



Fort Wayne Wire Die, Inc

**SINGLE CRYSTAL
NATURAL DIAMOND DIES**

**MORE WIRE PRODUCTION
FOR YOUR DIE INVESTMENT**

VALUE



Fort Wayne Wire Die single crystal natural diamond (SCND) dies are your best value because they deliver. More pounds of uniform wire per die. Greater consistency. Predictable wear. Superior recutability. And an overall reduced die cost.

Fort Wayne Wire Die carefully inspects all diamonds to ensure that they are free from carbon spots and internal defects. Plus, each die is properly profiled to offer uniform wire reduction, minimum die pull and good wire lubrication. Individually selected, X-ray-oriented, properly mounted, precisely profiled, highly polished and accurately sized, Fort Wayne Wire Die dies are an investment in wire drawing technology on which you can depend.

FORT WAYNE WIRE DIE IS YOUR BEST

SINGLE CRYSTAL NATURAL DIAMOND DIES

X-Ray Oriented

- More pounds of uniform wire.
- Greater consistency and die wear predictability.
- Extra productivity at each wire size throughout the die's life.

Individually Selected

- Free from carbon spots and internal defects.
- 100% individually inspected.

Diamond Flattening

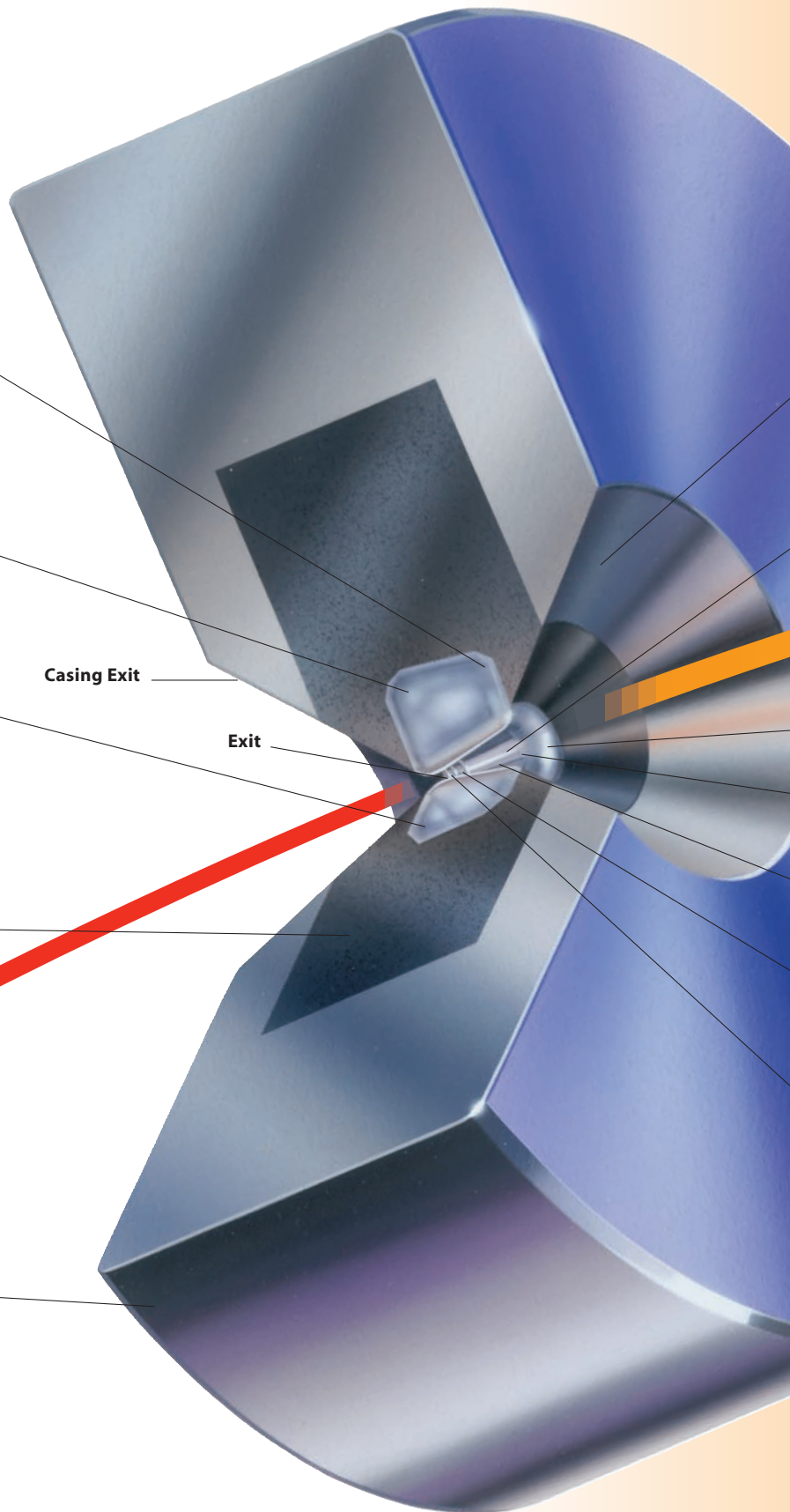
- Controls and maintains proper die orientation.
- Allows proper diamond centering for efficient use of the stone.
- Helps prevent high-sided dies.
- Facilitates diamond inspection.

One-Piece Mounting

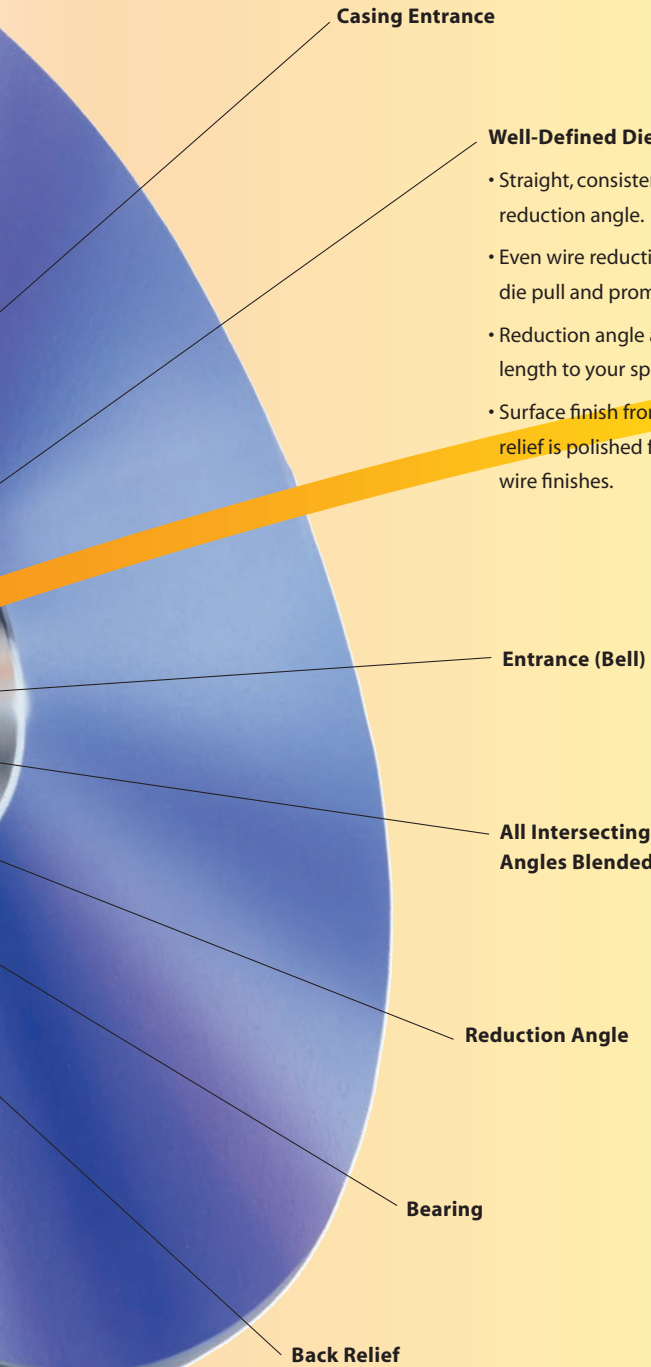
- Powdered metal matrix.
- Completely surrounds diamond.
- Pressure counterbalances drawing forces.
- Compressive force improves diamond strength.
- Excellent thermal conductivity to dissipate heat.

Stainless Steel Casing

- Durable stainless steel casing (special casing materials available).
- Stamped with hole size, manufacturer's name and a serial number.
- Casing dimensions to your specifications.



INVESTMENT



INDIVIDUALLY SELECTED

Diamond is the hardest, most durable material known to man. And carefully selecting individual diamonds is the first step in manufacturing high-quality wire drawing dies. At Fort Wayne Wire Die, each diamond is individually inspected and selected for good crystal shape and freedom from internal stress, cracks and carbon spots.

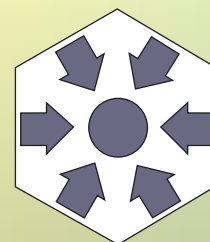
DIAMOND X-RAY ORIENTATION

Diamond orientation is the alignment of the axis of the die with respect to the various planes of the diamond. Through the use of our exclusive X-ray procedure, Fort Wayne Wire Die is able to identify and select the correct plane for each diamond.

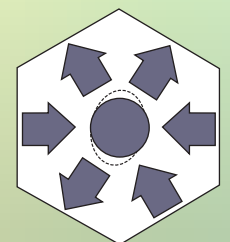
This procedure optimizes the abrasion resistance of the diamond and produces more wire for you at each die size. Because this is a permanent feature, it applies to each size throughout the life of the die.

Plus, achieving the best orientation—die after die—with X-ray technology helps provide predictable, uniform performance. This is a valuable consideration for customers implementing SPC and other quality assurance programs.

With X-ray orientation, the proper orientation plane provides more uniform wear characteristics around the bore circumference, producing rounder wire.



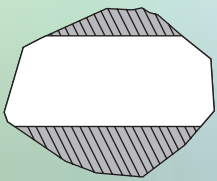
X-ray-oriented die



Nonoriented die

DIAMOND FLATTENING

Once the proper diamond orientation has been determined, two parallel flats are polished on the diamond. This procedure helps to control and maintain the proper diamond orientation during the manufacturing process. It allows Fort Wayne Wire Die technicians to properly center the diamond for the most efficient use, aids in the inspection of the diamond and reduces the possibility of high-sided dies.

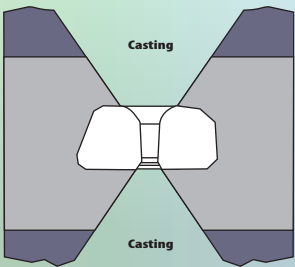


Side View

The process of polishing flats on both sides of the X-ray-oriented diamond ensures proper orientation through the entire manufacturing process.

ONE-PIECE POWDERED METAL MOUNTING

Fort Wayne Wire Die's one-piece mounting utilizes a powdered metal matrix that provides rigid reinforcement of the diamond, enabling it to withstand the drawing forces encountered, thereby reducing die breakage and improving die life. The powdered metal matrix also provides good thermal conductivity to dissipate the heat generated during the wire drawing process.



Special one-piece powdered metal mounting offers support on all sides of the diamond.

PRECISION PROFILED

For optimum wire drawing efficiency, the standard profile of each die from Fort Wayne Wire Die has a well-defined, straight reduction angle, as compared to a trumpet-shaped (convex) angle. A straight reduction angle provides uniform deformation of the wire and reduces drawing forces. In addition, a well-defined die profile promotes hydrodynamic lubrication, which provides for improved heat dissipation and longer die life.

ELONGATION SETS OF DIES

Our diamond dies are available in matched elongation sets especially designed for today's high-speed and multiwire drawing equipment. We have developed our own computer software to calculate the proper die sequences, and we physically performance-test the matched sets to ensure that they are the correct elongation.

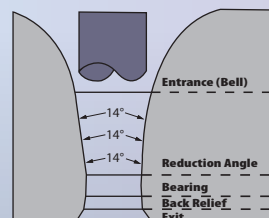
RECURTING SERVICE

We can recut your worn diamond dies for new die performance.

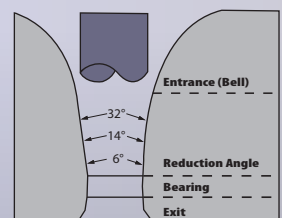
ONLY FROM FORT WAYNE WIRE DIE

With more than 70 years' experience as an industry leader, Fort Wayne Wire Die has the experience and technological capabilities to deliver the highest quality dies for all your wire drawing needs. When you require more pounds of uniform wire per die, greater consistency, predictable wear, superior capability for recutting and an overall reduced die cost, Fort Wayne Wire Die single crystal natural diamond dies are your best value.

FWWD's Straight Reduction Angle Profile



Trumpet-Shaped (Convex) Profile



Fort Wayne Wire Die's precision profiling technique ensures the straight reduction angle needed for optimum wire drawing efficiency.

Single Crystal Diamond Dies / SPECIFICATIONS



Fort Wayne Wire Die

Single crystal diamond (SCD) dies from Fort Wayne Wire Die are the result of expert technology and precision craftsmanship. The data shown below are standard specifications for typical wire drawing applications and apply equally to Single Crystal Natural or Single Crystal Synthetic Diamond Dies.

Fort Wayne Wire Die gives you the best in performance and quality because every diamond has been oriented in the optimum plane and high pressure mounted in a one-piece powdered metal matrix to give you flawless surface finish and consistent quality, run after run.

TOTAL BORE DIAMETER TOLERANCES SCD WIRE DRAWING DIES—NEW AND RECUTS

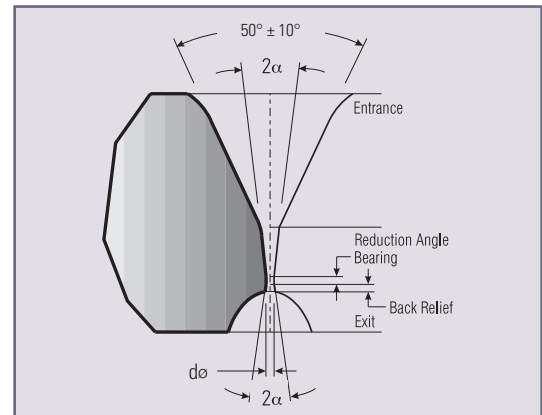
INCH

| Size Range | Standard Hole Size Tolerance STD102 | Standard Ovality Tolerance STD102 | Min. "Tightest" Hole Size Tolerance STD301 |
|---------------|-------------------------------------|-----------------------------------|--|
| .0006 or less | .000024 | .000020 | .000010 |
| .00061-.0008 | .000024 | .000020 | .000012 |
| .00081-.0010 | .000028 | .000020 | .000014 |
| .00101-.0020 | .000036 | .000020 | .000016 |
| .00201-.0030 | .000040 | .000020 | .000020 |
| .00301-.0040 | .000050 | .000030 | .000030 |
| .00401-.0050 | .000060 | .000040 | .000040 |
| .00501-.0080 | .000060 | .000040 | .000040 |
| .00801-.0100 | .000080 | .000040 | .000040 |
| .01001-.0160 | .000080 | .000040 | .000050 |
| .01601-.0200 | .000120 | .000080 | .000060 |
| .02001-.0300 | .000120 | .000080 | .000080 |
| .03001-.0400 | .000160 | .000100 | .000080 |
| .04001-.0600 | .000160 | .000100 | .000100 |
| .06001-.1500 | .000200 | .000120 | .000120 |
| .1501-.5000 | .000500 | .000500 | .000500 |

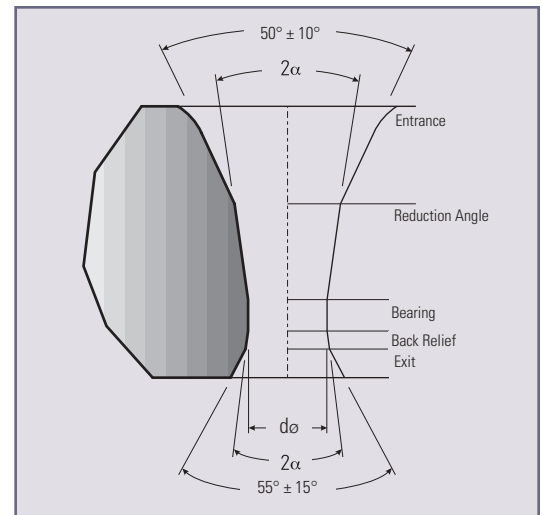
MILLIMETER

| Size Range | Standard Hole Size Tolerance STD102 | Standard Ovality Tolerance STD102 | Min. "Tightest" Hole Size Tolerance STD301 |
|---------------|-------------------------------------|-----------------------------------|--|
| 0.015 or less | 0.0006 | 0.0005 | 0.00025 |
| 0.0151-0.020 | 0.0006 | 0.0005 | 0.00030 |
| 0.0201-0.025 | 0.0007 | 0.0005 | 0.00035 |
| 0.0251-0.050 | 0.0009 | 0.0005 | 0.0004 |
| 0.0501-0.075 | 0.0010 | 0.0005 | 0.0005 |
| 0.0751-0.100 | 0.0012 | 0.0008 | 0.0008 |
| 0.101-0.125 | 0.0015 | 0.0010 | 0.0010 |
| 0.126-0.200 | 0.0015 | 0.0010 | 0.0010 |
| 0.201-0.250 | 0.0020 | 0.0010 | 0.0010 |
| 0.251-0.400 | 0.0020 | 0.0010 | 0.0012 |
| 0.401-0.500 | 0.0030 | 0.0020 | 0.0015 |
| 0.501-0.750 | 0.0030 | 0.0020 | 0.0020 |
| 0.751-1.000 | 0.0040 | 0.0025 | 0.0020 |
| 1.001-1.500 | 0.0040 | 0.0025 | 0.0025 |
| 1.501-3.80 | 0.0050 | 0.0030 | 0.0030 |
| 3.801-12.70 | 0.0127 | 0.0127 | 0.0127 |

TYPICAL DIE PROFILE



Typical Profile of New Single Crystal Diamond Dies under .004" (0.100 mm)



Typical Profile of New Single Crystal Diamond Dies over .004" (0.100 mm)

TYPICAL DIE SPECIFICATIONS FOR VARIOUS WIRE MATERIALS

| WIRE MATERIAL | DEGREE OF BLENDING | REDUCTION ANGLE (2α) | BEARING LENGTH |
|-------------------------------|--------------------|----------------------|----------------|
| Bare Copper | Well Blended | 18° ± 2° | 40% ± 10% |
| Aluminum | Well Blended | 20° ± 2° | 25% ± 10% |
| Tin or Silver Plated Copper | Very Well Blended | 20° ± 2° | 20% ± 10% |
| Stainless Steel | Slightly Blended | 14° ± 2° | 50% ± 10% |
| Tungsten | Slightly Blended | 14° ± 2° | 50% ± 10% |
| Brass or Copper Covered Steel | Slightly Blended | 10° ± 2° | 35% ± 10% |

Single Crystal Diamond Dies / SPECIFICATIONS



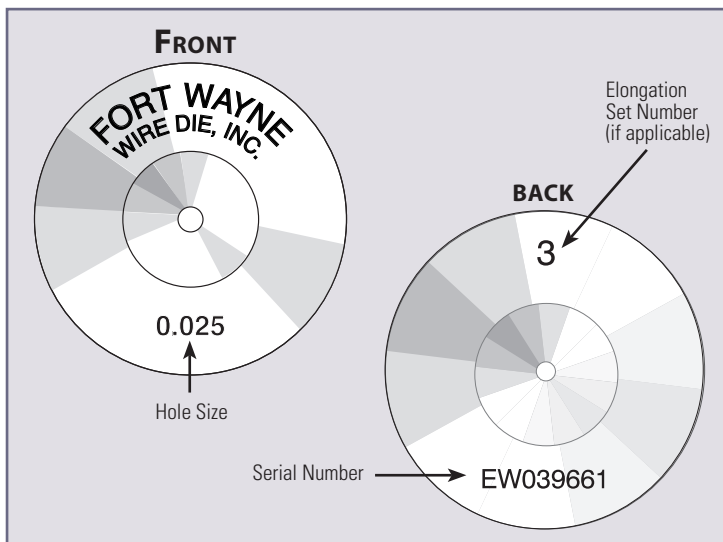
Fort Wayne Wire Die

STANDARD CASING SIZES

| INCH | | MILLIMETER | |
|-------------------|-------------------|-----------------|-------------------|
| SIZE RANGE | CASING SIZE D X T | SIZE RANGE | CASING SIZE D X T |
| .0163 and smaller | 1 or 1 1/8 x 5/16 | 0.1 and smaller | 25 x 6 or 8 |
| .0164-.041 | 1 or 1 1/8 x 3/8 | 0.101-0.40 | 25 or 28 x 8 |
| .042 and larger | 1 or 1 1/8 x 1/2 | 0.401-1.0 | 25 or 28 x 10 |
| | | 1.01 and larger | 25 or 28 x 12 |

*Special casing sizes available upon request.

STANDARD DIE STAMPING



SUGGESTED MICROSCOPE VIEWING RANGES

| INCH | MILLIMETER | MAGNIFICATION |
|------------------|------------------|---------------|
| HOLE SIZE | HOLE SIZE | |
| .002 and smaller | 0.05 and smaller | 120-160X |
| .00201-.004 | 0.051-0.10 | 90-120X |
| .00401-.010 | 0.101-0.25 | 60-90X |
| .0101-.090 | 0.251-2.30 | 30-45X |
| .0901 and larger | 2.301 and larger | 10-20X |

ORDERING INFORMATION

Fort Wayne Wire Die drawing dies provide the quality needed for optimum wire drawing efficiency. For enhanced order processing, please verify your product requirements for the following die specifications.

- 1 Casing Dimensions _____
- 2 Hole Size _____
- 3 Hole Size Tolerance _____
- 4 Reduction Angle _____
- 5 Bearing Length _____
- 6 Quantity per Hole Size _____
- 7 Wire Material _____

TYPICAL DIE SIZES BY WIRE TYPE

| WIRE TYPE | DIE SIZE RANGE |
|---------------------|----------------|
| Stainless Steel | 0.005 - 0.128 |
| Tungsten | 0.005 - 0.064 |
| Brass Covered Steel | 0.005 - 0.032 |
| Copper Coated Steel | 0.005 - 0.032 |
| Bare Copper | 0.005 - 0.128 |
| Tinned Copper | 0.005 - 0.064 |
| Aluminum | 0.005 - 0.032 |

| INCHES | .0005 | .001 | .002 | .004 | .008 | .016 | .032 | .064 | .128 | .256 | .512 |
|-------------|--------|-------|------|------|------|------|------|------|------|------|-------|
| MILLIMETERS | 0.0125 | 0.025 | 0.05 | 0.10 | 0.20 | 0.40 | 0.80 | 1.60 | 3.20 | 6.40 | 12.80 |

FORT WAYNE WIRE DIE

WHERE GREAT WIRE BEGINS

Operating from facilities in the United States, Canada, Germany, China and the Philippines and through representative offices located throughout the world, Fort Wayne Wire Die brings global expertise to service its international customer base. Experienced people and innovative ISO 9001:2015-certified processes build quality assurance into every die. When you need great wire, begin with one call to Fort Wayne Wire Die—your source for innovative, global solutions to wire drawing needs.



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Columbus, North Carolina, USA



London, Ontario, Canada



Metro Manila, Philippines



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