

Superior Solutions for Sheet Metal Fabricators

MATE[®] CLEANBEND[™] FORMING TECHNOLOGY

European Precision Style
Wila Trumpf Style
American Precision Style



2016
PN

WORLDWIDE HEADQUARTERS:

1295 Lund Boulevard, Anoka, Minnesota 55303 USA
Tel +1.763.421.0230 Fax +1.763.421.0285
U.S. Toll Free: Tel 800.328.4492 Fax 800.541.0285
mate.com

MATE[®]
M
**PRECISION
TOOLING**
TRUSTED | QUALITY | SERVICE | SOLUTIONS

TABLE OF CONTENTS

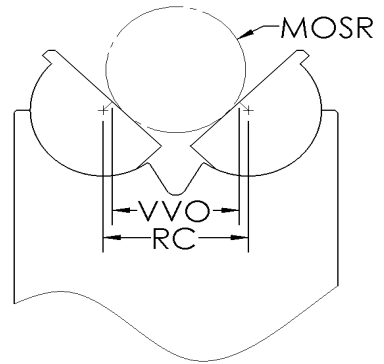
Mate® CleanBend™ Forming Technology

Helpful CleanBend™ Information	2
Why Use CleanBend™ and Force Factor Adjustment	3
European Precision Style System	4
Wila Trumpf Style System	5
Adapters for American Precision Style and Wila Trumpf Style	6
CleanBend Benefits	7

Helpful CleanBend Information Metric

Tool Style	Common Name	Part Number	VVO @ 90	MOSR @ 90	MOSR @ Max Angle	Max MT @ Max Angle (Mild Steel)	Max Angle of Bend	Max Tonnage Per Meter	Safe Min Bend Line Dim.	Rotation Centers
EPS Rail	CB 200	045.033 - 047	8.59	4.42	8.13	2.3	140	100	5.00	10.00
EPS Rail	CB 300	045.052 - 056	12.88	6.58	12.19	3.2	140	130	7.50	15.00
EPS Rail	CB 600	045.057 - 060	23.47	12.55	22.68	6.0	120	200	13.50	27.00
EPS Insert	CB 200	045.083 - 087	8.59	4.42	8.13	2.3	140	100	5.00	10.00
EPS Insert	CB 300	045.092 - 096	12.88	6.58	12.19	3.2	140	130	7.50	15.00
TWS	CB 000	029.000*	8.08	3.91	7.70	2.0	140	100	4.60	9.20
TWS	CB 100	029.100*	12.09	5.84	11.76	3.0	120	130	6.74	13.49
TWS	CB 150	029.150*	14.86	7.37	14.07	4.0	120	150	9.19	18.39
TWS	CB 200	029.200*	24.26	12.95	23.47	5.0	120	170	13.89	27.79
TWS	CB 300	029.300*	30.63	16.13	29.26	6.0	115	200	18.85	37.69

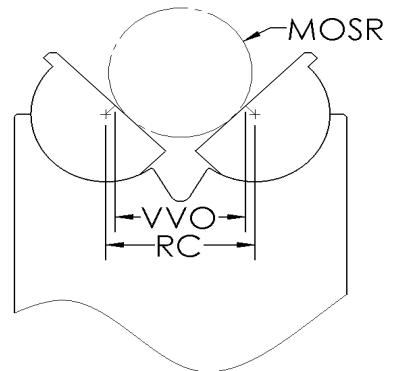
MOSR = Maximum Outside Radius
VVO = Virtual V Opening
RC = Rotation Centers
MT = Material Thickness



Helpful CleanBend Information Inches

Tool Style	Common Name	Part Number	VVO @ 90	MOSR @ 90	MOSR @ Max Angle	Max MT @ Max Angle (Mild Steel)	Max Angle of Bend	Max Tonnage Per Ft	Safe Min Bend Line Dim.	Rotation Centers
EPS Rail	CB 200	045.033 - 047	0.338	0.174	0.146	0.090	140	34	0.197	0.394
EPS Rail	CB 300	045.052 - 056	0.507	0.259	0.219	0.125	140	44	0.295	0.591
EPS Rail	CB 600	045.057 - 060	0.924	0.494	0.423	0.236	120	68	0.531	1.062
EPS Insert	CB 200	045.083 - 087	0.338	0.174	0.146	0.090	140	34	0.197	0.394
EPS Insert	CB 300	045.092 - 096	0.507	0.259	0.219	0.125	140	44	0.295	0.591
TWS	CB 000	029.000*	0.318	0.154	0.135	0.079	140	34	0.181	0.362
TWS	CB 100	029.100*	0.476	0.230	0.206	0.118	120	44	0.265	0.531
TWS	CB 150	029.150*	0.585	0.290	0.248	0.157	120	51	0.362	0.724
TWS	CB 200	029.200*	0.955	0.510	0.438	0.197	120	58	0.547	1.094
TWS	CB 300	029.300*	1.206	0.635	0.544	0.236	115	68	0.742	1.484

MOSR = Maximum Outside Radius
VVO = Virtual V Opening
RC = Rotation Centers
MT = Material Thickness



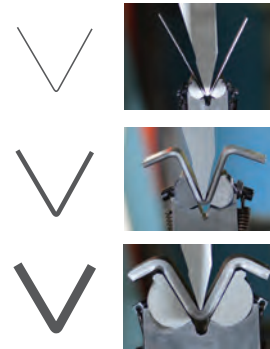
Why use Mate® CleanBend™?

Mate® CleanBend™ forming technology is designed to enable high quality sheet metal forming using rotating supports. The process mimics a folding operation. The result is a clean bend with minimal to no marking of the sheet metal.

Primary uses and applications:

- Bending a short flange
- Bending a flange to a diagonal sharp
- Bending across pre-existing holes
- Bending across a notch or gap
- Bending sensitive or delicate materials
- Bending highly polished materials
- Bending painted or coated surfaces
- Bending materials with foil or plastic coverings
- Bending tread plate

**Up to 40 degree
bend without
sheetmarking**



Mate® CleanBend™ Forming Technology is available for press brakes using:

- European Precision Style tooling configured with a rail for self-centering dies
- European Precision Style tooling configured for insert style dies
- Wila Trumpf Style die holders
- American Precision Style die holders (adaptor required)

Best Practices:

- Use an acute angle punch.
- Use the center of the die to distribute the force as equally as possible across the die. Avoid side loading.
- Use at least 50% of the die to avoid concentrated loads which can damage the tool and the machine.
- Check that the piece part is clean and burr free.
- Follow recommended maintenance practices.

Force factor adjustment:

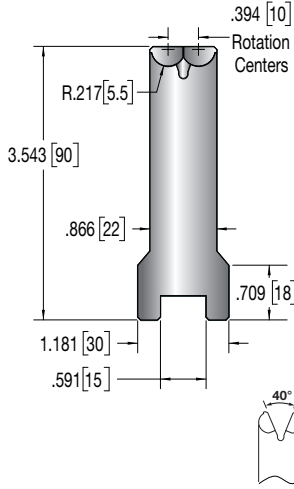
Because the springs that enable the Mate® CleanBend™ forming technology to function also exert a resisting force while bending, an adjustment to the force calculation should be made. Using a standard air bending chart for calculating tonnage, increase the force value by 0.61 tons per foot (2 tons per meter) to allow for spring resistance.



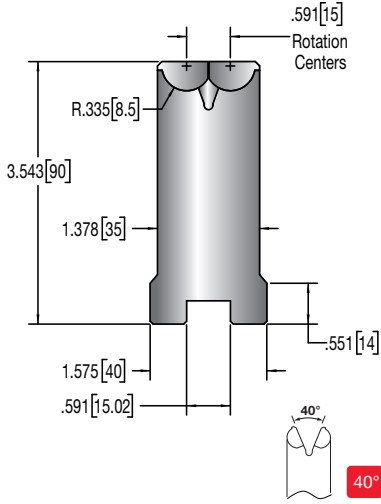
CLEANBEND™ EUROPEAN PRECISION STYLE

European Precision Style 15mm Rail Type

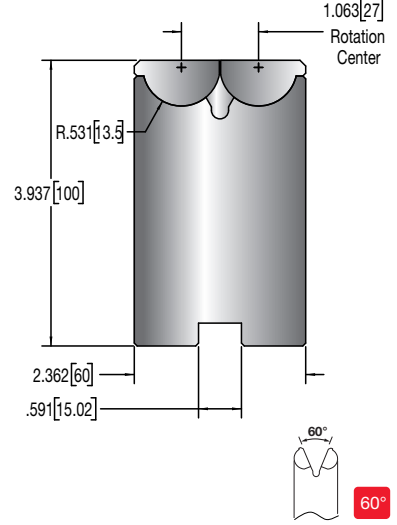
CB 200 Rail Type		VVO	H
Maximum Material Thickness — 2.3mm			
50	\$500.00	045.033	.34(9) 90.00
100	\$850.00	045.044	.34(9) 90.00
200	\$1,500.00	045.045	.34(9) 90.00
500	\$2,400.00	045.046	.34(9) 90.00
15 20 25 30	\$2,000.00	045.047	.34(9) 90.00



CB 300 Rail Type		VVO	H
Maximum Material Thickness — 3.2mm			
50	\$600.00	045.052	.50(13) 90.00
100	\$1,100.00	045.053	.50(13) 90.00
200	\$1,800.00	045.054	.50(13) 90.00
500	\$2,750.00	045.055	.50(13) 90.00
15 20 25 30	\$2,400.00	045.056	.50(13) 90.00

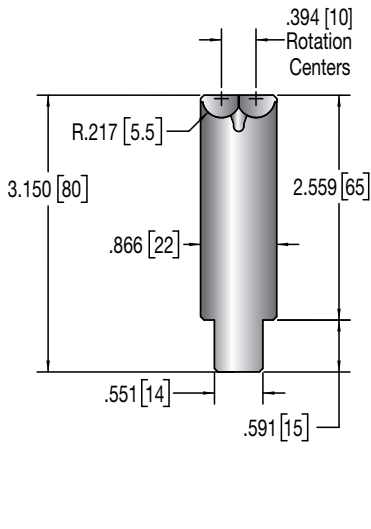


CB 600 Rail Type		VVO	H
Maximum Material Thickness — 6.0mm			
50	\$775.00	045.057	.92(24) 100.00
100	\$1,325.00	045.058	.92(24) 100.00
200	\$2,225.00	045.059	.92(24) 100.00
500	\$3,900.00	045.060	.92(24) 100.00

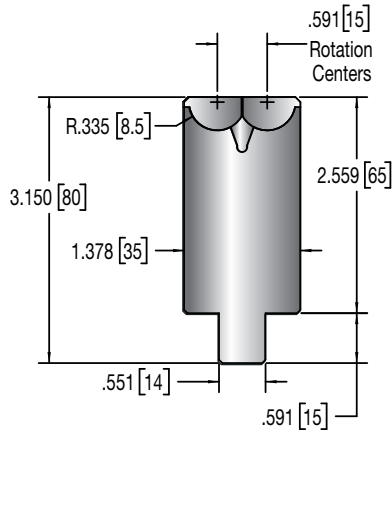


European Precision Style 14mm Insert Type

CB 200 Insert Type		VVO	H
Maximum Material Thickness — 2.3mm			
50	\$525.00	045.083	.34(9) 65.00
100	\$875.00	045.084	.34(9) 65.00
200	\$1,600.00	045.085	.34(9) 65.00
500	\$2,525.00	045.086	.34(9) 65.00
15 20 25 30	\$2,100.00	045.087	.34(9) 65.00



CB 300 Insert Type		VVO	H
Maximum Material Thickness — 3.2mm			
50	\$650.00	045.092	.50(13) 65.00
100	\$1,150.00	045.093	.50(13) 65.00
200	\$1,875.00	045.094	.50(13) 65.00
500	\$2,900.00	045.095	.50(13) 65.00
15 20 25 30	\$2,600.00	045.096	.50(13) 65.00



Note: VVO represents the equivalent V opening of a solid V die.



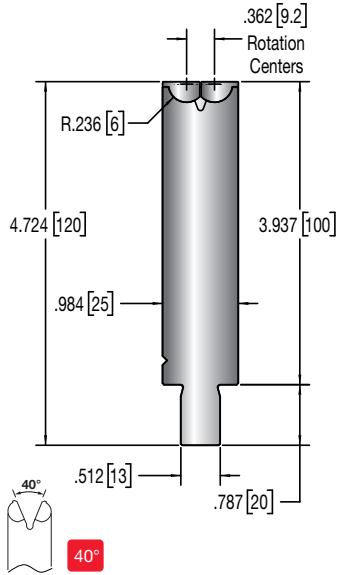
CLEANBEND™ WILA TRUMPF STYLE

Wila Trumpf Style

CB 000 Wila Trumpf Type VVO H

Maximum Material Thickness — 2.0mm

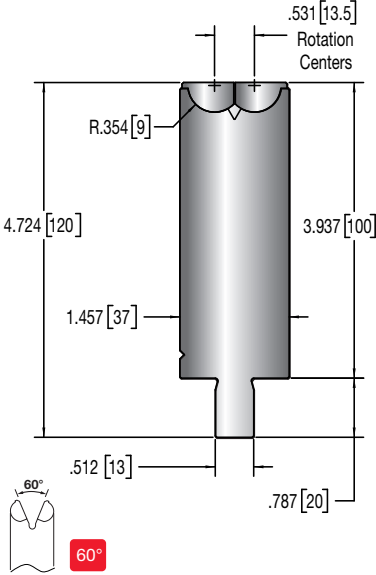
50	\$525.00	029.000L	.32(8)	100.00
100	\$750.00	029.000C	.32(8)	100.00
200	\$1,300.00	029.000D	.32(8)	100.00
300	\$1,825.00	029.000T	.32(8)	100.00
500	\$2,600.00	029.000S	.32(8)	100.00



CB 100 Wila Trumpf VVO H

Maximum Material Thickness — 3.0mm

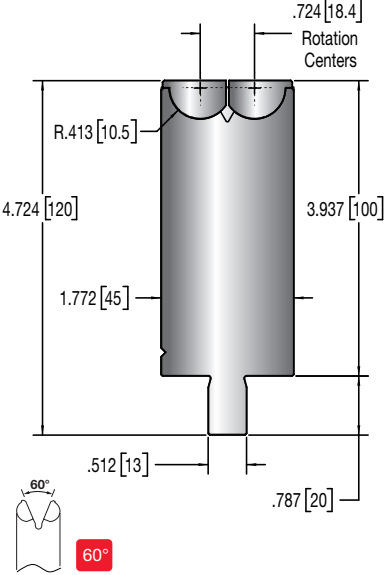
50	\$600.00	029.100L	.48(12)	100.00
100	\$875.00	029.100C	.48(12)	100.00
200	\$1,500.00	029.100D	.48(12)	100.00
300	\$2,100.00	029.100T	.48(12)	100.00
500	\$3,000.00	029.100S	.48(12)	100.00



CB 150 Wila Trumpf Type VVO H

Maximum Material Thickness — 4.0mm

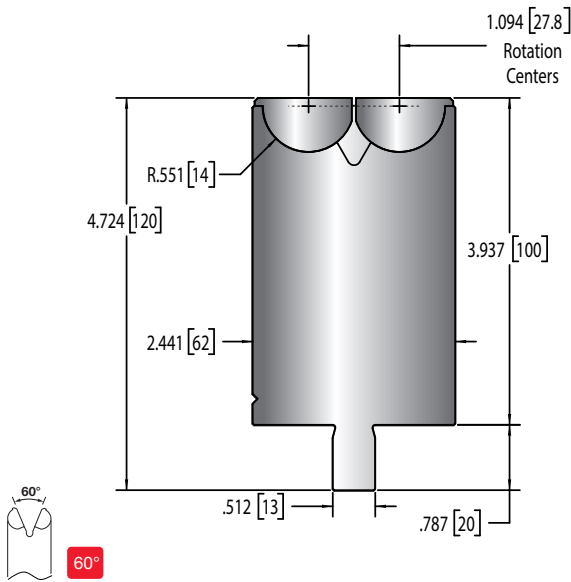
50	\$750.00	029.150L	.59(16)	100.00
100	\$1,100.00	029.150C	.59(16)	100.00
200	\$1,900.00	029.150D	.59(16)	100.00
300	\$2,650.00	029.150T	.59(16)	100.00
500	\$3,800.00	029.150S	.59(16)	100.00



CB 200 Wila Trumpf Type VVO H

Maximum Material Thickness — 5.0mm

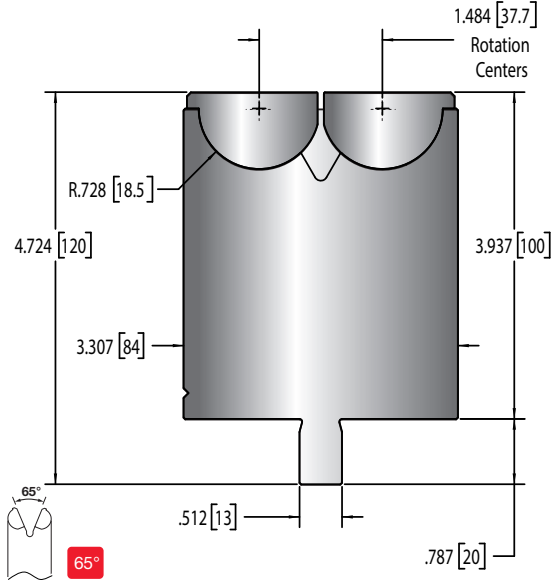
50	\$850.00	029.200L	.96(24)	100.00
100	\$1,200.00	029.200C	.96(24)	100.00
200	\$2,150.00	029.200D	.96(24)	100.00
300	\$3,000.00	029.200T	.96(24)	100.00
500	\$4,300.00	029.200S	.96(24)	100.00



CB 300 Wila Trumpf Type VVO H

Maximum Material Thickness — 6.0mm

50	\$1,050.00	029.300L	1.21(30)	100.00
100	\$1,450.00	029.300C	1.21(30)	100.00
200	\$2,600.00	029.300D	1.21(30)	100.00
300	\$3,650.00	029.300T	1.21(30)	100.00
500	\$5,200.00	029.300S	1.21(30)	100.00



Note: WVO represents the equivalent V opening of a solid V die.



CLEANBEND™ ADAPTERS AND MAINTENANCE

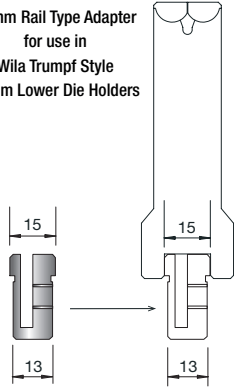
Rail 15mm Adapters

For use with European Precision Style – See page 4.

Adapt to Wila Trumpf Style

TWS FITBAR ADAPTER		
50	\$115.00	045.065
100	\$145.00	045.066
200	\$155.00	045.067
500	\$375.00	045.068
15 20 25 30	\$460.00	045.069

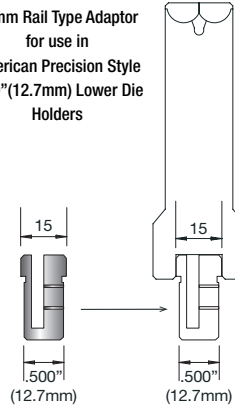
15mm Rail Type Adapter for use in Wila Trumpf Style 13mm Lower Die Holders



Adapt to American Precision Style

APS FITBAR ADAPTER		
50	\$115.00	045.074
100	\$145.00	045.075
200	\$155.00	045.076
500	\$375.00	045.077
15 20 25 30	\$460.00	045.078

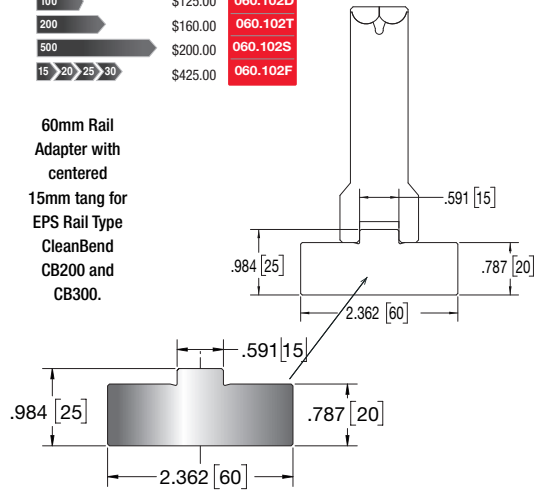
15mm Rail Type Adaptor for use in American Precision Style .500" (12.7mm) Lower Die Holders



Adapt to European Precision Style

EPS RAIL ADAPTER		
50	\$90.00	060.102C
100	\$125.00	060.102D
200	\$160.00	060.102T
500	\$200.00	060.102S
15 20 25 30	\$425.00	060.102F

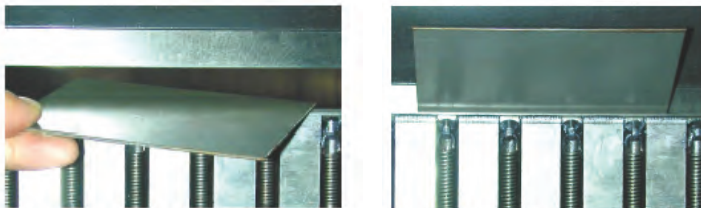
60mm Rail Adapter with centered 15mm tang for EPS Rail Type CleanBend CB200 and CB300.



Maintenance and lubrication:

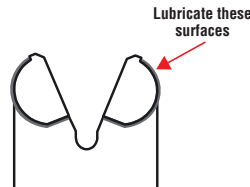
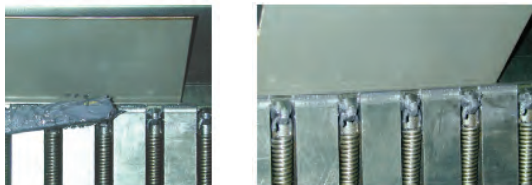
- Inspect and lubricate every 20,000 cycles of normal use.
- Every 10,000 cycles is recommended in dirty, extreme or heavy duty environments.
- Lubricate and maintain all working surfaces especially areas where rotation occurs.
- Keep working surfaces clean of dirt or shavings that can interfere with the smooth rotating action of the working surfaces.
- Lubricate springs and spring cavities with a light corrosion inhibiting industrial grade oil.
- Grease rotation contact surfaces with high pressure grease such as MolyKote EP grease by Dow Corning.
- Springs are accessible from the outside for easy maintenance and lubrication. No special tools are required.

Step 1 and 2



To expose the rotating working surfaces for lubrication, cycle the brake to engage and rotate the die.

Step 3

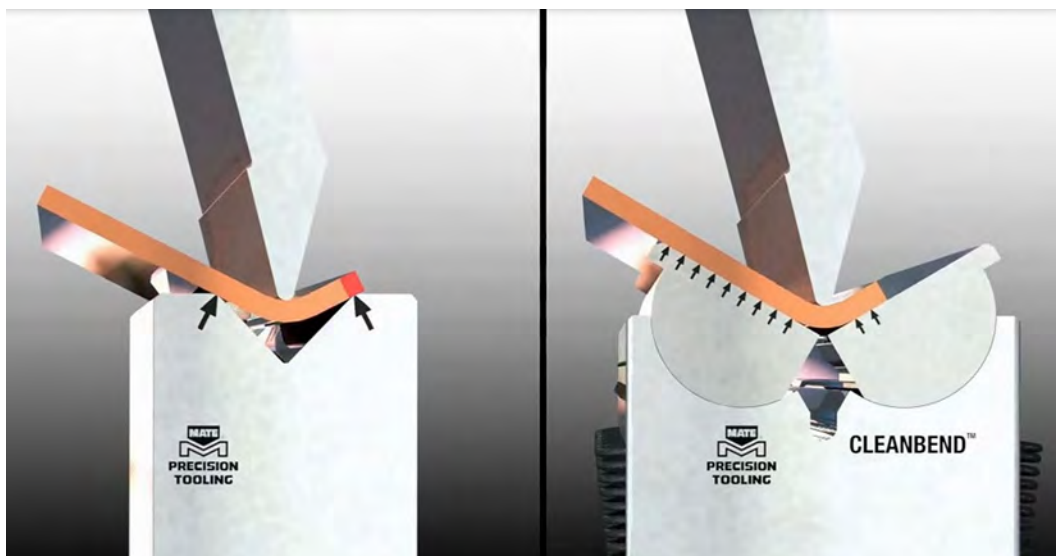


Grease rotation contact surfaces with high pressure grease such as MolyKote EP grease by Dow Corning, every 20,000 cycles of normal use.



CLEANBEND™ BENEFITS

Wide contact surfaces rotate to support the material while bending



To see the Mate® CleanBend™ technology in action go to:
<https://www.youtube.com/watch?v=wANZFc3HT0s>

Short flanges without die marks are easy with CleanBend



V die

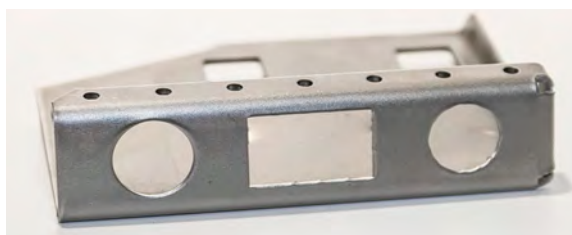


CleanBend™

Bends close to cutouts without die marks are easy with CleanBend



V die



CleanBend™





visit mate.com

MATE PRECISION TOOLING

WORLDWIDE HEADQUARTERS:

1295 Lund Boulevard, Anoka, Minnesota 55303 USA
Tel +1.763.421.0230 Fax +1.763.421.0285 mate.com

The Mate Logo is a registered trademark of Mate Precision Tooling Inc.
Amada Promecam is a registered trademark of Amada Europe Corporation.
Trumpf is a registered trademark of Trumpf GMBH & Co.
Wila is a registered trademark of WILA B.V.