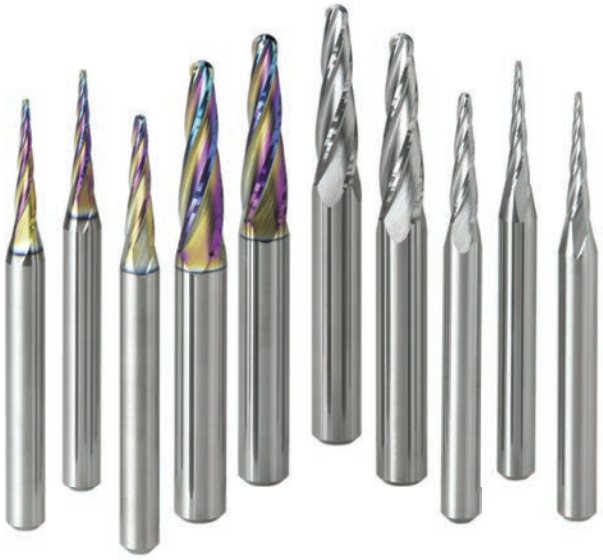


DIA EDGE

DLC4LATB/C4LATB

TAPER BALL NOSE END MILLS FOR MACHINING ALUMINUM ALLOY IMPELLERS

ABOUT OUR BRAND

Your manufacturing success is our success.

It's simple. We want to provide high-quality cutting tool products that help deliver unparalleled performance and control for you to manufacture precisely perfect products every day.

Our long heritage of building partnerships through cutting tool solutions to metal working manufacturers, like yours, has given Mitsubishi Materials USA a solid reputation as an industry leader. We understand the importance of getting it right the first time by delivering high-quality cutting tool product brands to help overcome machining challenges to improve machining processes.

Your success is our success and is the driving force behind our innovative products. Our product brands, DIAEDGE and MOLDINO, are trusted globally in the metal manufacturing and die & mold industries for delivering expertly-designed manufactured tools of the trade for highly specialized industries like yours.

With the acquisition of Hitachi Tool Engineering, LTD, our traditional Mitsubishi Materials USA cutting tool product line is now sold under the DIAEDGE product brand name.

Brands you can trust:

MITSUBISHI MATERIALS U.S.A.

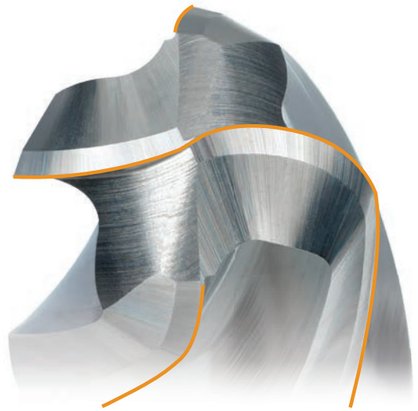
TRUSTED PRODUCT BRANDS

DIAEDGE MOLDINO

Taper Ball Nose End Mills for Machining
Aluminum Alloy Impellers

DLC4LATB/C4LATB

Featuring 4 peripheral flutes for strength and rigidity paired with only 2 ball end flutes for superior chip discharge.



— : Cutting Edge

A wide range of non-standard shapes are available. Please inquire for more information.

Ball Nose Taper End Mill
C4LATB

First Recommendation

NEW

DLC Coated Ball Nose Taper End Mill
DLC4LATB

The uniquely developed DLC coating provides excellent welding resistance during high speed machining and when the coolant supply is reduced. Additionally, the low coefficient of friction reduces cutting resistance.

Application Example

High Efficiency Machining of Aluminum Alloy Impellers

Excellent high depth of cut and feed.

Conventional

Breakage During Machining

C4LATB

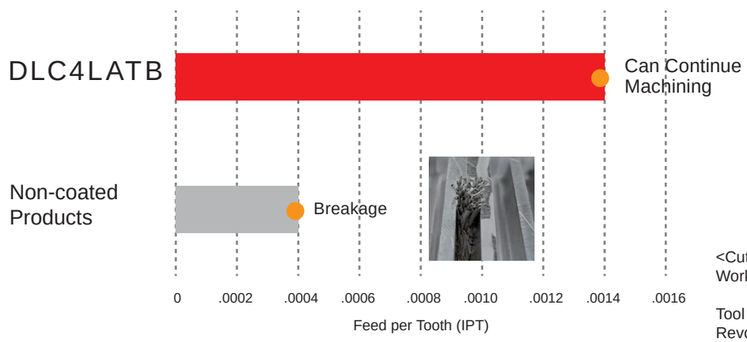
High Durability

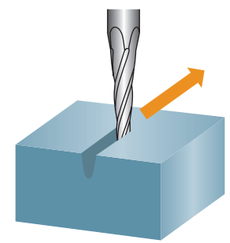
<Cutting Conditions>
Workpiece Material : Aluminum Alloy (A2618-T61)
Tool : C4LATBR100T040AP20
Revolution : 20000 min^{-1}
Max. Feed Rate : 78.74 IPM
Max. Depth of Cut : ap=.433 inch
Cutting Mode : Water Based
Machine : Vertical M/C

Cutting Performance

Slotting with a Limited Coolant Flow Rate

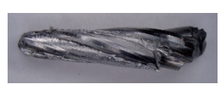
Resistance to welding prevents tool breakage when coolant supply is limited due to the geometry of the workpiece.





<Cutting Conditions>
Workpiece Material : Aluminum Alloy (A2618-T61)
Tool : DLC4LATBR100T040AP20
Revolution : 20000 min^{-1}
Feed per Tooth : fz=.0002- .0016 IPT
Depth of Cut : ap=.394 inch
Cutting Mode : Water Based
Machine : Vertical M/C (BT30)

DLC4LATB



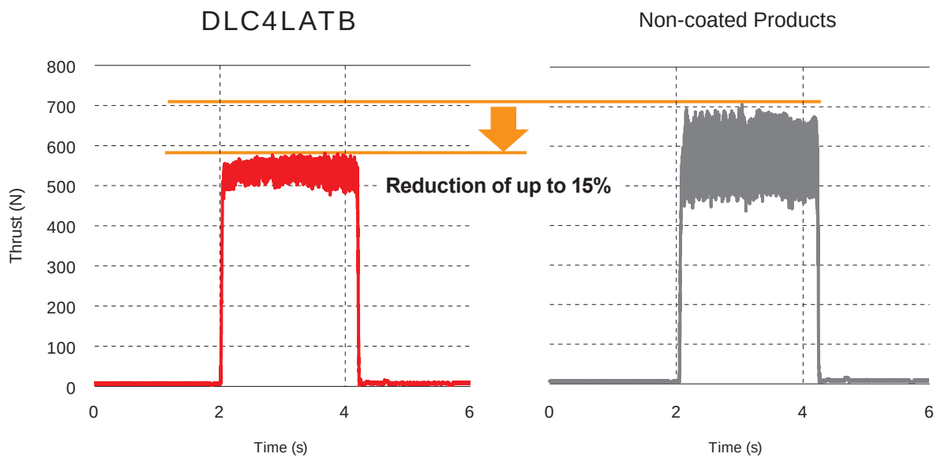
Non-coated Products

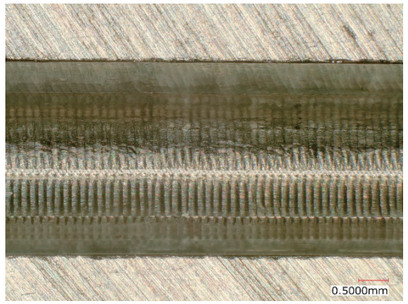
This test was performed with a limited coolant flow rate. If the coolant flow rate is sufficient, non-coated end mills can also be used.

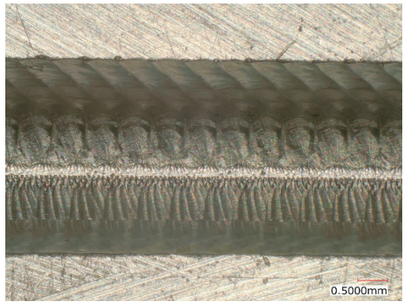
Cutting Performance

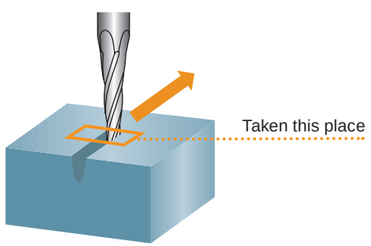
Comparison of Cutting Resistance when Slotting

Cutting resistance has been reduced by up to 15% compared to non-coated products.







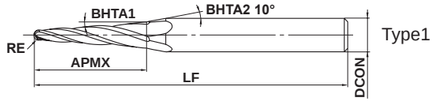


<Cutting Conditions>
Workpiece Material : Aluminum Alloy (A2618-T61)
Tool : DLC4LATBR100T040AP20
Revolution : 20000min-1
Feed per Tooth : fz=.0014 IPT
Depth of Cut : ap=.394 inch
Cutting Mode : Wet Cutting (Emulsion) External Coolant
Machine : Vertical M/C (BT30)

DLC4LATB NEW

Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



RE≤2					
± 0.010					
±5'					
DCON=6	DCON=8				
0 - 0.008	0 - 0.009				

- The high-rigidity design with improved breakage resistance achieves high-efficiency machining of aluminum alloy impellers.
- High resistance to welding when there is an insufficient coolant supply or during high-speed cutting.

(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	No.F *	Stock	Type
DLC4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
DLC4LATBR100T040AP20	1	4°	20	70	6	4	●	1
DLC4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
DLC4LATBR200T040AP30	2	4°	30	75	8	4	●	2

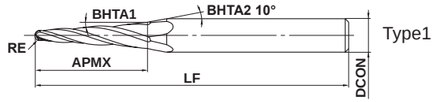
* Number of Flutes
Note 1) A wide range of non-standard shapes are available. Please inquire for more information.
(ex.: RE sizes starting from a minimum of R0.3, half included taper angles) or coatings.

● : USA Stock

C4LATB

Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



RE≤2					
± 0.010					
±5'					
DCON=6	DCON=8				
0 - 0.008	0 - 0.009				

● The high-rigidity design with improved breakage resistance achieves high-efficiency machining of aluminum alloy impellers.
● First recommended for machining aluminum alloy impellers.

(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	* No.F	Stock	Type
C4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
C4LATBR100T040AP20	1	4°	20	70	6	4	●	1
C4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
C4LATBR200T040AP30	2	4°	30	75	8	4	●	2

* Number of Flutes
Note 1) A wide range of non-standard shapes are available. Please inquire for more information.
(ex.: RE sizes starting from a minimum of R0.3, half included taper angles) or coatings.

RE = Radius of Ball Nose
BHTA1 = Taper Angle
APMX = Length of Cut
LF = Functional Length
DCON = Shank Dia.

● : USA Stock

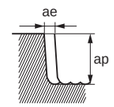
DLC4LATB/C4LATB

Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers

Recommended Cutting Conditions

■ Side Milling

(inch)

Workpiece Material	Aluminum Alloys				
RE (mm)	RE (inch)	Revolution (min-1)	Feed Rate (IPM)	Depth of Cut ap	Depth of Cut ae
0.5	.020	20000	78.7	.591	.030
1.0	.039	20000	157.5	.591	.059
1.5	.059	20000	204.7	.591	.089
2.0	.079	20000	204.7	.906	.118
Depth of Cut					

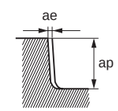
■ Slotting

(inch)

Workpiece Material	Aluminum Alloys			
RE (mm)	RE (inch)	Revolution (min-1)	Feed Rate (IPM)	Depth of Cut ap
0.5	.020	20000	23.6	.394
1.0	.039	20000	110.2	.394
1.5	.059	20000	157.5	.394
2.0	.079	20000	157.5	.591
Depth of Cut				

■ Side Milling (Finishing)

(inch)

Workpiece Material	Aluminum Alloys				
RE (mm)	RE (inch)	Revolution (min-1)	Feed Rate (IPM)	Depth of Cut ap	Depth of Cut ae
0.5	.020	20000	31.5	.709	.004
1.0	.039	20000	78.7	.709	.008
1.5	.059	20000	94.5	.709	.012
2.0	.079	20000	94.5	1.063	.012
Depth of Cut					

Case Examples for Non-standard Shapes

Note 1) Water-soluble cutting fluid is recommended.
Note 2) Climb cutting is recommended for side milling.
Note 3) If the rigidity of the machine or the work materials installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately, or set the depth of cut smaller.

MTEC
MACHINING TECHNOLOGY & EDUCATION CENTER

Welcome to our new world-class Machining Technology and Education Center (MTEC) in Mooresville, NC providing year round support and services to North America.

ABOUT MTEC

TOOLING PROPOSALS & EVALUATION
We will review your current processes or outline a new process. From this review, we will improve productivity, analyze programming methods and output a solution with programming, tooling and time savings.

MACHINING SIMULATION
Using the latest CAD/CAM software and our cutting tool experience, we will outline a new process using proper machining techniques to maximize tool life and productivity.

TECHNICAL SUPPORT
Dedicated local professionals to answer any of your order, product or technical questions.

TRAINING
We are excited to offer several levels of training with goals to reach our highest level--Craftsman Machining Technology. At MTEC NC, we will train using a combination of classroom and hands-on machine time to develop skills and real-world understanding of materials, tools and applications. In addition to multi-day courses, we will have Machining Technology skills seminars, as well as seminars from our partners to complement our apprentice level courses, our journeyman courses, and up to our craftsman level courses.

PROCESS IMPROVEMENTS
Review of the complete part processing and recommend changes of speed, feed, new tooling, reduction of passes, modifying programming and other solutions to reduce cycle time, save money and be proactive.

TRAINING COURSES
Programs are designed for several levels of skill development – from basic understanding to advance manufacturing with digital solutions, complementing to your valued experience in CNC machining environment.

- **New Machining Technology** Distributors
- **New Machining Technology** Mitsubishi Materials Customers
- **Advanced Milling & Drilling Technology**
- **Advanced Turning Technology**

ONLINE TRAINING
Our FREE e-learning program offers 11 courses in drilling, milling, turning, threading, tool grades and workpiece materials. Once each course is completed, you will be given the opportunity to print a certificate.

- **Basic Drilling**
- **Basic Milling**
- **Basic Turning**
- **Advanced Drilling**
- **Advanced End Milling**
- **Advanced Turning**
- **Basic Threading**
- **Advanced Face Milling**
- **Basic Workpiece Materials**
- **Tool Grades**
- **Advanced Workpiece Materials**

FOR MORE INFORMATION ON COURSE SCHEDULE, COURSE DESCRIPTION, AND ACCOMMODATIONS, PLEASE VISIT OUR WEBSITE.

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DIA EDGE

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41700 Gardenbrook Road, Suite 120
Novi, MI 48375
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Fax: 248.308.2627

For Your Safety

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

MITSUBISHI MATERIALS U.S.A.

Product Brands Crafted by Mitsubishi Materials U.S.A.

DIA EDGE MOLDINO

www.DIAEDGE.MMUS.com
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Tools specifications subject to change without notice.

B248A-US-2021.10