

Brief survey of how diamond/PCD dies are being worked by means of modern (EDER-) machines :

Questions of how to operate die working machines often do not concern so much the machines (= "automobiles") themselves, but clearly the "**die working KNOW HOW**" (= *driving school+driving license*) rather

Buying a machine (like e.g. a car/hardware) is easy, but running it to perfection (= availability of a driving license/software), is a totally different matter and no supplier of machines will automatically also offer/include a detailed Know How (software) for no extra cost.

The subsequently given information will give you a brief idea and answer to basic essentials of working ND/PCD dies by means of the necessary machines, although of course not down to the last details which clearly are content of "technical training/die working Know How" of course and available at cost only, if needed.

1) Ultrasonic machines (e.g. semi-automatic USP-115 or USP-TWIN) :

are working the conical/tapered parts of the die-geometry and there are the following operations possible :

a) de-ringing (= removal of a light/medium wear ring) -

in this case a workneedle in appropriate shape and suiting the die-reduction angle is used and with rather fine-sized micron diamond powders only.

Such, the wear ring is removed quickly and the reduction cone re-polished again, without interfering much with the cylindrical bearing itself.

Result: this die can get used again at the same size until about 60% of the initial die-bearing length will be available only. In this case, the die must then get reworked to a larger bore-size then onwards.

b) Reworking/enlarging the die to a now and defined size :

is done based on the so called "**meeting-point method**", meaning that the point where a newly processed reduction cone and the exit cone of a die are meeting. This is due to a specific, but easy to perform calculation available.

Based on this "meeting point", a defined size and length of the cylindrical bearing can get achieved then at suitable wire-type sizing/polishing units such as our HGM-21 machine (or standard CGM-1, or special UFW-1 units) :

2) Wire type sizing/polishing machine procedure :(HGM-21 model)

have been designed to create and polish the cylindrical diamond/PCD die bearing and its length, whenever the bearing has to be renewed.

Process done : a suitable calibrating wire (tungsten wire for die-sizes smaller 0.10 mm / hard steel wire for medium sizes up to abt. 0.50 mm / copper wire for larger die-sizes) is taken and in a diameter of about 5 % larger than the a.m. meeting point size and this has to be done repeatedly in steps of 5% (as the wire gets used up during calibration work) and under the use of increasingly finer micron diamond powder granulations, while measurements are to be effected in between.

The last (polishing) wire should be larger for 2 % only and very fine diamond polishing powder/suspension being used for this final step, which will leave the such worked die at the dimension required.

The semi-automatic **EDER HGM-21** is very simple to operate with hands-free PLC control throughout operation once the machine has been initialised. Each die working station features an automatic work cycle stop giving an audio and visual indication whenever the relevant operation is completed.

For ultrafine sized diamond die-bores (0.010 mm Ø upwards), a specialist Eder machine, model **UFW-1** is available too.

More details are contained in the relevant operation manuals concerned too – but even this brief survey should allow a better understanding of how easy it will be to recondition all his worn out diamond and PCD dies, by means of advanced EDER machines, which are simple to operate and – in case of semi-automatic equipment - with most working parameters easily established and maintained throughout all operations.

ATTENTION:

Please mind that for a perfect cleaning of dies, an Ultrasonic die cleaning tank unit (e.g. our Sonomatic models) and for the optical inspection of the dies' geometry and surface condition, an efficient special microscope with high magnification (e.g. our model DIM-Zoom 160) will be needed and should be available in every modern die workshop !

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