

COPY MILLING & PROFILING INSERTS

INCH



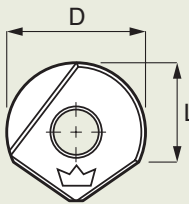
A *Cole* TOOLING SYSTEMS CO.



NEW!

③ MBT SuperFinisher Ball Nose Insert

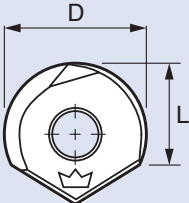
Precision ground, harder grade, for semi-finish and finish milling. Excellent choice for unattended finish milling at small depth and high speeds and feed rates.



Part No.	D	L
MBT 0375	.375	.349
MBT 0500	.500	.377
MBT 0625	.625	.433
MBT 0750	.750	.518
MBT 1000	1.000	.716
MBT 1250	1.250	.865

③ MB Ball Nose Insert

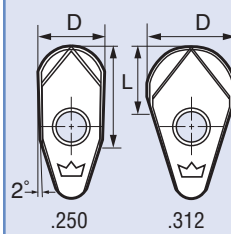
Unique cutting edge allows performance in all operations in material below 42 HRC; in semi- & finishing operations above. Significant benefits in heat-treated intricate geometries. Insert geometry allows smoother cutting motion-diminishing heat build up & tool deflection, reduces vibration caused by cutting action.



Part No.	D	L
MB 0375	.375	.349
MB 0500	.500	.377
MB 0625	.625	.443
MB 0750	.750	.518
MB 1000	1.000	.716
MB 1250	1.250	.865

⑤ VRBS Small Ball Nose Insert

Used for rough- to finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, graphite, etc. Suitable for high speed and hard milling.



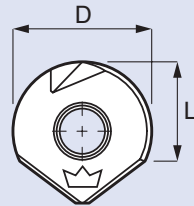
Part No.	D	L
VRBS-0250	.250	.294
VRBS-0312	.312	.184

These strong precision inserts are cost-effective replacements for solid carbide ball end mills.

For additional tool holders, see page 6.

③ RB-N Ball Nose Insert

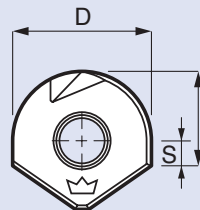
Precision ground, non-chipbreaker. Best choice for cavity, core and profile milling of pre-hard and fully hard die/hard steels, cast steels and cast iron. Strongest cutting edge design.



Part No.	D	L
RB 0375 N	.375	.390
RB 0500 N	.500	.377
RB 0625 N	.625	.443
RB 0750 N	.750	.518
RB 1000 N	1.000	.716
RB 1250 N	1.250	.865

③ BS-N Ball Nose Insert

Sidecutting, non-chipbreaker. Side cutting insert used in cavity and core profiling, for blending of fillets on medium and hard materials.



Part No.	D	L	S
BS 0375 N	.375	.390	.154
BS 0500 N	.500	.350	.100
BS 0625 N	.625	.421	.109
BS 0750 N	.750	.496	.121
BS 1000 N	1.000	.679	.179
BS 1250 N	1.250	.828	.203

BACK DRAFT, FLAT BOTTOM & TOROID INSERTS



A **Cole** TOOLING SYSTEMS CO.

INCH



Back Draft and Flat Bottom inserts are used to best advantage in applications where small corner radii are required, for example finishing of straight and steep side walls, blending and finishing of small corner radii, fillets and the like. Toroid Bull Nose Cutters combine the advantages of popular round insert toroidal "button cutters" and bull nose end mills with the proven design of Millstar's precision, single strong insert with twin-cutting geometry. The result is reduced machining time and enhanced accuracy and surface finish.

The inserts, and particularly the patented toroidal inserts, are designed to improve 3- and 5-axis milling of dies, molds and similar free-form three-dimensional surfaces. The precision ground inserts are held in Millstar's proven rock-solid dovetail seat for superior surface finish and machining accuracy. The insert designs avoid the area of zero cutting speed at the tip of ball nose inserts for improved tool life.

The toroidal tools in particular have the advantage of cutting at larger step-over or pitch while leaving no or smaller cusps; the tools also run at faster cutting speeds and feed rates. The toroidal bull nose design simplifies 3- and 5-axis programming, works on a variety of materials from non-ferrous metal, carbon graphite and stainless steels to pre-hard and fully hard mold and die materials.

NEW!

④ BDS Flat Bottom Insert

Precision ground, non-chipbreaker. Unique crossover design between flat bottom FB and back draft BD inserts. Allows straight walls with a larger step down than BD, but less cutting forces than FB; allows higher cutting speeds and feeds.

Part No.	D	L1	R
BDS-0375-	.375	0.125	1/32
BDS-0500-	.500	0.125	1/32 or 1/16
BDS-0625-	.625	0.125	1/32 or 1/16
BDS-0750-	.750	0.125	1/32 or 1/16
BDS-1000-	1.000	0.125	1/32 or 1/16

All "BDS" series inserts are non-chip breaker style**

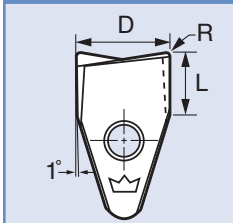
④ BD-R Back Draft Insert

Precision ground, with positive ground chipbreaker and 7 degree back-taper. Used for milling of cores, cavities, fillets with straight or very steep walls of softer material.

Part No.	D	L	R
BD 0375 R	.375	.340	1/32
BD 0500 R	.500	.380	1/32 / 1/16 / 1/8
BD 0625 R	.625	.457	1/32 / 1/16
BD 0750 R	.750	.540	1/32 / 1/16 / 1/8
BD 1000 R	1.000	.740	1/32 / 1/16 / 1/8
BD 1250 R	1.250	.919	1/32 / 1/16 / 1/8

⑤ VBD Small Back Draft Insert

Used for rough-to finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, aluminum alloys, graphite, etc. Suitable for high speed and hard milling.



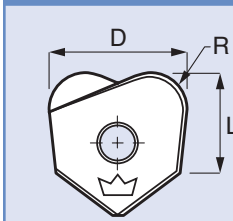
Part No.	D	L	R
VBD-0250	.250	.313	.015
VBD-0312	.312	.215	.015

These strong precision inserts are cost-effective replacements for solid carbide end mills.

For additional tool holders, see page 4.

④ TO Toroid Bull Nose Insert

Precision ground, large corner radius & back taper for spiral and pocket milling, milling of pre-hard and hardened flat surfaces at higher speeds than tools with smaller corner radii. Good choice for HS milling of Aluminum.

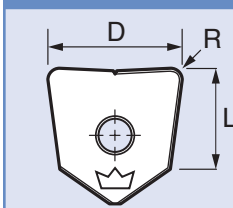


Part No.	D	L	R
TO 0375	.375	.349	.125
TO 0500	.500	.377	.125
TO 0625	.625	.433	.156
TO 0750	.750	.518	.187
TO 1000	1.00	.716	.250
TO 1250	1.25	.865	.312

Will faster, more accurate than "two button" round insert cutters.

④ BD-N Back Draft Insert

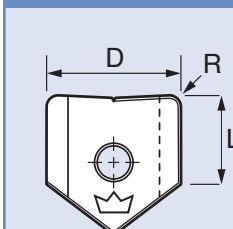
Precision ground, non-chipbreaker and 7 degree backtaper. Used for milling of cores, cavities, fillets with straight or very steep walls of harder material.



Part No.	D	L	R
BD 0375 N	.375	.357	1/32 / 1/16
BD 0500 N	.500	.380	1/32 / 1/16 / 1/8
BD 0625 N	.625	.457	1/32 / 1/16 / 5/32
BD 0750 N	.750	.540	1/32 / 1/16 / 1/8
BD 1000 N	1.000	.740	1/32 / 1/16 / 1/8
BD 1250 N	1.250	.919	1/32 / 1/16 / 1/8

④ FB-R Flat Bottom Insert

Precision ground, with positive ground chipbreaker. Flat bottom insert for shoulder milling, fillet finishing and long reach angular wall finishing of softer materials.



Part No.	D	L	R
FB 0250 R	.250	.270	.015
FB 0312 R	.3125	.270	.015
FB 0375 R	.375	.341	1/32
FB 0500 R	.500	.350	1/32 / 1/16 / 1/8
FB 0625 R	.625	.421	1/32 / 1/16
FB 0750 R	.750	.496	1/32 / 1/16 / 1/8
FB 1000 R	1.000	.679	1/32 / 1/16 / 1/8
FB 1250 R	1.250	.843	1/32 / 1/16 / 1/8

④ New HF (High Feed) Inserts

Millstar's new HF insert is designed for High Speed and High Feed machining. The HF is designed to run at high cutting speeds and feed rates with shallow depth of cut. The NEW curved geometry allows the chip to flow up and out of the cut quickly and smoothly allowing for the use of heavy chip loads. The geometry of the new HF insert generates cutting forces upward, toward the spindle, which helps eliminate vibration and deflection, allowing for very



high chip loads. The HF insert is designed to fit into Millstar's standard flat holders, style 4 (CYF, TAF and CBCYF) making these holders more versatile than ever.

The HF insert can be used in the following applications: Roughing, semi-finish of all softer materials. Nickel-based alloys and Stainless steel alloys (XRN coated) to pre-heat treated Tool steels (TLN coated). It can be used for roughing and semi-finishing of heat-treated materials up to 48 HRC.

Tool Ordering No.	Diameter D	Corner Radius A	Corner Radius B	Length D1	Step Over Ae	Depth of Cut Ap	Feed per Tooth Fz
HF-0375...	0.375	0.0155	0.1180	0.0125	0.28	0.016	.010-.020
HF-0500...	0.500	0.0315	0.1575	0.0203	0.375	0.019	.012-.022
HF-0625...	0.625	0.0470	0.1970	0.0235	0.46	0.025	.016-.028
HF-0750...	0.750	0.0625	0.2360	0.0315	0.56	0.030	.020-.035
HF-1000...	1.000	0.0755	0.2755	0.0345	0.75	0.039	.022-.040

.. After the part number please indicate TLN, XRN or HSN when ordering.



④ New TOBD-NF Back Draft Inserts for Non-Ferrous Materials

Millstar's new TOBD-NF insert is specifically designed for high speed and high feed roughing of Aluminum, but also has the versatility to be used for fine finishing as well. This unique cutting edge design allows the chips to flow freely up the flute allowing higher speeds and feeds. The TOBD-NF comes in diameters from 1/2 inch (12mm) up to 1 inch (25mm) and fits into our standard flat type tool holders making the holders more versatile than ever.



Tool Ordering No.	Diameter D	L	R
TOBD-0500-NF-NA	0.500	0.377	0.125
TOBD-0625-NF-NA	0.625	0.433	0.125
TOBD-0750-NF-NA	0.750	0.518	0.125
TOBD-1000-NF-NA	1.000	0.716	0.125

DISCLAIMER

Today's metalcutting operations are performed on high horsepower, high spindle speed CNC machines. These operations generate high temperatures, cutting forces and flying chips. Today's metalcutting tools can generally hold up under these conditions but they may also chip and fly apart. Adequate protection for workers is a must. All machine guards and protective equipment should be in place at all times. Grinding carbide, ceramic and other modern materials can create dusts and mists that should be collected by proper equipment.

Overexposure to dusts and mists can be a hazard to one's health. Dusts and mists can irritate existing skin and/or pulmonary conditions. Adequate respiratory, eye protection and ventilation should be used during grinding and workers should avoid prolonged contact with dusts and mists.

A safe environment must be provided as metalcutting is not just the holder and inserts. The machine, workpiece, clamping method cutting conditions all play a part in today's metal cutting environment.

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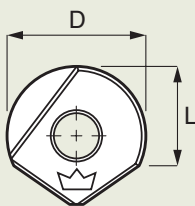
METRIC



NEW!

③ MBT SuperFinisher Ball Nose Insert

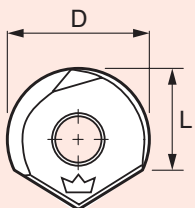
Precision ground, harder grade, for semi-finish and finish milling. Excellent choice for unattended finish milling at small depth and high speeds and feed rates.



Part No.	D	L
MBT 10	10	8,65
MBT 12	12	9,20
MBT 16	16	11,25
MBT 20	20	13,15
MBT 25	25	18,25
MBT 30	30	22,15
MBT 32	32	21,95

③ MB Ball Nose Insert

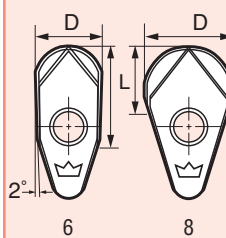
Unique cutting edge allows performance in all operations in material below 42 HRC; in semi- & finishing operations above. Significant benefits in heat-treated intricate geometries. Insert geometry allows smoother cutting motion-diminishing heat build up & tool deflection, reduces vibration caused by cutting action.



Part No.	D	L
MB 10	10	8,65
MB 12	12	9,20
MB 16	16	11,25
MB 20	20	13,15
MB 25	25	18,25
MB 30	30	22,15
MB 32	32	21,95

⑤ VRBS Small Ball Nose Insert

Used for rough- to finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, graphite, etc. Suitable for high speed and hard milling.



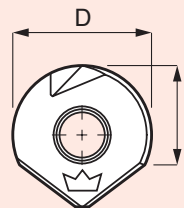
Part No.	D	L
VRBS-06	6	8,1
VRBS-08	8	4,5

These strong precision inserts are cost-effective replacements for solid carbide ball end mills.

For additional tool holders, see page 20.

③ RB-N Ball Nose Insert

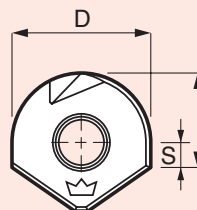
Precision ground, non-chipbreaker. Best choice for cavity, core and profile milling of pre-hard and fully hard die/mold steels, cast steels and cast iron. Strongest cutting edge design.



Part No.	D	L
RB 10 N	10	9,50
RB 12 N	12	9,20
RB 14 N	14	9,45
RB 16 N	16	11,25
RB 20 N	20	13,15
RB 22 N	22	17,45
RB 25 N	25	18,25
RB 30 N	30	22,15
RB 32 N	32	21,95

③ BS-N Ball Nose Insert

Sidcutting, non-chipbreaker. Side cutting insert used in cavity and core profiling, for blending of fillets on medium and hard materials.



Part No.	D	L	S
BS 10 N	10	9,50	3,65
BS 12 N	12	8,80	2,90
BS 16 N	16	10,70	2,85
BS 20 N	20	12,75	2,85
BS 25 N	25	17,20	4,85
BS 30 N	30	20,00	5,10
BS 32 N	32	21,00	5,30

BACK DRAFT, FLAT BOTTOM & TOROID INSERTS



A **Cole** TOOLING SYSTEMS CO.

METRIC



Back Draft and Flat Bottom inserts are used to best advantage in applications where small corner radii are required, for example finishing of straight and steep side walls, blending and finishing of small corner radii, fillets and the like. Toroid Bull Nose Cutters combine the advantages of popular round insert toroidal "button cutters" and bull nose end mills with the proven design of Millstar's precision, single strong insert with twin-cutting geometry. The result is reduced machining time and enhanced accuracy and surface finish.

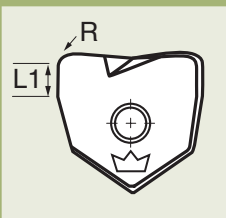
The inserts, and particularly the patented toroidal inserts, are designed to improve 3- and 5-axis milling of dies, molds and similar free-form three-dimensional surfaces. The precision ground inserts are held in Millstar's proven rock-solid dovetail seat for superior surface finish and machining accuracy. The insert designs avoid the area of zero cutting speed at the tip of ball nose inserts for improved tool life.

The toroidal tools in particular have the advantage of cutting at larger step-over or pitch while leaving no or smaller cusps; the tools also run at faster cutting speeds and feed rates. The toroidal bull nose design simplifies 3- and 5-axis programming, works on a variety of materials from non-ferrous metal, carbon graphite and stainless steels to pre-hard and fully hard mold and die materials.



④ BDS Flat Bottom Insert

Precision ground, non-chipbreaker. Unique crossover design between flat bottom FB and back draft BD inserts. Allows straight walls with a larger step down than BD, but less cutting forces than FB; allows higher cutting speeds and feeds.

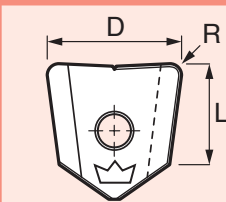


Part No.	D	L	R
BDS-10-	10	3	1
BDS-12-	12	3	1
BDS-16-	16	3	1,0 or 1,3
BDS-20-	20	3	1,0 or 1,6
BDS-25-	25	3	1,0 or 2,0

All "BDS" series inserts are non-chip breaker style**

④ BD-R Back Draft Insert

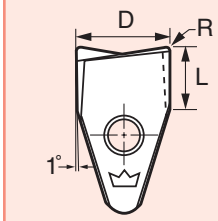
Precision ground, with positive ground chipbreaker and 7 degree backtaper. Used for milling of cores, cavities, fillets with straight or very steep walls of softer material.



Part No.	D	L	R
BD 10 R	10	8,5	0,5 / 0,8 / 1
BD 12 R	12	9,95	0,5 / 1
BD 16 R	16	11,55	0,5 / 1,0 / 1,3
BD 20 R	20	13,35	1,0 / 1,6
BD 25 R	25	19,95	1,0 / 2
BD 32 R	32	23,35	2,6

⑤ VBD Small Back Draft Insert

Used for rough-to finish-milling small radius or detail work, and surface milling in soft and hard steel, cast iron, aerospace and non-ferrous alloys, aluminum alloys, graphite, etc. Suitable for high speed and hard milling.



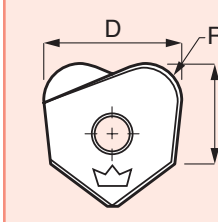
Part No.	D	L	R
VBD-06	6	8,6	0,4
VBD-08	8	5	0,4

These strong precision inserts are cost-effective replacements for solid carbide end mills.

For additional tool holders, see page 18.

④ TO Toroid Bull Nose Insert

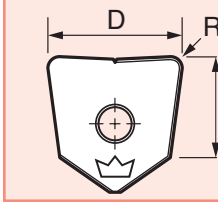
Precision ground, large corner radius & back taper for spiral and pocket milling, milling of pre-hard and hardened flat surfaces at higher speeds than tools with smaller corner radii. Good choice for HS milling of Aluminum.



Part No.	D	L	R
TO 10...	10	8,65	3
TO 12...	12	9,20	3
TO 16...	16	11,25	4
TO 20...	20	13,15	5
TO 25...	25	18,25	6
TO 30...	30	22,15	7,5
TO 32...	32	21,95	8

④ BD-N Back Draft Insert

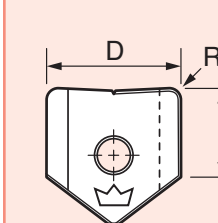
Precision ground, non-chipbreaker and 7 degree backtaper. Used for milling of cores, cavities, fillets with straight or very steep walls of harder material.



Part No.	D	L	R
BD 10 N	10	8,5	0,5 / 0,8 / 1,0
BD 12 N	12	9,95	0,5 / 1 / 2
BD 16 N	16	11,55	0,5 / 1 / 1,3 / 2 / 3
BD 20 N	20	13,35	0,5 / 1 / 1,6 / 2 / 3
BD 25 N	25	19,95	1 / 2
BD 32 N	32	23,35	1,0 / 2,6

④ FB-R Flat Bottom Insert

Precision ground, with positive ground chipbreaker. Flat bottom insert for shoulder milling, fillet finishing and long reach angular wall finishing of softer materials.



Part No.	D	L	R
FB 06 R	6	7,0	0,4
FB 08 R	8	7,0	0,4
FB 10 R	10	8,50	0,8
FB 12 R	12	9,15	1
FB 16 R	16	10,65	0,5 / 1,3
FB 20 R	20	12,25	1,6
FB 25 R	25	16,35	2
FB 32 R	32	21,30	2,6



④ New HF (High Feed) Inserts

Millstar's new HF insert is designed for High Speed and High Feed machining. The HF is designed to run at high cutting speeds and feed rates with shallow depth of cut. The NEW curved geometry allows the chip to flow up and out of the cut quickly and smoothly allowing for the use of heavy chip loads. The geometry of the new HF insert generates cutting forces upward, toward the spindle, which helps eliminate vibration and deflection, allowing for very



high chip loads. The HF insert is designed to fit into Millstar's standard flat tool holders, style 4 (CYF, TAF and CBCYF) making these holders more versatile than ever.

The HF insert can be used in the following applications: Roughing, semi-finish of all softer materials. Nickel-based alloys and Stainless steel alloys (XRN coated) to pre-heat treated Tool steels (TLN coated). It can be used for roughing and semi-finishing of heat-treated materials up to 48 HRC.

Tool Ordering No.	Diameter D	Corner Radius A	Corner Radius B	Length D1	Step Over Ae	Depth of Cut Ap	Feed per Tooth Fz
HF-10...	10	0,698	3,000	0,266	7,5	0,4	0,25-0,5
HF-12...	12	1,000	4,000	0,426	9	0,48	0,3-0,55
HF-16...	16	1,295	5,000	0,596	12	0,64	0,4-0,71
HF-20...	20	1,498	6,000	0,775	15	0,8	0,5-0,89
HF-25...	25	1,905	7,000	0,900	18,75	1	0,56-1,0

.. After the part number please indicate TLN, XRN or HSN when ordering.



④ New TOBD-NF Back Draft Inserts for Non-Ferrous Materials

Millstar's new TOBD-NF insert is specifically designed for high speed and high feed roughing of Aluminum, but also has the versatility to be used for fine finishing as well. This unique cutting edge design allows the chips to flow freely up the flute allowing higher speeds and feeds. The TOBD-NF comes in diameters from 1/2 inch (12mm) up to 1 inch (25mm) and fits into our standard flat type tool holders making the holders more versatile than ever.



Tool Ordering No.	Diameter D	L	R
TOBD-12-NF-NA	12,0	9,2	3,0
TOBD-16-NF-NA	16,0	11,25	3,0
TOBD-20-NF-NA	20,0	13,15	3,0
TOBD-25-NF-NA	25,0	18,25	3,0

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Overexposure to dusts and mists can be a hazard to ones health. Dusts and mists can irritate existing skin and or pulmonary conditions. Adequate respiratory, eye protection and ventilation should be used during grinding and workers should avoid prolonged contact with dusts and mists.

A safe environment must be provided as metalcutting is not just the holder and inserts. The machine, workpiece, clamping method cutting conditions all play a part in today's metal cutting environment.

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