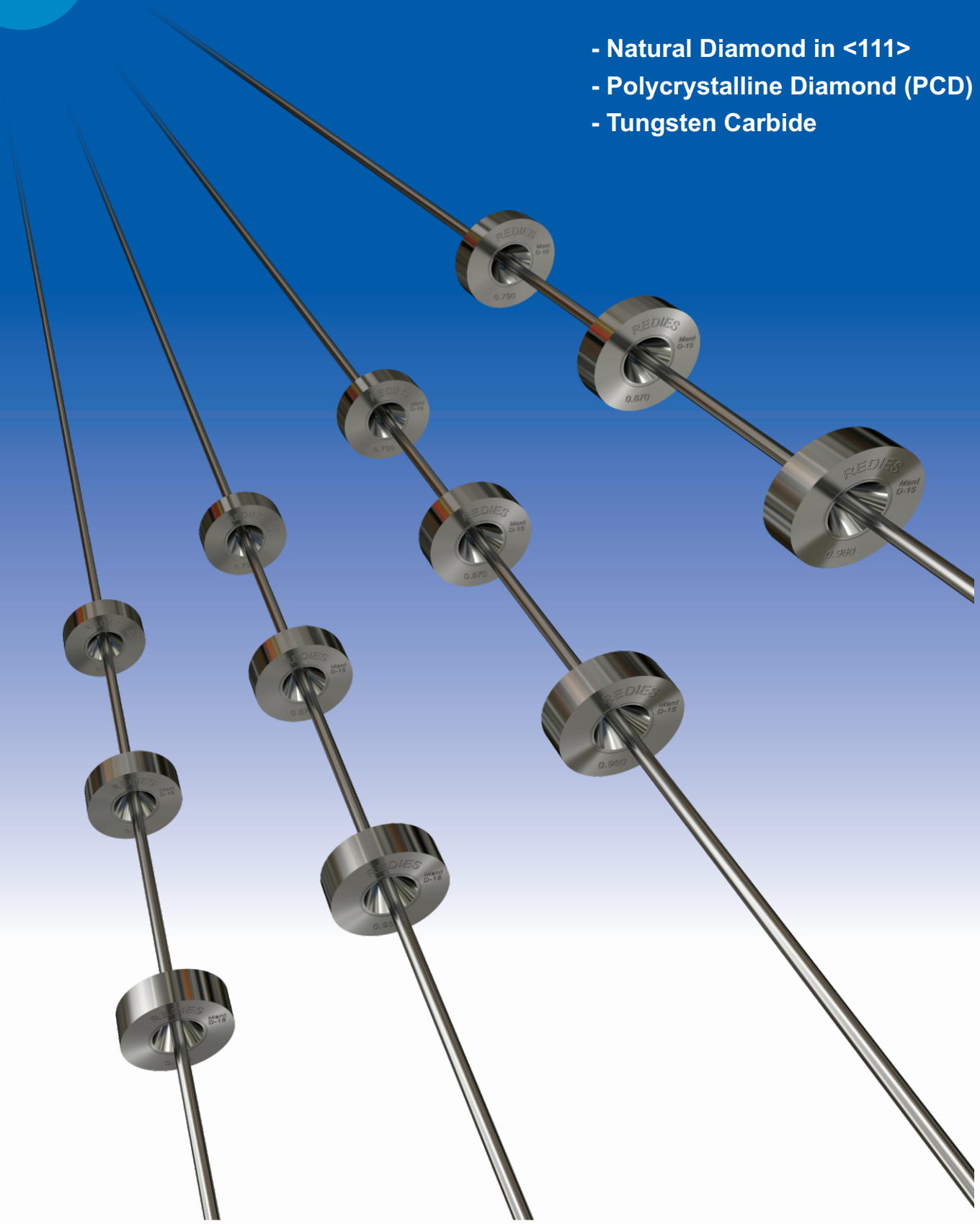
REDIES

Wire drawing dies

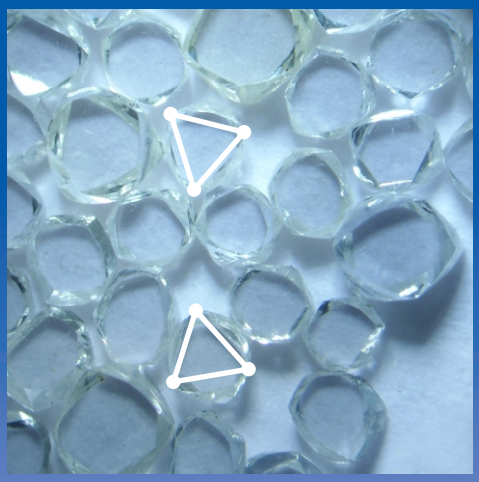
- Natural Diamond in <111>
- Polycrystalline Diamond (PCD)
- Tungsten Carbide



Advantageous products …
need the right materials

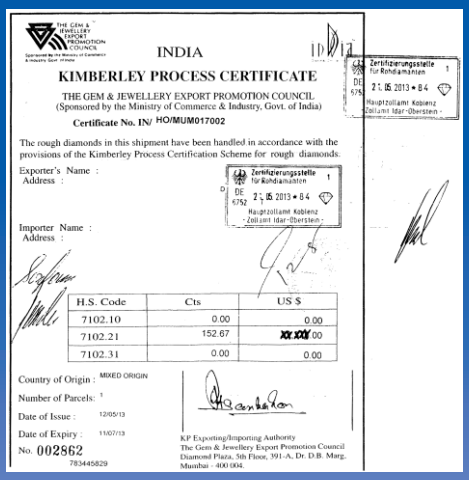
Diamond is carbon in crystalline form.
Crystals have direction-dependent (anisotropic) material properties.
The hardness of diamond is also dependent on the direction.
Optimal use of raw materials only by exact orientation!

To determine this orientation a clear and easily detectable crystal form is necessary. REDIES exclusively buys for the ND dies octahedron (double pyramid) or round dodecahedron models.



With an ideal crystal orientation 6 hard "nodes" occur around the perimeter of the bore. Cannot be better! For this the drilling must be perpendicular to one of the octahedral faces, i.e. in the crystalline direction <111>.

Our REDIES dies show the best results for dimensional accuracy (roundness) and tool life. The small triangle engraved on the front of our ND drawing dies is the symbol for the triangular octahedron face which is exactly perpendicular laser-pierced.



INDIA

KIMBERLEY PROCESS CERTIFICATE

THE GEM & JEWELLERY EXPORT PROMOTION COUNCIL
(Sponsored by the Ministry of Commerce & Industry, Govt. of India)

Certificate No. IN/ HO/MUM017002

The rough diamonds in this shipment have been handled in accordance with the provisions of the Kimberley Process Certification Scheme for rough diamonds.

Exporter's Name :
Address :

Importer Name :
Address :

H.S. Code	Cts	US $
7102.10	0.00	0.00
7102.21	152.67	xx,xxx.00
7102.31	0.00	0.00

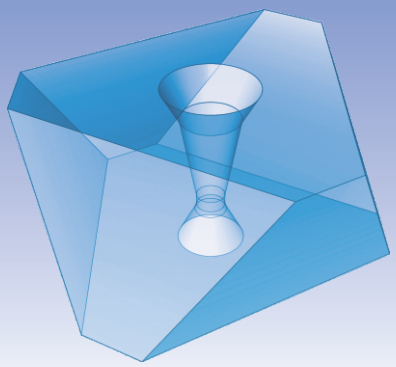
Country of Origin : MIXED ORIGIN
Number of Parcels : 1
Date of Issue : 12/05/13
Date of Expiry : 11/07/13
No. 002862

KP Exporting/Importing Authority
The Gem & Jewellery Export Promotion Council
Diamond Plaza, 5th Floor, 391-A, Dr. D.B. Marg, Mumbai - 400 004.

Expert diamond cutters enlarge the parallel surfaces so that the die geometry can be placed in a regular cylindrical diamond body.

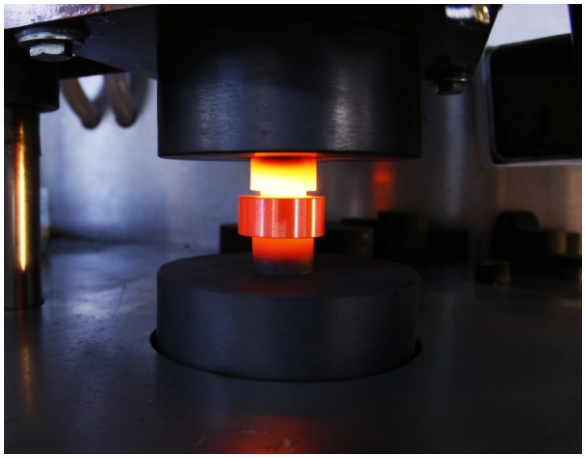
The second and equally important feature of the materials selected by us is the inner cleanliness. Stones with inclusions, gas bubbles or micro-cracks are not used, as these impurities would appear later on the inner surface of the die.

Natural Diamond in <111>



The colour of the diamonds is rather unimportant for our technical purposes. Our purchase of rough diamonds takes place where mass flows of diamond are processed into jewelry.

100 % of our goods have a certification in accordance with the Kimberley Process, whereby the trade in conflict-diamonds is counteracted.
see: www.kimberleyprocess.com



HIGH PRESSURE SINTERING

After optical centering in casings made of crack-detected stainless steel the sintering process is carried out at 200 bar and 950 °C. Fine-grain nickel base alloys or silver blended bronze alloys provide a "corset" to pre-stress the ND or PCD.

Only the conductive sintering method is applied at REDIES with ND or PCD dies. In contrast to the induction heating in this case the maximum temperature is generated in the center of the workpiece. Thus optimal embedding of the diamond resulting in good absorption of the drawing stress and dissipation of the process heat.

MANT®

Perfection & Competence in Diamond

POLYCRYSTALLINE DIAMOND (PCD)

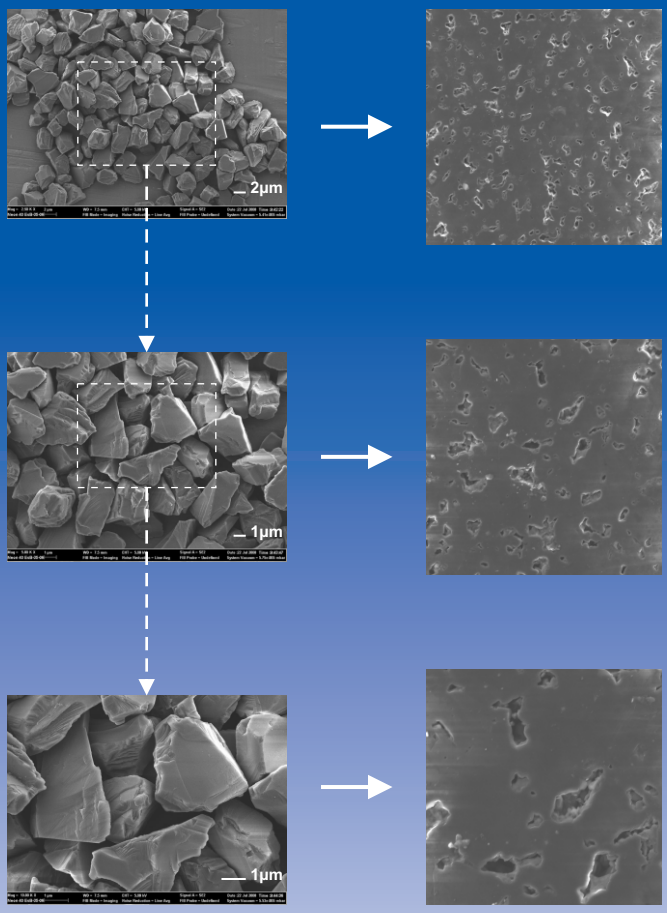
REDIES manufactures PCD materials from all well-known PCD producers into wire dies according to customers standards. Especially at great strain in steel drawing the dies made with MANT PCD have been proven as outstanding.
The MANT blanks are produced with focus on the selection of raw materials:
- Extremely clean diamond powder. Impurities less than 70 ppm.
- Very narrow range of grain size.
- Blocky structure of the crystals lacking "needles" and brittle "plates".

The sequence of SEM photograph images is showing the structure before and after the high-pressure liquid-phase sintering at different magnifications.
The images are taken from a standard material with 5 micron grain size.
What's really striking is the blocky structure of the original grains.

Interesting also what can not be seen on the pictures. Small and large crystals outside the narrow bandwidth are entirely absent
(see also the distribution diagram).

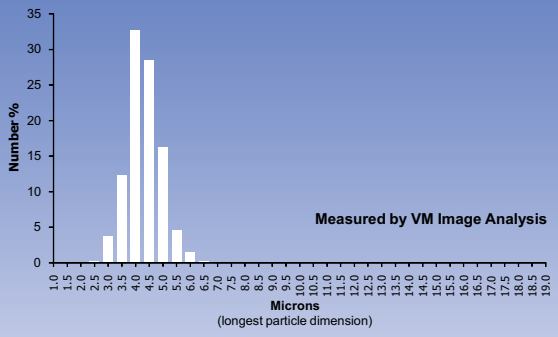
The diamond matrix generated in the synthesis process on the images to the right (92 % C + 8 % Co) shows the best amalgamation, i.e. bridging of the diamond crystals.

The remaining cobalt is formed in a globular shape. An extremely stable diamond "skeleton" has been created.



MICRON DIAMOND POWDER INSPECTION REPORT

Batch No.: **11316** Type/Size: **SYM 3-5**



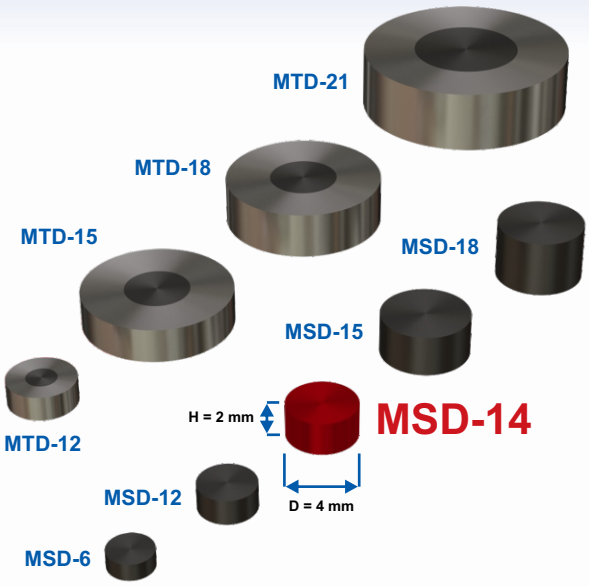
The "all-in-one" MANT MSD-14:

- Closes the huge gap in the size range between D-12 and D-14
- Can be used in the wire range from 0.2 up to 2 mm
- With 25 micron grain size excellent for drawing stainless steel

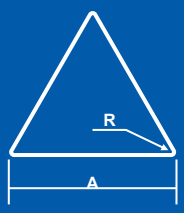
MANT® self-supporting PCD blanks

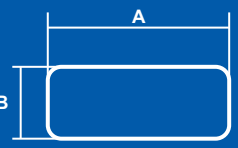
type	dimension D x H in mm	max. wire diameter in mm *	specific volume
MSD-6	2.5 x1.0	0.5	1
MSD-12	3.2 x 1.5	1.0	2
MSD-14	4.0 x 2.0	1.2	5
MSD-15	5.2 x 2.5	1.5	10
MSD-18	5.2 x 3.5	2.0	14

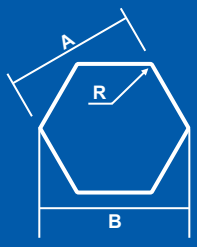
*** for new dies**

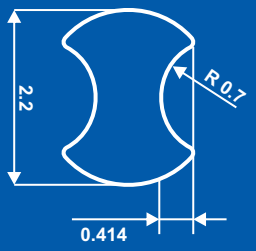


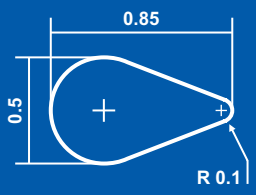
Examples of PCD profile tools

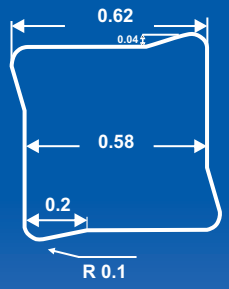




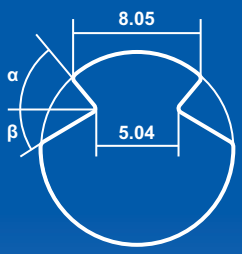








PCD profile tools are more and more substituting tungsten carbide tools. Some materials and certain strengths can be drawn economically only with PCD profiles.
REDIES customized profiles are made in the right tolerances according to the customer designs. Please feel free to contact us!



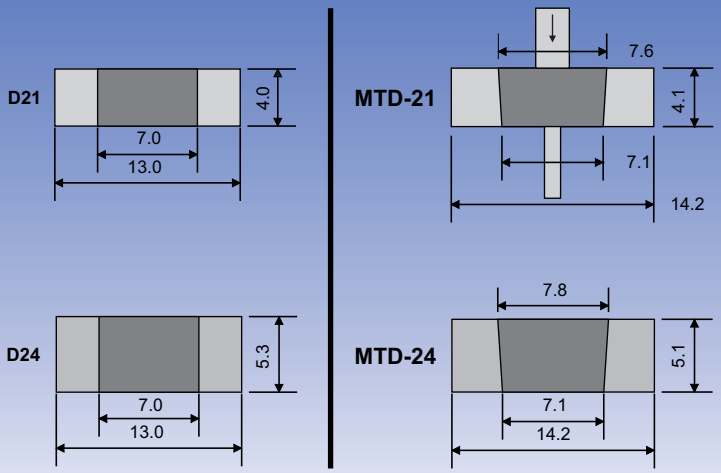
MANT PCD with conical fit in the tungsten carbide ring support.

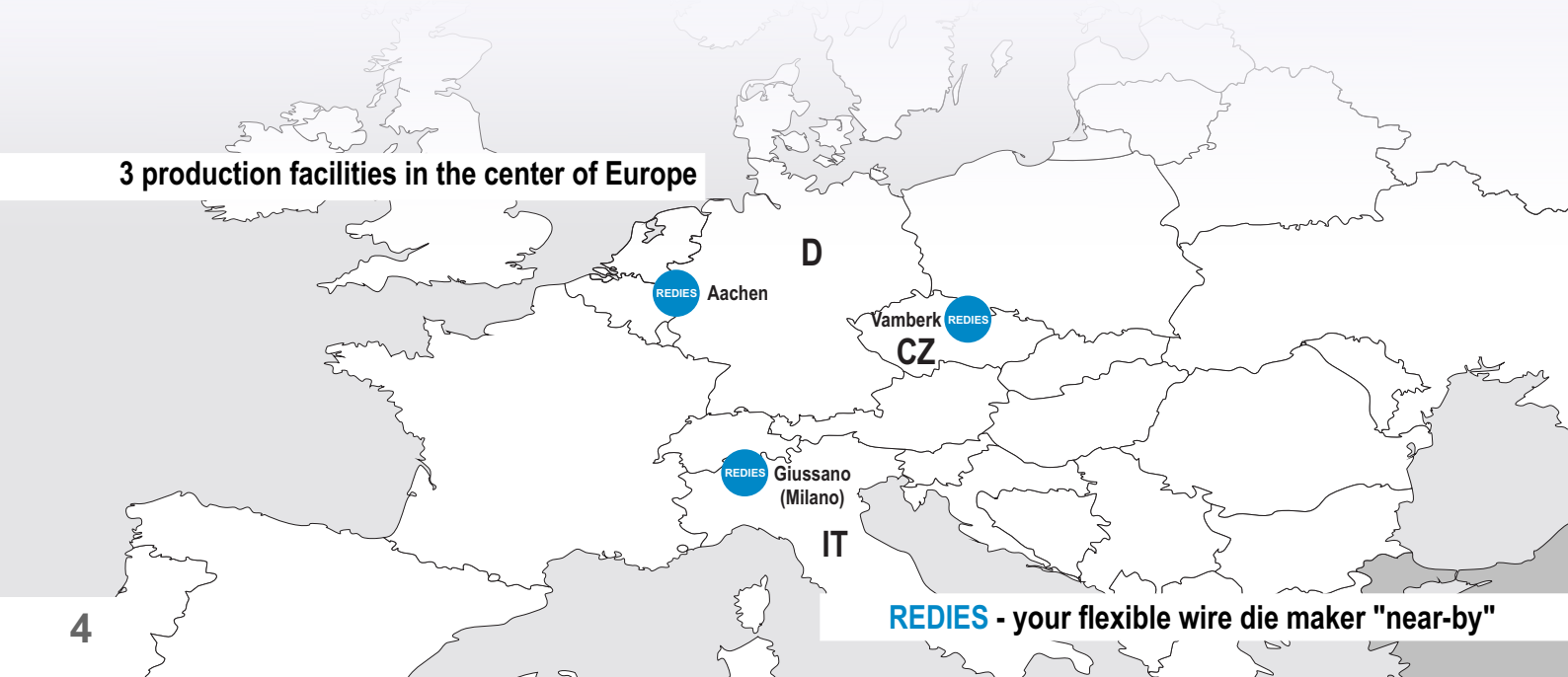
For wire diameters 1.5-2.0 mm and up the **MANT PCD** show higher structural stability than those in cylindrical setting of other brands.

The axial component of the drawing force is absorbed in a better way. Thus risk of breakage is reduced.

other PKD

MANT®





REDIES - your flexible wire die maker "near-by"