



# SONY METALS

**Excellence in Every Die**



# Introduction

SONY METALS Precision manufacturing capabilities are unique within the wire die industry, laser drilling technology and a disciplined approach to quality assurance help to provide exceptional repeatability in the manufacture of close tolerance.

To optimize the performance of today's high speed multi-wire drawing machinery SONY METALS manufactures wire drawing die sets that accurately matched to the elongation of wire drawing machines.

SONY METALS attention to precision and quality materials is the foundation of its specialty products. PCD and TC for various wires. Large diameter poly dies available for standing, bunching and tubing operations

Finally each die in the set is performance tested for the correct wire elongation and die pull. these dies can be used as a set since each die has been matched one to the other.

P.C.D. dies are used to draw both ferrous and non-ferrous metals at both high and low speeds.

Polycrystalline diamond dies have changed the wire industry substantially in the past 30 years when they began to arrive on the market. SONY METALS has grown with this product in terms of developing the techniques required to achieve the high surface finish required to meet the demands of today's market.

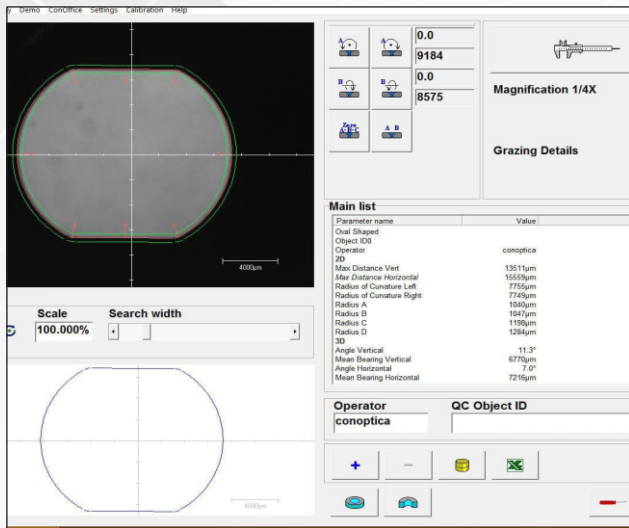
SONY METALS has the ability to produce PCD dies in a size range of 0.050mm to over 30.00mm in diameter for potential use in drawing, stranding, bunching, or tube drawing.

Our wire drawing dies have been successfully used in drawing many different materials, from copper, aluminium and stainless steel to new applications like CCA, CCS, medical wire and tubes. SONY METALS has developed a complete range of drawing tools/dies to meet the requirement of today's wire manufacturers.





# Quality Control



Profile Inspection



Laser Profiling



Sintering



# Tungsten Carbide Dies

LOW & HIGH CARBON- COPPER-ALU-ALLOY-STAINLESS STEEL-FLUX CORE-CO2-MIG WELD WIRE

## Finished Dies :

sony metals & turner can supply finished tungsten carbide dies. the precise technology and exact standards guarantees, better control of critical measurements such as reduction angle, bearing length and hole size dimension.

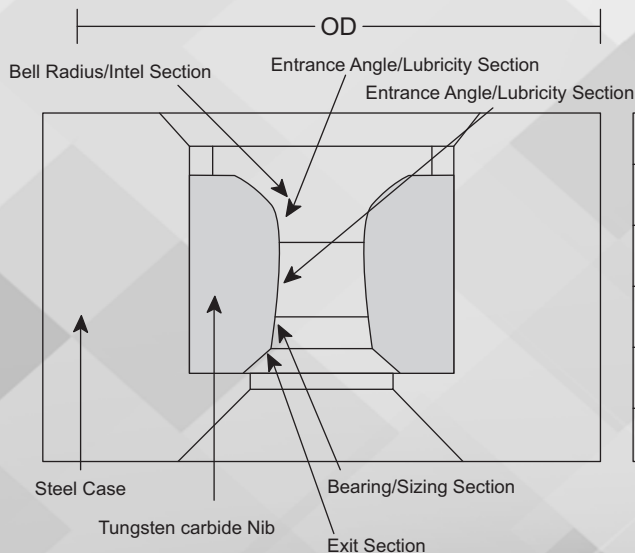
## Rough Cored Dies :

sony metals & turner superior mounting system assures concentrically mounted nibs with excellent support, from our large inventory you can select different nibs size from sandvik, Kennametal and TKT italy along with rough bore and casing size to meet your requirements.

## Dependable Quality :

sony metals & turner has made every effort to maintain rigid quality standards to assure our customers the best possible product.

| NIB NUMBER | NIB O.D. | NIB HEIGHT | CASING O.D. | CASING HEIGHT | HOLE SIZE RANGE |
|------------|----------|------------|-------------|---------------|-----------------|
| AT1        | 10       | 8          | 28          | 15            | 0.200-1.00      |
| AT2        | 13       | 10         | 28          | 15            | 1.00-2.00       |
| AT3        | 17       | 15         | 43          | 27            | 2.01-3.50       |
| AT4        | 19       | 17         | 43          | 27            | 3.51-5.00       |
| AT5        | 22       | 18         | 53          | 34            | 5.00-8.00       |
| AT6        | 25       | 20         | 70          | 40            | 8.00-10.00      |
| AT7        | 30       | 24         | 70          | 40            | 10.00-12.00     |
| AT8        | 35       | 24         | 70          | 40            | 12.01-14.00     |
| AT9        | 40       | 24         | 70          | 40            | 14.00-16.00     |
| AT10       | 45       | 25         | 70          | 40            | 16.01-21.00     |



| Part Names          | Soft Wire   | Hard Die    |
|---------------------|-------------|-------------|
| Intel Section       | 80°±20°     | 80°±20°     |
| Lubricity Section   | 35°±5°      | 35°±5°      |
| Compression Section | 16°±2°      | 16°±2°      |
| Sizing Section      | 0.20 - 0.50 | 0.4D - 0.8D |
| Exit Section        | 60°±20°     | 60°±20°     |



# Polycrystalline Diamond dies

wire drawing, Stranding & Compacting dies

We manufacture Polycrystalline Diamond dies in the size range of 0.150-15.00 mm.

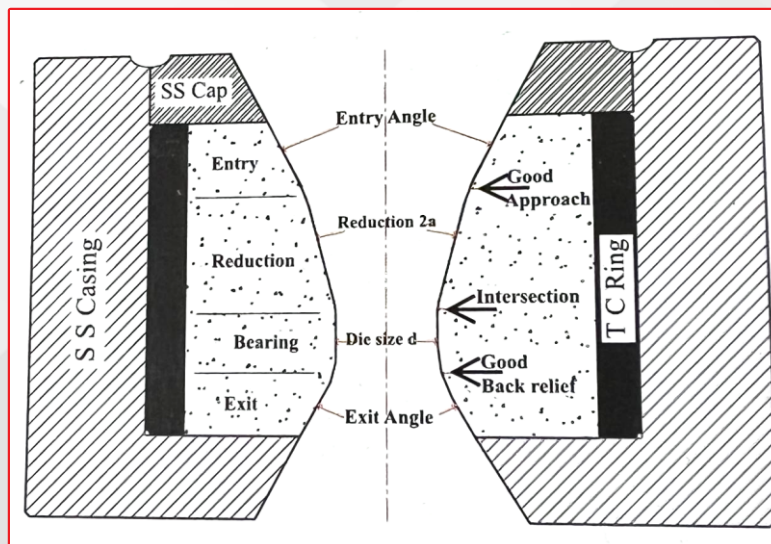
PCD blanks are available in 2 types - Self supported and Tungsten ring supported. Also different grain sizes of 1,3, 5, 10, 25 & 50 microns are available.

The PCD blanks are directly sourced from well known manufacturers mainly M/s Sandvik Hyperion (Formerly Diamond Innovations / GE), M/s Sumitomo & SF diamonds etc.



Thermally stable PCD blanks are mounted upto a temperature of 1200°C and these blanks are well suited for hot wire drawing applications.

Our PCD dies are widely used for drawing wet and dry stainless steel, Medical, Low and High Carbon Steel, Welding wire, Copper & Aluminium conductors, magnet, EDM, Tungsten, molybdenum, coated and alloy wires etc. Right selection of PCD blank and profile ensures perfect compacting of conductors, good surface and long life.



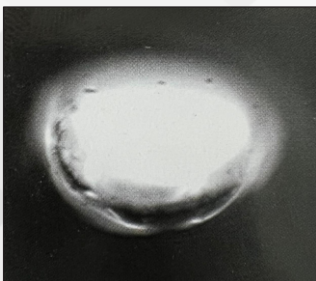
Typical profile of PCD Die

| S.No. | Details             | Soft Wire | Hard Wire |
|-------|---------------------|-----------|-----------|
| 1.    | Reduction Angle, 2a | 16-20°    | 10-14°    |
| 2.    | Bearing length      | 16-20°    | 35-40% d  |
| 3.    | Entry Angle         | 60°±10°   | 60°±10°   |
| 4.    | Exit Angle          | 60°±10°   | 60°±10°   |

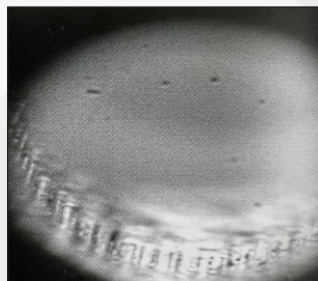
## Reconditioning & Repolishing Die Services



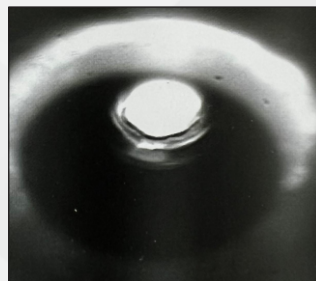
**What Happens?** The efficiency of the wire plant, wire surface, size & roundness of the wire is directly dependent on the condition of the string of dies. After many kilometers of wire drawing, a "wear ring" is formed at the contact point in the die profile. At this point, the dies need repolishing to retain the original die profile and roundness. Repolishing will bring back the die life, improves the wire surface finish, retains the size and reduces the wire breakages there by improving the productivity of the wire plant. When the wear ring is severe or the damage in the die profile is big and when the size is beyond tolerance, the dies are resized and re polished.



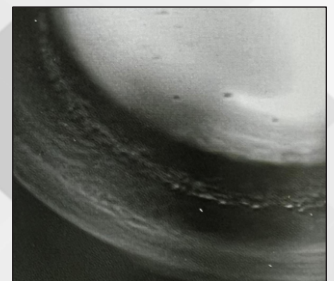
Pits at CP



Deep scratches



Deep wear-out



Wear ring

**What we do?** On receipt of the used dies at SONYMETALS plant, our inspector checks each and every die for its present size and visually checks under microscope for wear pattern and its severeness and decides if the die qualifies for repolishing or it should be resized. The inspector prepares a report and sends it to the customer informing the condition of the die and asks for approval to repolish or requests the customer to issue 3 nearest sizes to resize. Upon customer approval, the dies are repolished or resized. If required, the entry face of the casing is cleaned and new size is marked.

**What you get!** At SONYMETALS, every used die goes through the entire die working process including laser profiling if required and processed like a new die. As a result, our customers get highest advantage of SONYMETALS resources, as every used die gets new life to give prolonged performance.

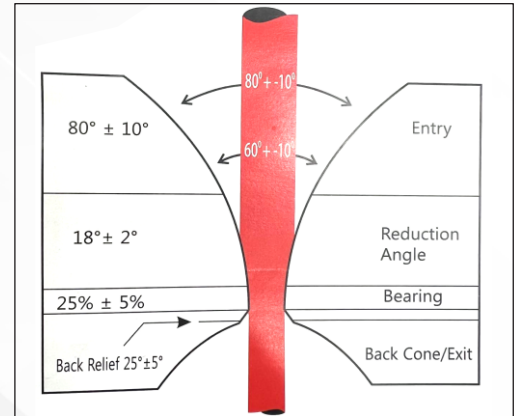
## A Typical Die Profile

The Entrance Cone has as its primary task to function as a "funnel" and to introduce a uniform distribution of the lubricant on the wire.

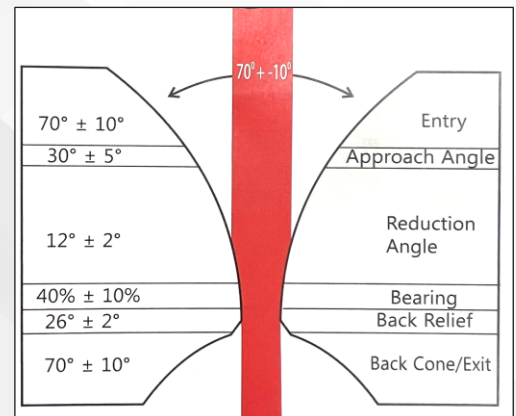
The Reduction Zone is that part of the drawing die where the reduction of the material takes place. The size of the drawing angle  $2\alpha$  is decided chiefly from a consideration of the value of the reduction.

The Bearing decides the size and surface finish of the drawn material. The form of the bearing is substantially cylindrical, although the diameter does increase slightly towards the reduction zone. Increasing the bearing length will give the die a somewhat longer life, but it also causes increased friction, greater generation of heat and poor lubricating action.

The Exit Angle serves to locate the power absorbing part of the die (The bearing) well inside the drawing bore, so as to prevent failures at the rear edge. When drawing dies are being regrind, care should be taken to see that a sufficiently large exit taper is left. It is also important for the exit taper to be accurately centered in line with the bearing to ensure that the wire will leave the die round and straight.



Poly-crystalline Diamond Die (PCD)



Poly-crystalline Diamond Die (PCD)

| Die Diameter | Tolerance in $\mu\text{m}$ | Roundness in $\mu\text{m}$ | Outer Dimension  |
|--------------|----------------------------|----------------------------|------------------|
| 0.051-0.099  | 0.0005                     | 0.0004                     | 25x8-25x10       |
| 0.1-0.500    | 0.001                      | 0.001                      | 25x8-25x10-28x12 |
| 0.501-1.000  | 0.0015                     | 0.0015                     | 25x10-28x12      |
| 1.001-2.500  | 0.0025                     | 0.002                      | 28x12-43x27      |
| 2.501-5.000  | 0.003                      | 0.002                      | 528x12-43x27     |
| 5.001-10.000 | 0.005                      | 0.004                      | 43x27-53x30      |

### TYPICAL DIES SPECIFICATIONS FOR VARIOUS WIRE MATERIALS

| Wire Material               | Degree of Blending | Reduction Angle        | Bearing Length  | Entry Angle             | Exit Angle              |
|-----------------------------|--------------------|------------------------|-----------------|-------------------------|-------------------------|
| Bare Copper                 | Well Blended       | $18^\circ \pm 2^\circ$ | $30\% \pm 10\%$ | $70^\circ \pm 10^\circ$ | $60^\circ \pm 10^\circ$ |
| Aluminum                    | Well Blended       | $20^\circ \pm 2^\circ$ | $20\% \pm 10\%$ | $70^\circ \pm 10^\circ$ | $60^\circ \pm 10^\circ$ |
| Aluminum Alloy              | Well Blended       | $14^\circ \pm 2^\circ$ | $30\% \pm 5\%$  | $70^\circ \pm 10^\circ$ | $60^\circ \pm 10^\circ$ |
| Tin or Silver Plated Copper | Very Well Blender  | $20^\circ \pm 2^\circ$ | $20\% \pm 10\%$ | $60^\circ \pm 10^\circ$ | $60^\circ \pm 10^\circ$ |
| Stainless/high Carbon       | Slightly           | $12^\circ \pm 2^\circ$ | $45\% \pm 10\%$ | $60^\circ \pm 10^\circ$ | $60^\circ \pm 10^\circ$ |



# SONY METALS



Email id : [mkt@sonymetals.com](mailto:mkt@sonymetals.com) | Website : <http://www.sonymetals.com>

Mob. 8168528070,8685061569

Address :1813, Block 1C, Tower E-3, Narela, New Delhi, Delhi, 110040, India