



COLLAPSIBLE CORES EXPANDABLE CAVITIES

SECTION I



| C-Cores: DT Series | Grinding Rings / Fixtures | C-Cores: RT Series |
|--------------------|---------------------------|--------------------|
| Prefix: DT | Prefix: DTG, RTGR | Prefix: CC, CCM |
| Page: I-1 | Page: I-6 | Page: I-7 |



| Expandable Cavities |
|---------------------|
| Prefix: EXCAV |
| Page: I-10 |



COLLAPSIBLE CORES

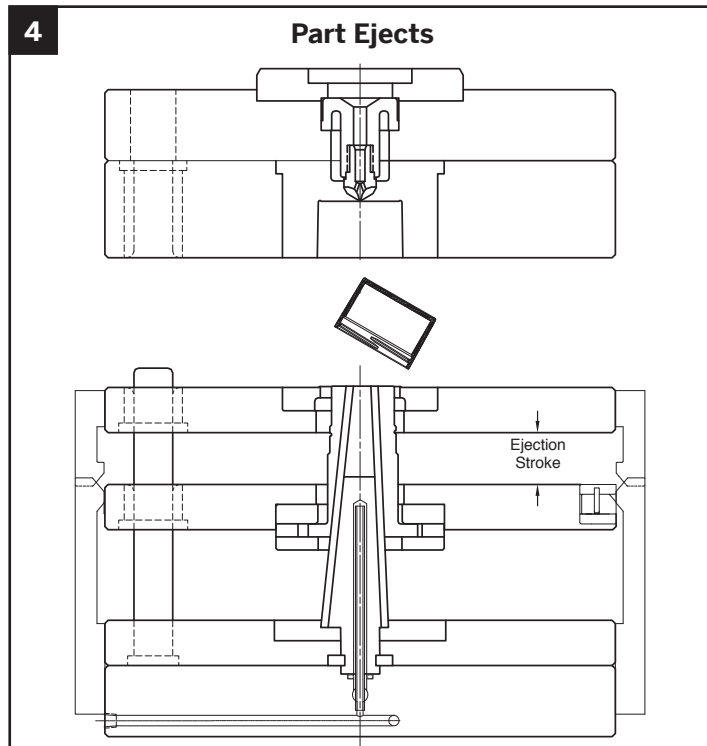
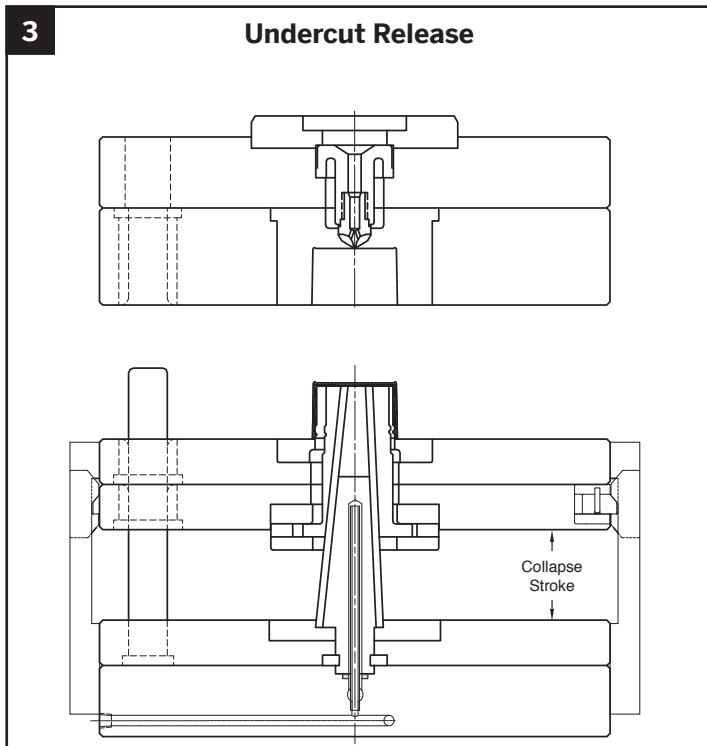
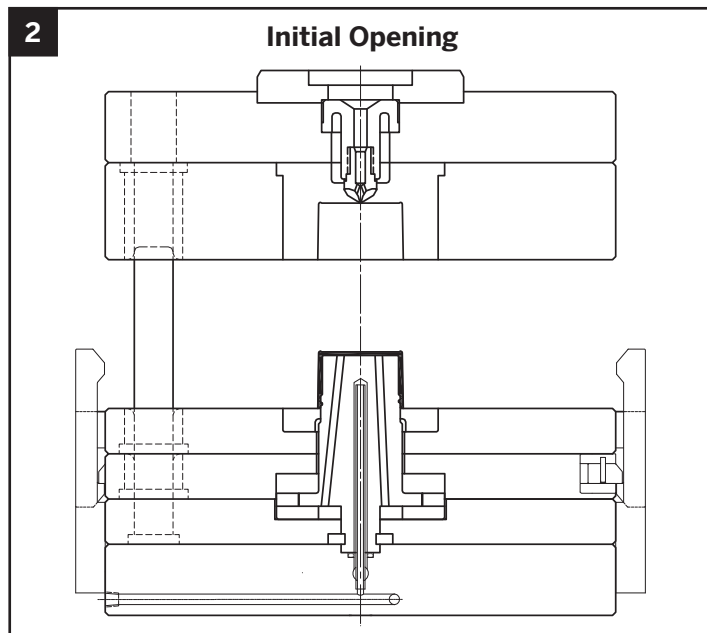
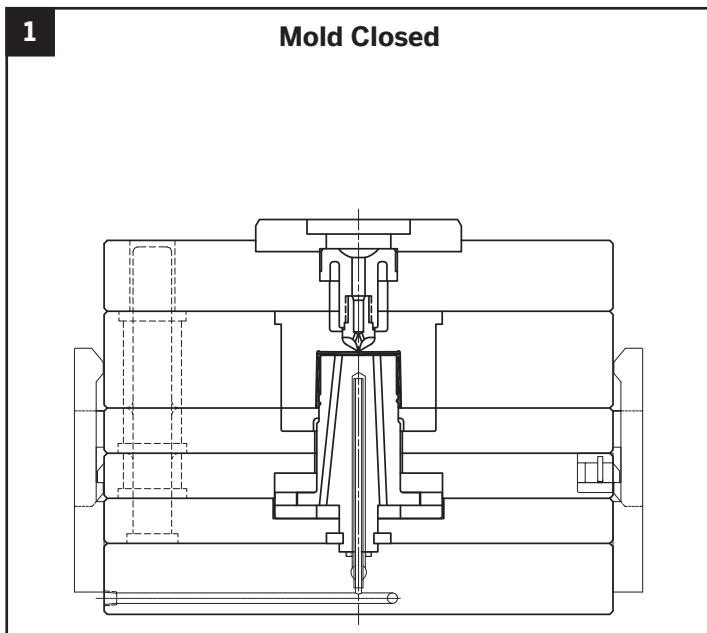
DT SERIES

The Dove Tail Series Collapsible Cores offer a more compact design and simplified mold approach over other tool designs.

Available in four standard sizes and also as customs, DT Series Collapsible Cores eliminate the need for complex unscrewing mechanisms as well as providing solutions for unmoldable internal undercut features such as o-ring grooves, slots, and snap fit details.

Now DT Cores can be supplied in diameters under 10 mm. Email information@roehrtool.com for a design review.

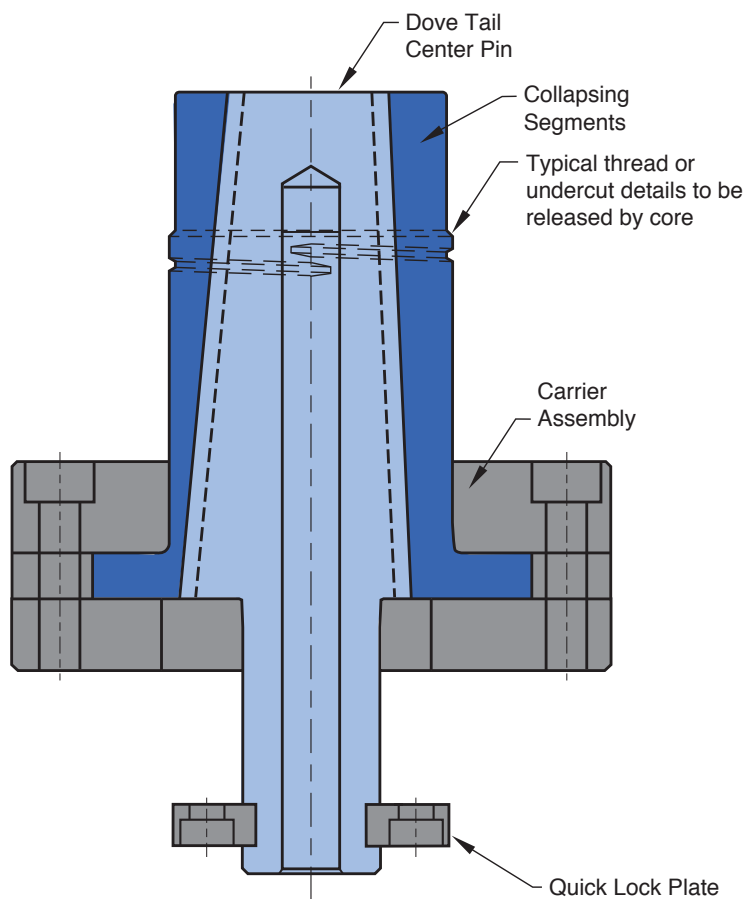
Standard sized Dove Tail (DT) Collapsible Cores are engineered and manufactured for Progressive Components through an alliance with Roehr Tool Solutions.





COLLAPSIBLE CORES

DT SERIES



Collapsing Segments

M A-2 **H** 54-57 HRC

- Designed to mechanically collapse when the center pin is withdrawn.
- The fit between the segments is controlled to permit flash-free molding.

Center Pin

M D-2 **H** 59-61 HRC

- Serves to expand the segments of the core to their molding position
- The pin may be flush to the core face.

Carrier Assembly

M D-2 **H** 59-61 HRC

- Mounts DT Core assembly to the mold carrier plate.
- Provides guided and anti-rotational segment movement.

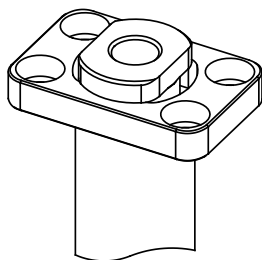


Quick Lock Feature

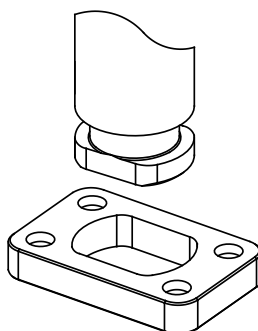
Plate Material: A-2, 54-57 HRC

Utilizing Roehr's exclusive Quick Lock mounting configuration, the DT Core can be removed and serviced while the mold remains in the press. This feature allows for a higher cavitation percentage and lower maintenance costs than other tool design approaches.

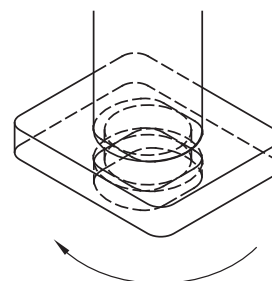
Bottom view of Center Pin and Quick Lock Plate in locked position.



Align and push end of Center Pin through Quick Lock Plate.



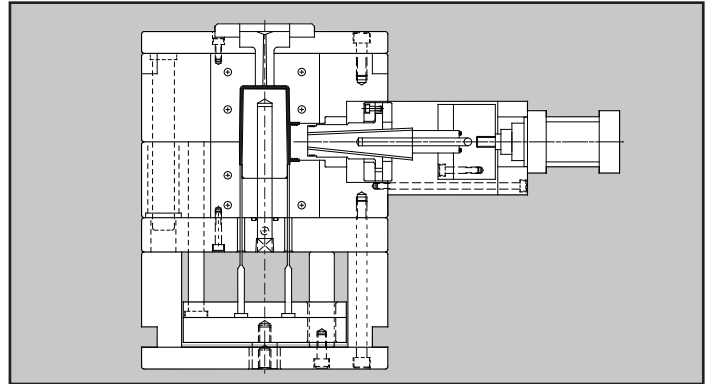
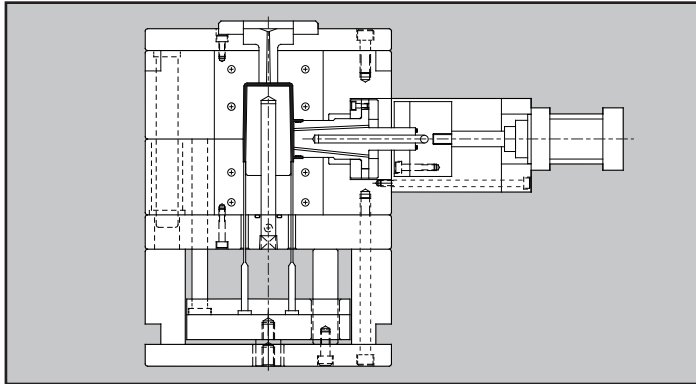
Rotate Center Pin clockwise 90° to lock into place.



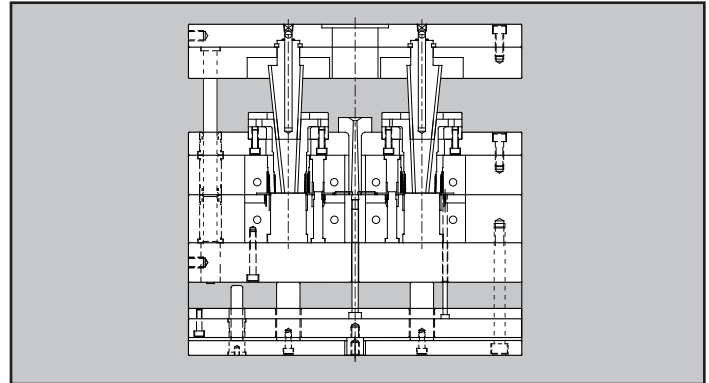
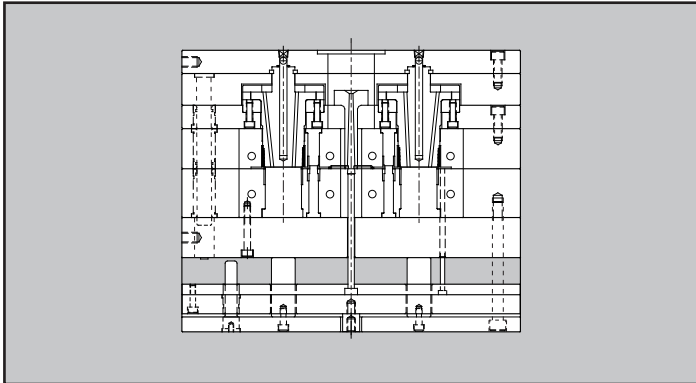
COLLAPSIBLE CORES

DT SERIES APPLICATIONS

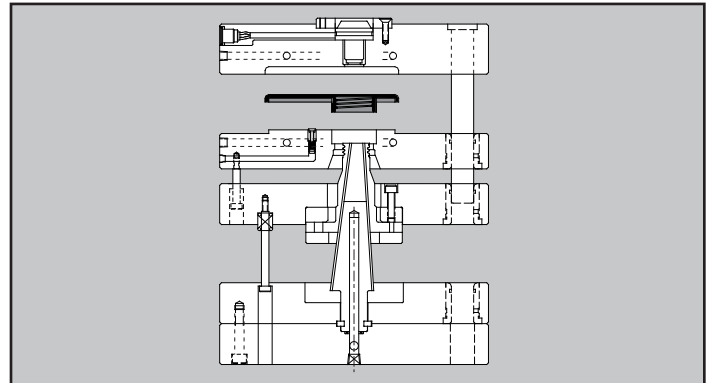
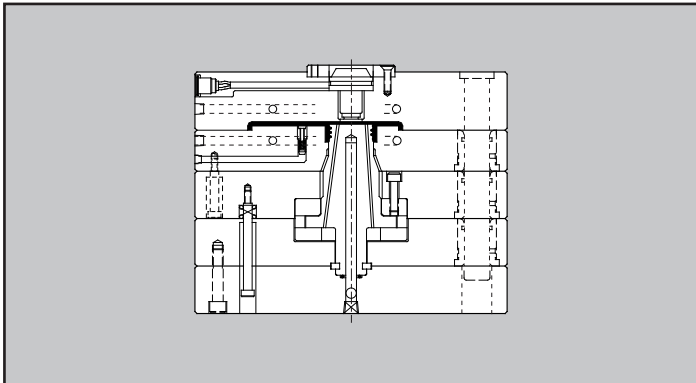
Side Action



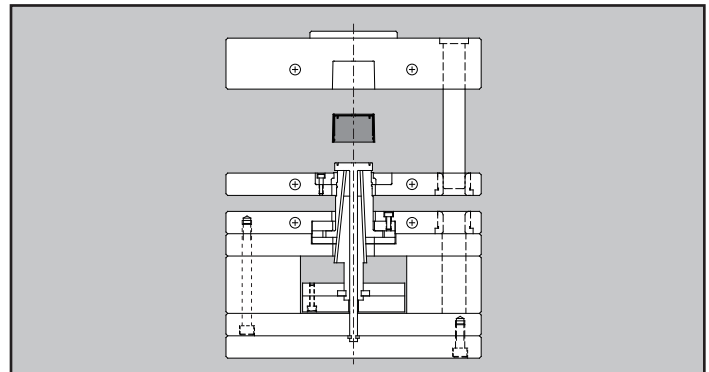
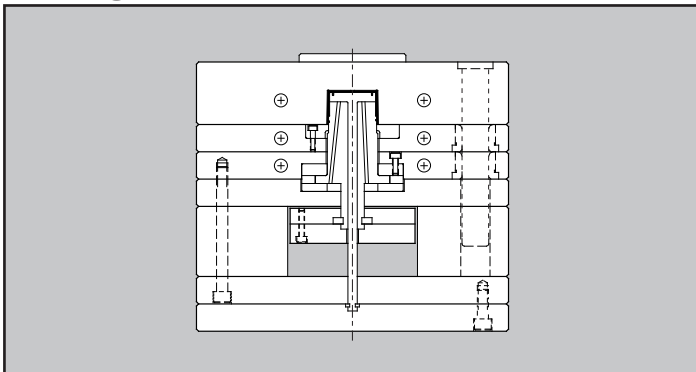
Cavity Side



Boss Detail



Seal Ring



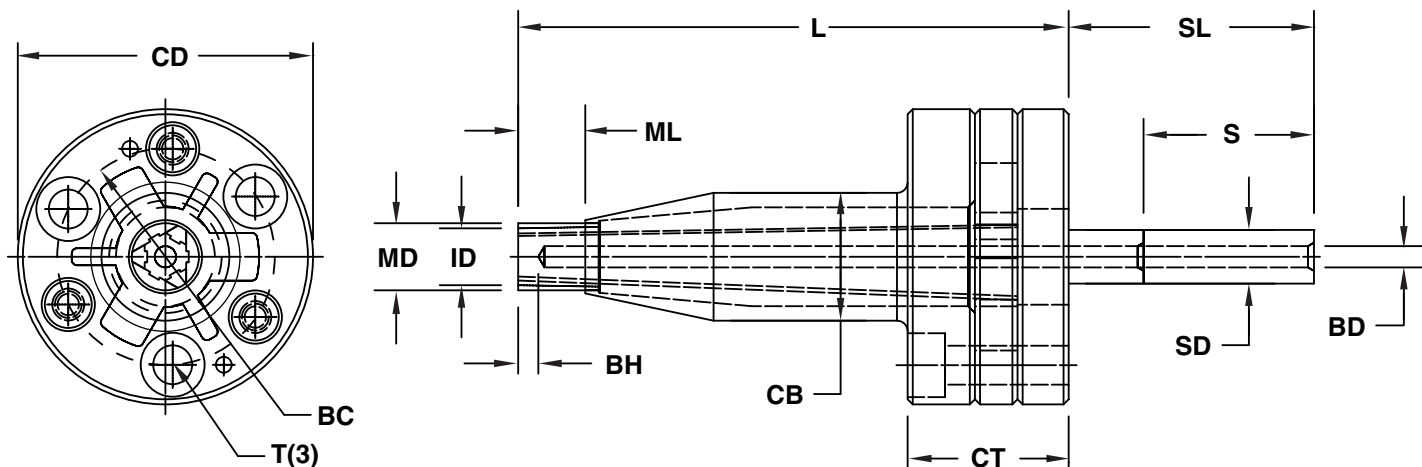


COLLAPSIBLE CORES

DT CORE SUB-10MM SERIES

The Sub-10mm DT Cores make it possible to release very small threads and undercuts in molded caps, connectors and small medical applications.

- Allows molding of parts with 7-10mm ID.
- Quick Lock plates enable core removal from parting line.
- Simpler alternative to unscrewing molds.
- Reduces cycle time and maintenance requirements.

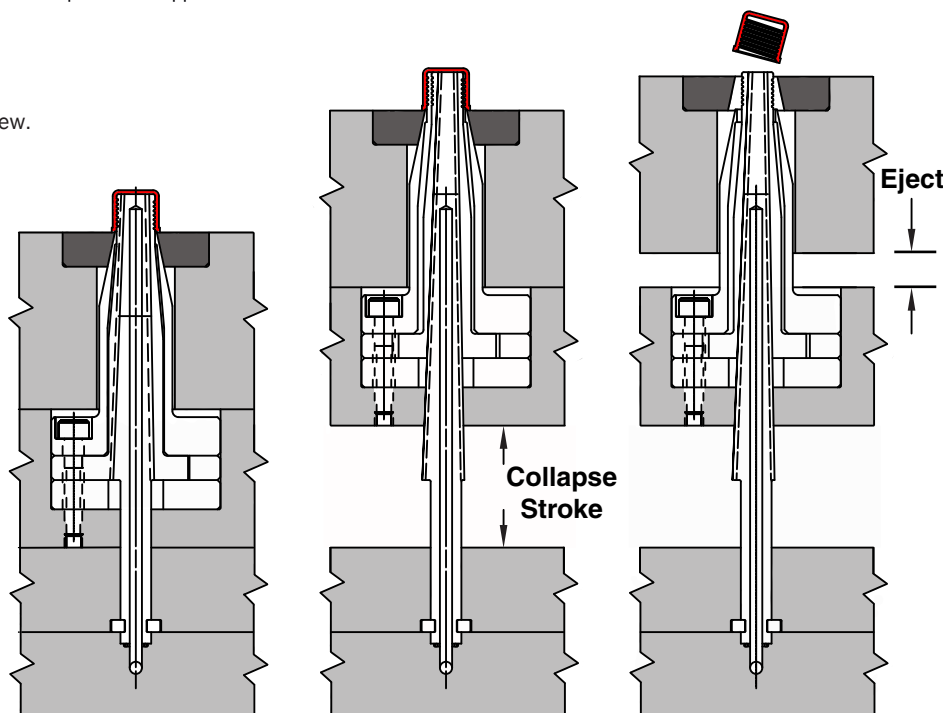


| CATALOG NUMBER | MD Maximum Molding Diameter | ID Minimum Molding Diameter | ML Maximum Molding Length | UC Maximum Undercut | CD Carrier Assembly Diameter | CB Carrier Assembly Body | CT Carrier Assembly Thickness | L Length | SL Shaft Length | SD Shaft Diameter | S Maximum Collapse Stroke | BD Cooling Hole Diameter | BH Cooling Hole Height | BC Mounting Bolt Circle | T Mounting Bolt (3) |
|----------------|--------------------------------|--------------------------------|------------------------------|------------------------|---------------------------------|-----------------------------|----------------------------------|-------------|--------------------|----------------------|------------------------------|-----------------------------|---------------------------|----------------------------|------------------------|
| S10-Custom | 10 | 7 | 10 | .38 | 44 | 19 | 24 | 82 | 36 | 8 | 50 | 3 | 3 | 32 | M5x25 |

NOTE: Submit part geometry to information@roehrtool.com for quotes and application review.

Application Guidelines:

- Maximum undercut depth is determined by final molding diameter from application review.
- Collapse stroke is determined by undercut depth from application review.
- Cores are supplied complete with machined molding details.



GRINDING RINGS AND FIXTURES



Grinding Rings for Collapsible Cores securely hold the core segments in place against the center pin when grinding or EDM'ing details.

M D-2 **H** 59-61 HRC **S** Black Oxide

DT CORE GRINDING FIXTURES

| CATALOG NUMBER | CORE SIZE |
|----------------|-----------|
| DTGF18 | DT18 |
| DTGF28 | DT28 |
| DTGF38 | DT38 |
| DTGF48 | DT48 |

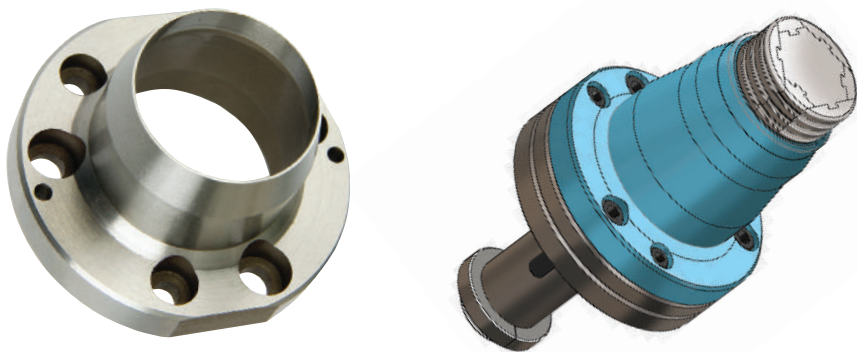
M Aluminum **S** Black Anodize

RT CORE GRINDING RINGS

| CATALOG NUMBER | CORE SIZE (PREFIX CC) |
|----------------|-----------------------|
| RTGR125 | 125 |
| RTGR150 | 150/175 |
| RTGR200 | 175/200/202/250/252 |
| RTGR300 | 302/352 |
| RTGR400 | 402 |
| RTGR500 | 502 |
| RTGR600 | 602 |
| RTGR650 | 652 |
| RTGR700 | 702 |

Top: RT Core shown with Grinding Ring.
Bottom: DT Core shown with Grinding Fixture.

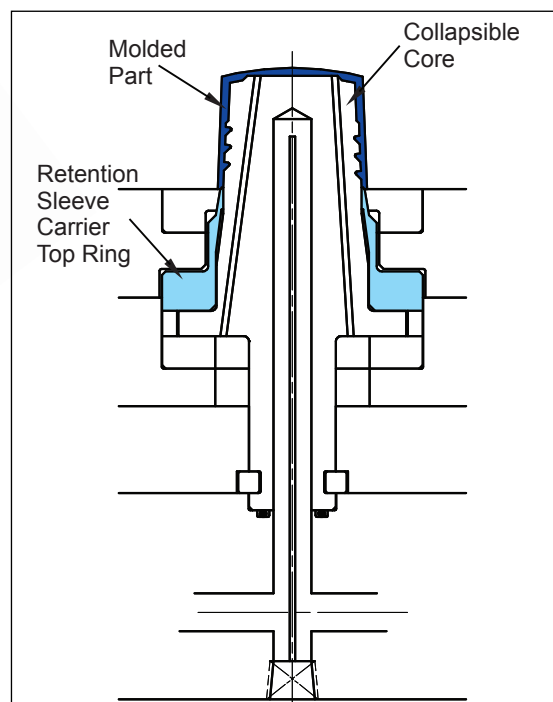
RETENTION SLEEVES



M D-2 **H** 59-61 HRC

Retention Sleeves for DoveTail Collapsible Cores assure the position of the molded part during core collapse and part ejection.

Contact information@roehrtool.com for more information.





COLLAPSIBLE CORES & MINICORES®

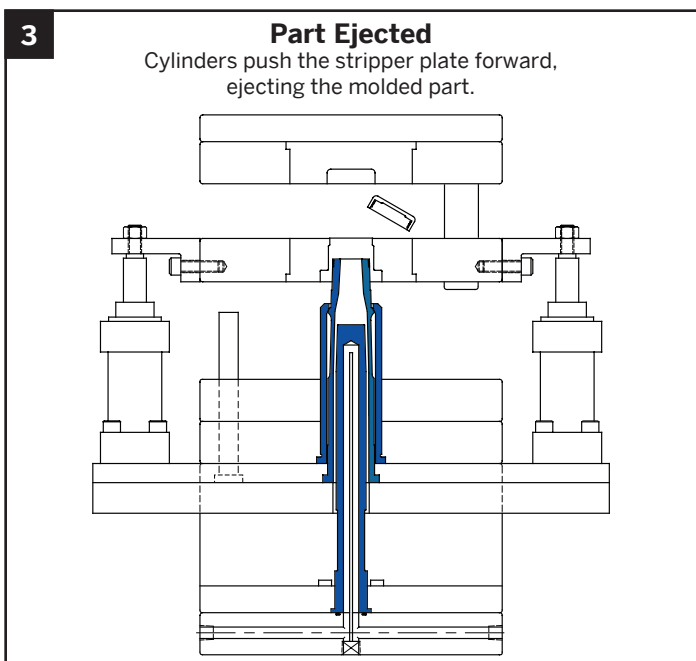
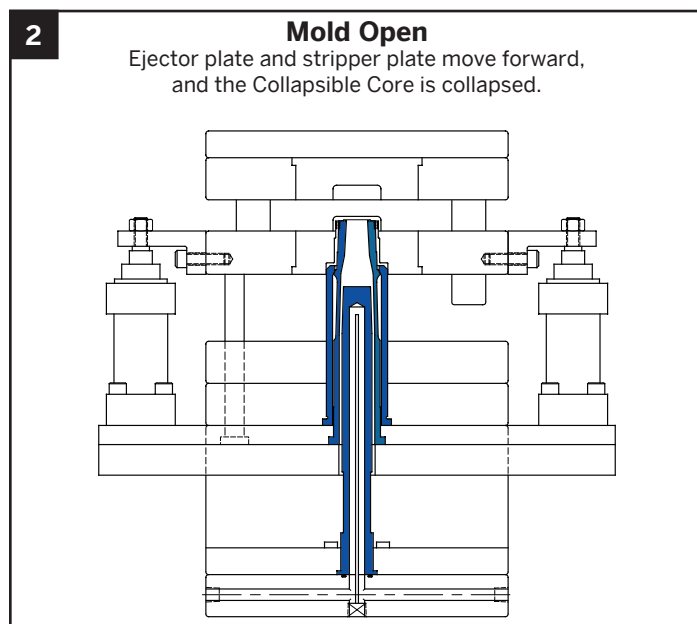
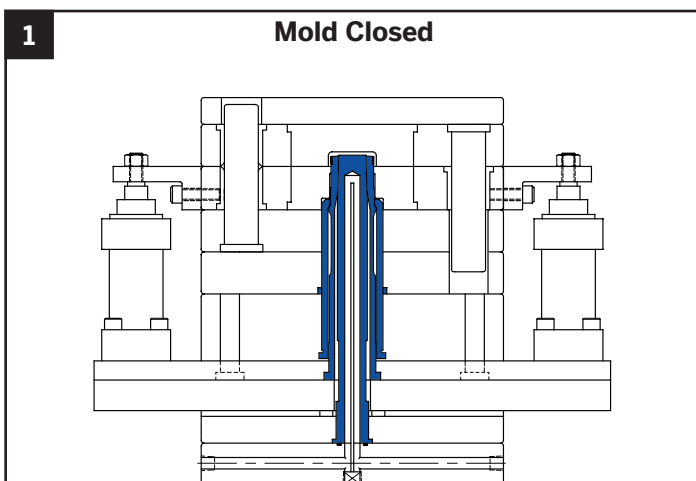
RT SERIES

The RT Series Collapsible Cores are available in sizes to fit most inside detail applications. Whether molding threads or complex details, these cores can simplify design and production. Collapsible Cores allow for smaller molds to run faster cycles with less moving parts.

Standard sized Collapsible Cores (RT) and MiniCores (RT) are engineered and manufactured for Progressive Components through an alliance with Roehr Tool Solutions.

Made from premium tool steels and heat treated using proprietary heat treating methods.

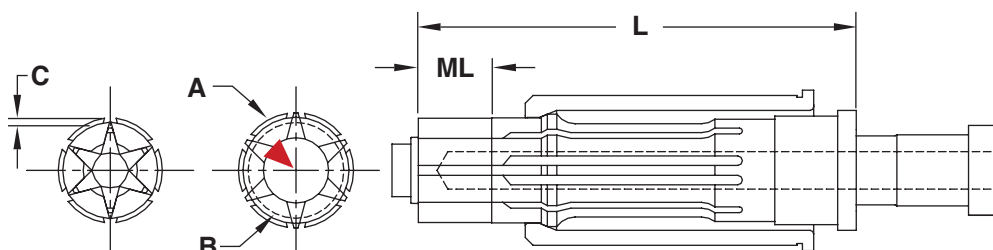
Standard diameters range from 13mm to 105mm.



Roehr Tool can provide Collapsible Cores with details machined complete. Contact an engineer at information@roehrtool.com for an application review and quotation.

COLLAPSIBLE CORES

RT SERIES

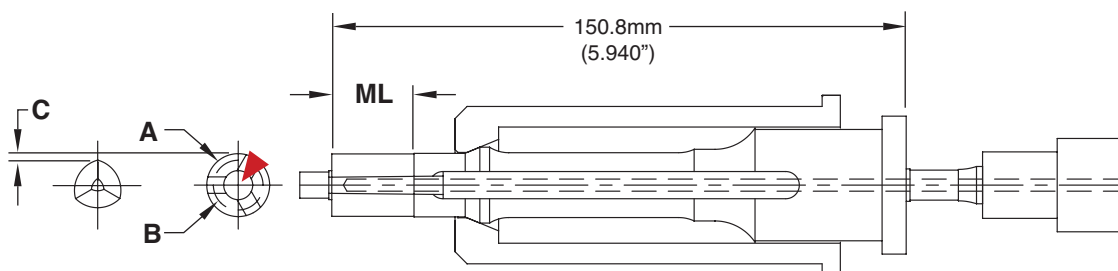


▶ CAD insertion point

| CATALOG NUMBER | A Maximum Outer Diameter | | B Minimum Inner Diameter | | Center Pin Diameter (At top of Collapsible Core) | | ML Max. Molded Length (Including Mold Shut-Off) | | C Collapse per Side at Top of Core** (Range Shown) | | | | L Length of Collapsible Core | |
|----------------|-----------------------------|--------|-----------------------------|-------|---|-------|---|-------|---|------|------|------|---------------------------------|--------|
| | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm |
| CC-125-PC | .720 | 18.29 | .620 | 15.75 | .485 | 12.32 | .800 | 20.32 | .027 | .69 | .032 | .81 | 5.605 | 142.37 |
| CC-150-PC | .850 | 21.59 | .700 | 17.78 | .580 | 14.73 | 1.000 | 25.40 | .037 | .94 | .042 | 1.07 | 6.615 | 168.02 |
| CC-175-PC | .970 | 24.64 | .760 | 19.30 | .640 | 16.25 | 1.000 | 25.40 | .043 | 1.09 | .048 | 1.21 | 6.615 | 168.02 |
| CC-200-PC | 1.270 | 32.25 | .910 | 23.11 | .785 | 19.93 | 1.150 | 29.21 | .043 | 1.09 | .048 | 1.21 | 7.315 | 185.80 |
| CC-250-PC | 1.270 | 32.25 | .910 | 23.11 | .785 | 19.93 | 1.150 | 29.21 | .043 | 1.09 | .048 | 1.21 | 5.440 | 138.17 |
| CC-202-PC | 1.390 | 35.30 | 1.010 | 25.65 | .885 | 22.47 | 1.150 | 29.21 | .055 | 1.39 | .064 | 1.62 | 7.315 | 185.80 |
| CC-252-PC | 1.390 | 35.30 | 1.010 | 25.65 | .885 | 22.47 | 1.150 | 29.21 | .055 | 1.39 | .064 | 1.62 | 5.440 | 138.17 |
| CC-302-PC | 1.740 | 44.19 | 1.270 | 32.25 | 1.105 | 28.06 | 1.400 | 35.56 | .068 | 1.72 | .083 | 2.10 | 7.315 | 185.80 |
| CC-352-PC | 1.740 | 44.19 | 1.270 | 32.25 | 1.105 | 28.06 | 1.400 | 35.56 | .068 | 1.72 | .083 | 2.10 | 6.065 | 154.05 |
| CC-402-PC | 2.182 | 55.42 | 1.593 | 40.46 | 1.388 | 35.25 | 1.700 | 43.18 | .090 | 2.28 | .103 | 2.61 | 7.815 | 198.50 |
| CC-502-PC | 2.800 | 71.12 | 2.060 | 52.32 | 1.750 | 44.45 | 1.900 | 48.26 | .115 | 2.92 | .125 | 3.17 | 9.625 | 244.47 |
| CC-602-PC | 3.535 | 89.78 | 2.610 | 66.29 | 2.175 | 55.24 | 2.400 | 60.96 | .140 | 3.55 | .148 | 3.75 | 11.250 | 285.75 |
| CC-652-PC | 3.800 | 96.52 | 2.890 | 73.41 | 2.450 | 62.23 | 2.400 | 60.96 | .150 | 3.81 | .160 | 4.06 | 11.250 | 285.75 |
| CC-702-PC | 4.225 | 107.31 | 3.350 | 85.09 | 2.790 | 70.86 | 2.400 | 60.96 | .165 | 4.19 | .170 | 4.32 | 11.250 | 285.75 |

MINICORES®

RT SERIES



| CATALOG NUMBER | For Closure Diameter Range | A Maximum Outer Diameter | | B Minimum Inner Diameter | | Center Pin Dia. (At top of Collapsible Core) | | Width of (3) Non-Collapsing Center Pin Blades (At Top of Core) | | ML Max. Molded Length (Including Mold Shut-Off) | | C Collapse per Side at Top of Core | |
|----------------|----------------------------|-----------------------------|-------|-----------------------------|-------|---|-------|--|------|---|-------|--|------|
| | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm |
| CCM-0001 | 13-16 | .645 | 16.38 | .425 | 10.80 | .300 | 7.62 | .170 | 4.32 | .850 | 21.59 | .052 | 1.32 |
| CCM-0002 | 17-20 | .805 | 20.45 | .560 | 14.22 | .420 | 10.67 | .190 | 4.83 | .850 | 21.59 | .057 | 1.45 |
| CCM-0003 | 21-24 | .965 | 24.51 | .710 | 18.03 | .560 | 14.22 | .200 | 5.08 | 1.000 | 25.40 | .059 | 1.50 |

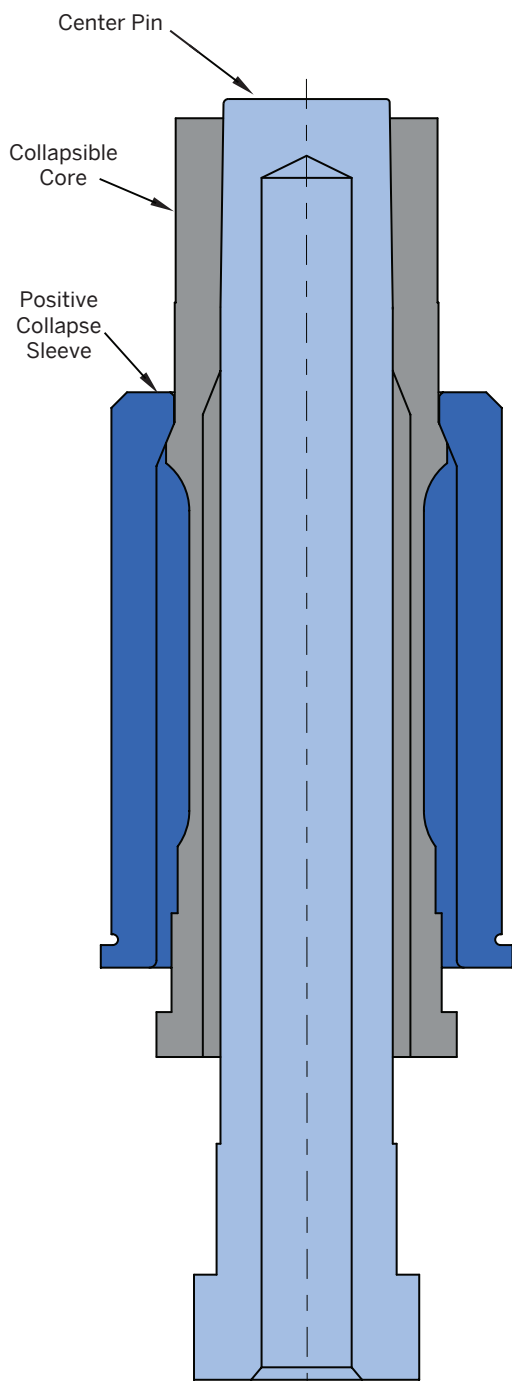


COLLAPSIBLE CORES & MINICORES®

RT SERIES

Description of Components and Basic Operation

Both styles of the Collapsible Cores (Standard and MiniCores®) are three-part assemblies, designed for simplicity of installation, reliability in operation, and long life. The three parts include a Collapsible Core, a Positive Collapse Sleeve, and a Center Pin.



Collapsible Core

M A-2 **H** 54-57 HRC

- Designed to collapse independently when the center pin is withdrawn.
- The fit between segments is controlled to permit flash-free molding.

Positive Collapse Sleeve

M 52100 **H** 54-57 HRC

- Designed to function when the Collapsible Core fails to collapse independently. In normal operation, the PC Sleeve is not functioning. It is essential to have such a unit for maximum safety and reliability in automatic and semi-automatic operation.

Center Pin

M D-6 **H** 60-65 HRC

- Serves to expand the segments of the Collapsible Core to their molding position.
- The pin must protrude beyond the face of the collapsing core segments, and it must have a radius around its top edge to operate properly.

Application Guidelines

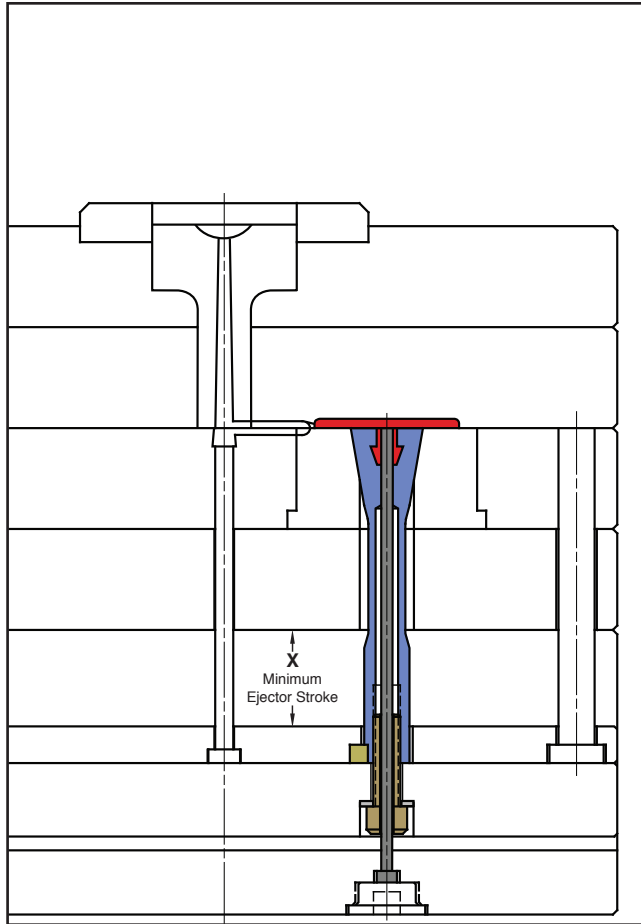
- Standard Collapsible Cores have a Max. OD ("A") of thread or configuration ranging from .720" (18.29mm) - 4.225" (107.31mm) and offer complete 360° thread or undercut geometry.
- MiniCores have a Max. OD of thread or configuration ranging from .645" (16.38mm) - .965" (24.51mm) and offer up to 70% full thread or undercut geometry. (Internal geometry is interrupted in three places to allow core segments to collapse.)
- Molded parts do not need to be closed at one end. They can be partially or completely open. Also, undercuts do not need to be continuous.
- Cores are capable of operating without benefit of lubrication, however, treating the Collapsible Core with an additional treatment for wear reduction or corrosion resistance is beneficial.
- Custom cores with size requirements that fall outside of the standard Collapsible Core and MiniCore ranges are available. In addition, finished cores with machined, EDM'd, or ground details can be supplied. Contact Roehr Tool at information@roehrtool.com for an application review and quotation.

EXPANDABLE CAVITIES

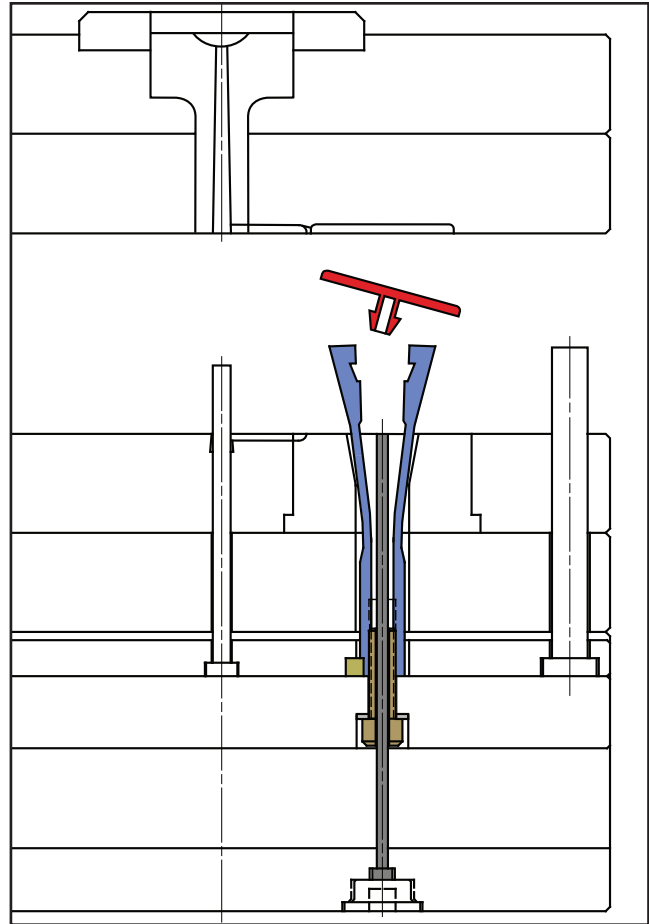
EX-CAV[®] SYSTEM

Expandable Cavities mold undercuts such as threads, dimples, and protrusions. The patented Ex-Cav design eliminates the engineering, maintenance, and machining required for side action mechanisms which results in smaller molds or higher mold cavitation.

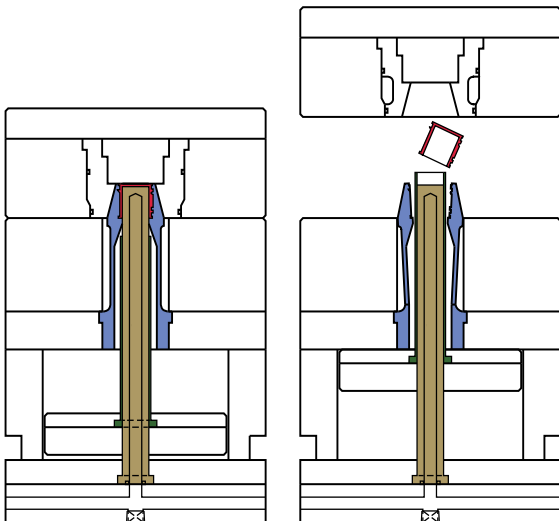
Standard sized Expandable Cavities (Ex-Cavs) are engineered and manufactured for Progressive Components through an alliance with Roehr Tool Solutions.



Mold Closed



Mold Open

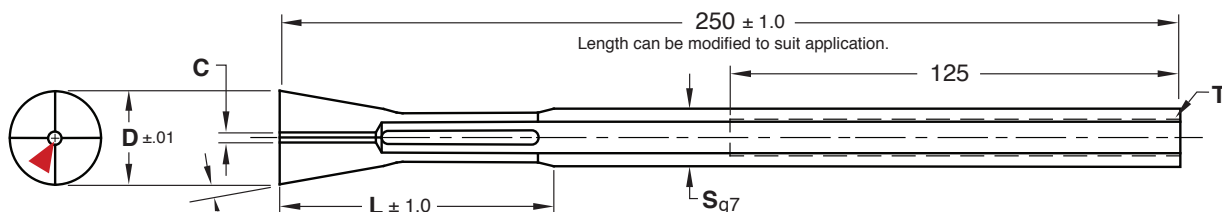
**Technical Information:**

- Four sizes offered to satisfy a wide range of parts.
- The Ex-Cav expands along a conical shape, 10° per side.
- Manufactured from A-2, 54-57 HRC material for repeatable expansion. For optimal performance, the Ex-Cavs should ride against a hardened insert.
- Maximum temperature: 260°C / 500° F
- Expandable Cavities are capable of operating without lubrication.
- However, treating the Ex-Cav with an additional coating for wear reduction or corrosion resistance is beneficial.
- Ex-Cavs can be ordered with molding detail for a 'mold ready' component.
- Fixturing bushings for machining details in house are also available.
- Custom Ex-Cavs are available. Also, when an entire part is formed within the cavity, an A-Series Ex-Cav can be provided, shown at left.



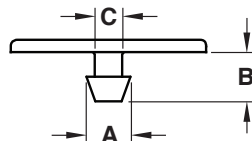
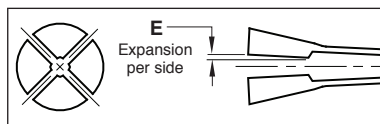
EXPANDABLE CAVITIES

EX-CAV® SYSTEM



M A-2 **H** 54-57 HRC

CAD insertion point



| CATALOG NUMBER | D Ex-Cav Diameter | A Maximum Part Diameter -10° per side | B Maximum Molding Length | C Minimum Part Inner Diameter | E Expansion Per Side | F Min. Wall Thickness | L | S Body Diameter | T Thread | X Minimum Ejection Stroke (Prev. page) |
|----------------|-------------------|---------------------------------------|--------------------------|-------------------------------|----------------------|-----------------------|-----|-----------------|----------|--|
| EXCAV20 | 20 | 14 | 13 | 2.5 | 1.6 | 3 | 59 | 14 | M8 | 15 |
| EXCAV26 | 26 | 18 | 20 | 3.5 | 2.5 | 4 | 76 | 16 | M10 | 15 |
| EXCAV38 | 38 | 30 | 27 | 4.0 | 3.0 | 4 | 89 | 27 | M18 | 20 |
| EXCAV50 | 50 | 40 | 39 | 5.5 | 3.5 | 5 | 101 | 34 | M24 | 20 |

Mounting kits sold separately below.
Ex-Cav sizes outside of this chart are available as customs.

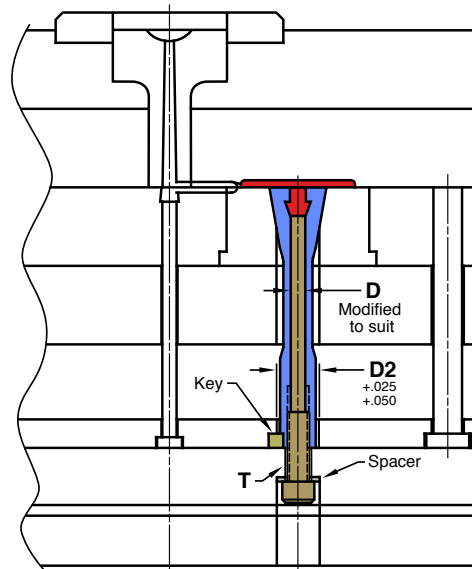
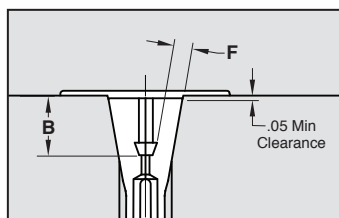
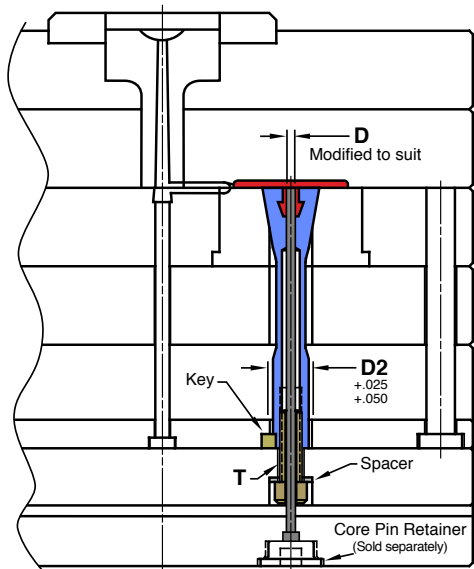
MOUNTING KITS & MACHINING SPECS

Hollow Bolt Mounting Kit Includes:

- Key (7 Thk. x 8 x 40)
- Hollowed Bolt
- Standard DIN H-13 Ejector Pin (400mm Long)
- Spacer

Pin Bolt Mounting Kit Includes:

- Key (7 Thk. x 8 x 40)
- Threaded Bolt/Pin (H-13, 40-44 HRC, 280mm Long)
- Spacer



| EX-CAV NUMBER | D Nominal Pin Diameter | T Bolt Size | Spacer Size (IDxODxThk) | D2 | HOLLOW BOLT KIT NUMBER |
|---------------|------------------------|--------------|-------------------------|----|------------------------|
| EXCAV20 | 3.5 | M8-1.25 x 40 | 8x22x4 | 14 | EXC20BH |
| EXCAV26 | 4 | M10-1.5 x 40 | 10x23x4 | 16 | EXC26BH |
| EXCAV38 | 10 | M18-2.5 x 50 | 19x33x6 | 27 | EXC38BH |
| EXCAV50 | 14 | M24-3 x 55 | 25x42x6 | 34 | EXC50BH |

| EX-CAV NUMBER | D Pin Diam. ± .05 | T Bolt Thread | Spacer Size (IDxODxThk) | D2 | PIN BOLT KIT NUMBER |
|---------------|-------------------|---------------|-------------------------|----|---------------------|
| EXCAV20 | 6.0 | M8-1.25 | 8x22x4 | 14 | EXC20BP |
| EXCAV26 | 7.7 | M10-1.5 | 10x23x4 | 16 | EXC26BP |
| EXCAV38 | 14.5 | M18-2.5 | 19x33x6 | 27 | EXC38BP |
| EXCAV50 | 19.8 | M24-3 | 25x42x6 | 34 | EXC50BP |

Replacement DIN Ejector Pins are sold on page A-4.
Core Pin Retainers are sold on pg A-17.