

MDA – New grinding wheel concept for grinding superhard cutting materials

Grinding layers with new metal bonds achieve superlative values when machining cutting inserts made of superhard materials. The processing time can be reduced by up to 45 percent.

The machining of superhard inserts places stringent demands on the tool that is used. As a rule, ceramic bond systems are applied for this purpose, and occasionally synthetic resin or hybrid bond systems. The corresponding solutions have been technically perfected and have also been used at Diametal for many years. Nevertheless, the company remains true to its principle of continuously exploring new approaches and also considering unconventional solutions in the process. This attitude has led the developers at Diametal to re-examine the performance limits of metal bonds. Years of experience and the good results attained with metal bonds on machines with an in-process dressing unit have secured a promising basis to start from.

The results of this initiative, which are nothing short of overwhelming, now confirm the high expectations. Through systematic optimisation and innovative developments in the bond formulation, we have been able to produce abrasive rims with astonishingly good properties and performance values, as can be seen from the two examples cited. For instance, it has been possible to reduce the processing time for indi-

vidual inserts by up to 45% in comparison with the solution implemented up to now. Despite the significantly higher removal rate achieved by the new tool, the service life of the grinding wheel has not suffered as a consequence. The machining of the workpiece is therefore markedly more efficient as a whole and more economical as a result.

The results are impressive and they validate our conviction that it pays off to break new ground. It is now up to the users to profit from this know-how and the new insights gained.

MORE INFO

For more details please contact:

Beat Gilomen

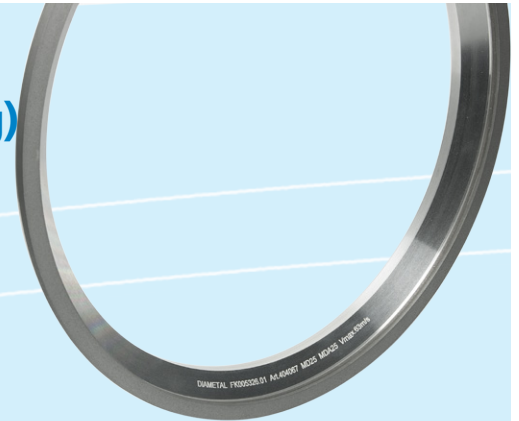
Tel. +41 (0)32 344 32 89

beat.gilomen@diametal.ch

DIAMETAL FK005326.01 Art.404087 MD25 MDA25 Vmax 83m/s



Grinding example with MDA wheels Machine with U-axis (In-Process Dressing)



Full CBN insert	various grades	
Blank	13.2x13.2x4.8 sharp-edged	volume 840 mm ³
Finished part	12.7x12.7x4.8	volume 760 mm ³
Removed volume	80 mm ³	
Largest contact area	65 mm ²	
4x radius 1.6 mm		
Protective chamfer	20°x0.2 mm both-sided	
Coolant	oil	
In-Process Dressing		

	Standard	New concept
Grinding wheel grit size	MD25	MD25 MDA27
Grinding wheel dimension	400x16x6mm	400x16x6mm
Cycle time	270 – 330s	150 – 180s
Grinding wheel wear per insert	0.0035 – 0.0055mm	0.0045 – 0.0065mm
Dressing wheel wear per insert	0.25 – 0.45mm	0.050 – 0.065mm
Normal force	300 – 450N	150 – 200N
Quality	initial position	improved because of lower forces

Carbide insert	tangential insert	
Blank	16.5x9.5x4.9 sharp-edged	volume 770 mm ³
Finished part	16.0x9.5x4.4	volume 650 mm ³
Removed volume	120 mm ³	
Largest contact area	155 mm ²	
4x radius 1.6 mm		
Protective chamfer	10°x0.2 mm both-sided	
Coolant	oil	
In-Process Dressing		

	Standard	New concept
Grinding wheel grit size	D46	D39 MDA25
Grinding wheel dimension	400x16x6mm	400x16x6mm
Cycle time	200s	130s
Grinding wheel wear per insert	0.00030mm	0.00035mm
Dressing wheel wear per insert	0.020mm	0.007mm
Normal force	150N	100N
Quality	initial position	improved because of lower forces improved because of finer grit size