BM 2740 series
BM 2740/BM 2740P
Multi-purposed Large sized Bridge Type Machining Center

Doosan Machine Tools
Optimal Solutions for the Future
BM 2740 series
BM 2740/BM 2740P

In accordance with enhanced acceleration/deceleration characteristics due to a rigid machine structure, and high speed machining capabilities, the BM series provides unrivalled productivity for the production of plate materials and large parts for general industries.
Features

1. **Spindle with high capability and high power effective for high-speed machining and powerful cutting**

   Built-in spindle offering high speed and precision ensures optimal productivity and precision in parts machining.

2. **Guaranteed highest capabilities**

   The world-leading capability and specifications deliver excellent machining capabilities.

3. **Optimal stabilized structure**

   Stable structure guaranteed by the application of a high-rigidity roller LM full axis and ball screw nut cooling standard.
High Performance Spindle

The heavy duty spindle assembly and face/taper contact spindle nose reduces vibration and improves workpiece surface finish during high speed machining.

Built-in Main Spindle

A Belt or gear excluded built-in motor is equipped for the main shaft, which minimizes vibration and noise during high speed rotation. Moreover, with an optimum combination of precision bearings effective for heat generation control at high speeds with 4-lane, it carries out high quality processing while maintaining a balance of precision for the main axis of which the vibration source is removed. In accordance with maintaining the strength of main shaft with minimizing rotating inertia, it allows great reduction of the time for reaching to the maximum speed of the main shaft, which leads to high productivity.

Spindle power- torque diagram

Selection of dual contact connecting spindle

The spindle taper and nose are finish-ground together to allow simultaneous face and taper location of tooling.

- Simultaneous contact of tools to main shaft section and taper
- Enhancing the strength and reducing vibration
- Enhancement of processing capability and surface resolution in severe conditions
- Possible to utilize conventional tools (100% compatible)

Major advantages

- Strength enhancement with increment of standard diameter
- Dramatic enhancement of ATC cyclic precision degree
- Prevention of Z-axis displacement at high speed rotation
- Increased durability of tools
Rapid Traverse

Tool changing takes place using a highly efficient and reliable CAM type tool change mechanism for high speed and long term reliability.

<table>
<thead>
<tr>
<th></th>
<th>BM 2740</th>
<th>BM 2740P</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-axis</td>
<td>16 m/min (629.9 ipm)</td>
<td>16 m/min (629.9 ipm)</td>
</tr>
<tr>
<td>Y-axis</td>
<td>24 m/min (944.9 ipm)</td>
<td>24 m/min (944.9 ipm)</td>
</tr>
<tr>
<td>Z-axis</td>
<td>24 m/min (944.9 ipm)</td>
<td>36 m/min (1417.3 ipm)</td>
</tr>
</tbody>
</table>

Strong traverse system structure

Roller guide applied

Rigid coupling

Ball screw nut cooling

The accuracy of the axis traverse is improved by applying a cooling jacket to the ballscrews which has the effect of reducing thermal transfer.

Tool Magazine

Tool storage capacity

<table>
<thead>
<tr>
<th></th>
<th>BM 2740</th>
<th>BM 2740P</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 ea (60 ea opt)</td>
<td>30 ea (40 ea opt)</td>
<td></td>
</tr>
</tbody>
</table>

Tool change time (T-T-T)

<table>
<thead>
<tr>
<th></th>
<th>BM 2740</th>
<th>BM 2740P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 s</td>
<td>1.5 s</td>
<td>D1D1</td>
</tr>
</tbody>
</table>
**Machining Capacity**

BM series provides high processing performance in various cutting procedures.

### BM 2740

<table>
<thead>
<tr>
<th>Face mill</th>
<th>Carbon steel (SM45C)</th>
<th>Face mill</th>
<th>Gray casting (GC25)</th>
<th>Tap</th>
<th>Carbon steel (SM45C)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face mill</strong></td>
<td><strong>ø125mm Face mill (8Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
</tr>
<tr>
<td><strong>Machining rate</strong></td>
<td>784 cm³/min (308.7 in³/min)</td>
<td>960 cm³/min (378.0 in³/min)</td>
<td><strong>Machining rate</strong></td>
<td><strong>Machining rate</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Spindle speed</strong></td>
<td>500 r/min</td>
<td>500 r/min</td>
<td><strong>Spindle speed</strong></td>
<td>180 r/min</td>
<td></td>
</tr>
<tr>
<td><strong>Feedrate</strong></td>
<td>980 mm/min (38.6 ipm)</td>
<td>1200 mm/min (47.2 ipm)</td>
<td><strong>Feedrate</strong></td>
<td>810 mm/min (31.9 ipm)</td>
<td></td>
</tr>
</tbody>
</table>

### BM 2740P

<table>
<thead>
<tr>
<th>Face mill</th>
<th>Carbon steel (SM45C)</th>
<th>Face mill</th>
<th>Aluminum (AL6061)</th>
<th>Tap</th>
<th>Aluminum (AL6061)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face mill</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
<td><strong>ø80mm Face mill (6Z)</strong></td>
</tr>
<tr>
<td><strong>Machining rate</strong></td>
<td>768 cm³/min (302.4 in³/min)</td>
<td>2688 cm³/min (1058.3 in³/min)</td>
<td><strong>Machining rate</strong></td>
<td><strong>Machining rate</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Spindle speed</strong></td>
<td>1200 r/min</td>
<td>1200 r/min</td>
<td><strong>Spindle speed</strong></td>
<td>3600 r/min</td>
<td></td>
</tr>
<tr>
<td><strong>Feedrate</strong></td>
<td>4000 mm/min (157.5 ipm)</td>
<td>7000 mm/min (275.6 ipm)</td>
<td><strong>Feedrate</strong></td>
<td>1800 mm/min (70.9 ipm)</td>
<td></td>
</tr>
</tbody>
</table>

### Attainment of High Precision

**Surface roughness**

Ra 0.15 μm  
- Spindle speed: 12000 r/min  
- Feedrate: 1200 mm/min  
- Machine: BM2740P

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*Since data above is collected in accordance with test standards of our company, it is changeable along with the conditions.*
Specification and Performance Optimized for LCD/LED Consumer Market

This product has been exclusively designed for the production of LCD/LED components and parts made from flat Aluminium sheet, such as Aerospace components. The investment cost has been reduced by using energy-saving and environmental-friendly elements during the product’s development.

Passage Width & Height

The distance from the table surface to the spindle nose has been minimised to allow for shortest possible tools and provide optimum rigidity.

The widest distance between columns & table size in its class

<table>
<thead>
<tr>
<th>Model</th>
<th>Distance between columns</th>
<th>Table size</th>
<th>Loading capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM 2740</td>
<td>2740 mm (107.9 inch)</td>
<td>4000 x 2500 mm (157.5 x 98.4 inch)</td>
<td>10000 kg (22045.9 lb)</td>
</tr>
<tr>
<td>BM 2740P</td>
<td>3000 kg (6613.8 lb)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Selection of High Column (Raising Block) specification

Optional high column specification (using raising blocks) can accommodate increased workpiece height.
Major features of machine structure

The BM series has been designed from the beginning using Finite Element Method (FEM), from single elements such as bed, column etc through to the complete assembled structure. This ensures minimum vibration levels during machining the workpiece.

Bed and table structure

The table traverses along three roller guideways and minimises table overhang at both ends. This guarantees the same accuracy and performance across the entire table surface area.

Crossrail structure

The crossrail is designed with an arch-type structure to reduce geometric errors caused by bend and twist of the cross beam. High accuracy of machining is achieved over long periods.
**Column structure**

The column has been designed using structural analysis and has an extra-wide base to optimise stability and reduce column bending during long periods of running.

![Column structure diagram](image)

**Column bed connection structure**

The column and bed are connected in two planes side and upper face - to provide high level rigidity and accuracy.

![Column bed connection structure](image)

**Saddle and spindle structure**

**High strength Z-axis propping structure**

In order to minimise displacement of the spindle and to maximise rigidity, the Z axis assembly is supported by a 3 lane LM guide block structure.

![High strength Z-axis propping structure](image)

**Low spindle overhang distance**

The rigidity of the Z axis is optimised by reducing the distance from the Z axis to the spindle centre of gravity. This allows high acceleration / deceleration rates to be used when drilling and tapping small diameter holes.

- A : **280 mm** (11.0 inch) (BM2740)
- B : **270 mm** (10.6 inch) (BM2740P)

![Low spindle overhang distance](image)
Chip Disposal

The machine includes two screw-type conveyors to remove chips from the working area into a lift up chip conveyor positioned at the end of the machine.

Operation

Many features are included which makes the machine operation easier for the operator.

Coolant Gun

The coolant gun allows the operator to quickly clean the working area of the machine and the workpiece.

Internal screw conveyer

2-lane screw is adopted.

Chip conveyor opt.

Hinge type

Scraper type

Drum filter type

Coolant Chiller opt.

The coolant chiller lowers coolant temperature, helping to cool both the workpiece and tool during the machining operation. When using insoluble cutting oils, a coolant chiller is recommended to cool heated oil and preserve machining precision.

Operation

Many features are included which makes the machine operation easier for the operator.

Coolant Gun

The coolant gun allows the operator to quickly clean the working area of the machine and the workpiece.

MPG

The MPG makes set up easier for large size workpieces.

Semi splash guard std

Full splash guard opt.

Semi splash guard in consideration of workplace environment

Indoor operation foothold

Provision of table front face and left/right indoor foothold

Indoor lamp (LED)

Cross lower working lamp

Signal tower

Alarm lamp (indicating abnormal condition of machine)

Processing completion light (indicating completion of processing)

Processing ongoing light (indicating ongoing process)

Convenient absolute positioning system

Machine operation is possible without the need to reference return to machine origin when powering on. The machine location is saved by battery backup while in power off condition.
## Easy Operation Package

These Doosan software packages have been customised to make setup and diagnostic operations easier for the customer.

<table>
<thead>
<tr>
<th>Tool Date Registry Table</th>
<th>Sensor Status Monitor</th>
<th>Table Moving for Setup</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATC Recovery Help</td>
<td>M-code Help</td>
<td>G-code Help</td>
</tr>
</tbody>
</table>

### Power Saving

**Power saving function**  
This function saves electricity when the machine is not in use.

**Automatic machine light turns off**  
The operating lamp is automatically turned off.

**Operating condition**  
In case of no spindle rotation and shaft conveyance in the condition of no switch input in control panel, a function herein is operated.  
▶ There is an input button for using the power saving function.

**Automatic machine sleep**  
The axis shaft servo AMP power and PSM power are shutdown.  
▶ Chip conveyer motor operation is stopped.

A Hot key is separated for display and conveyance of machine, and single button input in jog mode allows conveyance of the whole shaft to a designated location with calling tool replacement and arbitrary command tools and conveyance to the designated location for the structure setting and manual tool length setting.
External Dimensions

BM 2740

Top View

Front View

Side View

Table

Tool Shank

BT50

Unit: mm (inch)
BM 2740P

Top View

Front View

Side View

Table

Tool Shank

BT40 MAS 403 BT 40

• Pull Stud 15° Replacing the standard required by
PS BT40 M16 J5 B or PS - 806 (NIKKEN)

Unit: mm (inch)
## Machine Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>BM 2740</th>
<th>BM 2740P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travels</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel distance</td>
<td>mm (inch)</td>
<td>4000 (157.5)</td>
<td>4000 (157.5)</td>
</tr>
<tr>
<td>X-axis</td>
<td>m (inch)</td>
<td>4000 (157.5)</td>
<td>4000 (157.5)</td>
</tr>
<tr>
<td>Y-axis</td>
<td>m (inch)</td>
<td>2700 (106.3)</td>
<td>2700 (106.3)</td>
</tr>
<tr>
<td>Z-axis</td>
<td>m (inch)</td>
<td>800 (31.5)</td>
<td>500 (19.7)</td>
</tr>
<tr>
<td>Effective width between columns</td>
<td>m (inch)</td>
<td>2740 (107.9)</td>
<td>2740 (107.9)</td>
</tr>
<tr>
<td>Table to spindle nose</td>
<td>m (inch)</td>
<td>150–950 (5.9–37.4)</td>
<td>80–580 (3.1–22.8)</td>
</tr>
<tr>
<td><strong>Feedrates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid Traverse Rate X-axis</td>
<td>m/min (ipm)</td>
<td>16 (629.9)</td>
<td>16 (629.9)</td>
</tr>
<tr>
<td>Y-axis</td>
<td>m/min (ipm)</td>
<td>24 (944.9)</td>
<td>24 (944.9)</td>
</tr>
<tr>
<td>Z-axis</td>
<td>m/min (ipm)</td>
<td>24 (944.9)</td>
<td>36 (1417.3)</td>
</tr>
<tr>
<td>Cutting feedrate</td>
<td>m/min (ipm)</td>
<td>8000 (315.0)</td>
<td>8000 (315.0)</td>
</tr>
<tr>
<td><strong>Table</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table size</td>
<td>mm (inch)</td>
<td>4000 × 2500 (157.5 × 98.4)</td>
<td>4000 × 2500 (157.5 × 98.4)</td>
</tr>
<tr>
<td>Table loading capacity</td>
<td>kg (lb)</td>
<td>10000 (22045.9)</td>
<td>3000 (6613.8)</td>
</tr>
<tr>
<td><strong>Spindle</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool shank</td>
<td>-</td>
<td>BT50</td>
<td>BT40</td>
</tr>
<tr>
<td>Ram size</td>
<td>mm (inch)</td>
<td>380 × 380 (15.0 × 15.0)</td>
<td>-</td>
</tr>
<tr>
<td>Max. Spindle speed</td>
<td>r/min</td>
<td>10000</td>
<td>12000</td>
</tr>
<tr>
<td><strong>ATC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool storage capa.</td>
<td>ea</td>
<td>40 (60)</td>
<td>30 (40)</td>
</tr>
<tr>
<td>Max. tool diameter</td>
<td>mm (inch)</td>
<td>125 / 220 (4.9 / 8.7)</td>
<td>85 / 125 (3.3 / 4.9)</td>
</tr>
<tr>
<td>Max. tool length</td>
<td>mm (inch)</td>
<td>350 (13.8)</td>
<td>300 (11.8)</td>
</tr>
<tr>
<td>Max. tool weight</td>
<td>kg (lb)</td>
<td>15 (33.1)</td>
<td>8 (17.6)</td>
</tr>
<tr>
<td>Tool selection</td>
<td>memory random</td>
<td>memory random</td>
<td></td>
</tr>
<tr>
<td><strong>Motors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spindle motor power</td>
<td>kW (Hp)</td>
<td>25 / 30 (33.5 / 40.2)</td>
<td>18.5 / 22 (24.8 / 29.5)</td>
</tr>
<tr>
<td><strong>Power source</strong></td>
<td></td>
<td>Electric power supply (rated capacity)</td>
<td>kVA</td>
</tr>
<tr>
<td><strong>Tank capacity</strong></td>
<td></td>
<td>Coolant tank capacity</td>
<td>L (galon)</td>
</tr>
<tr>
<td><strong>Machine Dimensions</strong></td>
<td></td>
<td>Lubrication tank capacity</td>
<td>L (galon)</td>
</tr>
<tr>
<td>Height</td>
<td>mm (inch)</td>
<td>4810 (189.4)</td>
<td>3760 (148.0)</td>
</tr>
<tr>
<td>Length</td>
<td>mm (inch)</td>
<td>4914 (193.5)</td>
<td>4684 (183.0)</td>
</tr>
<tr>
<td>Width</td>
<td>mm (inch)</td>
<td>10815 (425.8)</td>
<td>10815 (425.8)</td>
</tr>
<tr>
<td>weight</td>
<td>kg (lb)</td>
<td>45000 (99206.6)</td>
<td>38000 (83774.4)</td>
</tr>
</tbody>
</table>

### Standard Feature
- Spindle head cooling system
- Coolant gun
- Flood coolant
- Air curtain
- Ball screw nut cooling system
- Coolant tank & Chip pan
- Potable MPG
- Semi splash guard
- Easy operation package
  - Renishaw GUI (Screen only)
  - Tool management system
  - Pattern cycle & Operation rate
- DTMM (Tool Load Monitoring System)
- DAFT (Apative Feed Control)
- Working step (BM 2740)

### Optional Feature
- Air gun
- Auto. workpiece measurement
- Spindle thermal compensation
- Full splash guard
- Linear scale
- Lift up chip conveyor & bucket
- MPG (LCD type)
- Side anchoring
- DHC (Doosan Heat Control)
- Auto tool breakage detection
- Air blower
- Coolant chiller
- Working step (BM 2740P)

*The specifications and information above-mentioned may be changed without prior notice.
*For more details, please contact Doosan
NC Unit Specifications

Fanuc 32i

AXES CONTROL
- Controlled axes: 3 (X, Y, Z)
- Simultaneous controlled axes: Positioning (G00) / Linear interpolation (G01) : 3 axes, Circular interpolation (G02, G03) : 2 axes
- Backlash compensation
- Least command increment: 0.001mm / 0.0001inch
- Least input increment: 0.001mm / 0.0001inch
- Machine lock: all axes / Z axis
- Mirror image: Reverse axis movement (setting screen and M - function)
- Stored pitch error compensation
- Pitch error offset compensation for each axis
- Stored stroke check: 1 Overtravel controlled by software

INTERPOLATION & FEED FUNCTION
- 2nd reference point return: G30
- Circular interpolation: G02, G03
- Exact stop check: G09, G61 (mode)
- Feed per minute: mm / min
- Feedrate override (10% increments): 0 - 200%
- Jog override (10% increments): 0 - 200%
- Manual handle feed (1 unit)
- Manual handle feedrate: 0.1/0.01/0.001mm
- Override cancel: M48 / M59
- Rapid traverse override: F0 (fine feed), 25 / 50 / 100 %
- Reference point return: G27, G28, G29
- Skip function: G31
- Helical interpolation
- AICC I: 30 block preview
- Machine condition selection function
- Thread cutting, synchronous cutting
- Program restart
- Automatic corner deceleration
- Feedrate clamp by circular radius
- Linear ACC/DEC before interpolation (Specify AI Contour control)
- Control axis detach
- Rapid traverse bell-shaped acceleration/deceleration
- Smooth backlash compensation

SPINDLE & M-CODE FUNCTION
- M-code function: M 3 digits
- Spindle orientation
- Spindle speed command: 55 digits
- Spindle speed override (10% increments): 50 - 150%
- Rigid tapping: G64, G74

TOOL FUNCTION
- Tool nose radius compensation: G40, G50, G62
- Number of tool offsets: 32 ea
- Tool length compensation: G43, G44, G49(nation)
- Tool number command: G112 digits
- Tool life management: Geometry / Wear and Length / Radius offset
- Tool offset memory C: memory
- Tool length measurement

PROGRAMMING & EDITING FUNCTION
- Absolute / Incremental programming: G90 / G91
- Auto. Coordinate system setting
- Background editing
- Canned cycle: G73, G74, G76, G80 - G89, G99
- Circular interpolation by radius programming
- Custom macro B
- Inch / metric conversion: G20 / G21
- Label skip
- Local / Machine coordinate system: G52 / G53
- No. of Registered programs: 500 ea
- Optional stop: M01
- Part program storage: 6040m (2,100ft) / 256Kbyte
- Program number: 0 - 4 digits
- Sub program: Up to 4 nesting
- Tape code: ISO / EIA Automatic discrimination
- Work coordinate system: G54 - G59
- Additional work coordinate system (48 Pair): G54.1 P1 - 48 pairs
- Coordinate system rotation: G68, G69
- Optional angle chamfering / corner R
- Macro executor

OTHERS FUNCTIONS (Operation, Setting & Display, etc)
- Alarm display
- Alarm history display
- Dry run
- Ethernet function
- Graphic display: Tool path drawing
- Toolpath preview
- Memory card interface
- MDI / DISPLAY unit: 10.4” color LCD, Keyboard for data input, soft-keys
- Operation functions: Tape / Memory / MDI / Manual
- Operation history display
- Program restart
- Run hour and part number display
- Search function: Sequence NO. / Program NO.
- Self - diagnostic function
- Single block
- Multi language display

OPTIONAL SPECIFICATIONS
- 3D coordinate conversion
- 3D tool compensation
- Addition of tool pairs for tool life management: 1024 pairs
- AICC II: 80 block preview
- Automatic corner override: G62
- Additional work coordinate system: G54.1 P1 - 300 (300 pairs)
- Dynamic graphic display: Machining profile drawing
- EZ Guide i (Doosan infracore Conversational Programming Solution) with 10.4” Color TFT
- Exponential interpolation
- Interpolation type pitch error compensation
- EZ Guide i (Doosan infracore Conversational Programming Solution) with 10.4” Color TFT
- High speed skip function
- Involute interolation: G02.2, G03.2
- No. of Registered programs: 1000 ea
- Number of tool offsets: 99 / 200 / 400 ea
- Optional block skip addition: 9 blocks
- Part program storage: 512K / 1M / 2M byte
- Polar coordinate command: G15 / G16
- Polar coordinate interpolation: G12.1 / G13.1
- Programmable mirror image: G50.1 / G51.1
- Single direction positioning: G60
- Tool load monitoring function (doosan)
- Tool position offset: G45 - G48
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