

# Wire Drawing Systems

INCH MEASUREMENTS



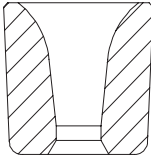
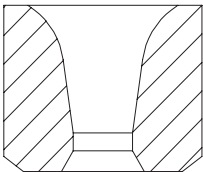
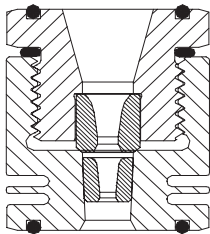
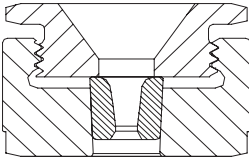
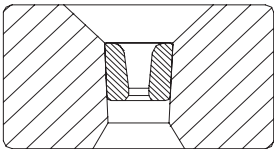
PARAMOUNT DIE



**PARAMOUNT DIE**

DRAWING SYSTEMS FOR THE WIRE INDUSTRY

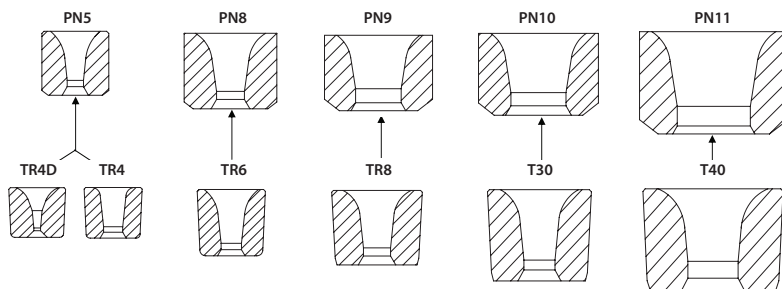
## Insert Drawing Systems - A Wide Range of Options

	<p><b>The Carbide Drawing Insert:</b></p> <ul style="list-style-type: none"><li>- Six standard insert sizes cover a drawing range from .010 - .850 (0.20 - 21.60mm).</li><li>- Extensive inventory of standard specifications maintained for rapid turnaround.</li><li>- Tapered outside diameter is precision ground for a secure fit and optimal heat transfer.</li><li>- Available in a broad spectrum of approach angles, tolerances, and finishes.</li></ul>
	<p><b>The Carbide Pressure Insert:</b></p> <ul style="list-style-type: none"><li>- Five standard pressure insert sizes to correspond with each draw insert type.</li><li>- For use with all ParaLoc pressure system holders.</li><li>- Range of sizes accommodates all reductions, drafts and pressure clearances.</li><li>- Specially designed O.D. back chamfer creates a seal with the ParaLoc holder base.</li></ul>
	<p><b>The ParaLoc Pressure Holder:</b></p> <ul style="list-style-type: none"><li>- Precision manufactured from the highest quality stainless steel.</li><li>- Sustains extreme lubricant pressure without leaking or failing.</li><li>- Available in a large range of sizes and dimensions to fit almost all die boxes.</li><li>- Maximizes the life of the drawing insert by optimizing wire lubrication.</li></ul>
	<p><b>The ParaLoc Non-Pressure Holder:</b></p> <ul style="list-style-type: none"><li>- Precision manufactured from the highest quality stainless steel.</li><li>- Provides an alternative insert holder if the pressure holder exceeds die box limitations.</li><li>- Generates less lubricant carry-through than the ParaLoc Pressure System.</li><li>- Locks the drawing insert into place for machines that have excessive back tension.</li></ul>
	<p><b>The ParaCase Reusable Casing:</b></p> <ul style="list-style-type: none"><li>- Precision manufactured from the highest quality stainless steel.</li><li>- Holds inserts securely in most applications.</li><li>- Available in standard wire die casing sizes.</li><li>- The simplest and quickest to change of all the insert holder options.</li></ul>





## ParaLoc Carbide Inserts (Inch)



The inserts listed are standard inventory.  
Other diameters, approach angles, and  
tolerances available upon request.

*Note: When using these inserts in a ParaLoc Pressure Holder the indicated  
PN must be used with the Correct T-Series Draw Insert*

### Drawing Insert Standards

Standard Size Ranges and Stocking Plan			
Drawing Insert Type	Standard Angles	Standard Size Range	Stocking Increment
TR4D	9°	.0250 - .0595	.0005
TR4	9°	.0300 - .0795	.0005
		.0800 - .1950	.0010
	12°	.0300 - .0795	.0005
		.0800 - .1950	.0010
		.1960 - .2300	.0010
TR6	12°	.1750 - .2130	.0020
		.2150 - .3500	.0010
	16°	.2150 - .3500	.0010
TR8	12°	.3000 - .3990	*
	18°	.3500 - .5190	*
T30	10°/12°/18°	.2560 - .6000	*
T40	12°/18°	.5500 - .8500	*

\* Sizes made to order from available rough core.

Standard Tolerances		
Size Range	Bearing Length	Internal Diameter
.0100 - .0199	20 - 50%	+.0000 / -.0002
.0200 - .0249	25 - 50%	+.0000 / -.0003
.0250 - .0299	25 - 50%	+.0000 / -.0004
.0300 - .0999	30 - 50%	+.0000 / -.0005
.1000 - .1969	30 - 50%	+.0000 / -.0010
.1970 - .2959	25 - 45%	+.0000 / -.0010
.2960 - .3939	20 - 40%	+.0000 / -.0010
.3940 - .4999	20 - 35%	+.0000 / -.0010
.5000	20 - 30%	+.0000 / -.0010

### Pressure Insert Standards

Standard Size Ranges and Stocking Plan			
Drawing Insert Type	Standard Angles	Standard Size Range	Stocking Increment
PN5	16°	.0300 - .0345	*
		.0350 - .0990	.0010
		.1000 - .1990	.0020
		.2000 - .2400	.0050
		.2410 - .2800	*
PN8	18°	.2800 - .4300	*
PN9	18°	.4350 - .6250	*
PN10	18°	.3000 - .7800	*
PN11	18°	.7850 - 1.1450	*

\* Sizes made to order from available rough core.

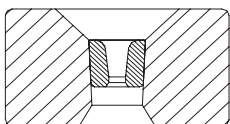
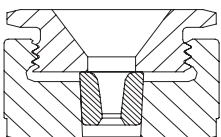
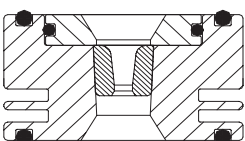
Standard Tolerances		
Size Range	Bearing Length	Internal Diameter
.0200 - .0499	10 - 50%	+.0005 / -.0000
.0500 - .1999	05 - 40%	+.0010 / -.0000
.2000 - .3999	05 - 40%	+.0010 / -.0000
.4000 +	05 - 30%	+.0020 / -.0000





## ParaLoc Non-Pressure Holders (Inch Standards)

### NS Holders (Non-Pressure Application, Straight O.D.)

Holder Type	Die Box Diameter	Available Draw Insert Types	Item Number	Outside Diameter	Assembled Height	Socket Type
 Type "A"	1.0"	TR4/TR4D	NS25X14-4A	0.995"	0.562"	–
	1.5"	TR4/TR4D	NS38X22-4A	1.495"	0.875"	–
		TR6	NS38X22-6A	1.495"	0.875"	–
		TR8	S38X22-8A	1.495"	0.875"	–
	2.0"	TR6	NS51X29-6A	1.995"	1.125"	–
		TR8	NS51X29-8A	1.995"	1.125"	–
 Type "B"	1.5"	TR4/TR4D	NS38X22-4B	1.495"	0.875"	2
	2.0"	TR4/TR4D	NS51X29-4B	1.995"	1.125"	5
		TR6	NS51X29-6B			
		TR8	NS51X29-8B			
	3.0"	TR4/TR4D	NS76X44-4B	2.995"	1.75"	8
		TR6	NS76X44-6B			
		TR8	NS76X44-8B			
		TR10	NS76X44-10B			
		T30	NS76X44-30B			
 Type "C"	1.5"	TR4/TR4D	NS38X22-4CFR	1.495"	0.875"	–
	2.0"	TR4/TR4D	NS51X29-4CFR	1.995"	1.125"	–
		TR6	NS51X29-6CFR			
	3.0"	TR4/TR4D	NS76X44-4CFR	2.995"	1.750"	–
		TR6	NS76X44-6CFR			
		TR8	NS76X44-8CFR			
		T30	NS76X44-30CFR			

### NS Holder Types

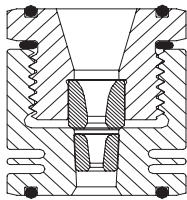
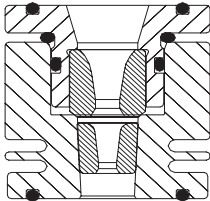
- Type "A" - Type "A" holders are the most basic holder type and are recommended for use in most non-direct water cooled die boxes or in wet drawing applications where excessive back tension during string up is not a concern for pulling the insert out of the casing.
- Type "B" - Type "B" holders include a threaded cap which provides security against the draw insert pulling back out of the casing during string up. Type "B" holders are recommended for use in all die boxes except for those with direct water cooling. Type "B" holders require the use of a hex socket for assembly.
- Type "C" - Type "C" holders are designed for use in most direct water cooled applications where the die box has a threaded locking nut. Type "C" holders include both a plug which clamps against the die boxes threaded nut to secure the draw insert and cooling fins which provide considerably more surface area for improved heat dissipation. The O-ring seals are designed to compress into the cap's grooves to provide an exceptional water seal when the die box cap is tightened against the holder. Type "C" holders are also offered without O-ring seals.
- All holder types are heat treated for exceptional durability and service life.



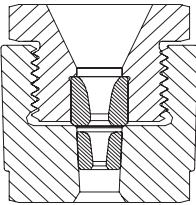


## ParaLoc Pressure Holders (Inch Standards)

### PS Holders (Pressure Application, Straight O.D.)

Holder Type	Die Box Diameter	Available Draw Insert Types	Item Number	Outside Diameter	Assembled Height	Socket Type
 Type "B" with external O-ring seals	1.5"	TR4/TR4D	PS38X44-45BFR	1.495"	1.750"	2
	2.0"	TR4/TR4D	PS51X57-45BFR	1.995"	2.250"	5
		TR6	PS51X57-68BFR			
	3.0"	TR4/TR4D	PS76X88-45BFR	2.995"	3.460"	8
		TR6	PS76X88-68BFR			
		TR8	PS76X88-89BFR			
		TR30	PS76X88-3010BFR			
 Type "C" with external O-ring seals	1.5"	TR4/TR4D	PS38X44-45CFR	1.495"	1.750"	N/A
	2.0"	TR4/TR4D	PS51X57-45CFR	1.995"	2.250"	N/A
		TR6	PS51X57-68CFR			
	3.0"	TR4/TR4D	PS76X88-45CFR	2.995"	3.460"	N/A
		TR6	PS76X88-68CFR			
		TR8	PS76X88-89CFR			
		TR30	PS76X88-3010CFR			

### PT Holders (Pressure Application, Tapered O.D.)

Holder Type	Die Box Diameter	Available Draw Insert Types	Item Number	Assembled Height	O.D. Taper (Including Angle)	Socket Type
 Type "B"	1.500"	TR4/TR4D	PT38X44-45B3	1.750"	3°	2
	2.175"	TR4/TR4D	PT55X61-45B3	2.400"	3°	5
		TR6	PT55X61-68B3			
	2.750"	TR4/TR4D	PT70X88-45B3	3.460"	3°	7
		TR6	PT70X88-68B3			
		TR8	PT70X88-89B3			
		TR30	PT70X88-3010B3			

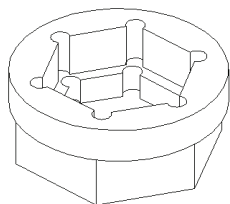
#### Pressure Holder Information:

- Pressure holders are designed to increase draw insert lubrication by enabling the drawing lubricant to pressurize during the drawing process. Pressure holders are recommended predominately for use with dry lubricants however can be utilized with grease and emulsions by adjusting the pressure insert clearance.
- All pressure holders require the use of a pressure insert in conjunction with the draw insert. The inner diameter of the pressure insert is sized to be larger than the incoming wire size based on a percentage of clearance. The following pressure insert sizes are paired with the following draw inserts: PN5 = TR4, PN8 = TR6, PN9 = TR8, PN10 = T30, PN11 = T40.
- Type "B" pressure holders are designed with cooling fins to provide additional cooling capability. The O-ring seals are designed to compress into the cap's grooves to provide an exceptional water seal while at the same time allowing the holder to contact the locking cap of the die box. The "PS" Type "B" holders are also offered without O-ring seals and cooling fins for non-direct water cooling applications.
- Type "C" pressure holders are designed for use in most direct water cooled applications where the die box has a threaded locking nut. Type "C" holders include both a plug which clamps against the die boxes threaded nut to secure the draw insert and cooling fins which provide considerably more surface area for improved heat dissipation. The O-ring seals are designed to compress into the cap's grooves to provide an exceptional water seal when the die box cap is tightened against the holder. This holder type requires no threads and therefore both ends are round and do not require any special tool for assembly or disassembly.

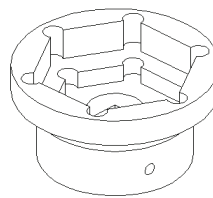




## ParaLoc Accessories



**CAP SOCKET**



**BASE SOCKET**

**ParaLoc Sockets:** A must for quick assembly and disassembly of ParaLoc holders. (1/2" drive torque wrench offered separately)

P-CS-2	Cap Socket for NS3x Holders
P-CS-2-5	Cap Socket (2 in 1) for PS3x, PS5x, & PT5x Holders
P-CS-4	Cap Socket for NS4x Holders
P-CS-4-5	Cap Socket (2 in 1) for NS5x, PS4x, PS5x, & PT5x Holders
P-CS-5-6	Cap Socket (2 in 1) for PS5x, PT5x, PS6x, & PT6x Holders
P-CS-5-7	Cap Socket (2 in 1) for PS5x, PT5x, & PT7x Holders
P-CS-8	Cap Socket for NS7x, & PS7x Holders
P-BS-1	Base Socket for PT3x Holders
P-BS-2	Base Socket for NS3x Holders
P-BS-2-5	Base Socket (2 in 1) PS3x, PS5x & PT5x Holders
P-BS-3	Base Socket for PT4x Holders
P-BS-4	Base Socket for NS4x Holders
P-BS-4-5	Base Socket (2 in 1) NS5x, PS4x, PS5x, & PT5x Holders
P-BS-5-6	Base Socket (2 in 1) PS5x, PT5x, PT6x, & PT7x(6°) Holders
P-BS-5-7	Base Socket (2 in 1) PS5x, PT5x, PT7x(3°) Holders
P-BS-8	Base Socket for NS7x & PS7x Holders

### Replacement O-rings for ParaLoc Holders

P-OR-116	ParaLoc Holder O-ring PS3x (Internal)
P-OR-118	ParaLoc Holder O-ring PS4x, & NS3x (Internal)
P-OR-120	ParaLoc Holder O-ring PS3x & NS3x (External)
P-OR-122	ParaLoc Holder O-ring PS4x & NS4x (External)
P-OR-219	ParaLoc Holder O-ring PS5x & NS5x (Internal & External)
P-OR-225	ParaLoc Holder O-ring PS7X88-CFR (Internal)
P-OR-227	ParaLoc Holder O-ring NS7x (Internal)
P-OR-327	ParaLoc Holder O-ring PS7x (Internal) & PS7x & NS7x (External)

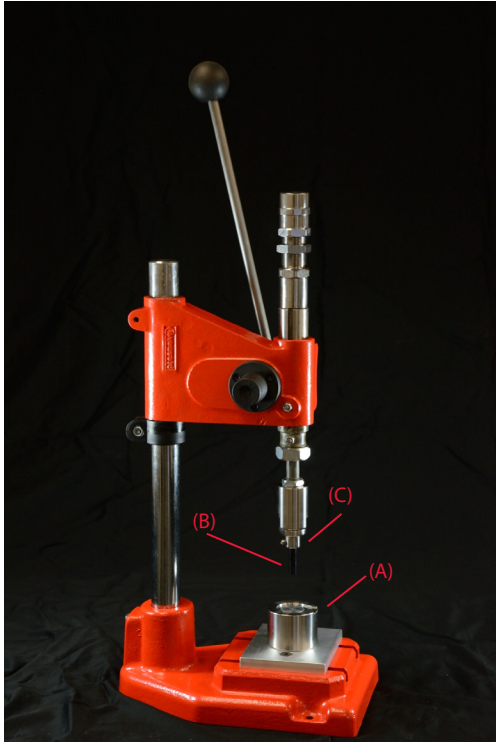
### Miscellaneous Accessories

P-HA	Dead Blow Hammer
P-TW	Torque Wrench
P-AD-PS51-PS63	Adapter, Converts a PS51 to a PS63
P-AD-PT55-PS76	Adapter, Converts a PT55 to a PS76
P-AD-PT55-PT70	Adapter, Converts a PT55 to a PT70





## 3-Ton Impact Press (Model P-IP3)



### Complete Unit as Shown

P-IP3	Complete Unit
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*Note: Complete unit includes once centering plate and one extraction pin/holder*

Part #	Description
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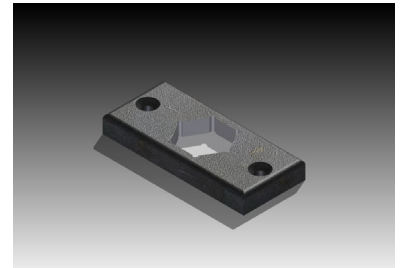
(A)	P-CP	Centering Plate
(B)	P-IP3-EP	Extraction Pin
(C)	P-IP3-PH	Extraction Pin Holder

*\* Please contact Paramount Die for available sizes.*

### 3-Ton Impact Press Accessories

P-IP3-CSP	Cap Socket Plate
P-CS	Cap Socket

*\* Please contact Paramount Die for available sizes.*



I. 3-Ton Impact Press Unit (P-IP3), comes with Ram, Centering Plate Adapter, Extended Handle with Comfort Ball Grip, one Centering Plate, one Extraction Pin Holder and one Extraction Pin.

- (1) Heavy duty cast iron head and base press frame.
- (2) Durable hardened steel internal mechanisms and hardened stainless steel ram adapter.
- (3) Hardened steel and precision ground press pins are available separately to match your insert sizes.
- (4) Press base is pre-drilled to allow for easy and secure mounting.

II. 3-Ton Impact Press Cap Socket Plate (P-IP3-CSP), mounts to your holder changing station or workbench to provide easy assembly and disassembly of ParaLoc holders.

- (1) Cap sockets are available to fit all "B" type ParaLoc holders with hex caps and bases.

III. Benefits and Advantages.

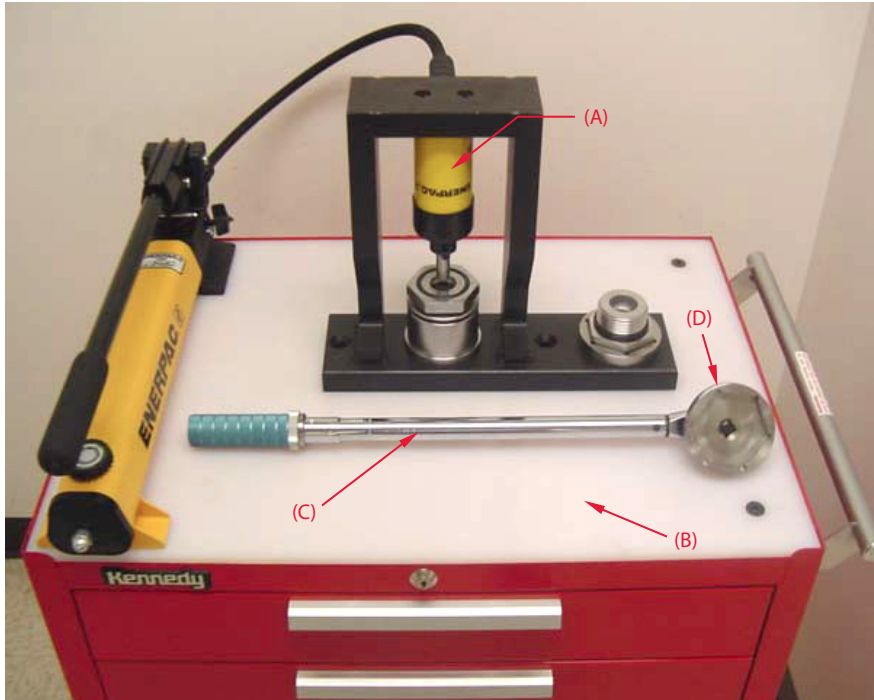
- (1) No special tooling needed.
- (2) Fast and accurate alignment of extraction pin to center of insert.
- (3) Minimum effort required to activate the ram plunger.
- (4) Fully adjustable impact force settings.
- (5) New centering plate with insert cutout is designed to accurately locate holders and minimize insert damage upon removal.







## ParaLoc Mobile Changing Station (Model P-HP)



Part #	Description
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(A)	P-IP	Hydraulic Press Unit
(B)	P-MC	Mobile Cabinet (Only)
(C)	P-TW	Torque Wrench
(D)	*	Base Socket

### Complete Unit as Shown

P-MCS-HP	Complete Unit
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### Changing Station Accessories

P-TR-TR4	TR4 Storage Rack
P-TR-PN5	PN5 Storage Rack

*\* Base Socket part number will be determined by the ParaLoc holder used.*

*Note: Recommended for Removal of TR8 and Larger Draw Inserts. (Use P-IP unit for TR6 and Smaller Insert Types).*

### A. Hydraulic Press Unit (P-HP), comes with Cap Socket and Centering Plate (Torque Wrench & Base Socket sold separately).

- (1) Precision machined (Black Oxide) press frame with mounting holes.
- (2) 10,000 PSI Hydraulic Single acting solid plunger cylinder.
- (3) Two speed (10,000 PSI) hydraulic hand pump.
- (4) Hardened steel and precision ground press pin.
- (5) Centering Plate (use to accurately align the ParaLoc holders).
- (6) 2-in1 Cap Socket (Used to hold the ParaLoc caps for easy assembly and disassembly).
- (7) Pre-Drilled mounting holes with mounting hardware (included).

### B. Mobile Storage Cabinet

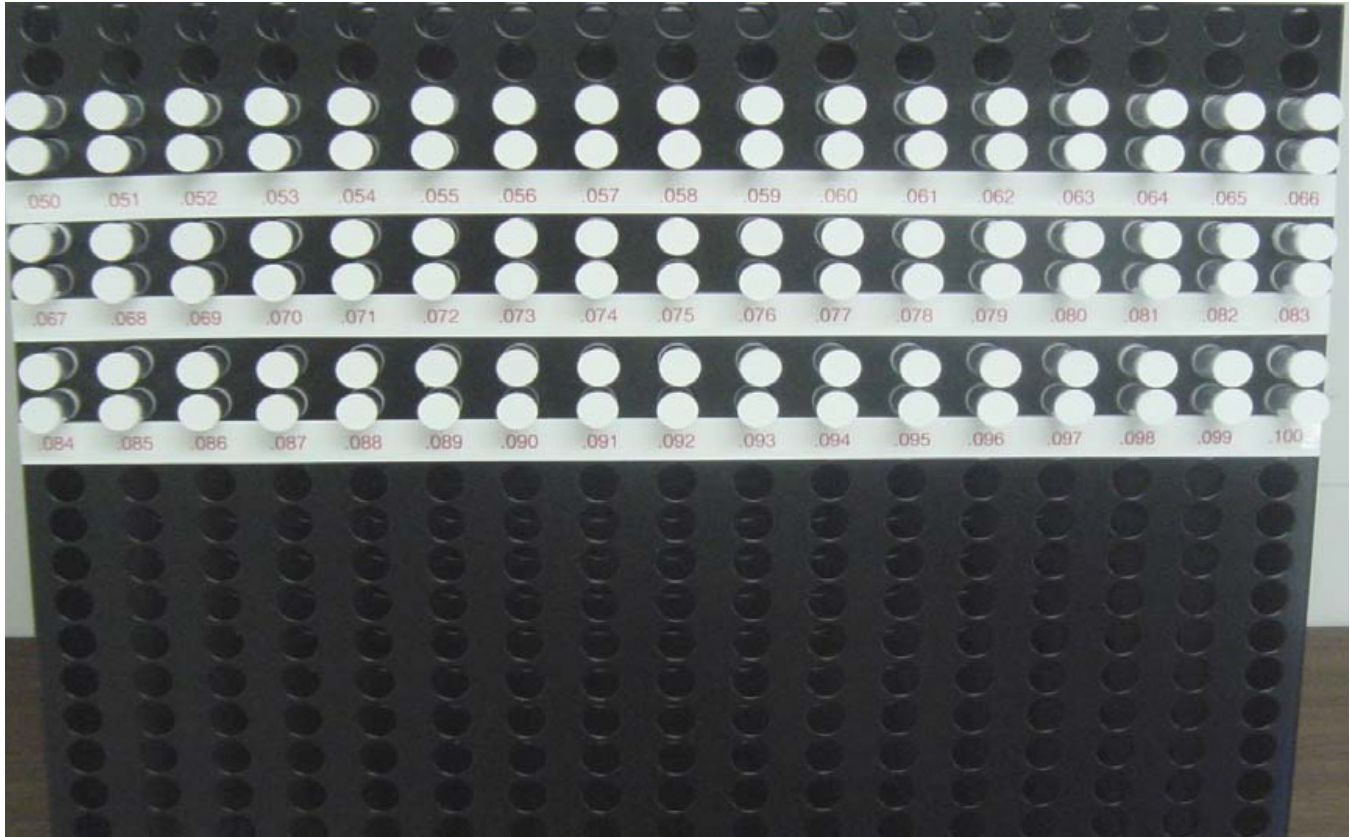
- (1) High quality steel construction with "UHMW" Polyethylene work surface.
- (2) Heavy duty casters allowing for easy movement around the shop areas.
- (3) Five pull out drawers equipped with liners for storing draw inserts/pressure inserts and ParaLoc holders.







## Storage Rack Systems



- A. Welded and rigid, fabricated from 16 GA. (.0625") steel.
- B. Black semi gloss powder coat finish.
- C. Supplied with magnetic Label Holders.
- D. Keyholes (4 places) on the back of the racks for easy mounting to a wall or other flat surface.
- E. Unit will hold 408 Tubes, or a maximum of 4080 TR4 carbide draw inserts (slightly fewer for the PN5 rack). (Actual numbers depend on the labeling layout).
- F. Easy to read parts numbers, sizes, and quantities.
- G. Effective method to organize and track inventory.
- H. Units are supplied with 8 strips of magnetic label tape (single strips can be purchased separately).

Part #	Description
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P-TR-TR4	TR4 Rack
P-TR-TR8-T30	TR8/T30 Rack
P-TR-PN5	PN5 Rack
P-TR-MTAPE	Magnetic Label Tape

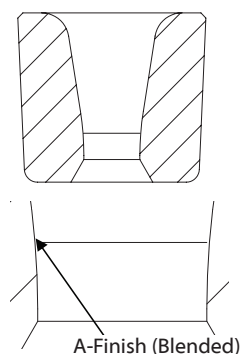
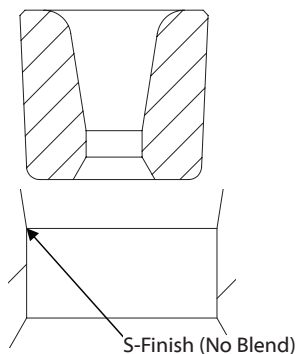




## Item Number Explanations

### Inserts

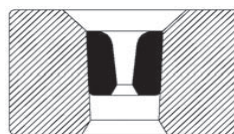
<b>T</b>	Insert Type
<b>R</b>	
<b>4</b>	
<b>-</b>	Spacer
<b>1</b>	Approach Angle (Included angle in degrees)
<b>2</b>	
<b>P</b>	Carbide Material Grade
<b>.</b>	Internal Diameter (Inch measurements begin with a decimal .1050)
<b>1</b>	
<b>0</b>	
<b>5</b>	
<b>0</b>	Bearing Length as a percentage of internal diameter (1st two characters are the minimum tolerance and the second two characters are the maximum tolerance)
<b>-</b>	
<b>3</b>	
<b>0</b>	
<b>5</b>	Finish: S=Standard, A=High Polish/Well Blended, for CVD coated inserts Y=Standard, X=Well Blended (see Drawings Below)
<b>0</b>	
<b>5</b>	
<b>0</b>	
<b>5</b>	I.D. Tolerance (1st character is the + specification and second is the minus specification, Increments are .0001) (Sample Shown is +.0000/- .0005)
<b>5</b>	



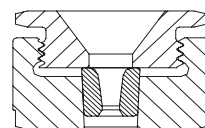
### ParaLoc and ParaCase Holders

<b>P</b>	Pressure Type: P=Pressure ParaLoc, N=Non-Pressure ParaLoc
<b>S</b>	O.D. Type: T=Tapered O.D, S=Straight O.D.
<b>3</b>	Outside Diameter of holder in mm
<b>8</b>	
<b>X</b>	Spacer
<b>4</b>	Assembled Length of holder in mm
<b>4</b>	
<b>-</b>	Spacer
<b>4</b>	Draw Insert Type: 0=BRO, 4=TR4, 6=TR6, 8=TR8, 9=TR9, 10=TR10
<b>5</b>	Pressure Insert Type: 5=PN5, 6=PN6, 8=PN8, 9=PN9, 10=PN10, 11=PN11
<b>B</b>	Holder Type - A= Para-Case (No Drive or Locking Cap), B=Two Piece with Locking Cap (Hex Drive), C= Two Piece With Locking Cap (No Drive)
<b>F</b>	ParaLoc Option: F=Cooling Fins (If OD Type="T" this would be a number that equals the OD taper of the holder (Included Angle)
<b>R</b>	ParaLoc Option: R=O-ring seals (Used For Direct Water Cooling Die Boxes)

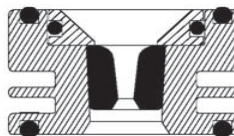
Type "A" (ParaCase)



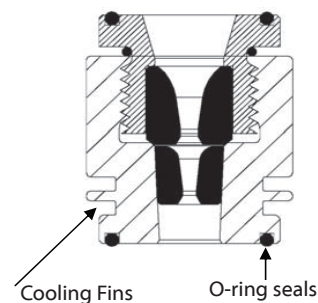
Type "B" (Non-Pressure)



Type "C"



Type "B" (Pressure)



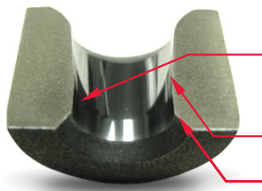


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DRAWING SYSTEMS FOR THE WIRE INDUSTRY

## Things To Know About Recut Dies

The main argument against recutting inserts is that very few of these recuts are returned to an "As good as new" condition. Many die rooms simply lack the production equipment and/or inspection equipment to guarantee consistent control of the many important parameters in a wire die. Improperly manufactured wire dies translate to inconsistent and typically less than optimal wire drawing performance. The wire die is a very important part of the wire drawing process and the same level of consistency needs to be maintained with both new and recut inserts. Paramount guarantees that all recut inserts are returned to an "As good as new" condition.

### Key Parameters To Consider For Both New And Recut Dies



#### Good Die

Bearing Zone is round and Cylindrical (near zero taper). Bearing length is optimal and is even on all sides. The bearing/angle intersection is slightly blended.

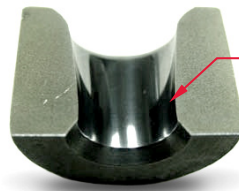
Sub-Micron Finish (Angle & Bearing)

Correct Back Relief Depth (Needed for Support)



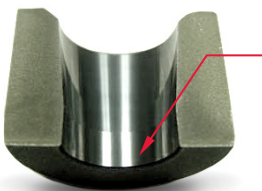
#### Asymmetrical Bearing

Bearing length uneven, may result in oval/out of round wire, cast & helix problems and also "Cork Screwed" wire



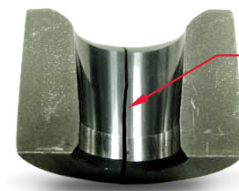
#### Over Blended Bearing

Over blended bearings, may result in shorter die life due to the actual bearing length being very short.



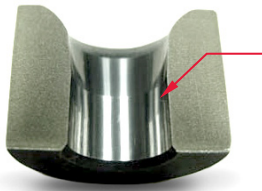
#### Short Back Relief Angle

The back relief angle provides support for the bearing, a very short back angle may result in die breakage starting in this area.



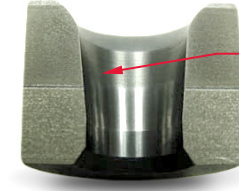
#### Cracked Die

Cracked or broken dies are known to start from small hairline fractures. Paramount inspects 100% of recuts for cracks using Eddy current testing.



#### Long Bearing Length

Excessively long bearings will result in higher friction/more heat, require more power to draw, and may result in "Suck Down" (small diameter). Also reduces the length of the available reduction angle.



#### Poor Surface Finishes

Poor surface finishes in the angle or bearing areas can lead to scratches on the wire and in some cases will result in "Galling"

### Other important Facts

Many die rooms are recutting only a few dies to a given size at a time requiring constant changeover. Many die rooms also do not have the luxury of removing the ideal amount of carbide stock with every recut. By processing over 1,000,000 used inserts per year, Paramount Die has the luxury of setting up highly efficient and automated production runs. Since Paramount Die sells virtually every diameter size to a wide range of customers, we can remove the optimal level of material which guarantees clean up of the wear zone without removing more material than is necessary.



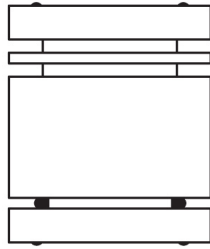
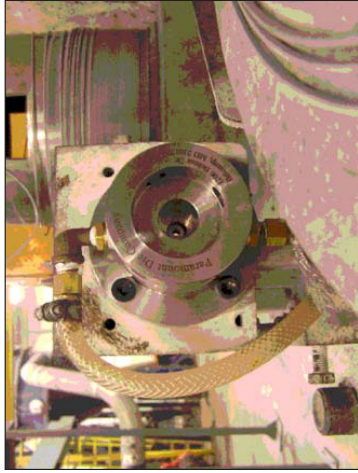
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**PARAMOUNT DIE**  
DRAWING SYSTEMS FOR THE WIRE INDUSTRY

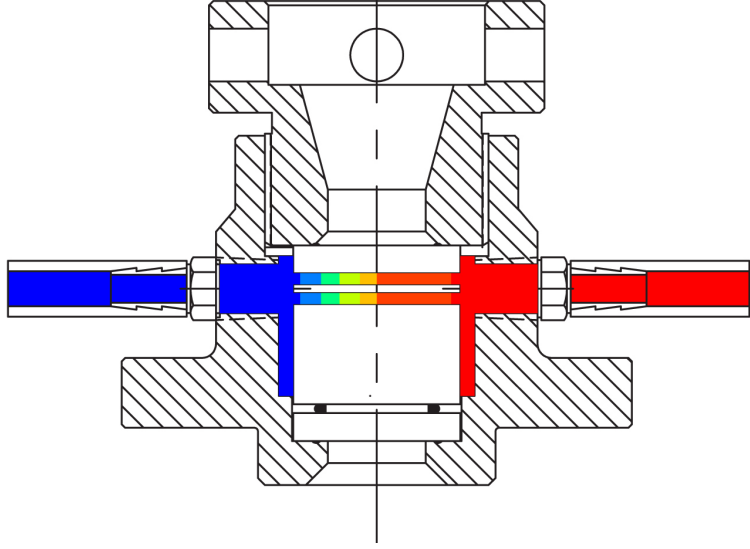
## Direct Water Cooled Die Box



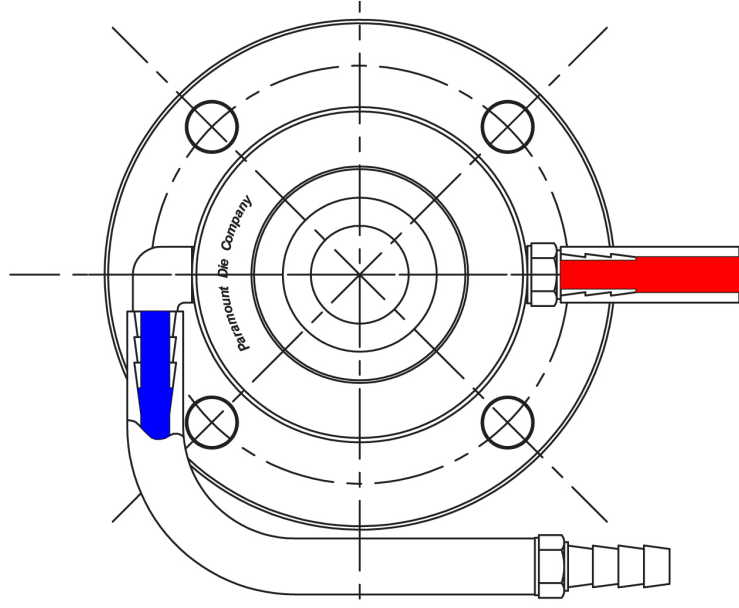
PS38X44-45CFR HOLDER  
THREADLESS




INLET WATER



OUTLET WATER TO DRAIN



TOLERANCES: (EXCEPT AS NOTED) FRACTIONAL: +/- 1/64" DECIMAL: (xx) +/- .010 (xxx) +/- .002 FINISH: 125 ANGULAR: +/- 1°	REV: CONCEPT	 1306 Continental Drive Abingdon, MD 21009 410-272-4600  THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF PARAMOUNT DIE. ANY REPRODUCTION IN WHOLE OR IN PART WITHOUT THE WRITTEN PERMISSION OF PARAMOUNT DIE IS PROHIBITED.
	DRAWN BY: RUG	
	SCALE: 1:1	
	DATE: 03.09.07	
MAT:	D/N: DIE BOX DESIGN ASSEMBLY FOR	
FILEPATH	TITLE: PS38X44-45CFR THREADLESS HOLDER	