

# D-M-E Multiform, Collapsible Core and Expandable Cavity Systems

EFFICIENTLY MOLD  
PLASTIC PARTS REQUIRING  
INTERNAL THREADS, UNDERCUTS,  
PROTRUSIONS OR CUT-OUTS



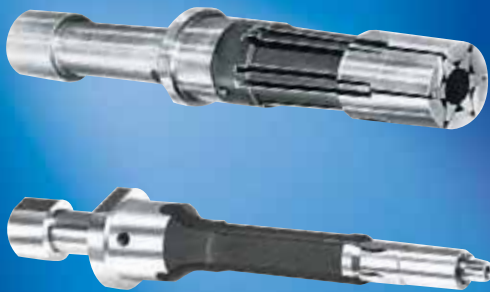
Multiform, Collapsible Core and Expandable Cavity Systems

# Table of Contents



## Multiform Collapsible Cores

<i>Application Examples</i> .....	55
<i>Features and Benefits</i> .....	56
<i>Undercut Ratios</i> .....	56
<i>Installation/Motion Sequence</i> .....	57



## Collapsible Cores

<i>Features and Benefits</i> .....	58
<i>Ordering Information</i> .....	58

## Collapsible Mini-Cores

<i>Features and Benefits</i> .....	59
<i>Ordering Information</i> .....	59



## Expandable Cavity Systems

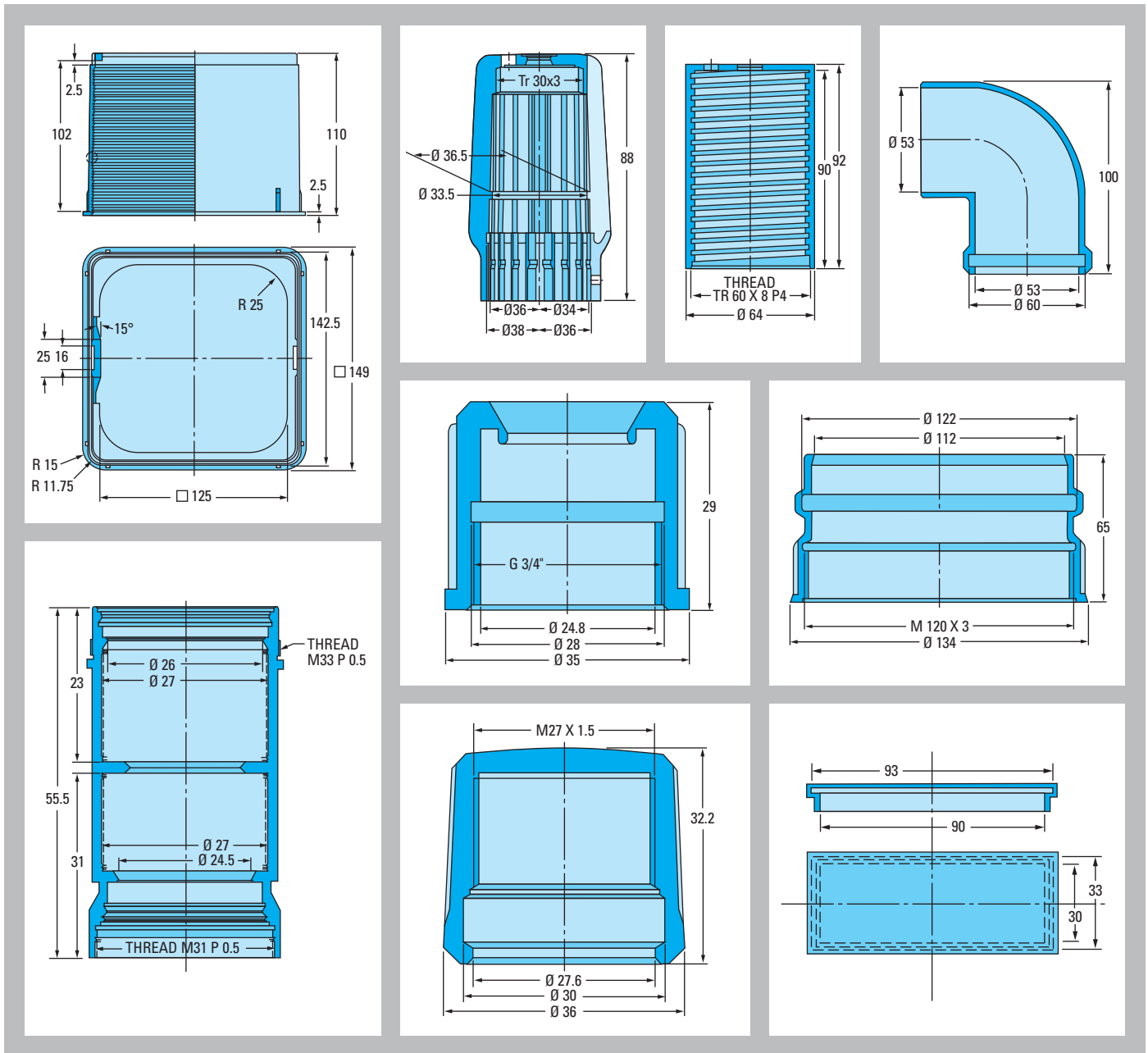
<i>Features and Benefits</i> .....	60
<i>Typical Molded Parts</i> .....	61
<i>Components</i> .....	62
<i>Typical Applications</i> .....	63
<i>Plastic Part Design</i> .....	64
<i>Cavity/Striker Insert Design</i> .....	65
<i>Operating Sequence</i> .....	66
<i>Typical Mold Layouts</i> .....	67
<i>Application Guidelines</i> .....	68
<i>Quote Request Form</i> .....	69

**Online Price Guide**

Go to [www.dme.net/prices](http://www.dme.net/prices) for the latest pricing guide.

# Application Examples

## Application Examples for Multiform Collapsible Cores



# Multiform Collapsible Cores – Features and Benefits



- From diameter 10 to 200mm
- Can be used for round, square or oval parts
- Various coating options
- Can be used with all thermoplastics used in injection molding
- Also suitable for diecasting and thermosets
- Separate segments are exactly adjusted to match perfectly together
- For undercuts up to 12%
- High degree of temperature control as of diameter 14mm



## Ordering Information

Multiform Collapsible Cores are supplied to customer specification. If you would like to place an order, please contact D-M-E. To calculate the core's geometry, a drawing showing the item is required.

## The Multiform Collapsible Core and its Possibilities

- With this Multiform Collapsible Core, internal undercuts on plastic or die-cast items are no longer a problem.
- Internal undercuts – all the way round or just partially – on round, square or oval parts can now be carried out without any problems.
- Parts no longer have to be separated into two pieces. The procedures for gluing, ultrasonic welding, screwing or mechanical reworking are no longer required.
- Parts with single or multistart threads (also a combination of right- and left-handed threads).
- By means of the D-M-E Multiform Collapsible Core, non-loosening water-tight snap-on connections can be created. Threaded components, such as screw caps, can be produced at reduced cost, as the core allows the wall thickness to be reduced to a minimum. The dimensional stability of parts manufactured using D-M-E Multiform Collapsible Cores meets the highest requirements. For example, an accuracy of  $\pm 0.015\text{mm}$  is achieved for flatness and roundness. Since no ejection draft line is required, precisely shaped, cylindrical parts with a uniform wall thickness can be produced.

## Possible Undercut Ratios

The size of the maximum undercut ratio depends on the internal length (L). For each item's contour, the best possible design conditions are calculated, so that the best diameter and internal length ratios are achieved for each application.

For pre-selection, the small diameter (d) for a given large diameter (D) and a given internal length (L) can be calculated using the following formulas:

### For small internal lengths:

$$\frac{\text{internal length } L}{\text{large diameter } D} < 2$$

$$d = D \times (0.866 + \frac{L}{D} \times 0.0328)$$

### For large internal lengths:

$$\frac{\text{internal length } L}{\text{large diameter } D} \geq 2$$

$$d = D \times (0.9316 + (\frac{L}{D} - 2) \times 0.017)$$

**Example:** internal length L = 76.8mm  
large diameter D = 128.0mm

$$\text{Ratio } \frac{L}{D} = \frac{76.8\text{mm}}{128\text{mm}} = 0.6 \rightarrow \text{small internal length (formula 1)}$$

$$d = D \times (0.866 + \frac{L}{D} \times 0.0328) = 128\text{mm} \times (0.866 + 0.6 \times 0.0328)$$

$$d = 113.64\text{mm}$$

The small diameter d can be a minimum of 113.64mm.

d = small diameter	D = large diameter	L = internal length
--------------------	--------------------	---------------------

# Installation and Motion Sequence

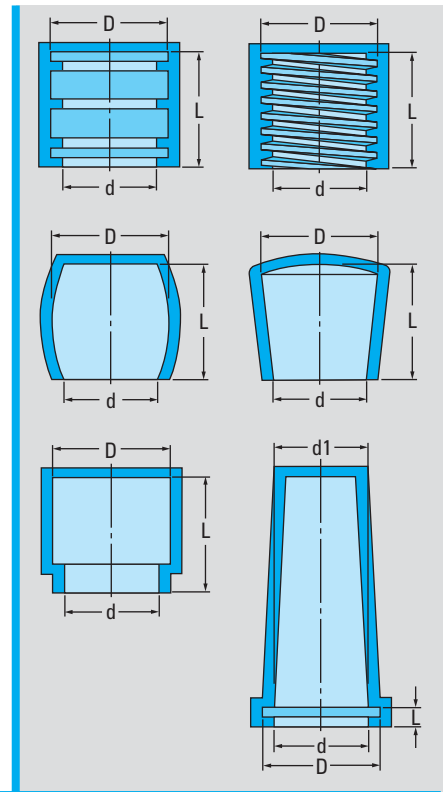
## Structure

Normally, the D-M-E Multiform Collapsible Core consists of an inner core and six external segments. The segments are arranged on the inner core in various precisely calculated bevelled planes. During ejection, the segments slide across the inner core (dovetail) and perform a radial movement, which allows the internal undercut to demold.

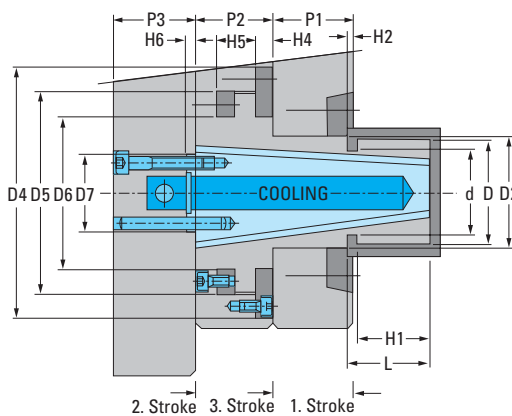


The internal undercut is comprised of the smaller diameter "d" and the bigger diameter "D." For a mathematical calculation of the Multiform Collapsible Core, the internal length "L" is also of great importance. The larger the ratio of L to D, the smaller the possible undercut ratio.

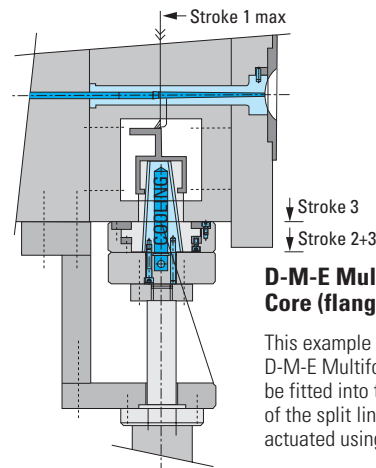
In order to achieve an excellent undercut ratio for large item lengths where the internal undercut is at the item's front part, it is possible to flange a stationary core in front of the D-M-E Multiform Collapsible Core.



## Installation Instructions



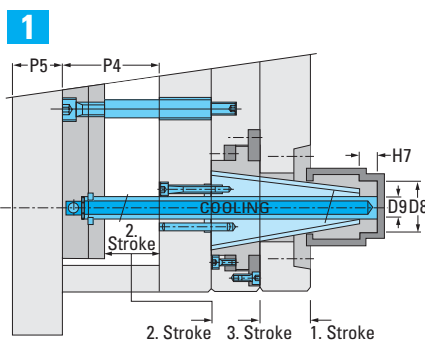
- D = large diameter
  - d = small diameter
  - D2 = stripping diameter
  - L = internal length
  - P1 = stripping plate
  - P2 = segment retaining plate
  - P3 = clamping plate
  - D4 = max. external diameter
1. Stroke = mold opens
  2. Stroke = axial segment movement (segment lift)
  3. Stroke = stripping
- Stroke 2 added to Stroke 3 = ejection stroke



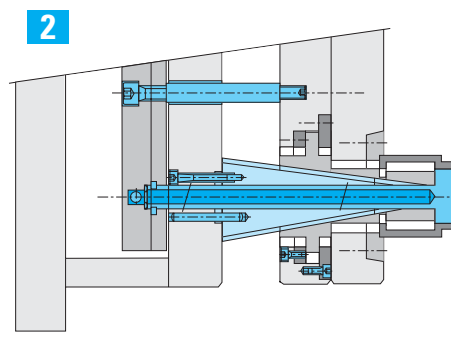
### D-M-E Multiform Collapsible Core (flanged on the side)

This example illustrates that the D-M-E Multiform Collapsible Core can be fitted into the tool in the direction of the split line or obliquely. It is actuated using a hydraulic cylinder.

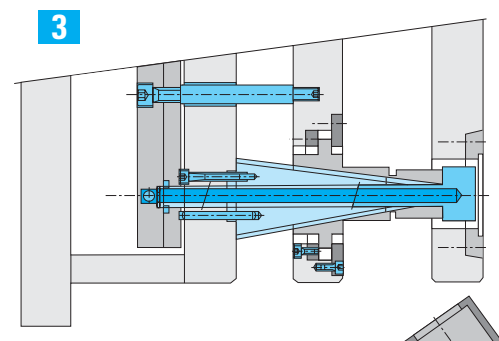
## Motion Sequence (with flanged stationary core)



The cooling time has expired – the mold opens completely.



Ejection movement forward until the segments' axial movement has been completed; undercut is released.



Ejector movement completed; part is ejected.