HARDINGE 5C arbors for shell end mills have standard 5C collet shanks for direct application to the spindles of HARDINGE TM and UM Milling Machines. The hardened and precision ground arbor section and the lugs conform to standard specifications for shell end mills in the four sizes indicated below. These arbors provide rigid holding and positive drive of shell end mills for end and face milling operations.

<table>
<thead>
<tr>
<th>Arbor Size</th>
<th>Tool Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>MA 1/2</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>MA 3/4</td>
</tr>
<tr>
<td>1&quot;</td>
<td>MA 1</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>MA 1 1/4</td>
</tr>
</tbody>
</table>

For Additional Mill Tooling, refer to 5C Spindle Tooling Bulletin HA-202. The 5C Collets and Taper Hole Collets can be used interchangeably between the horizontal cutter spindle and dividing head. Jaw chucks, face plates, step chucks and closers are for use with dividing head only.

HARDINGE Fly Cutter Holders

Fly cut milling with a single cutting edge can improve your milling operations and reduce your costs.

The single cutting edge generates less heat than associated with conventional, multiple tool cutter holders as it cuts clean and eliminates practically all rubbing surfaces; therefore, work does not require heavy clamping.

Three head sizes are available for facing cuts of 1", 2" and 3" diameters. All sizes have standard 5C HARDINGE collet shank for direct mounting in the spindle of HARDINGE TM or UM Milling Machines.

The fly cutter holders have two slots, one for right and one for left hand milling. The HARDINGE Fly Cutter Holders accommodate 3/8" square carbide tools.
Universal Plain Dividing Head* for TM Milling Machines

The HARDINGE Dividing Head is designed for extreme accuracy and maximum convenience in operation. The sturdy construction is shown by the accompanying illustrations. The dividing head and tailstock swing 7½" in diameter and have a maximum between-center distance of 9½". The head is graduated in degrees and the spindle can be swung from 10° below horizontal to 20° beyond vertical. The draw spindle is of two-piece construction. The draw spindle handle can be removed without loosening the collet; thus, collet work can be done with the head in the vertical position or at any other desired angle. An adjustable stop plate is provided which can be locked in any position — this speeds up work when you are doing repetitive angular milling.

The preloaded ball bearing spindle is ground for direct application of standard 1-1/16" round capacity 5C HARDINGE collets which are also used in the main cutter spindle. The spindle nose can be supplied with either the standard HARDINGE threaded nose or standard HARDINGE taper nose to provide interchangeability of spindle nose attachments between the dividing head and HARDINGE lathes, chucking machines and second operation machines. There is a 4 to 1 ratio for rapid indexing of the spindle from the crank through hardened and ground Zerol gears. Seven index plates are furnished giving all divisions up to 50, all even number divisions and 75 up to 100. The table supplied shows all divisions obtainable up to 360 inclusive. The removable keys in the dividing head base and bolts fit a T-slot 7/16" wide. Standard equipment consists of: dividing head, 7 index plates, center with driver, tailstock, spanner wrench for draw spindle, and index table chart.

*Dividing Head Furnished with Taper Spindle Unless Threaded Nose is Specified.

HARDINGE Rapid Indexing Dividing Head

Dividing Head Spindle Set Parallel to Cutter Spindle
— Note Collet Seating Directly in Spindle

Collet-Like Chucking to 6" Diameter
with Standard 5C Step Chucks and Closers
**Vertical Head**
The vertical head provides eight spindle speeds from 200 to 3350 RPM. The unit can also be used in the horizontal position for drilling and boring with power feed. Uses 4C collets.

**Swivel Base for Dividing Head**
The swivel base is used with the dividing head for compound angle work.

**5C Stub Arbors**
5C stub arbors are available in ¼", ½" or ¾" sizes. The stub arbors can also be used for simple milling operations on HARDINGE Lathes.

**5C Arbor - Overarm Type**
The 5C overarm arbors are available in two sizes, ¾" and 1". Both sizes have 5C collet shank for direct mounting in the spindle for horizontal milling operations.

**Swivel Vise**
The jaws of the swivel vise are 4½" wide and 1" deep. Maximum opening 2½", overall height is 3¼". Handle is removed after work is locked in place.