

MEETING POINT

DRAWING DIE DIAMETER MEASUREMENT

Task

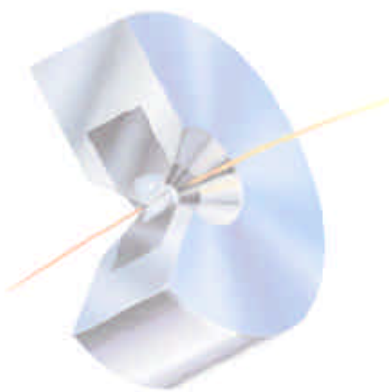
When drawing dies are produced, or reworked, the meeting point diameter is measured as a part of the production process. This enables the operator to size the die to a correct combination of final diameter and bearing length. Usually the meeting point diameter is calculated by assuming what the final diameter, final bearing length, reduction angle, and exit angle are known. See equation below.

Solution

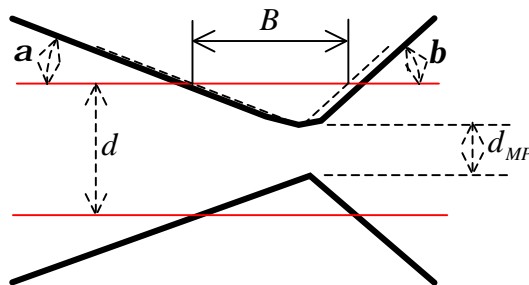
By using the Diameter&Ovality Supervisor the meeting point diameter can be quickly measured with the highest accuracy available in the market, making this process control an optimum choice. From this meeting point diameter estimates of what will be the final combination of bearing and diameter is calculated. By starting with final data this supervisor can also display what meeting point diameter one should aim for.

Benefit

It is of utmost importance to start sizing the die from the correct starting diameter, otherwise the final diameter, the final bearing length, or both, will be out of the specifications. In the long run the alternatives are more expensive, either caused by longer measurement time or less control of the final die quality. The advantage is that this directly on-the-die measuring technique avoids pulling a wire through the unfinished die, and then deduce the die diameter from the wire diameter. Although pin or air pressure gauges can be used, these techniques are both time consuming and less accurate, especially for small diameters. For these unfinished dies we know that the light is grazing along a short distance (the meeting point) inside the die making the grazing and off-angle corrections small. These measurements are therefore especially accurate and repeatable.



$$d_{MP} = d - \frac{2 \cdot B}{ctg(a) + ctg(b)}$$



Step by Step

- By use of the “Meeting Point Model” measure the meeting point diameter by manually or automatically placing the die on the measurement table, and start measurement (for maximum accuracy we advice that the grazing length is set to a length smaller than 10% of the diameter. 5% is a good choice).
- After a couple of seconds the measurement results are displayed on the monitor screen. Both the meeting point diameter and ovality is shown.
- In addition calculations of the final combination of bearing length and diameter, and estimates of the optimum meeting point diameter are displayed.