PRO-DUO™

**Cutter Style:**
1TW7, 1TW8

**Insert Series**
NBEU1603R
NBEU1904R
NBEU25T4R

**Grades:**
IN2035
IN2504
IN2505
IN2530
IN4005
IN4030

**Applications:**
Die & Mold
Aerospace
General Purpose

# Roughing & Semi-Finishing Ball Nose

Features and Benefits

- Aggressive, strong insert design
- Exceptional cutting edge strength
- Highly stable cutting performance
- High helix cutting edge for smooth milling
- Designed for semi-rough and roughing applications
- Unique double-sided Insert with 2 cutting edges provides economy
- One insert is used for both central and peripheral pockets
- Coolant through cutter bodies

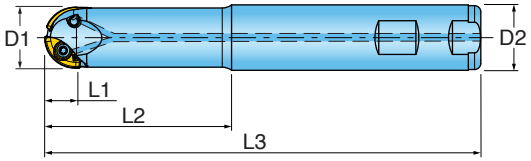
NEW PRODUCT ANNOUNCEMENT 2016

Member IMC Group
Ingersoll Cutting Tools

PRO-DUO™

## Ball Nose End Mill

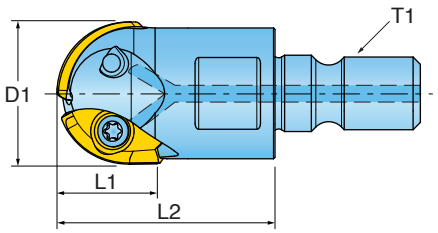
### Ball Nose End Mill, 2-Flute, Steel Shank


| Cutter Number | D1 Nominal Diameter | L1 Cut Length | L2 Extension Length | L3 Overall Length | Z No. of Flutes | D2 Shank Size/Style |
|---|---|---|---|---|---|---|
| 1TW7Q-0601379R01 | .625 | .480 | 1.375 | 4.750 | 2 | .625 Weldon |
| 1TW8Q-06013S7R01 | .625 | .480 | 1.375 | 5.000 | 2 | .750 Cylindrical |
| 1TW8Q-06013S7R02 | .625 | .480 | 1.375 | 6.000 | 2 | .750 Cylindrical |
| 1TW7J-0702084R01 | .750 | .527 | 2.000 | 4.000 | 2 | .750 Weldon |
| 1TW7J-0702084R02 | .750 | .527 | 2.000 | 6.000 | 2 | .750 Weldon |
| 1TW8J-0701580R01 | .750 | .527 | 2.000 | 6.000 | 2 | 1.000 Weldon |
| 1TW8J-0701850R02 | .750 | .527 | 2.000 | 7.000 | 2 | 1.000 Weldon |
| 1TW7K-1002780R01 | 1.000 | .685 | 2.750 | 5.000 | 2 | 1.000 Weldon |
| 1TW7K-1002780R02 | 1.000 | .685 | 2.750 | 6.000 | 2 | 1.000 Weldon |
| 1TW8K-1001981R01 | 1.000 | .685 | 2.750 | 6.000 | 2 | 1.250 Weldon |
| 1TW8K-1001981R02 | 1.000 | .685 | 2.750 | 7.000 | 2 | 1.250 Weldon |

## Ball Nose Top-On Modular

### Ball Nose End Mill, 2-Flute, Top-On Style

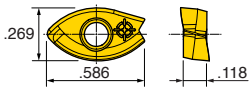




| Cutter Number | D1 Nominal Diameter | L1 Cut Length | L2 Extension Length | Z No. of Flutes | T1 Shank Adaption |
|---|---|---|---|---|---|
| 1TW7Q-06012X5R01 | .625 | .480 | .984 | 2 | M8 |
| 1TW7J-07014X6R01 | .750 | .528 | 1.181 | 2 | M10 |
| 1TW7K-10017X7R01 | 1.000 | .685 | 1.378 | 2 | M12 |

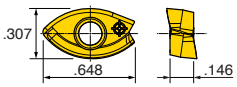
# PRO-DUO™

## Inserts

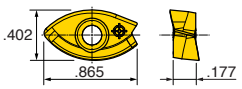
**NBEU1603R**




**NBEU1904R**




**NBEU25T4R**




| Cutter Diameter | Insert Part Number | Grade | IN2035 | IN2504 | IN2505 | IN2530 | IN4005 | IN4030 |
|---|---|---|---|---|---|---|---|---|
| .625 | NBEU1603R | | ● | ● | ● | ● | ● | ● |
| .750 | NBEU1904R | | ● | ● | ● | ● | ● | ● |
| 1.000 | NBEU25T4R | | ● | ● | ● | ● | ● | ● |

✱ Please check both insert and pocket for correct positioning.
Insert marked ⌖ must be clamped in pocket marked ⌖ on the cutter.

✱ One insert is used for both central and peripheral pockets

## Hardware

| Cutter Diameter | Cutter Diameter |  Screw |  Driver |
|---|---|---|---|
| .625 | 1TW7Q-0601379R01 | SM25-064-00 | DS-T08S |
| | 1TW8Q-06013S7R01 | | |
| | 1TW8Q-06013S7R02 | | |
| | 1TW7Q-06012X5R01 | | |
| .750 | 1TW7J-0702084R01 | SM30-072-00 | DS-0022 |
| | 1TW7J-0702084R02 | | |
| | 1TW7J-0701580R01 | | |
| | 1TW7J-0701580R02 | | |
| | 1TW7J-07014X6R01 | | |
| 1.000 | 1TW7K-1002780R01 | SM35-087-00 | DS-0010 |
| | 1TW7K-1002780R02 | | |
| | 1TW7K-1001981R01 | | |
| | 1TW7K-1001981R02 | | |
| | 1TW7K-10017X7R01 | | |

# PRO-DUO™

## Operating Guidelines

| Pro-Duo - Series 1TW7, 1TW8 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Material | | Brinnell Hardness | SFM | Feed per Insert | IN2035 | IN2504 | IN2505 | IN2530 | IN4005 | IN4030 | Coolant |
| Cast Iron | Gray | - | 785 - 1250 | .006 - .035 | | 3 | 2 | | 1 | | No |
| | Nodular | | 590 - 920 | .004 - .030 | | | | | | | |
| Steel | Low Carbon 1018, 8620 | 85 - 175 | 650 - 1150 | .004 - .035 | | 3 | 2 | | 1 | | No |
| | High Carbon F-6180 | 175 - 225 | 590 - 1050 | .004 - .025 | | | | | | | |
| | Alloyed Steel 4140 | 275 - 325 | 390 - 820 | .002 - .030 | | | | | | | |
| | Tool Steel P20 - H13 | 200 - 250 | 330 - 650 | .002 - .025 | | | | | | | |
| | Hardened Steel, HRC 50-65 | 495 - 712 | 300 - 600 | .003 - .025 | | 1 | 3 | | 2 | | |
| Stainless Steel | 300 Series, 304, 316 | - | 400 - 900 | .002 - .030 | 1 | | | 3 | 4 | 2 | No |
| | 400 Series 15-5 PH, 17-4 PH | - | 650 - 985 | .002 - .030 | | | | | | | |
| | 13-8 PH | - | 200 - 400 | .002 - .020 | | | | | | | Yes |
| Nickel Alloys | Inconel 600, 706, 718, 903, Hastelloy | - | 65 - 265 | .002 - .020 | 1 | | | 3 | | 2 | Yes |
| Titanium | 6AL-4V | - | 130 - 360 | .002 - .030 | 1 | | | 3 | | 2 | Yes |

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.