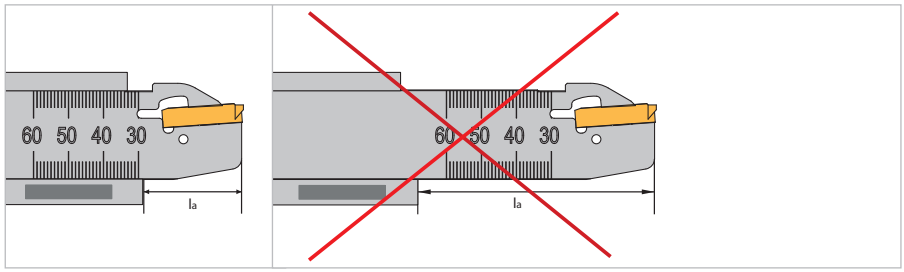
The edge height should be within a tolerance of +/-.004“ (0.1mm) from the center line.

Tool positioning



The part-off tool should be positioned in 90° angle to the tool axis, the component should be held with minimum overhang.

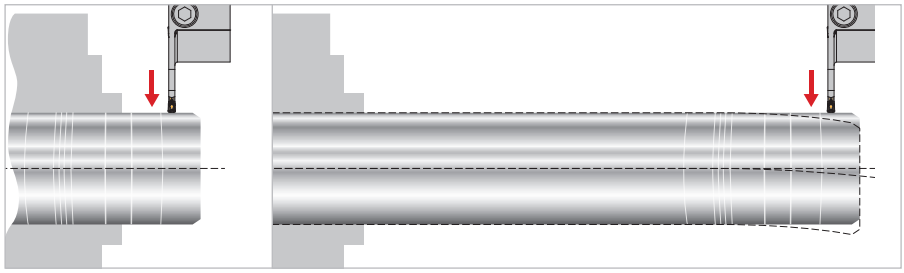
Tool overhang



For optimum stability it is important always to keep the tool overhang to a minimum. Ideally, overhang la should not be more than 8x groove width.

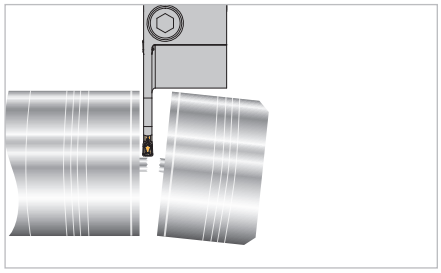
- **Better straightness**
- **Reduced vibration**
- **Improved tool life**

Component overhang

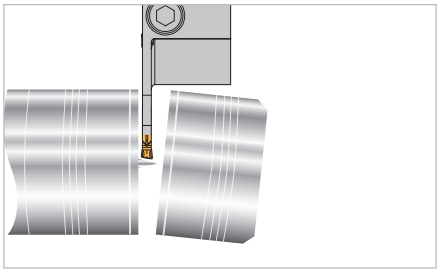


In order to reduce vibrations the component should always be clamped with as little overhang as possible. Always machine as close to the chuck as possible.

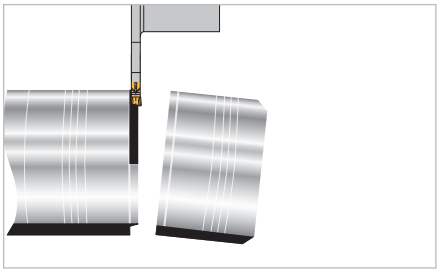
Recommendations for cut-off



- From Ø .197" (5mm) reduce the feed rate "f" by approximately 50 %. Do not cut across center (risk of breakage).

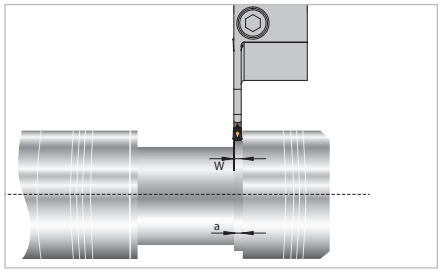


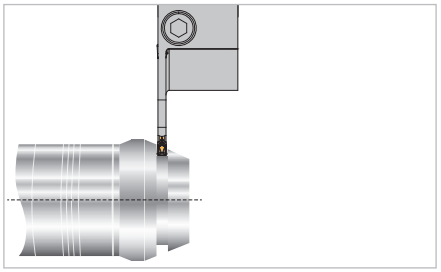
- For "pip" free cut-off, use either right or left handed insert. To minimize deflection reduce the feed rate by 20 – 50 %.



- To avoid ring formation use right or left handed inserts. Reduce feed rate by 20 – 50 %.

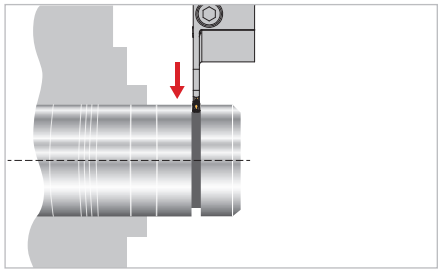
Recommendations for grooving



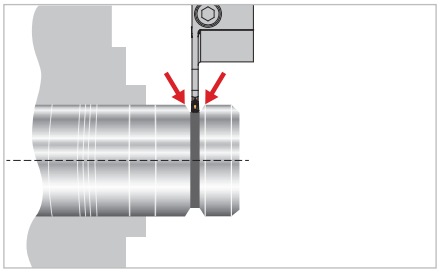


- When grooving with an axial displacement the width "a" should be a minimum of 70 % of the groove width "W".
- When grooving into an angled surface reduce feed rate by 20 – 50 % until in full cut.

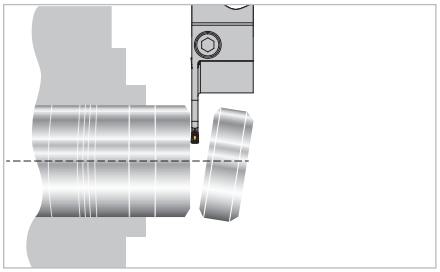
Chamfering and cut-off



1. Pre-grooving

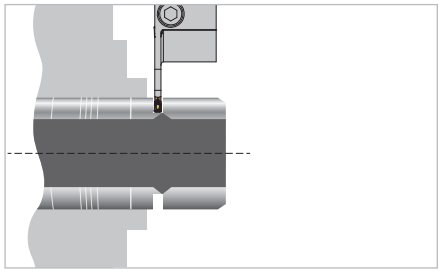


2. Chamfering



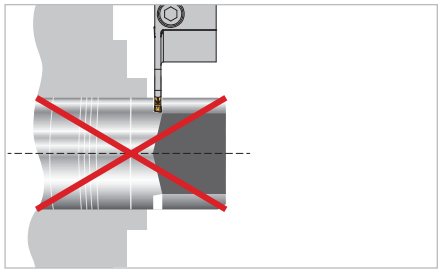
3. Cut-off

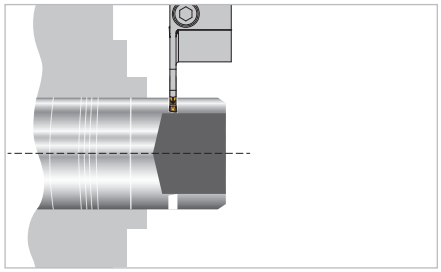
Internal chamfering before cut-off



The cutting edges of the chamfer tool and part-off tool must match accurately to achieve burr free machining.

Cutting off bores



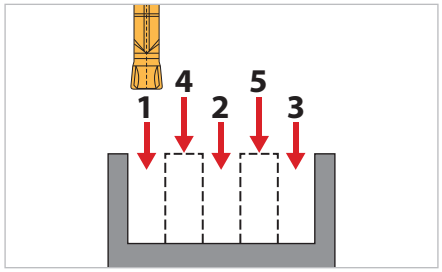


The bore must be deep enough to allow the full width of the cut-off insert to break into the hole.

Machining of external grooves

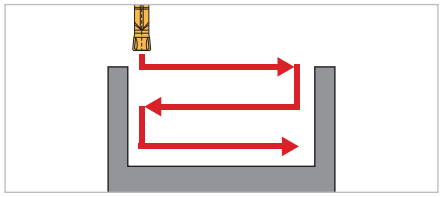
The most popular ways of producing wide grooves between two shoulders are: Multiple plunge grooving, Groove turning, Ramping and Pocketing

Multiple plunge grooving



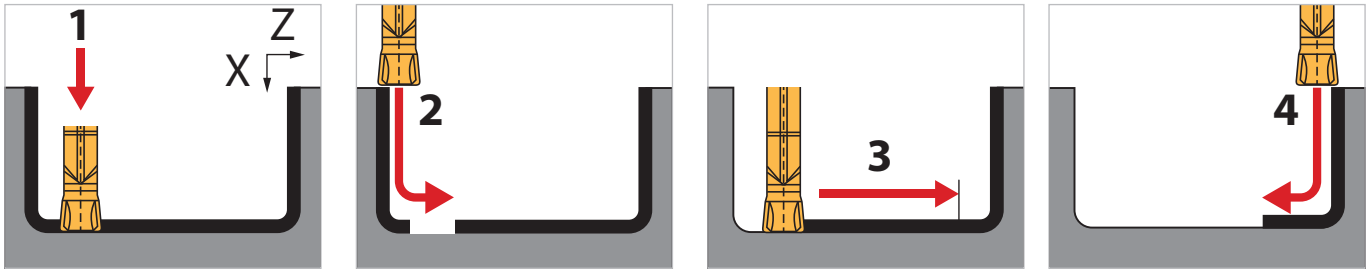
First the full grooves are machined, grooves 1, 2 and 3, afterwards 4 and 5. This protects the corner radius and the chip is directed to the center of the chip breaker. Widths of groove 4 and 5 should be 60–80% of insert width (W).

Groove turning



The groove depth (ap) depends on the width of the insert, material and the edge length of the inserts.
General rule:
ap max. = W x 0.7
ap min. = Corner radius "r"

Groove finishing machining



1) Be careful when finishing. As the radius of the insert moves mainly in the Z-axis which can produce very thin chips, that can lead to vibration and poor surface finishes.

2) When using the machine path shown (1-4), axial and radial depths of cut should be between .020" and .040" (0.5–1.0mm).

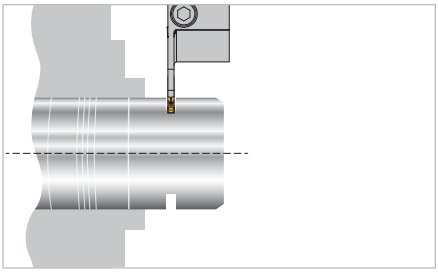
General

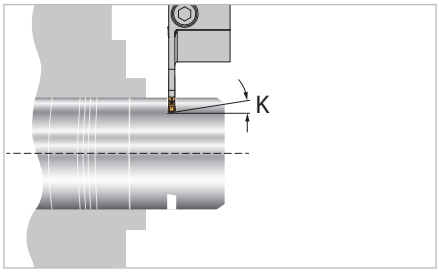
Pay attention to select the correct tools. Tools should have minimum overhang to reduce vibrations and increase tool life.

When selecting inserts, consider:
- **Cut-off width in mm**
- **Chip breaker for the material**
- **Approach angle and corner radius**

Select insert width as narrow as possible and as wide as necessary. By reducing the insert width, the cutting forces are reduced. You will also waste less material, especially in mass production. Whenever possible it is always recommended to use neutral inserts that offer better swarf control and tool life.

Effects on machining





When selecting corner radius:
- A smaller radius reduces the pressure on the component and reduces burr formation
- A bigger radius offers higher feed rate potential and longer tool life.

Criteria	Neutral insert	Right or left insert
Stability	Good	Worse
Pip leftover	Big	Less
Burr formation	Big	Less
Vibrations	Less	More
Surface finish	Good	Worse
Straightness	Good	Worse
Chip flow	Good	Worse
Tool life	Good	Worse

Pip free cut-off

In order to reduce the pip formation we recommend ground inserts in left or right handed execution with as small as possible approach angle.

This may be the only way of achieving the desired surface requirement. Please note that a larger approach angle can reduce the pip formation. However, can also lead to poor flatness, reduced surface finish and worse tool life.

To obtain maximum stability always select a holder with minimum overhang.

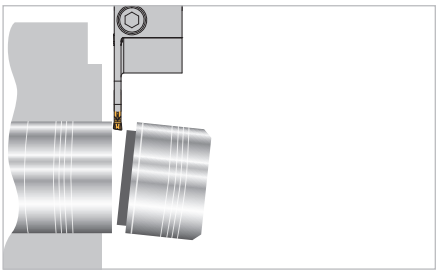
Burr free cut-off

In order to obtain a good burr free surface finish we recommend ground inserts in left or right handed execution and with minimum approach angle.

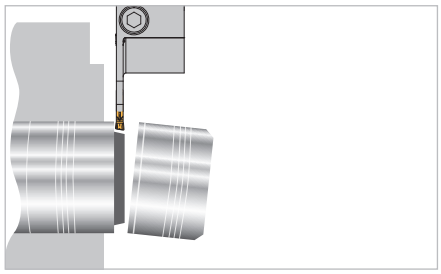
Please note that a larger approach angle can improve the burr formation.

With short tool overhang and secure strong insert locking you achieve excellent stability and straightness while parting off.

Parting off tube



Excessive tool overhang often leads to instability, tool breakage and poor component finish.



Always select tools as short and narrow as possible. Higher approach angle will lead to lower cutting forces.

Wall thickness (inch)	Insert width (inch)
< .197“	.039
.197 – .315	.059 – .079
.315 – .472	.098
.472 – .630	.118
.630 – .787	.157
.787 – .945	.197
.945 – 1.181	.236

Cut-off small diameters and thin walled components

In order to reduce cutting forces, we recommend ground inserts.

Narrow cut-off widths with sharp cutting edges are recommended.

Precision grooving

Precision grooving is the most economical and productive method of groove production.

In the ARNO grooving range you will find numerous groove widths, ground to +/- .0008” (0.02mm) width tolerance.

A

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Product Compliance Management
München, 2015-11-04

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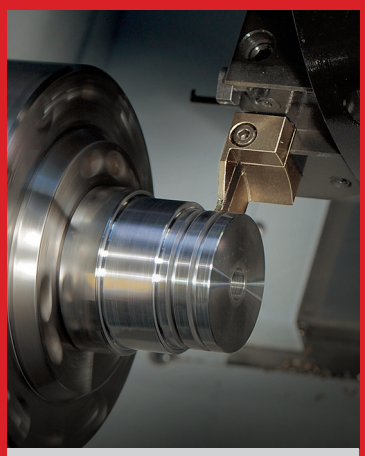

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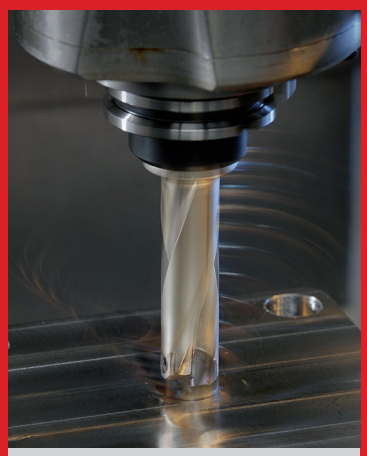
Milling Cutters and Inserts for
Milling and Thread Milling



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