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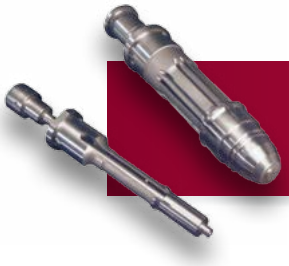
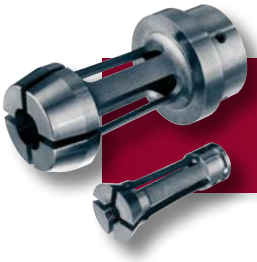


Collapsible Cores 5



Expandable Cavities 15

DT Series Collapsible Cores 23

THE POWER OF POSSIBILITIES.

At **DME** - a Milacron company - we see ourselves as problem solvers. A global integrated team that is driven by the desire to help each customer's "what ifs" come to life.

23/09/2016

"We want customers calling us with their toughest problems and wildest ideas. We are in the business of creating solutions and realizing aspirations – of building what used to be impossible."

Tom Goeke
CEO, MILACRON

A GLOBAL TEAM, WORKING AS ONE.

Milacron has a global perspective on what matters in manufacturing. With over 15 manufacturing facilities in six countries, we sell our plastics processing solutions in over 100 countries across six continents. We have an installed base of 40,000 machines, 153,000 hot runners and over 3.5 million square feet of manufacturing space. We put this know-how to work every day to improve productivity, cut costs, increase energy efficiency, eliminate scrap, and reduce cycle times across a diverse range of industries. Behind it all is our people – caring, committed and creative – who build long-term relationships with our customers.

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Success in today's global market starts with the best product, at the best price, in the required time frame. To achieve this, **DME** provides customers with the best blend of manufacturing, outsourcing and strategic partners, managed to be delivered right on time anywhere in the world using contemporary, sophisticated techniques.

DME delivers a variety of mold components available in all regional standards. Thousands of high performance, off-the-shelf and engineered solutions let our customers spend more time on valuable cavity work. Along with a comprehensive line of equipment and supplies, we provide the high quality products you need to speed up assembly and simplify operations.

Only **DME** can provide customers with the worldwide resources required to compete in the market of Injection Molds & Components, Hot and Cold Runner spare parts as well as in Die Set Molds & Components or Surface Finishing Technologies.

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MARKETS SERVED.

- Medical
- Irrigation
- Caps and closures (packaging)
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- Automotive

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Collapsible Cores

DME

Info CCM-CC

General description of the Collapsible Cores

It is over 40 years since DME first introduced the Collapsible Core and today it still continues to be a major influence for molding plastic parts requiring internal threads, undercuts, cut-outs etc. During this time a lot of technical knowledge and experience has been gained from many applications tackled, some of which have been very complicated. This "Know how" has been constantly passed on to the user, either through new developments, application improvements or suggestions for new applications. One such development is the new range smaller diameters which complete the series of Collapsible Cores. The Collapsible Cores now range from 7 mm to 107 mm, for the outer diameters with the corresponding inner diameter ranging from 7 mm to 85 mm. The effective collapse ranges from 0.38 mm to 4,2 mm per side at the tip of the Core, depending on the diameter of the Core.

Operation

After cooling, the mold opens and the ejector plate assembly moves forward as far as the stop. This causes the core sleeve to move away from the centre pin and the positive collapsed sleeve to engage, which ensures that all segments have collapsed. However, the molded part remains or hangs until the stripper plate is moved forward to eject the components. This is usually carried out by the activation of two double acting air cylinders mounted on the ejector plates and connected to the stripper plate on the outside of the mold. The stripper plate is then retracted using the two air cylinders before the mold is closed. When closing the mold, one has to ensure that the ejector plates are returned before the mold is fully closed. This can be achieved by the use of early ejector returns. The core sleeve is returned to the molding position thus preventing damage to the Collapsible Cores. When the mold is fully closed the next cycle can begin. When using Collapsible Cores the designer has a product which offers many opportunities for producing many variations of molded caps. The result is a mold which functions reliably and economically irrespective of whether it concerns a single or multiple cavity mold. Parts with internal protrusions, dimples, interrupted threads and cut-outs can be economically produced on a high or low volume basis. It should be noted that due to the design of the Mini Collapsible Core only interrupted threads and undercuts can be produced. The interruptions consist of three small slots with width "J" (See table), but in most cases this does not imply any technical disadvantages.

Design Procedure

The following steps are used to determine if a part can be molded on the Mini or Standard Collapsible Core:

a) Calculate the expected actual shrinkage "S" = part Ø x shrinkage (%) "S1" = part length x shrinkage (%)

b) Determine that the part minor diameter "A" is not less than "A min" (See table and Fig 1)

c) Determine that the part major diameter "B" is not greater than "B max" (See table and Fig 1)

d) Determine that thread depth or part undercut at "L" does not exceed the calculated dimension "C" (see Table and Fig.1). The collapse available decreases from the front of the core at a rate of 0,02 mm/mm. When the amount of collapse "C" of the Mini or Standard Collapsible Cores is insufficient, Collapsible Cores of the same size but with a greater collapse can be obtained.

Type	CK Max.
CCM-0001	1.45 mm/side
CCM-0002	1.60 mm/side
CCM-0003	1.80 mm/side
CC 125 PC	0.80 mm/side
CC 150 PC	1.07 mm/side
CC 175 PC	1.20 mm/side
CC 250 PC	1.20 mm/side

Type	CK Max.
CC 252 PC	1.60 mm/side
CC 352 PC	2.10 mm/side
CC 402 PC	2.65 mm/side
CC 502 PC	3.20 mm/side
CC 602 PC	3.75 mm/side
CC 652 PC	4.06 mm/side
CC 702 PC	4.32 mm/side

CK = Collapse per side at top of core.

e) Determine that part depth "D" (Fig 1) does not exceed the value "D" given in the table. Dimension "K min" of the table must be equal to or larger than "K min".

See collapsible core structure on page 8

Material and hardness

a) The centre pin is manufactured from high quality alloy steel 1.2436, hardened to 60-65 HRC. Centre pins for Standard as well as for Mini Collapsible Cores are fitted to a specific core and cannot be interchanged. This is due to the centre pin and core sleeve being assembled and ground together.

b) Core sleeves are manufactured in a 1.2363 steel (AISI 01) and hardened to 55-60 HRC. All centre pins and core sleeves carry a serial number. Always verify the serial number prior to grinding or final assembly.

c) The positive collapse sleeve is manufactured in tool steel and hardened to 55 ± 5 HRC. It is designed to function when the Collapsible Core fails to collapse independently upon withdrawal of the centre pin. Its aim is an additional and necessary safety factor.

What materials can be molded?

All commonly used thermoplastic molding resins. For many years filled and non-filled molding resins have been successfully molded. Special requirements have to be taken into consideration when PVC is processed. When using the Mini or Standard Collapsible Cores for processing this material it is recommended you contact **DME.**

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Part design - special requirements

For successful operation the design of the part must fulfil the following requirements:

a) In contrast with the Standard Collapsible Core it is not possible to mold parts with full threads with the Mini Collapsible Core. The three remaining "marks" on the part result from the three interrupted areas with width "J" of the non-collapsing centre pin blades. Make sure that the top of the centre pin protrudes beyond the top of the core sleeve.

b) The centre pin must protrude beyond the core face by at least the distance "F". Protrusions down to "F min" are acceptable but "F max" is recommended. For "F min" and "F max" see Table or Collapsible Core dimensions leaflet. Radius "R" is most important. For "R min" and "R max" see Collapsible Core dimension drawing.

c) There must be no undercuts on the face of the core segments. This will prevent the Collapsible Core from functioning.

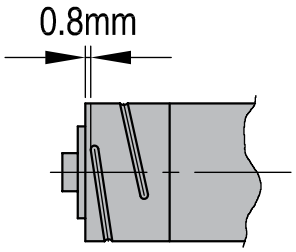
d) Undercuts on the face of the pin must not interfere with full radial movement of the core. They must be located either forward of the core face or within a diameter smaller than "G" (see Table, Fig 3; max 4 mm - see Collapsible Core dimension drawing). In no case should the undercuts be so deep that they come close to the cooling lines in the centre pin. For special requirements please contact
DME.

e) The core face must have a draft of at least 3° starting no further than 0.8 mm from the top of the pin. A greater draft is desirable when "B" is near "B max" (ex. 4-5°).

f) All undercuts should be drafted. A minimum draft of 5° is required (see Table, fig 3), more is recommended. Interrupted undercuts also require a side draft of at last 5°.

g) Means must be provided for carrying the molded part off of the collapsed core at the completion of the ejection stroke. This is normally done by providing a ring projection (0.25 x 0.25 mm) on the face of the stripper stroke. The part must not drag over the core (see detail Y on Collapsible Core dimensions leaflet).

h) As in conventional practice, sharp interior corners must be avoided to prevent stress concentration in the steel. Never permit a ground thread to run out through the face of the core. This leaves a knife edge of steel that will break off in time.

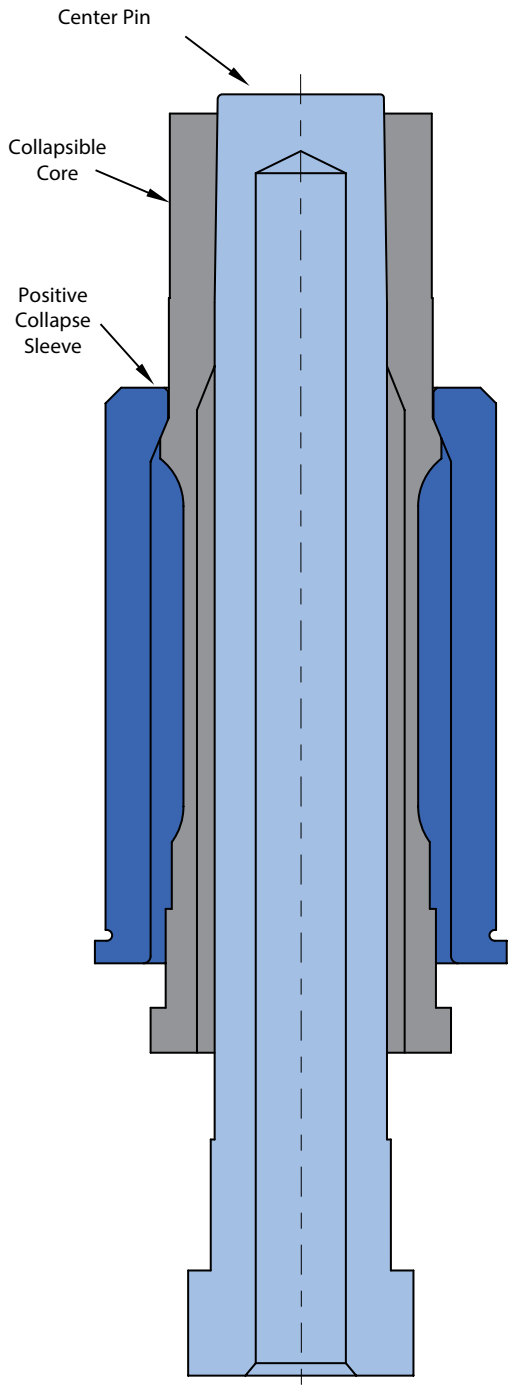


Info

Construction

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

Mat.: 1.2363 - Hardness: 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

Mat.: 1.3505- Hardness: 54-57 HRC

- Designed to function if the Collapsible Core should fail 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

Mat.: 1.2436 - Hardness: 60 -62 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 18.29mm (.720") - 107.31mm (4.225") and offer complete 360˚ thread or undercut geometry.**
- **MiniCores have a Max. OD of thread or configuration ranging from 16.38mm(.645") - 24.51mm(.965") 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 DME for an application review and quotation.

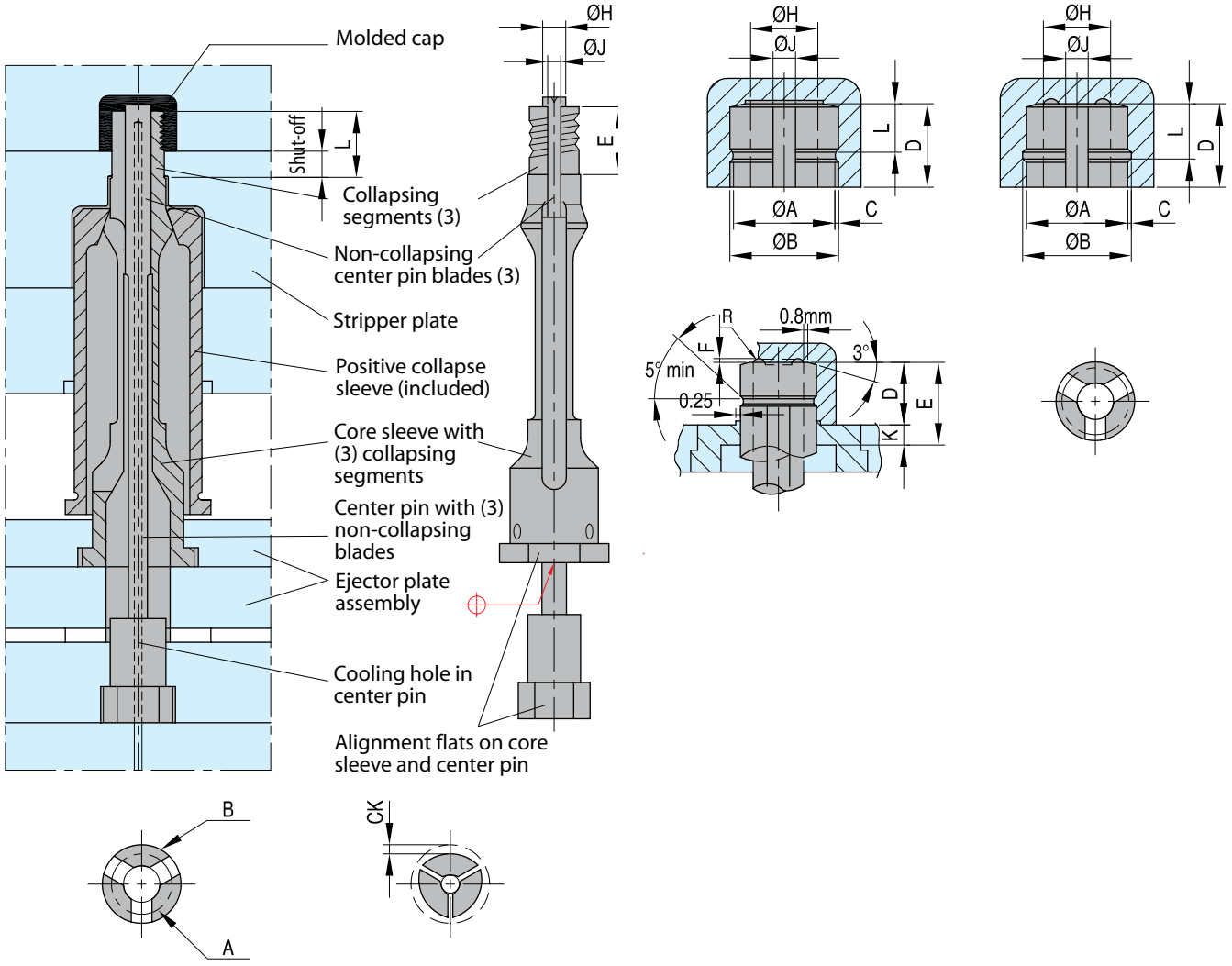
23/09/2016

Collapsible mini-cores

CCM

MiniCores broaden the applications of collapsible core molds to parts as small as 10,80 mm. Due to the smaller diameters involved, these MiniCores employ three larger collapsing segments combined with three narrow, non-collapsing blades which are part of the center pin. As a result, the internal undercut geometry is not 360 degrees around but instead interrupted in three places. The 3-blade design allows for more collapse which means a deeper undercut feature can be released.

In addition to threads, other configurations such as dimples, cut-outs or protrusions beyond the capabilities of unscrewing molds can be successfully molded. Three standard sizes of MiniCores are available with diameters from 10,80 to 24,51 mm.



REF	A. Part Minor Ø (min.)	B. Part Major Ø (max.)	C. Maximum part undercut at L	D. Maximum part depth	E. Length of fitted surface on core	F. Pin protrusion, min.	G. Inside diameter collapsed core nom	H. Pin diameter at face (nominal)	K. Stripper bushing shut-off	J. Width of non-collapsing	R. Pin tip radius	S. Material shrinkage
CCM 0001	10,80-S	16,38-S	1,32-(0,02L+0,5S)	21,60-S1-K	21,59	0,4 (0,8 max)	2,30	7,62	4,00	4	0,20	S= Shrinkage factor (%) x Part diameter (mm) S1= Shrinkage factor (%) x Part length (mm)
CCM 0002	14,22-S	20,45-S	1,45-(0,02L+0,5S)	21,60-S1-K	21,59	0,4 (0,8 max)	4,60	10,67	4,83	4	0,20	
CCM 0003	18,03-S	24,51-S	1,50-(0,02L+0,5S)	25,40-S1-K	25,40	0,4 (0,8 max)	7,90	14,22	5,08	4	0,20	

Build in instructions available upon request.

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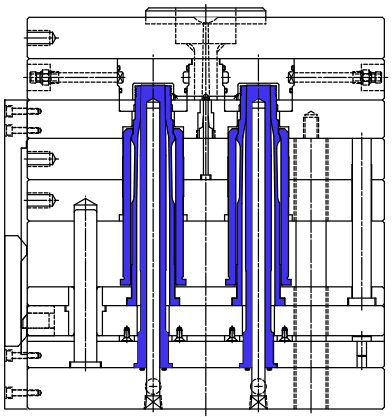
CC

Collapsible cores

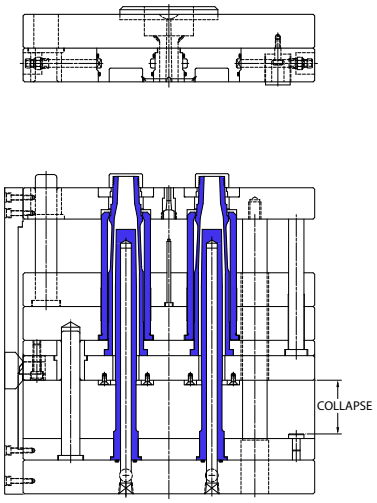
Collapsible Cores are available in sizes to fit most inside detail applications. Whether molding threads or complex details, these cores can simplify design and production. Collapsible Cores allow for smaller molds to run faster cycles with less moving parts.

1 Mold Closed



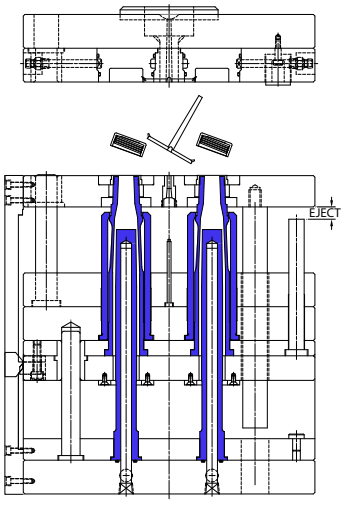
2 Mold Open

Ejector plate and stripper plate move forward, and the Collapsible Core is collapsed.



3 Part Ejected

Machine pushes the stripper plate forward, ejecting the molded part.



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Collapsible cores

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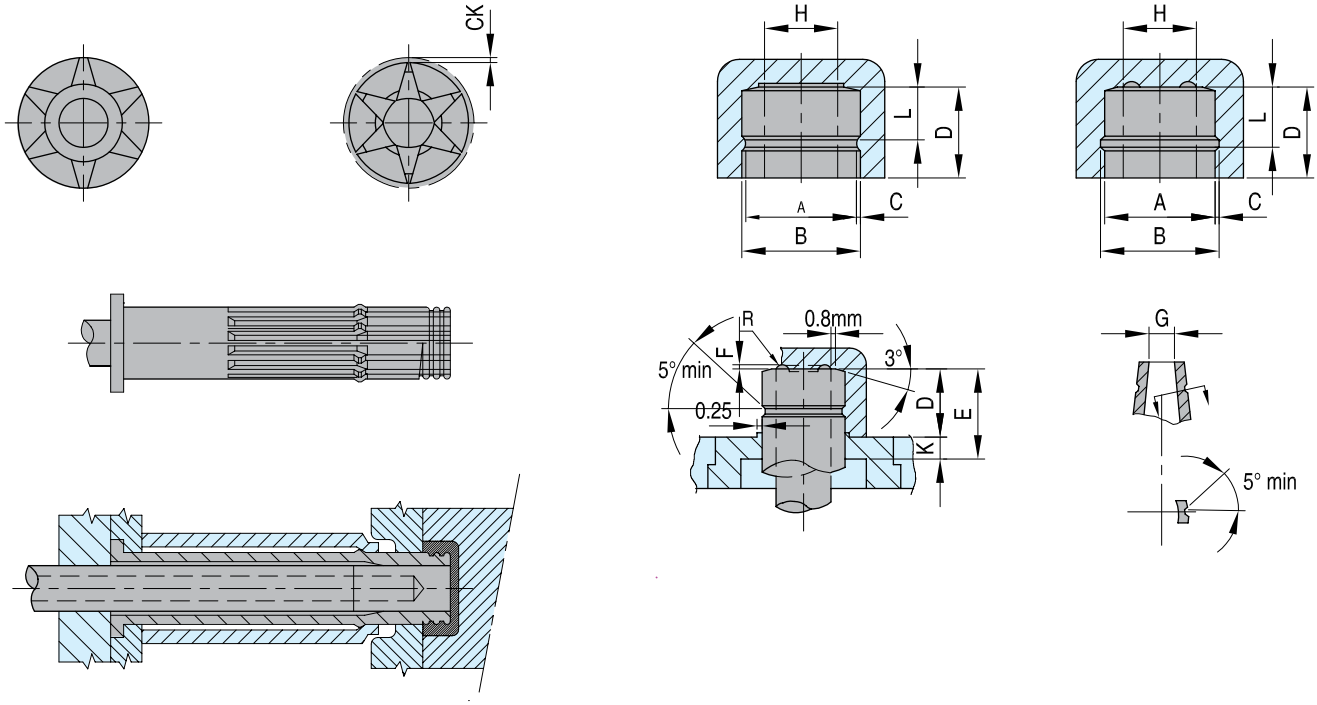

REF	A. Part Minor Ø (min.)	B. Part Major Ø (max.)	C. Maximum part undercut at L	D. Max. part depth	E Max. molded length	F. Pin protrusion, min.	G. Inside diameter collapsed core nom	H. Pin diameter at face (nominal)	K. Stripper bushing shut-off	R. Pin tip radius	S. Material shrinkage
CC 125 PC	15,75-S	18,29-S	0,69 - (0,02L+0,5S)	E-K	20,32	0,4	5,3	12,32	4	0,20-0,25	S= Shrinkage factor (%) x Part diameter (mm) S1= Shrinkage factor (%) x Part length (mm)
CC 150 PC	17,78-S	21,59-S	0,94 - (0,02L+0,5S)	E-K	25,40	0,4	5,8	14,73	4	0,20-0,25	
CC 175 PC	19,30-S	24,64-S	1,09 - (0,02L+0,5S)	E-K	25,40	0,4	7,4	16,25	4	0,20-0,25	
CC 250 PC	23,10-S	32,25-S	1,09 - (0,02L+0,5S)	E-K	29,21	0,4 (1,9 max)	10,2	19,93	4	0,20-0,25	
CC 252 PC	25,65-S	35,30-S	1,40 - (0,02L+0,5S)	E-K	29,21	0,4 (1,9 max)	11,9	22,47	4	0,25-0,30	
CC 352 PC	32,26-S	44,19-S	1,73 - (0,02L+0,5S)	E-K	35,56	0,5 (1,9 max)	15,0	28,06	4	0,25-0,35	
CC 402 PC	40,46-S	55,42-S	2,29 - (0,02+0,5S)	E-K	43,18	0,8 (1,9 max)	18,4	35,25	5	0,30-0,35	
CC 502 PC	52,32-S	71,12-S	2,92 - (0,02L+0,5S)	E-K	48,26	0,9 (2 max)	24,0	44,45	6 (min.4)	0,35-0,40	
CC 602 PC	66,29-S	89,78-S	3,55 - (0,02L+0,5S)	E-K	60,96	1,1 (2,0 max)	30,5	55,24	6,5	0,50-0,60	
CC 652 PC	73,41-S	96,52-S	3,81 - (0,02L+0,5S)	E-K	60,96	1,5	34,3	62,23	7	0,60-0,70	
CC 702 PC	85,09-S	107,31-S	4,19 - (0,02L+0,5S)	E-K	60,96	1,5	41,9	70,86	7	0,60-0,70	

Build in instructions available upon request.

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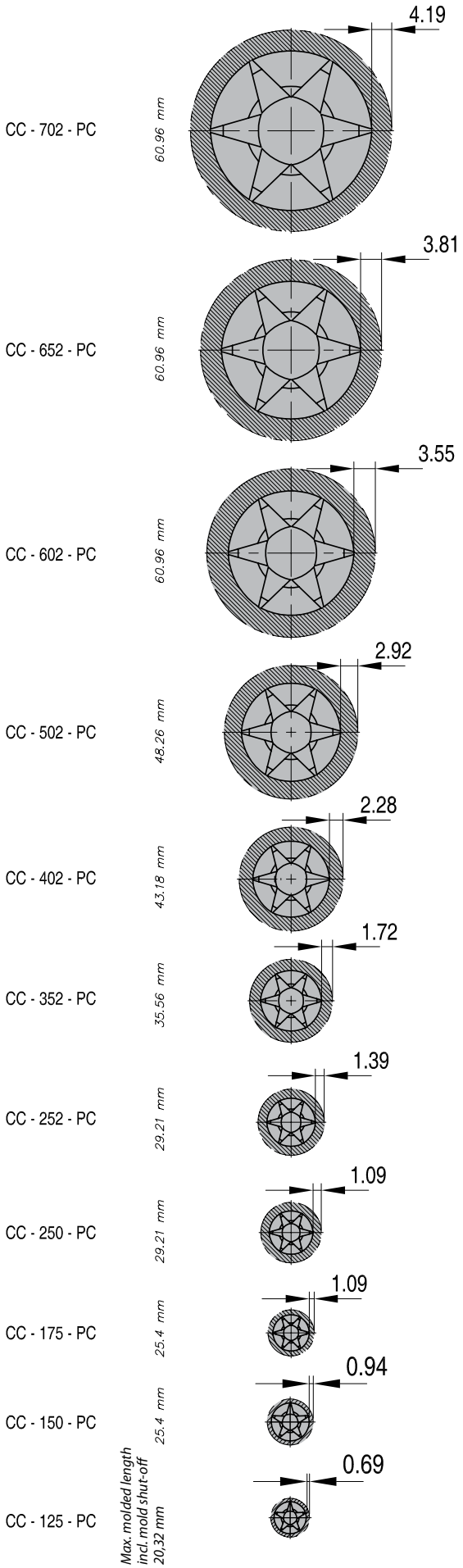
CC

Collapsible cores



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Collapsible cores

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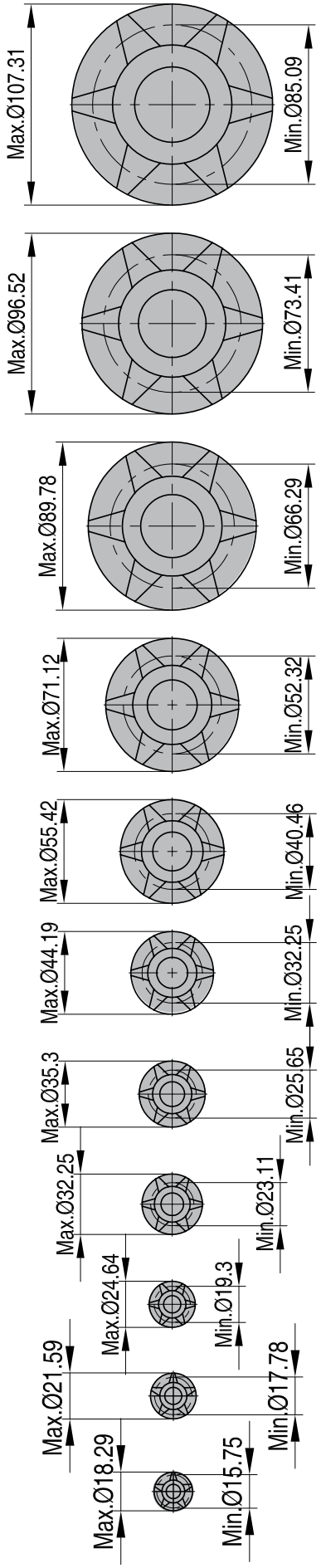

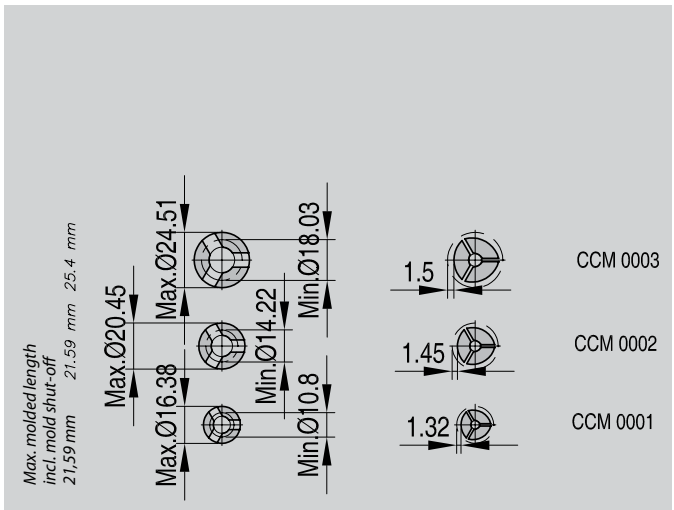

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CC...GR

Grinding rings

NEW!

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

core grinding rings	
REF	**core size (prefix cc)**
CC125GR	Grinding ring for CC125PC
CC150GR	Grinding ring for CC150/175PC
CC200GR	Grinding ring for CC250/252PC
CC300GR	Grinding ring for CC352PC
CC400GR	Grinding ring for CC402PC
CC500GR	Grinding ring for CC502PC
CC600GR	Grinding ring for CC602PC
CC650GR	Grinding ring for CC652PC
CC700GR	Grinding ring for CC702PC

How to order:

Order examples:

REF	
CC250PCEU	collapsible core incl. grinding ring
CC250PC	collapsible core excl. grinding ring
CC250GR	grinding ring

23/09/2016

MILACRON®

Expandable Cavities

DME

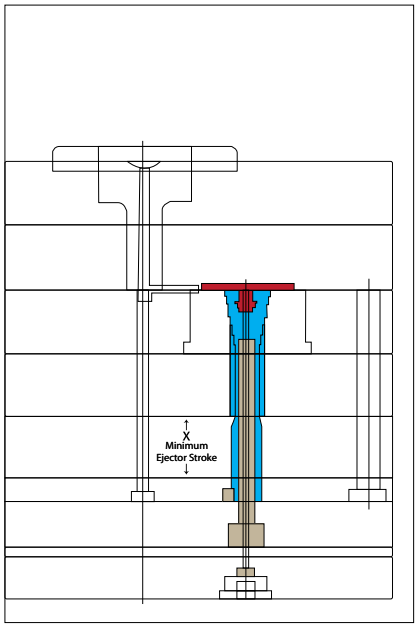
EXCAV

Ex-Cav™ System

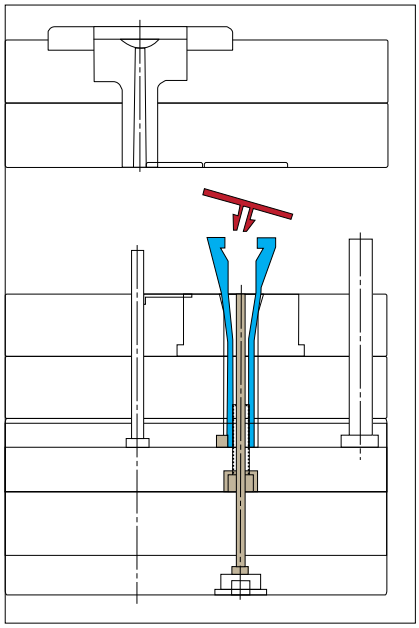
Cost savings that maximize value:

- Simplified mold design
- Eliminates traditional slides; allows molding of details once considered "un-moldable"
- Uses existing ejector system for actuation; either mold open or ejection stages the Expandable Cavity forward to release the molded undercut
- Reduces maintenance costs
- Maximizes cavities per mold
- Compact; often enabling more cavities in the mold and/or the use of a smaller mold base
- Improved mold balance and flexibility in design
- Easily accommodates family molds
- Reduces cycle time from staging plates forward during mold open
- Can be ordered with the required molding detail, eliminating the risk of machining errors or scrapping the unit, saving time and money
- Detail is machined in a one-piece unit eliminating the risk of error or mismatch that can occur with mating slides
- Manufactured with certified alloy steel (A-2) (~1.2363) and proprietary processing techniques to ensure long life and dependable performance

Expandable Cavities simplify tooling design to effectively mold undercuts such as threads, dimples, and protrusions on parts such as snap O-ring caps, plumbing supplies, industrial flanges and valves, electrical fixtures, and much more.
The patented Expandable Cavity design eliminates the engineering, maintenance, and machining required for slide action mechanisms which results in smaller molds or higher mold cavitation.

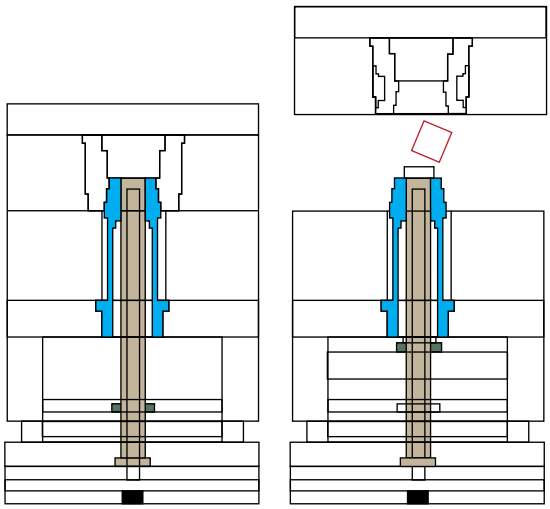


Mold Closed



Mold Open

Technical Information:
Available in four standard sizes to satisfy a wide range of applications.
The Expandable Cavity expands along a conical shape; 10° per side.
Manufactured from ~1.2363 tool steel (54-57 HRC) for repeatable expansion. For optimal performance, the Expandable Cavity should ride against a hardened insert.
Expandable Cavities are capable of operating without lubrication. However, treating the Expandable Cavity with an additional coating for wear reduction or corrosion resistance is beneficial.
Expandable Cavities can be ordered with molding detail for a 'mold ready' component.



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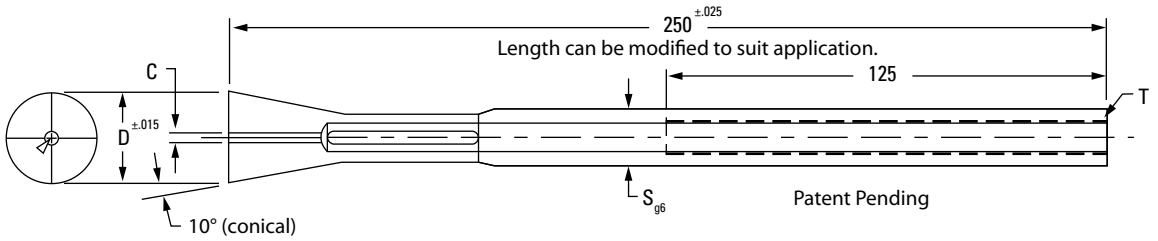
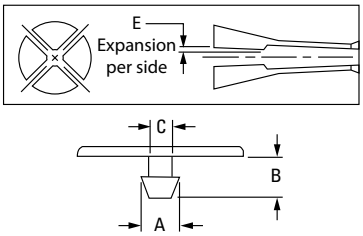
Info





REF	D Ex-Cav diameter	A Max. Part Diameter -10°/side	B Max. molding length	C Min. part inner diameter	E Expansion per side	F Min. Wall Thickness	S Body diameter	T Thread	X Min. ejection stroke (Next page)
EXCAV20	20	14	13	2,5	1,6	3	14	M8	15
EXCAV26	26	18	20	3,5	2,5	4	16	M10	15
EXCAV38	38	30	27	4,0	3,0	4	27	M18	20
EXCAV50	50	40	39	5,5	3,5	5	34	M24	20

All dimensions and tolerances in millimeters. Mounting kits sold separately (see below). Expandable Cavity sizes not shown on this table are available by special order.

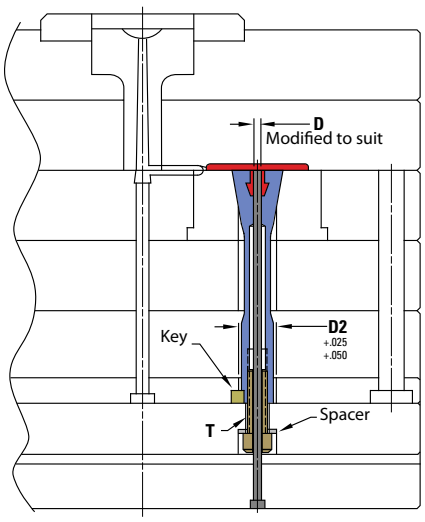
Mounting Kits — EXC ... BH, BP

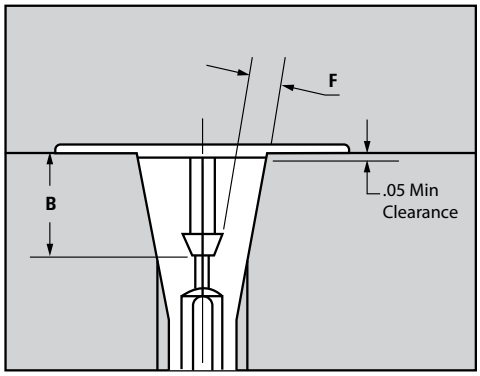
Hollow Bolt Mounting Kit Includes:

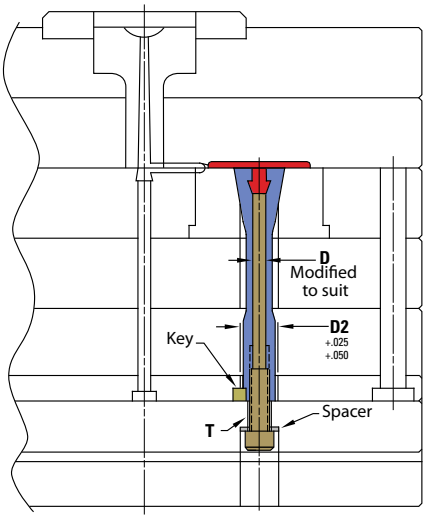
- Key (7 Thk. × 8 × 40)
- Hollow Bolt
- Standard DIN H-13(~1.2344) Ejector Pin (400mm long)
- Spacer

Pin Bolt Mounting Kit Includes:

- Key (7 Thk. × 8 × 40)
- Threaded Bolt/Pin (H-13 (~1.2344), 40-44 HRC, 280mm long)
- Spacer







REF Hollow Bolt Kit	D Nominal Pin Diameter	T Bolt size	S Spacer Size (ID × OD × Thk)	D2	For
EXC20BH	3,5	M8-1,25 × 40	8 × 22 × 4	14	**EXCAV20**
EXC26BH	4,0	M10-1,5 × 40	10 × 23 × 4	16	**EXCAV26**
EXC38BH	10,0	M18-2,5 × 50	19 × 33 × 6	27	**EXCAV38**
EXC50BH	14,0	M24-3 × 55	25 × 42 × 6	34	**EXCAV50**

REF Pin Bolt Kit	D Nominal Pin Diameter	T Bolt size	S Spacer Size (ID × OD ×Thk)	D2	For
EXC20BP	6,0	M8-1,25	8 × 22 × 4	14	**EXCAV20**
EXC26BP	7,7	M10-1,5	10 × 23 × 4	16	**EXCAV26**
EXC38BP	14,5	M18-2,5	19 × 33 × 6	27	**EXCAV38**
EXC50BP	19,8	M24-3	25 × 42 × 6	34	**EXCAV50**

23/09/2016

Info EXP

Expandable Cores

Broad Range of Benefits

Simple Design
The revolutionary design and engineering of the Expandable Core saves steps and solves problems that have complicated plastics molding for years. In addition to simplifying new tooling design, it can be retrofit to existing molds.

More Reliable
Complete reliability of the Expandable Core is assured, not only by the simplicity of the design, but also by the use of superior materials and proven proprietary processing techniques. It has been field tested over several million cycles.

More Compact
Using the DME Expandable Core allows you to design more cavities in each mold.

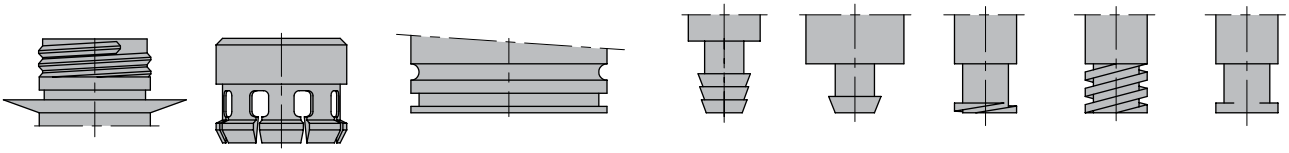
Speeds Molding Process
The Expandable Core concept completely eliminates the need for side-action mechanisms and the additional machining steps they require.

Speeds Development
The Expandable Core concept simplifies the engineering required to design and manufacture a new Core.

Lowers Development & Processing Costs
The Expandable Core saves money at every step from initial tooling to processing to maintenance. Items such as complex design details, core slides and required mechanical components.

EXP

Typical application



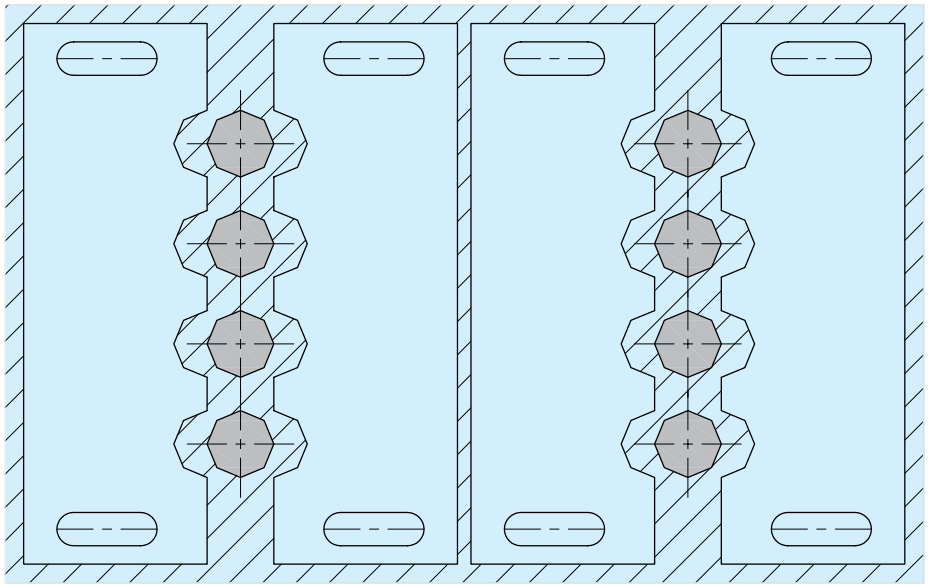
Bottle tops | Snap fit covers/lenses | O-ring grooves | Barb connections | Luer connections

REF
EXP ****

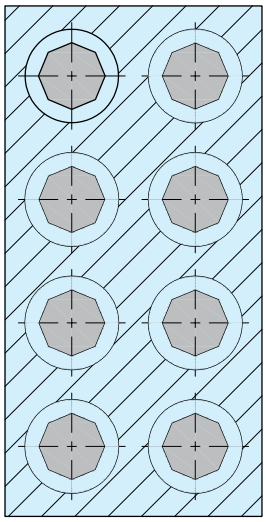
23/09/2016

Typical mold layouts

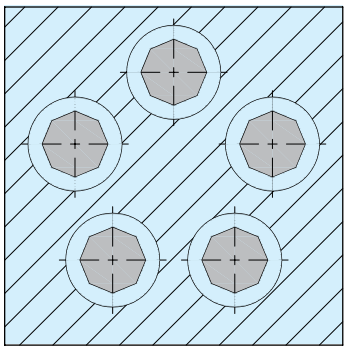
Go from this mold layout
with conventional slide mold



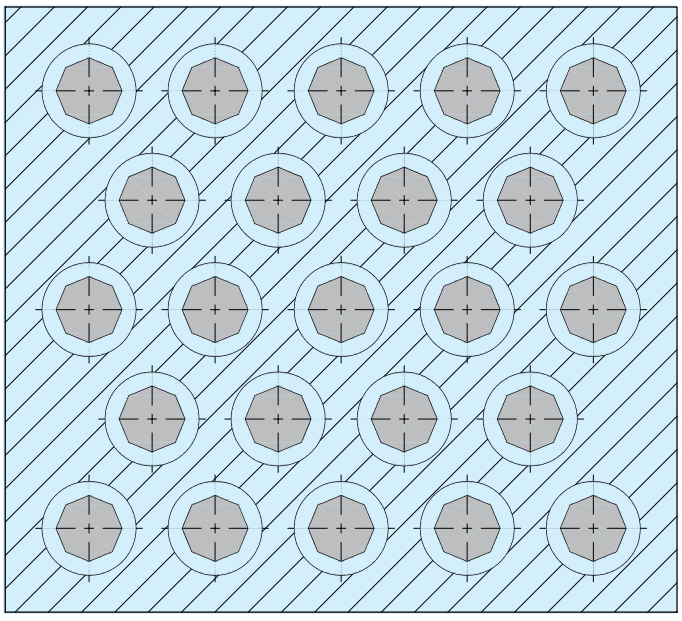
to this reduced mold size
with expandable cavity



Radial mold layout with expandable cavity



Nest mold layout with expandable cavity

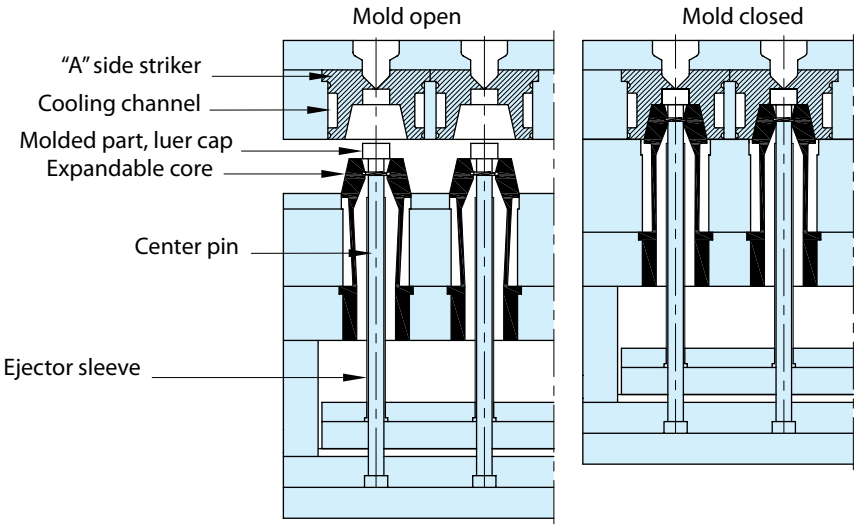


Expandable Core
The Expandable Core is typically made of 1.2363 tool steel, hardened to 54-58 HRC. The typical tool has 4 segments.

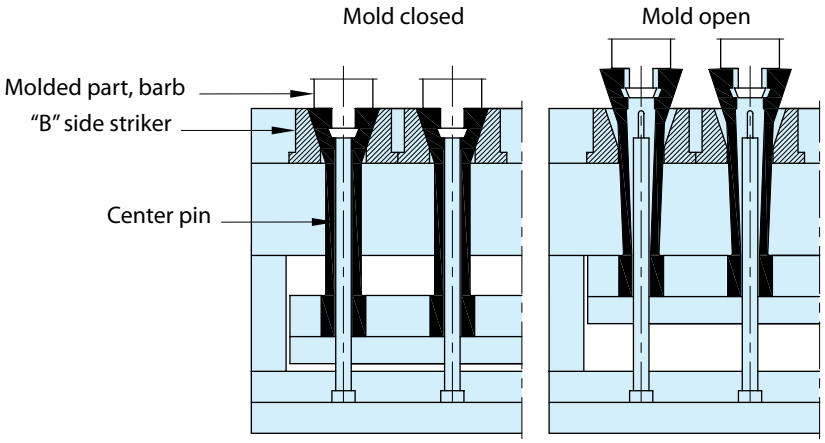
Striker Insert
The Striker Insert is made from different types of tool steel. It is hardened to 32-45 HRC scale, depending on the application. The Striker Insert has a lower hardness than the Expandable Core to ensure the eventual wear will occur on the Striker Insert. Depending on the part configuration, the Striker Insert can be used in the "A" or "B" side of the mold.(See figure 1 and 2 for details). The Striker Insert must be closely fit to the Expandable Core to ensure that in the mold closed position the segments are completely sealed against one another. The tolerance on this fit must be held to ± 0.013 mm. This will ensure flash free molding. When the mold is closed, the exterior of the Expandable Core must be supported by the Striker Insert at least 7/8 of the molded length plus the shut-off, to ensure no flash conditions. Allow for 5 mm of shut-off length below the molding length, any more is excessive.

Interchangeable Center Pin
The solid center mandrel is the most common type of center pin. It may have an inner cooling channel depending on its size. The center pin provides an internal shut-off with the Expandable Core.

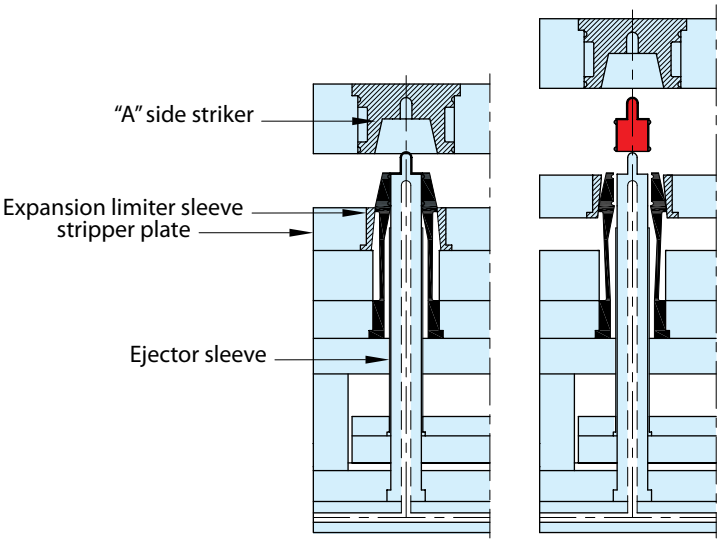
Typical application with"A" side striker insert



Typical application with "B" side striker insert



With "A" striker insert and expansion limiter sleeve

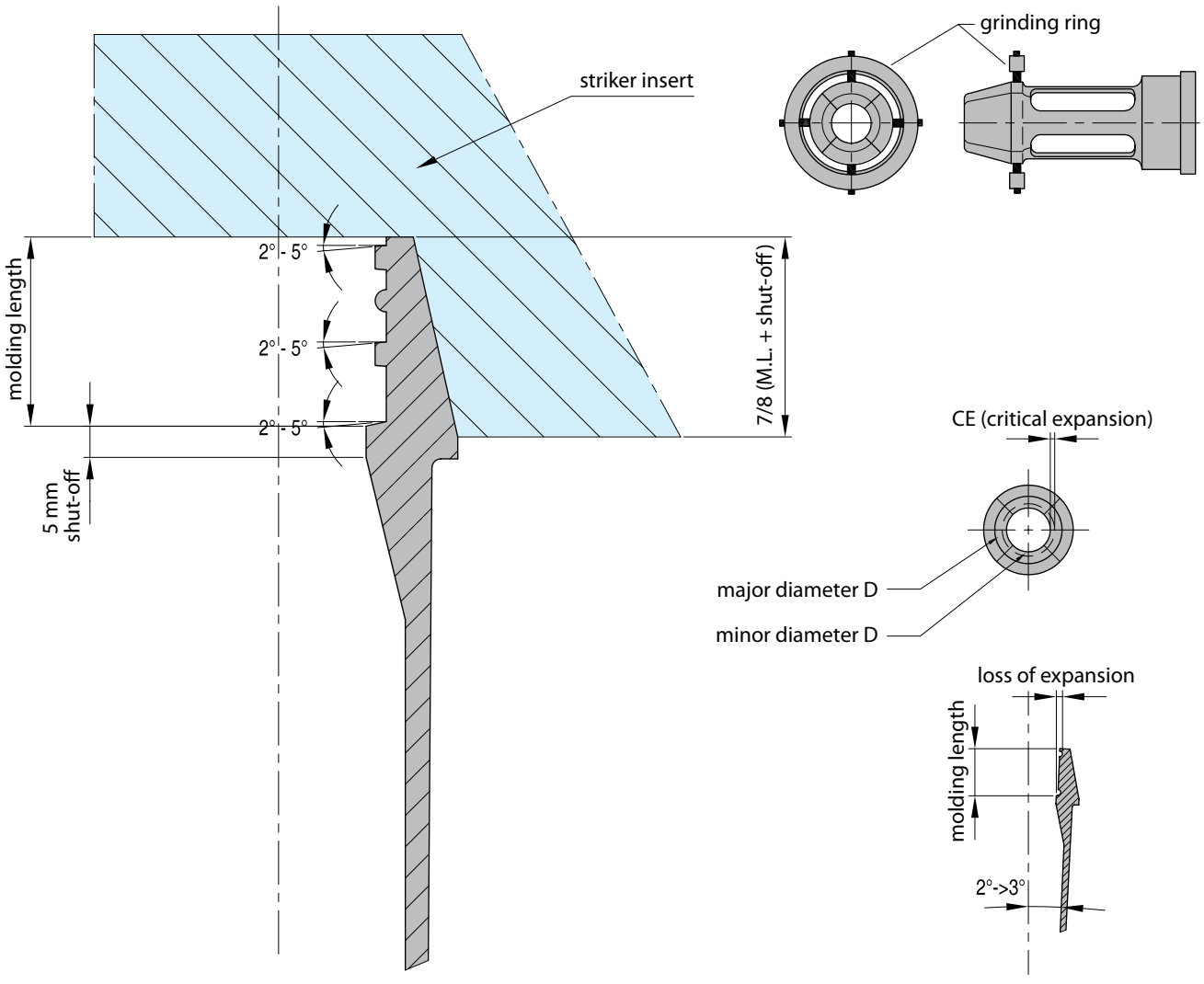


23/09/2016

Expandable Core and Striker Insert Design

The Expandable Core can mold a full 360° around. The most common configuration is 4 segments that mold 90° apiece. The Expandable Core can also be designed as asymmetrical, such as two segments that mold 90° apiece and 3 segments that mold 60° apiece. The amount of expansion varies according to the part requirements, and clearances needed.
The critical expansion needed to release the undercut is not the radial difference between major diameter (D) and minor diameter (d). Most Expandable Cores are usually ground or EDM'd. It is important when grinding to flood tool with suitable coolant for hardened tool steels. (Dress wheel frequently). The wheel must be of a soft grade. When grinding make sure the Expandable Core completely closed in a true circle by using the grinding ring supplied, as shown here. After all finish grinding, polishing and EDM'ing work, be sure to demagnetize the Expandable Core to prevent adhesion of any metal particles that might find their way into the Core during molding.

Note : ***DME*** does not provide the part configuration detailing or machining.



MILACRON®

Send to: DMEEU_specialprojects@milacron.com

Quote Request Form

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Contact name: ..... P.O. #: .....

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ZIP/Postal Code:..... Country: .....

Shipping method:

❑ UPS Ground ❑ UPS 2nd Day Air ❑ UPS Next Day ❑ FedEx ❑ Other .....

Expandable Cavity Requirements

I. POLYMER SPECIFICATIONS:

A. What is the material to be molded? .....

B. What is the process temperature? .....

❑ Filled ❑ Unfilled ❑ Glass ❑ Mineral

II. DIMENSIONS OF EXPANDABLE CAVITY: (Part print is required)

A. Specify largest diameter to be molded .....

B. Specify smallest diameter to be molded .....

C. Specify major diameter of undercut or thread .....

D. Specify minor diameter of undercut or thread .....

III. MOLDED PART LENGTH:

A. Molding Length: .....(Within the Expandable Cavity)

B. Mold Shut-off: .....**.200**..... (Shut-off land below part)

IV. EXPANSION REQUIREMENTS: (See Expandable Cavity and Striker Insert Design)

A. Critical Expansion per side: .....

B. Loss of expansion (.050in/in): .....

Multiply molding length (Distance from top of Expandable Cavity to bottom of last undercut) by .050in

C. Clearance (Air) between plastic and steel upon expansion: .....**.005**.....

V. MOLD LAYOUT

A. Distance from gate (center to center): .....

B. Number of cavities: .....

❑ Retrofit ❑ New Mold

23/09/2016

MILACRON®

DT Series Collapsible Cores

DME

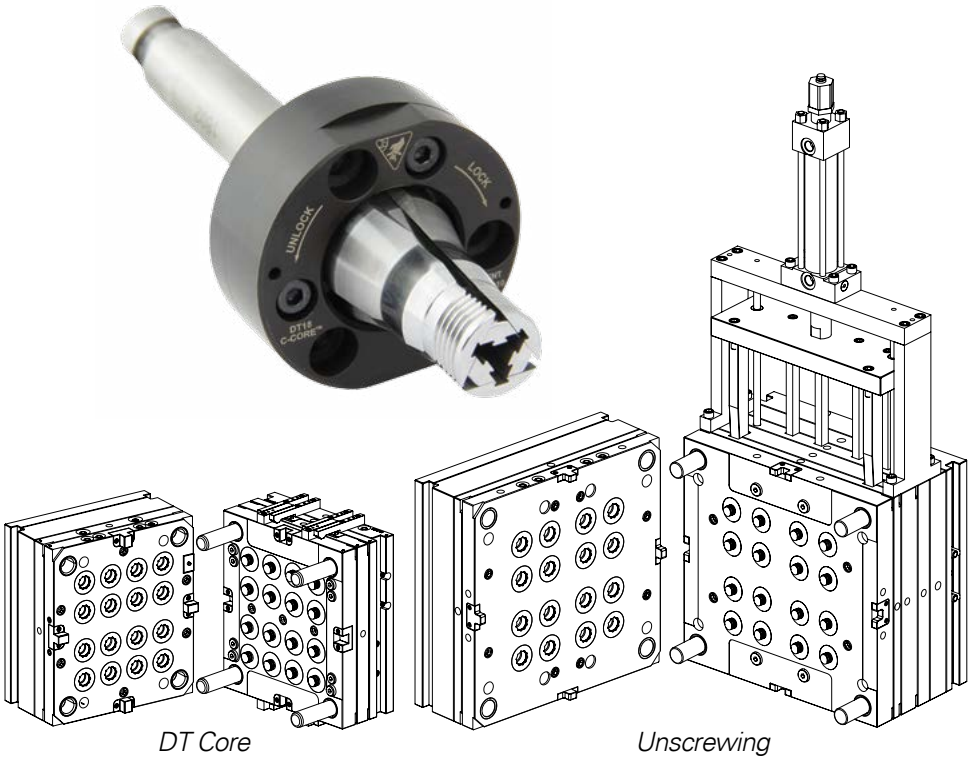
Info

Increased Profits

DT Collapsible Cores offer a unique opportunity to revisit older tooling designs and rebuild or refurbish the molds for maximum production efficiency and profitability. Many molders have realized the cost-saving and profit-boosting benefits of using DT Cores.

DT Cores allow for:

- Simplified, smaller molds
- Faster cycle times
- Improved part quality
- Reduced mold maintenance
- Ability to rebuild existing tools and breathe new life into old unscrewing molds.
- Conversion to DT Cores through replacement mold or back half rebuild



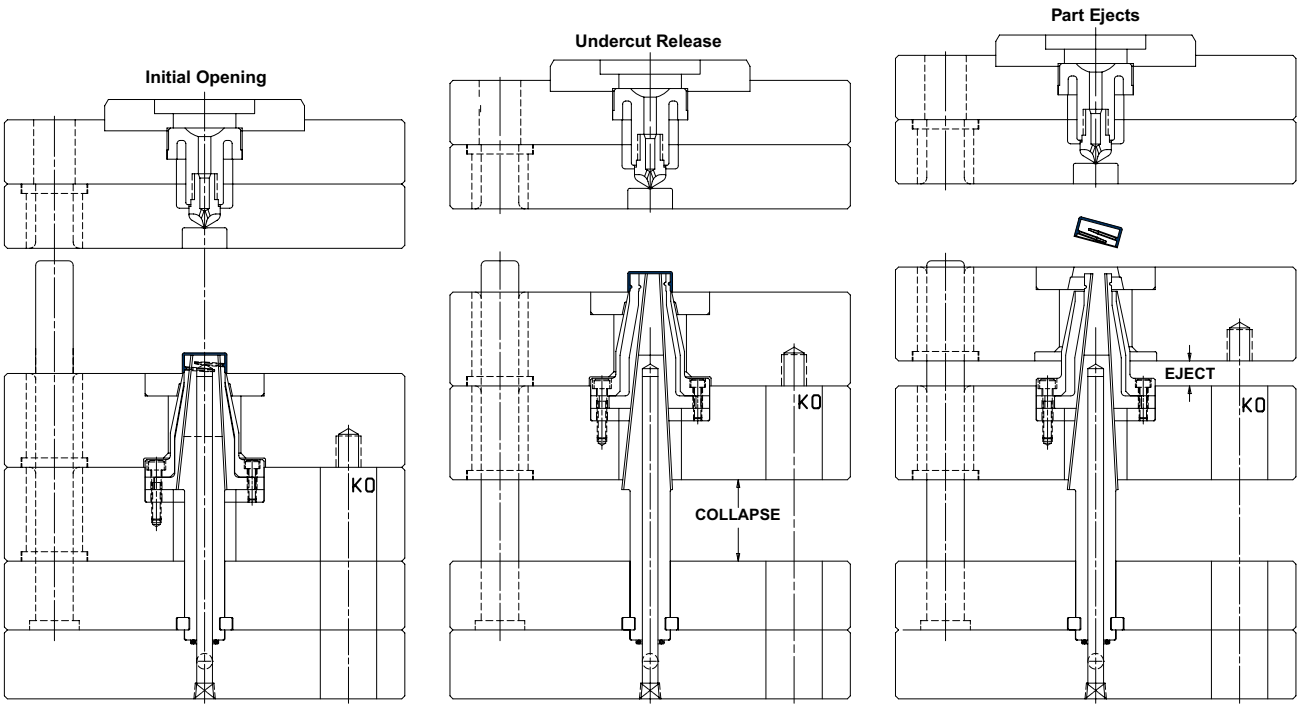
DT Core *Unscrewing*

Simplified Mold Design

The DT Collapsible Core is a positive, mechanically actuated collapsible core that eliminates complex gear and rack approaches, resulting in a simpler mold and a faster cycle time.

The maintenance advantage is dramatic due to a patented quick-lock feature that allows removal and servicing of the core unit while the mold is still in the press.

The DT Core's compact design allows for shorter stack height, tighter cavity spacing, and also creates opportunities for use in slides or on the stationary side of the mold.

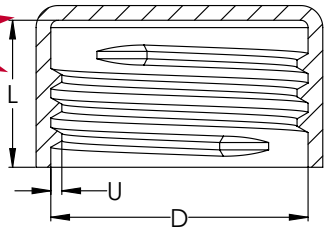


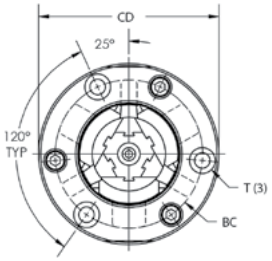
DT Cores use a simple single stage collapse/eject sequence typically run by the machine KO.

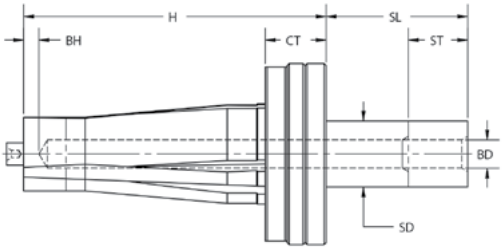
23/09/2016

Info

NEW!







REF	D Maximum Outer Diameter	U Max Undercut	L Maximum Molding Length	ST Maximum Collapse Stroke	H Core Length	SD Shaft Diameter	BD Cooling Hole Diameter	BH Distance to Cooling Hole	SL Shaft Length	CD Carrier Diameter	CT Carrier Assembly Thickness	BC Mounting Screw Bolt Circle	T Mounting Screws (SHCS)
DT1010	10.00-10.99mm .394-.433in	.36mm .014in	7.5mm .295in	43.5mm 1.713in	87mm 3.425in	10.5mm .413in	3mm .1in	5mm .2in	58mm 2.283in	50mm 1.969in	21mm .827in	37mm 1.457in	M5 x 25
DT1111	11.00-11.99mm .433-.472in	.41mm .016in	8mm .315in	44.5mm 1.752in									
DT1212	12.00-12.99mm .472-.511in	.46mm .018in	8.5mm .335in	45.5mm 1.791in	87mm 3.425in	12mm .472in	4mm .2in	5mm .2in	59mm 2.323in	52mm 2.047in	21mm .827in	38mm 1.496in	M6 x 35
DT1313	13.00-13.99mm .512-.551in	.51mm .020in	9mm .354in	46.5mm 1.831in									
DT1414	14.00-14.99mm .551-.590in	.56mm .022in	9.5mm .374in	47mm 1.850in	87mm 3.425in	14mm .551in	5mm .2in	5mm .2in	60mm 2.362in	54mm 2.126in	21mm .827in	41mm 1.614in	M5x25
DT1515	15.00-15.99mm .591-.630in	.61mm .024in	10mm .394in	47.5mm 1.870in									
DT1616	16.00-16.99mm .630-.669in	.66mm .026in	10.5mm .413in	48mm 1.890in	87mm 3.425in	15.5mm .610in	6mm .2in	5mm .2in	62mm 2.441in	56mm 2.205in	21mm .827in	43mm 1.693in	M5x25
DT1717	17.00-17.99mm .669-.708in	.71mm .028in	11mm .433in	48.5mm 1.909in									
DT1819	18.00-19.99mm .709-.787in	.82mm .032in	12mm .472in	50mm 1.969in	99mm 3.898in	18mm .709in	8mm .3in	6mm .2in	61mm 2.402in	63mm 2.480in	24mm .945in	49mm 1.929in	M6x30
DT2021	20.00-21.99mm .787-.866in	.92mm .036in	12.5mm .492in	55mm 2.165in									
DT2224	22.00-24.99mm .866-.984in	1.04mm .041in	13mm .512in	59mm 2.323in	109mm 4.291in	22mm .866in	10mm .4in	6mm .2in	64mm 2.520in	69mm 2.717in	24mm .945in	55mm 2.165in	M6x30
DT2527	25.00-27.99mm .984-1.102in	1.20mm .047in	15mm .591in	66.5mm 2.618in									
DT2830	28.00-30.99mm 1.102-1.220in	1.36mm .053in	18mm .709in	71mm 2.795in	129mm 5.079in	28mm 1.102in	12mm .5in	6mm .2in	60mm 2.362in	77mm 3.031in	26mm 1.024in	63mm 2.480in	M6x30
DT3133	31.00-33.99mm 1.220-1.338in	1.50mm .059in	21mm .827in	78mm 3.071in									
DT3436	34.00-36.99mm 1.339-1.456in	1.73mm .068in	22mm .866in	79mm 3.110in	139mm 5.472in	34mm 1.339in	14mm .6in	6mm .2in	64mm 2.520in	93mm 3.661in	27mm 1.063in	75mm 2.953in	M8x30
DT3739	37.00-39.99mm 1.457-1.574in	1.88mm .074in	24mm .945in	85mm 3.346in									
DT4042	40.00-42.99mm 1.575-1.693in	2.06mm .081in	25mm .984in	86mm 3.386in	151mm 5.945in	39mm 1.535in	17mm .7in	6mm .2in	65mm 2.559in	101mm 3.976in	32mm 1.260in	83mm 3.268in	M8x35
DT4345	43.00-45.99mm 1.693-1.811in	2.24mm .088in	27mm 1.063in	93mm 3.661in									
DT4648	46.00-48.99mm 1.811-1.929in	2.42mm .095in	28mm 1.102in	94mm 3.701in	161mm 6.339in	42mm 1.654in	20mm .8in	6mm .2in	69mm 2.717in	110mm 4.331in	32mm 1.260in	90mm 3.543in	M8x35
DT4951	49.00-51.99mm 1.929-2.047in	2.57mm .101in	31mm 1.220in	99mm 3.898in									
DT5254	52.00-54.99mm 2.047-2.165in	2.77mm .109in	32mm 1.260in	100mm 3.937in	183mm 7.205in	50mm 1.969in	22mm .9in	6mm .2in	85mm 3.346in	130mm 5.118in	39mm 1.535in	107mm 4.213in	M10x45
DT5557	55.00-57.99mm 2.165-2.283in	2.95mm .116in	34mm 1.339in	106mm 4.173in									
DT5860	58.00-60.99mm 2.283-2.401in	3.10mm .122in	36mm 1.417in	111mm 4.370in									

for sizes larger than 60 mm, contact DME directly.
Build in instructions available upon request.

23/09/2016

Info

Construction

Collapsing Segments

Mat.: 1.2363- Hardness: 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

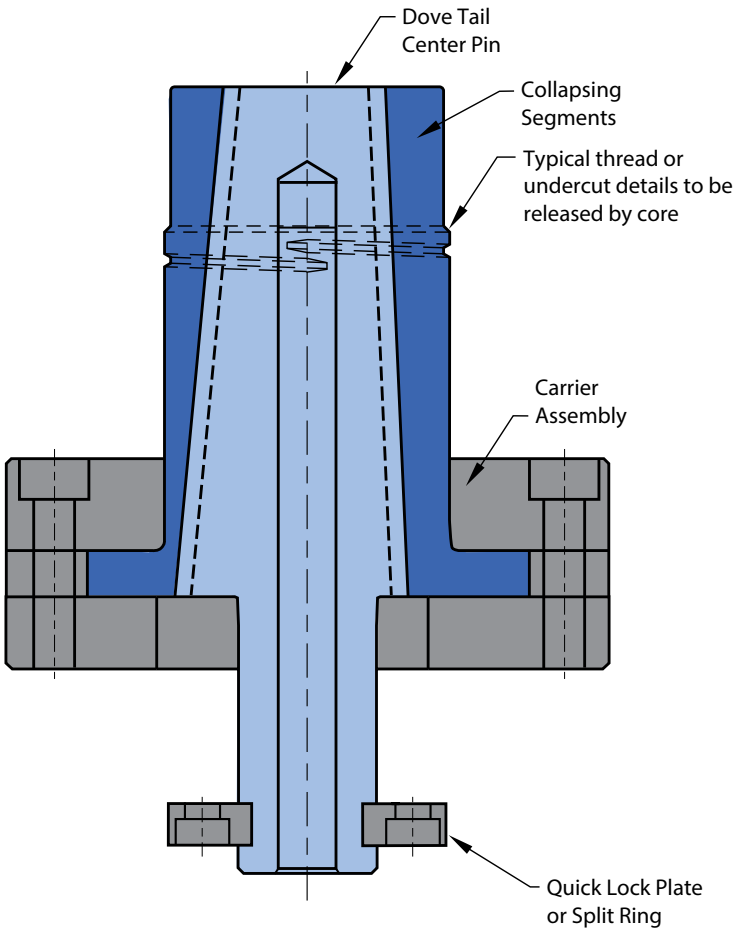
Mat.: 1.2379- Hardness: 60-62 HRC

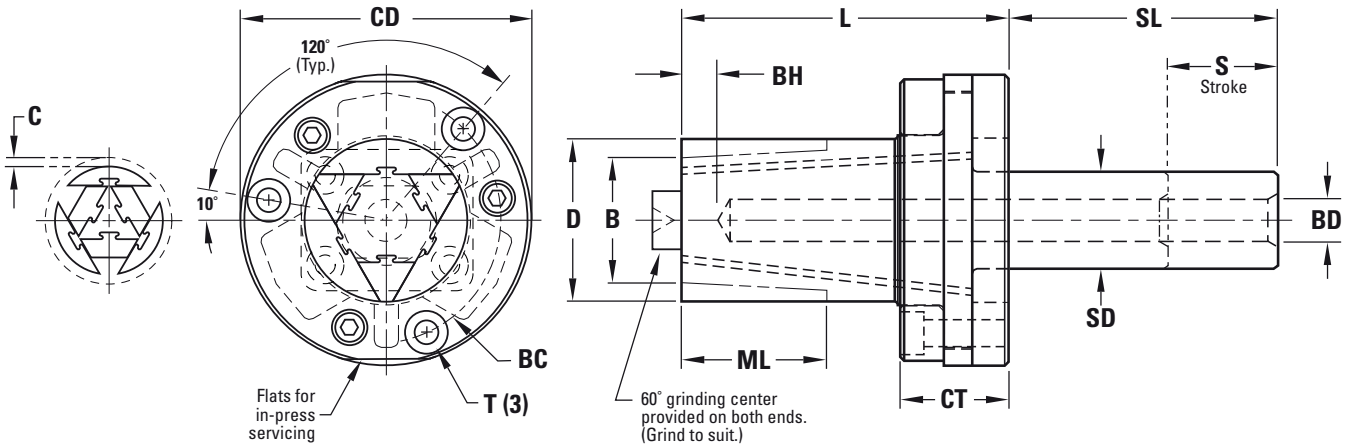
- Serves to expand the segments of the core to their molding position
- The pin may be flush to the core face.

Carrier Assembly

Mat.: 1.2379- Hardness: 60-62 HRC

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





All dimensions and tolerances are in milimeters.

REF	D Maximum Outer Diameter	B Minimum Inner Diameter +3°/Side	ML Maximum Molding Length	C Maximum Collapse	CD Carrier Diameter	CT Carrier Assembly Thickness ± 0,05	L Core Length +0,1 -0,0	SL Shaft Length	SD Shaft Diameter +0,00 -0,02	BD Cooling Hole Diameter	BH Distance to Cooling Hole	BC Mounting Screw Bolt Circle	T Mounting Screws	S Maximum Collapse Stroke
DT18	21	17	22	1,1	53	21	60	60	16	6	6	40	M5 x 25	34
DT28	33	25	28	1,6	60	22	67	60	20	8	8	47	M5 x 25	38
DT38	42	33	43	2,1	76	28	85	60	25	10	10	60	M6 x 35	54
DT48	54	42	50	2,4	98	37	104	70	30	12	12	78	M8 x 40	62

23/09/2016

Setral grease

DTG100

Setral is a full synthetic, solid free non-migrating grease for long term lubrication that is used to coat the sliding surfaces between our segments and center pin.
DME recommends this grease for all DT core applications. MSDS and technical data sheets are available from DME.

Description: Setral INT/300 Grease : 100g Tube

DTGF...

Grinding fixtures

NEW!

Grinding Fixtures for DT Collapsible Cores securely hold the core segments in place against the center pin when grinding, high speed machining or EDM'ing details.

Although normally DME would provide cores with finished molding details, grinding fixtures allow customers to machine their own details.

REF	core size
DTGF1011	Grinding fixtures for DT1010 - DT1111
DTGF1213	Grinding fixtures for DT1212 - DT1313
DTGF1415	Grinding fixtures for DT1414 - DT1515
DTGF1617	Grinding fixtures for DT1616 - DT1717
DTGF1821	Grinding fixtures for DT1819 - DT2021
DTGF2227	Grinding fixtures for DT2224 - DT2527
DTGF2833	Grinding fixtures for DT2830 - DT3133
DTGF3439	Grinding fixtures for DT3436 - DT3739

REF	core size
DTGF4045	Grinding fixtures for DT4042 - DT4345
DTGF4651	Grinding fixtures for DT4648 - DT4951
DTGF5260	Grinding fixtures for DT5254-DT5557-DT5860
DTGF18	Grinding fixtures for DT18
DTGF28	Grinding fixtures for DT28
DTGF38	Grinding fixtures for DT38
DTGF48	Grinding fixtures for DT48

DT...

Quick lock plate (optional)

NEW!

US PATENT NUMBER: 8,033,810

Features:

Plate Material: 54-57 HRC

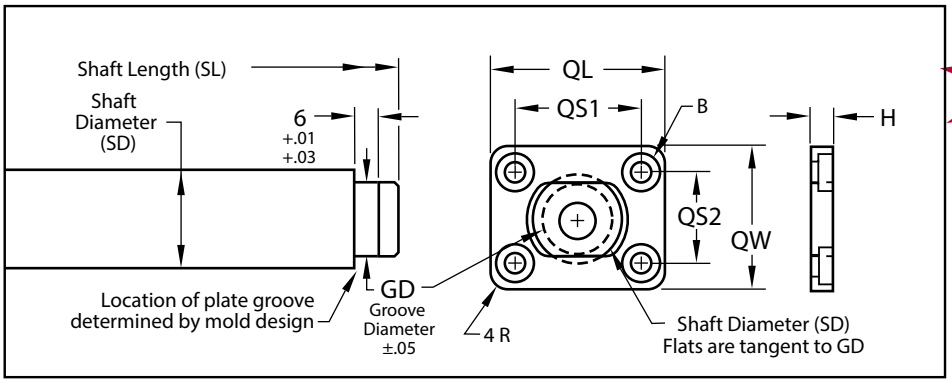
Utilizing DME's exclusive Quick Lock mounting configuration, the DT Core can be removed and serviced while the mold remains in the press. This feature allows for a higher cavitation percentage and lower maintenance costs than other tool design approaches.

23/09/2016

Quick lock plate (optional)

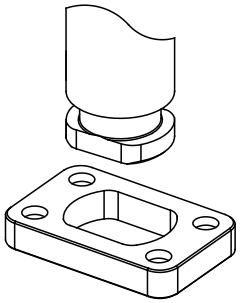
DTQL...

NEW!

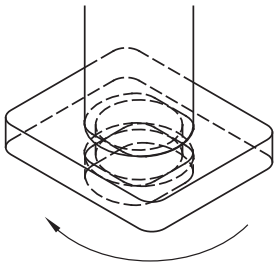


REF	For	GD	QL +0.00 -0.05	QW +0.00 -0.05	QS1	QS2	H	B MOUNTING SCREWS
DTQL1011	Quick Lock plate for DT1010 - DT1111	7.43mm .93in	26.01mm 1.024in	18.01mm .709in	17.50mm .689in	9.50mm .374in	4mm .1575in	M3 LHCS
DTQL1213	Quick Lock plate for DT1212 - DT1313	9.02mm 355in	27.99mm 1.102in	18.01mm .709in	19.51mm .768in	9.50mm .374in	4mm .1575in	M3 LHCS
DTQL1415	Quick Lock plate for DT1414 - DT1515	9.81mm 386in	30mm 1.181in	19.99mm .787in	21.49mm .846in	11.51mm .453in	5mm .1969in	M3 SHCS
DTQL1617	Quick Lock plate for DT1616 - DT1717	10.60mm .417in	32mm 1.260in	22mm .866in	23.50mm .925in	13.49mm .531in	5mm .1969in	M3 SHCS
DTQL1821	Quick Lock plate for DT1819 - DT2021	12.99mm .511in	35mm 1.378in	24.99mm .984in	24.99mm .984in	15.01mm .591in	6mm .2362in	M4 SHCS
DTQL2227	Quick Lock plate for DT2224 - DT2527	16.16mm .636in	38mm 1.496in	27.99mm 1.102in	27.99mm 1.102in	18.01mm .709in	6mm .2362in	M4 SHCS
DTQL2833	Quick Lock plate for DT2830 - DT3133	21.72mm .855in	43.99mm 1.732in	32mm 1.260in	34.01mm 1.339in	22mm .866in	6mm .2362in	M4 SHCS
DTQL3439	Quick Lock plate for DT3436 - DT3739	25.69mm 1.011in	51.99mm 2.047in	40.01mm 1.575in	40.01mm 1.575in	27.99mm 1.102in	8mm .3150in	M5 SHCS
DTQL4045	Quick Lock plate for DT4042 - DT4345	30.45mm 1.199in	56.01mm 2.205in	43.99mm 1.732in	43.99mm 1.732in	32mm 1.260in	8mm .3150in	M5 SHCS
DTQL4651	Quick Lock plate for DT4648 - DT4951	34.42mm 1.355in	57.99mm 2.283in	46mm 1.811in	46mm 1.811in	34.01mm 1.339in	8mm .3150in	M5 SHCS
DTQL5260	Quick Lock plate forDT5254-DT5557-DT5860	39.18mm 1.543in	65.99mm 2.598in	54mm 2.126in	53.01mm 2.087in	41mm 1.614in	10mm ..3937in	M6 SHCS
DTQL18	Quick Lock plate for DT18	12mm .472in	35mm 1.378in	22mm .866in	25mm .984in	12mm .472in	6mm .236in	M4 SHCS
DTQL28	Quick Lock plate for DT28	15mm .591in	38mm .1.496in	25mm .984in	28mm 1.102in	15mm .591in	6mm .236in	M4 SHCS
DTQL38	Quick Lock plate for DT38	19mm .748in	41mm 1.614in	31mm 1.220in	30mm 1.181in	20mm .787in	6mm .236in	M4 SHCS
DTQL48	Quick Lock plate for DT48	23mm .906in	44mm 1.732in	35mm 1.378in	34mm 1.339in	25mm .984in	6mm .236in	M4 SHCS

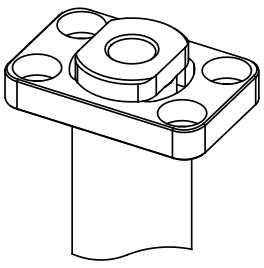
Align and push end of Center Pin through Quick Lock Plate.



Rotate Center Pin clockwise 90° to lock into place.



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



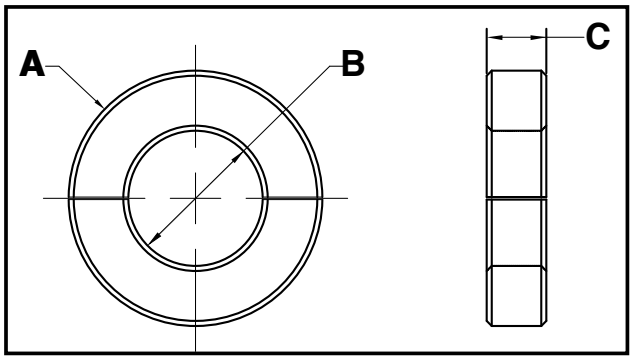
23/09/2016

DTSR...

Split ring

NEW!

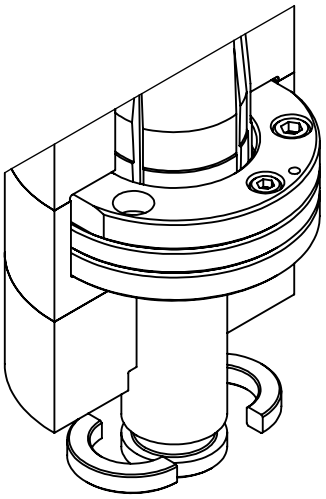
Utilizing DME's split ring allows for a simpler attachment method.



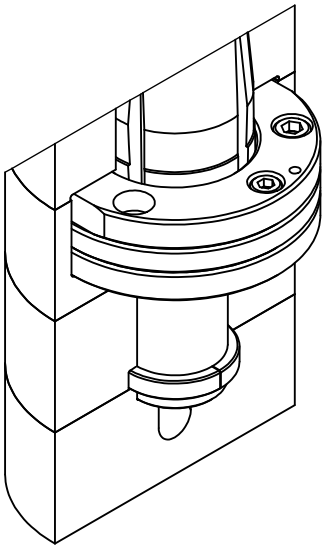
REF	For	A Outer Diameter	B Inner Diameter	C THICKNESS
DTSR1011	Split ring for fixing DT1010 - DT1111	16mm .63in	7.95mm .313in	3.99mm .157in
DTSR1213	Split ring for fixing DT1212 - DT1313	17.53mm .69in	9.53mm .375in	3.99mm .157in
DTSR1415	Split ring for fixing DT1414 - DT1515	20.32mm .80in	10.31mm .406in	5mm .197in
DTSR1617	Split ring for fixing DT1616 - DT1717	21.08mm .83in	11.13mm .438in	5mm .197in
DTSR1821	Split ring for fixing DT1819 - DT2021	25.40mm 1.00in	13.49mm .531in	5.99mm .236in
DTSR2227	Split ring for fixing DT2224 - DT2527	28.70mm 1.13in	16.66mm .656in	5.99mm .236in
DTSR2833	Split ring for fixing DT2830 - DT3133	34.29mm 1.35in	22.23mm .875in	5.99mm .236in
DTSR3439	Split ring for fixing DT3436 - DT3739	42.16mm 1.66in	26.19mm 1.031in	8mm .315in

REF	For	A Outer Diameter	B Inner Diameter	C THICKNESS
DTSR4045	Split ring for fixing DT4042 - DT4345	46.99mm 1.85in	30.96mm 1.219in	8mm .315in
DTSR4651	Split ring for fixing DT4648 - DT4951	50.80mm 2.00in	34.93mm 1.375in	8mm .315in
DTSR5260	Split ring to fix DT5254-DT5557-DT5860	59.69mm 2.35in	39.70mm 1.563in	9.98mm .393in
DTSR18	Split ring for fixing DT18	24.89mm .98in	12.70mm .500in	6.35mm .250in
DTSR28	Split ring for fixing DT28	27.94mm 1.10in	15.88mm .625in	6.35mm .250in
DTSR38	Split ring for fixing DT38	34.80mm 1.37in	20.62mm .812in	6.35mm .250in
DTSR48	Split ring for fixing DT48	37.59mm 1.48in	25.40mm 1.000in	6.35mm .250in

Assemble Core into Mold. Then collapse core to install split ring



Push Center pin forward to molding position and install back plate



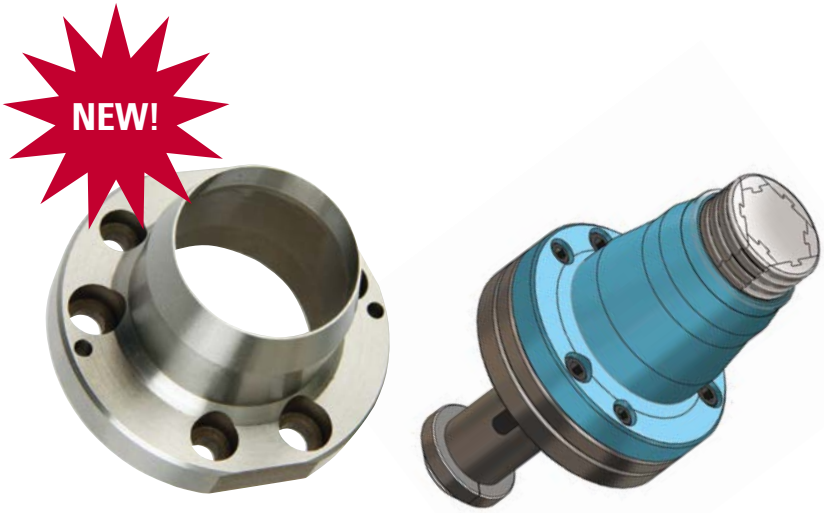
23/09/2016

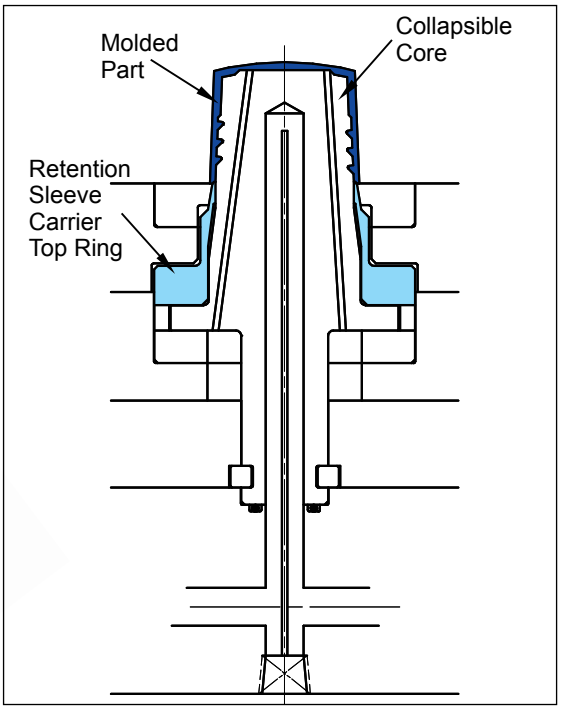
Retention sleeve (optional)

Info

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

E-mail DMEEU_specialprojects@milacron.com for more information.





US PATENT NUMBER: 9,011,138

DTSUB10

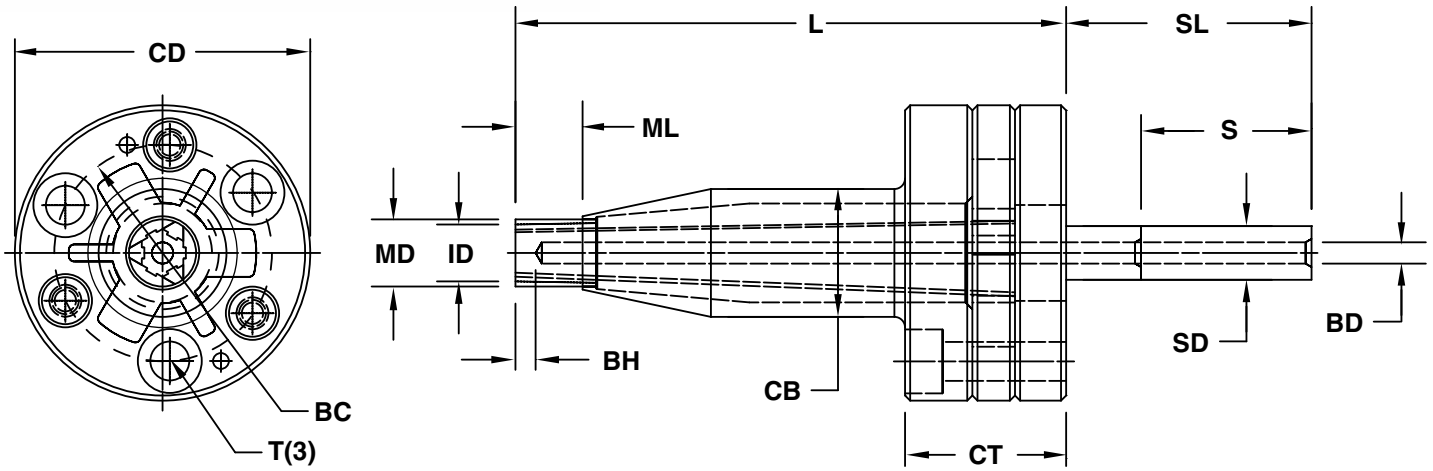
Sub-10 DT core series

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

- **Allows molding of parts with 7-10mm ID**.
- Simpler alternative to unscrewing molds.
- Reduces cycle time and maintenance requirements.

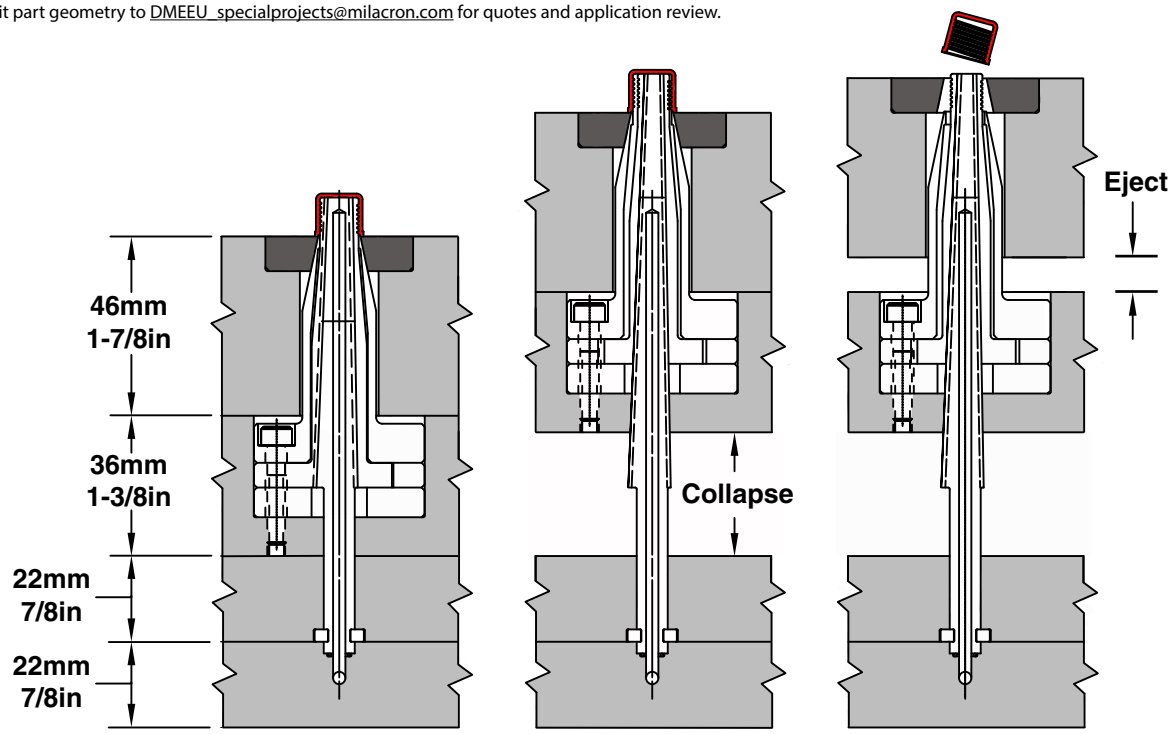
Application Guidelines:

- 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.



REF	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)
DTSUB10	10mm .394in	7mm .276in	10mm .394in	.38mm .015in	44mm 1.732in	19mm .748in	24mm .945in	82mm 3.228in	36mm 1.417in	8mm .315in	50mm 1.969in	3mm .118in	3mm .118in	32mm 1.260in	M5x25

NOTE: Submit part geometry to DMEEU_specialprojects@milacron.com for quotes and application review.

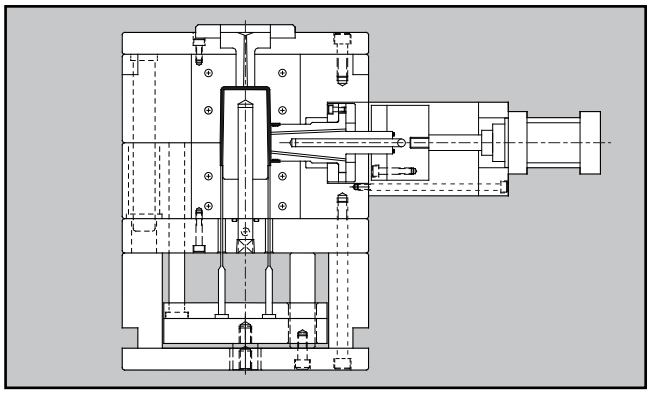


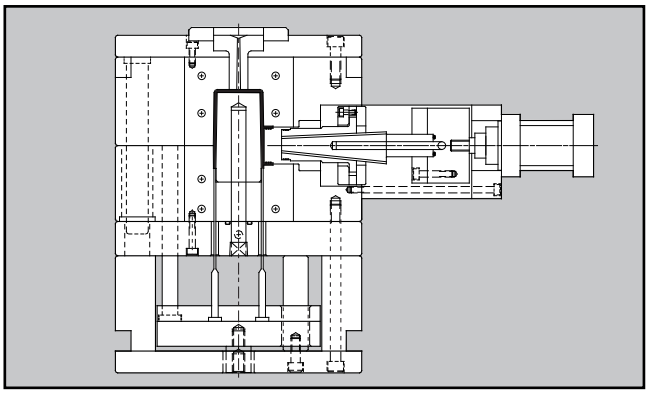
23/09/2016

DT series applications

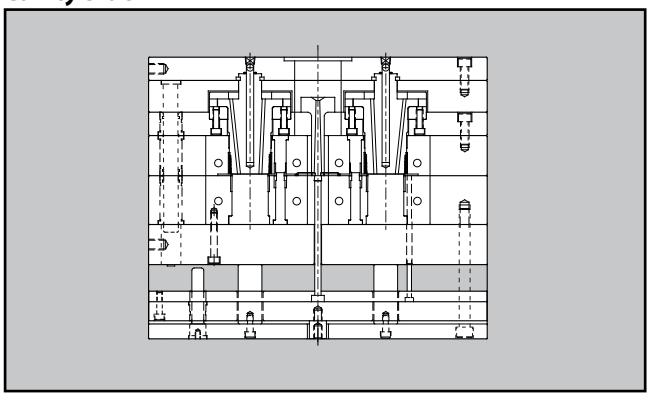
Info

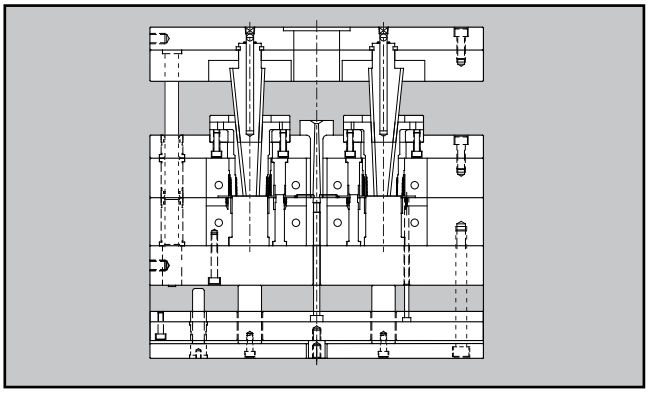
Side Action



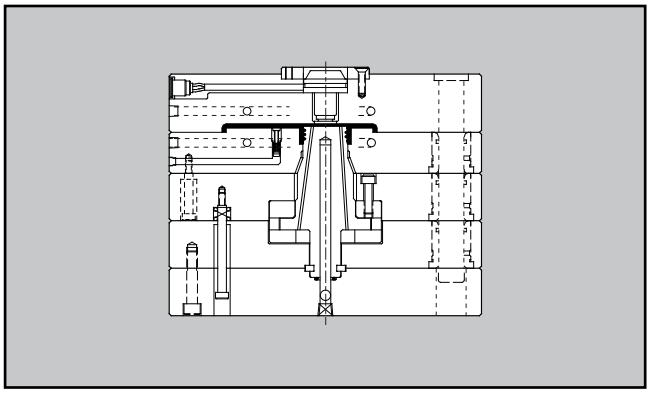


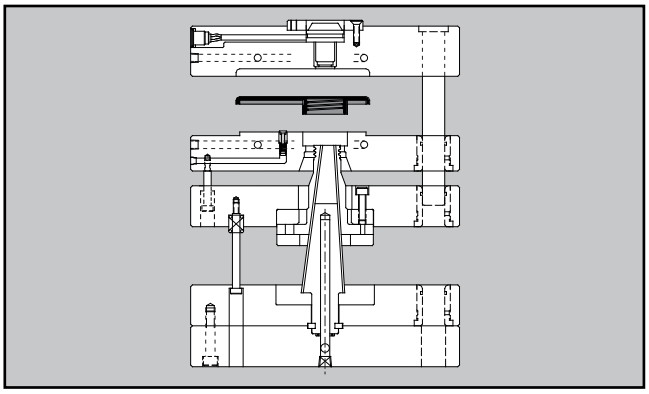
Cavity Side



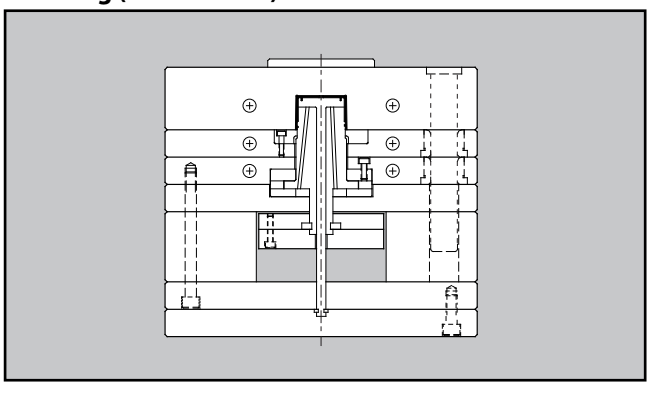


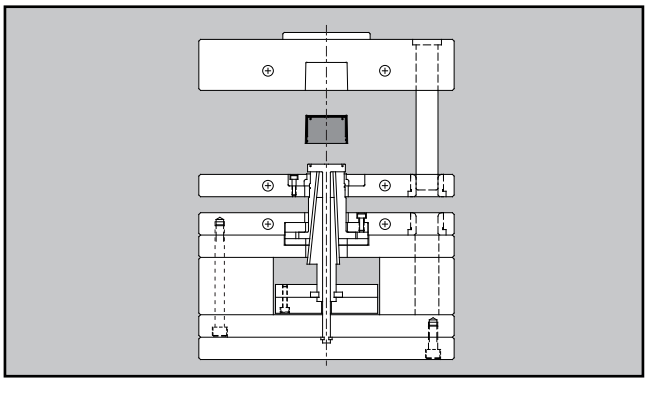
Boss Detail





Seal Ring (Pancake Pin)

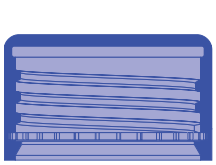




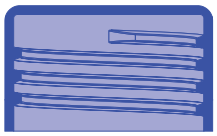
23/09/2016

Info

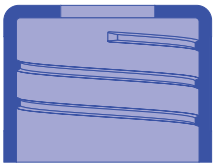
DT series custom applications



TE Cap



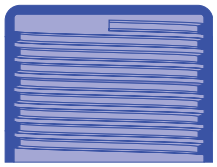
CT Cap



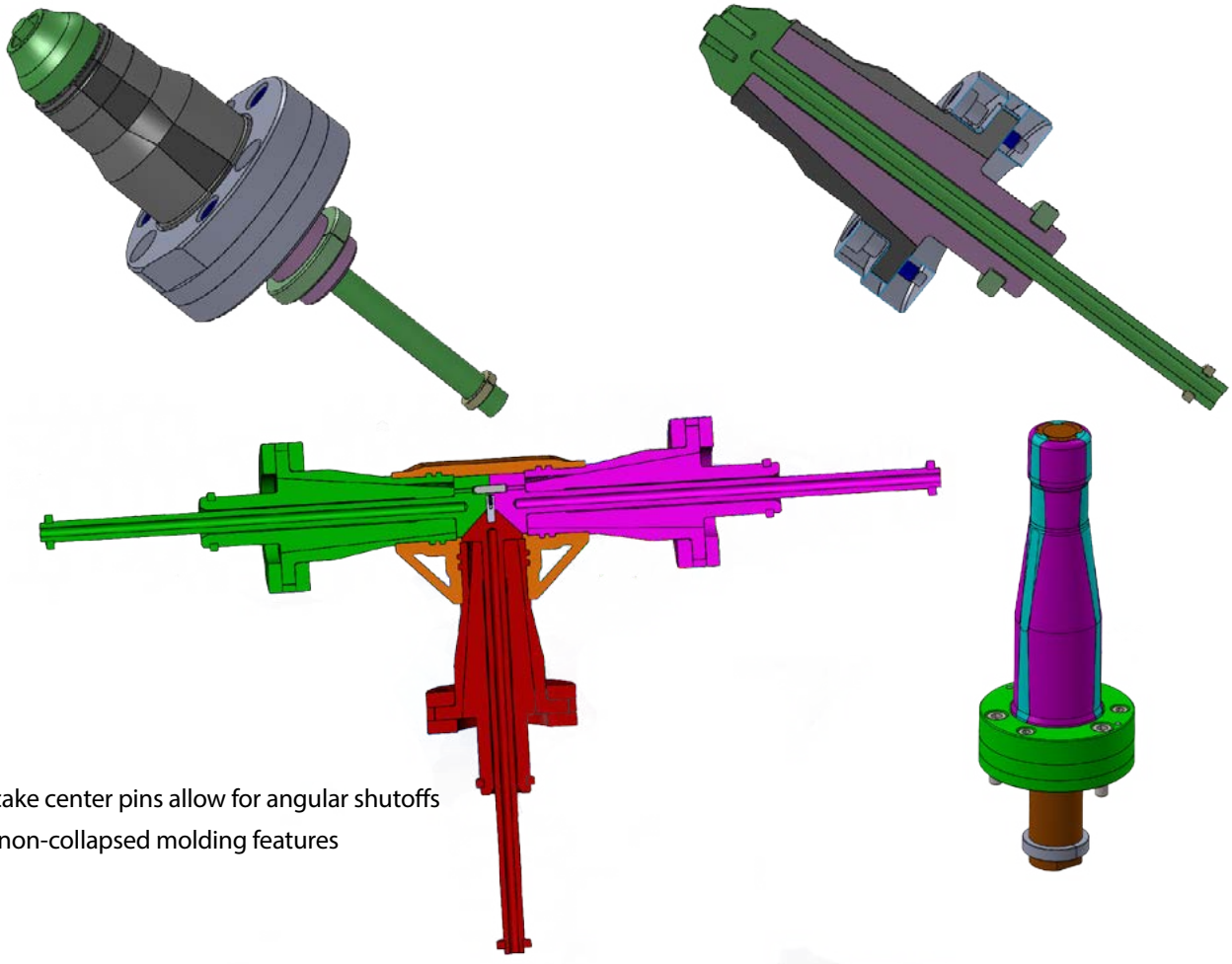
Threaded Collar

Prescription

Dosing

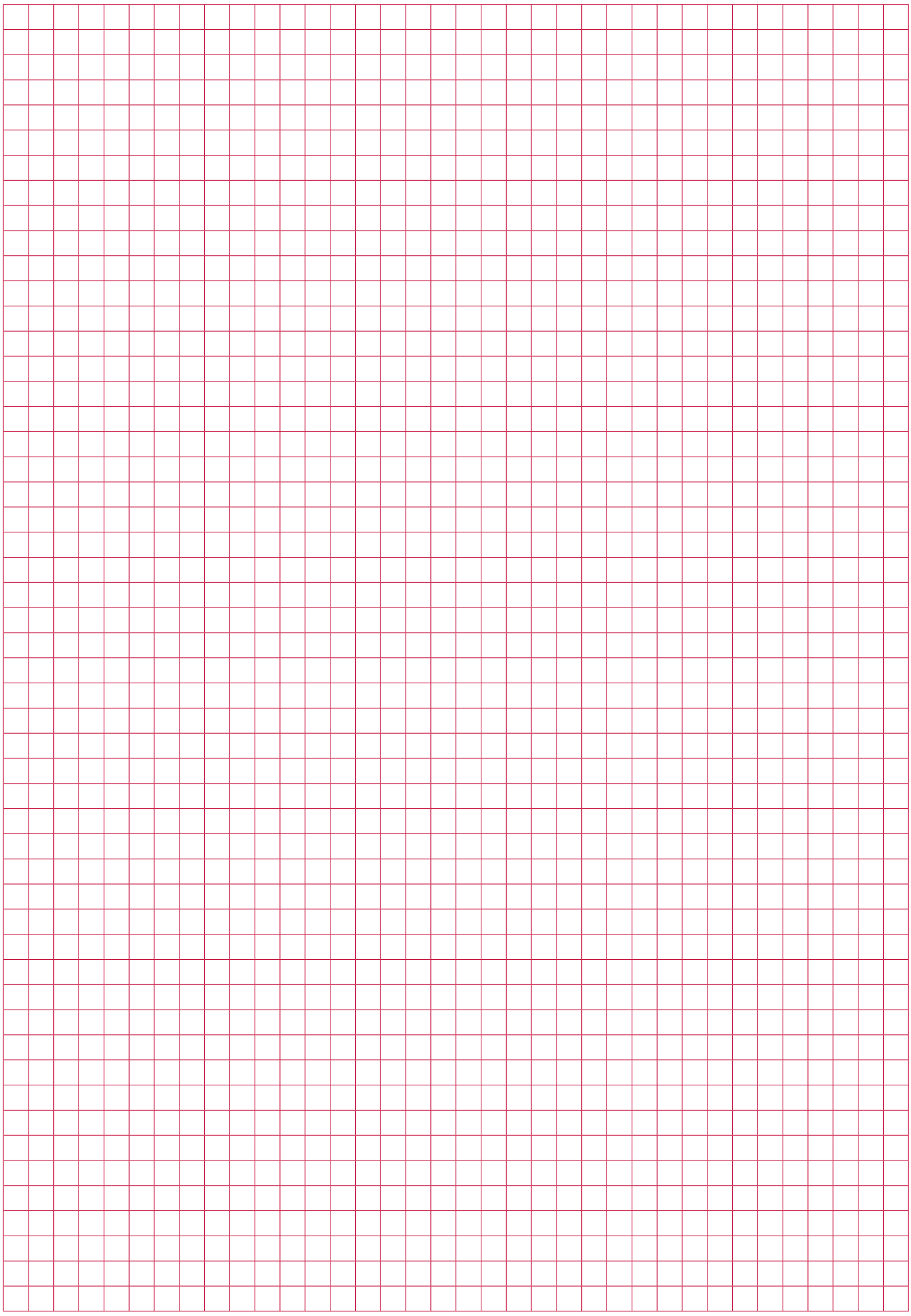


Long Thread Run



Pancake center pins allow for angular shutoffs and non-collapsed molding features

23/09/2016



GENERAL CONDITIONS OF SALE DME EUROPE

1. CONCLUSION OF CONTRACT - APPLICATION
The contract is validly entered into and the order is accepted after written confirmation by seller. These sales conditions apply to the exclusion of any other terms or conditions, unless expressly accepted in writing beforehand by the vendor.
Seller has 30 (thirty) days since the reception of the order to accept or to refuse it. During this period, buyer shall not withdraw his order.
Absence of any written confirmation of the order shall only be interpreted as being an implicit acceptance in case of performance of the order by seller.

2. PAYMENT
Unless otherwise agreed in writing, invoices are payable in the stated currency within 30 (thirty) days after invoice date to the-bank designated by seller. Transfer charges are for account of buyer.
If buyer does not pay within this term, seller shall automatically have ipso jure and without any prior formal notice, the right to charge legal interest plus 2 % from due date of the invoice. Moreover, in case of late payment, a fixed indemnity corresponding to 10 % of the payable amount shall automatically be due from the first day following the due date, without prejudice to seller's right to prove higher damage and ask for corresponding indemnity. Should payment be in foreign currency, seller has the right to adapt the foreign currency in case of depreciation-of this foreign currency in regard of the euro.
Should payment of the delivered goods be in instalments, the non-payment of one of the instalments gives seller the right to terminate the contract. The payments, which were done until then, shall remain property of seller as indemnity, without prejudice to the right to claim further damages or to the right to require the performance of the contract.
Payment of advance shall not give buyer the right to terminate the contract upon reimbursement of the paid advance, If payment is done by bill of exchange or check, payment is deemed satisfied only when the bill of exchange or the check is honoured.
Place of payment is always Mechelen even if payment is done with bill of exchange.

3. RETENTION OF TITLE
Delivered goods remain property of seller until full payment has been received by seller. The sale of an unpaid item by buyer to a third party results in automatic assignment of the debt due by the third party to buyer, inclusively the retention of title, to seller. Seller has then the authority to take any necessary means in order to validly assign towards the third party. Seller may retake unpaid goods at any time and he may inform any client and/or any subcontractor of buyer about the fact that seller is and remains the only owner of the concerned goods until full payment.
The purchaser undertakes to carefully keep the goods that have not been paid for, and undertakes not to pledge them or use them in any other way as a guarantee or security. The purchaser shall inform third parties who may apply any security rights over his assets (such as, but not limited to, the lessor of the premises occupied by the purchaser) that the products are and shall remain the property of the vendor until full payment of all sums owed by the purchaser to the vendor, and in the event of an attachment
or other measures taken by third parties that apply to products for which full payment has not yet been made the purchaser undertakes to immediately inform the vendor of this to enable him to apply his rights.

4. RISKS
Notwithstanding the preceding provisions, the risk transfers to buyer as soon as he has the goods at his disposal.

5. DISPATCHING OF INSIGNIFICANT VALUE
Each dispatch of less than € 50 will be increased with costs of payments and-may, at sellers option, be sent cash on delivery (COD).

6. PRICE OFFERS AND PRICE LISTS
Price offers and price lists are without obligation and are subject to change without any previous notice.
Any information released by seller is delivered in good faith and seller shall not be responsible for the choice of material and goods.

7. PRICE AND DISPATCHING
All prices are ex works. Transportation, duties and taxes for account of buyer, unless seller's previous and express written specification to the contrary. Seller shall send goods by the fastest and most economic way at the risks of buyer. Goods may be insured by seller at buyer's option, the insurance premiums are for buyer. Seller is not responsible for the choice of packing.

8. DELIVERY
Date of delivery is the date when the goods are ready for inspection at the indicated place. Place of origin is Mechelen, Belgium, or any other place indicated by seller. Seller is not responsible for any late delivery, except those delays due to his own fault or gross negligence.

9. RETURNING OF GOODS
No goods can be returned without seller's previous, express and written consent. If buyer commits an error in ordering, the retaking of goods is possible only for inventory standard items. Goods must be returned within 15 (fifteen) days after invoice date and all goods must be in original conditions,' all costs of transport are for buyer, as well as insurance and repacking costs. Special-order goods, marked or used items are non-returnable.

10. DEFECTS
Seller warrants defects in material and/or workmanship. Warranty is limited to the replacement or repair, at seller's option, of any merchandise found defective during 1 month. This warranty does not include defects due to buyer's fault or to abnormal use, bad maintenance, imperfect installation, buyer's inadequate repair, unforeseeable circumstances or in case changes were brought to material without previous and express written approval of seller.
Notice of conspicuous defects must be given to seller by registered letter sent within 10 (ten) working days following date of delivery.
Notice of hidden defects must be given to seller by registered letter with in 10 (ten) working days after date of discovery, and in any case, within a 10-month term following date of delivery.
Seller is not responsible for any damage and in particular salary and material costs, losses, loss of profit or loss of a chance incurred by buyer, unless it is demonstrated that defect is due to seller's gross or intentional fault. If seller is responsible for defect, seller has the right either to terminate the contract and to pay back all the invoiced prices or to replace the delivered product within a reasonable term. If goods for repair must be transported, costs and risks of this transport are for buyer.
In case seller is responsible for any damage, this will be limited to the foreseeable damage with a maximum amount corresponding to the amount of the product's invoiced price.
Should a third party lodge a claim against seller to obtain payment of an indemnity for a damage for which seller is not responsible in accordance with the present conditions or for a higher amount than the one seller is responsible for, buyer will warrant seller against those claims.

11. DESCRIPTION
Only product descriptions used in seller's latest literature and correspondence with buyer, are binding for description of goods.
Buyer is responsible for using items in conformity with all regulations, including but not limited to, the safety regulations in force at the place of use.

12. SPECIFIC ORDERS
For the performance of a special work, the project signed by buyer is binding to the extent it has been accepted by seller.
For the performance of such work, special conditions may be required. In case of any inconsistency between general conditions and special conditions, the special conditions shall apply. Should special conditions be unclear, they shall be interpreted in light of the general conditions.

13. ACT OF GOD
Seller shall not pay any damage for non-performance or late performance of his undertakings due to Act of God. Act of God includes in particular and without being limited thereto, strike, lock-out, and the non-performance by seller's suppliers of their undertakings.

14. VALIDITY AND INDIVIDUAL CLAUSES
If one or more provisions of these present general conditions are held to be invalid, the remaining provisions will continue to be valid and enforceable, and parties will agree upon other provisions having an economic effect that corresponds closest to the economic effect of the invalid provision(s).

15. WAIVER
In case seller does not exercise one of his rights in accordance with the present conditions, this shall not be interpreted as a waiver of these rights.

16. APPLICABLE LAW – COMPETENT COURTS
This sales contract will be governed by Belgian law. The competent court is the Commercial Court of Mechelen, without prejudice to seller's right to introduce the case before another competent court.

DME Europe C.V.B.A.
Schaliënhoevedreef 20-D
RPR - RPM Mechelen
BE-2800 Mechelen, Belgium
VAT ID: BE0456932455

P +32 15 28 87 30
F +32 15 40 51 17
W www.milacron.com

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