



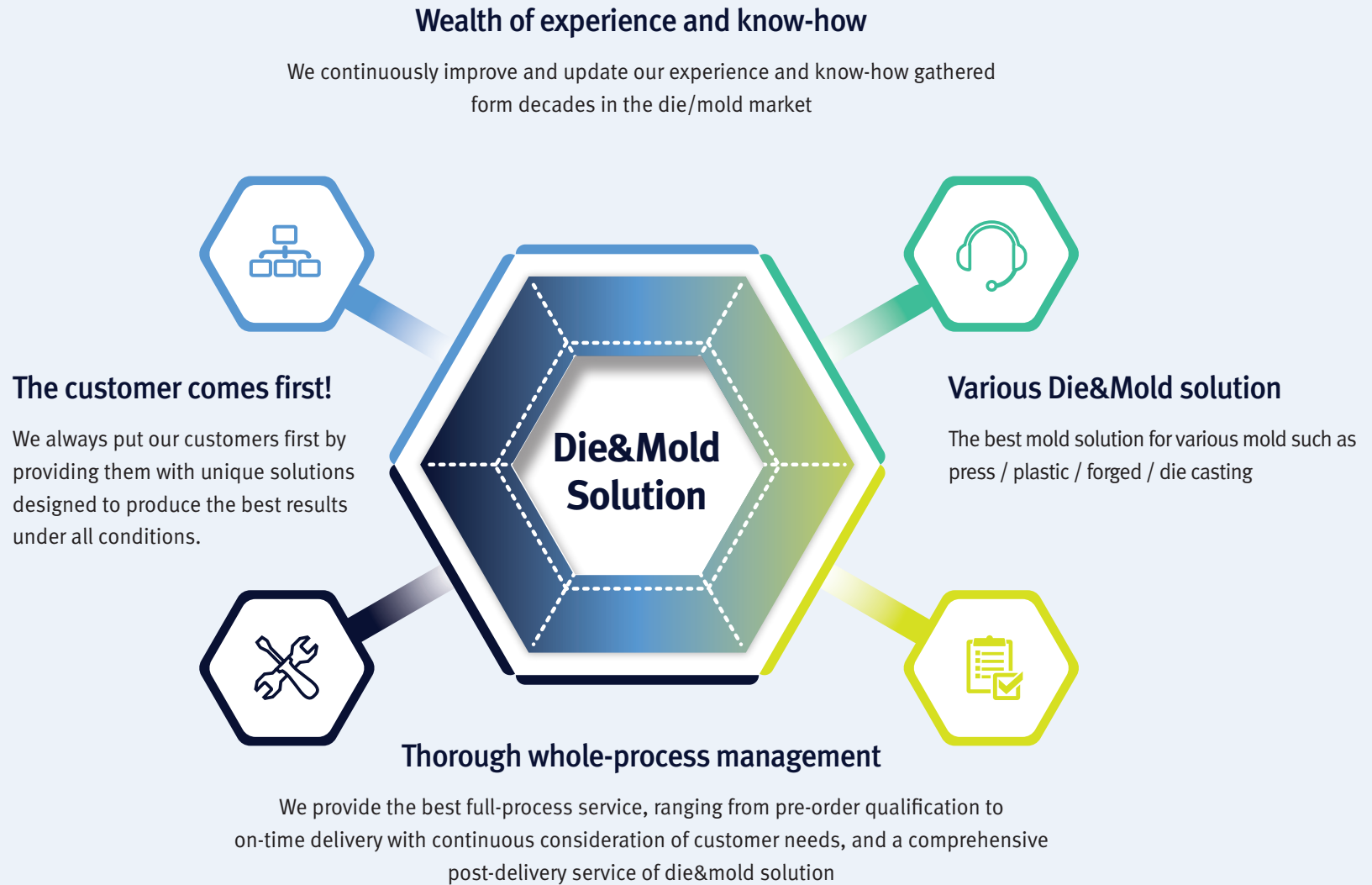
Doosan Machine Tools

# **Doosan** **Die & Mold Solution** **Reference**



ver. EN 210510 SU

CONFIDENTIALITY NOTICE: Not to be copied  
This document is the informational asset of Doosan Machine Tools Co., Ltd.  
Thus, unauthorized access, revision, distribution and copying of this document  
are strictly prohibited.



The molds are classified into various types. The most commonly used classification methods are classified into plastic mold, press mold, die casting mold, forged mold, and other specialist molds depending on the application and the material of the molded product.

## Forging mold

Crankshaft and other forging molds.

## Die casting mold

Engines are made using die casting molds.

## Plastic mold

Bumpers are made using plastic molds.

## Specialist Molds

Tires are made using other specialist molds.

## Press mold

Exterior of the cars body are made using Press die.



# Die & Mold Product line-up

## About Die & Mold

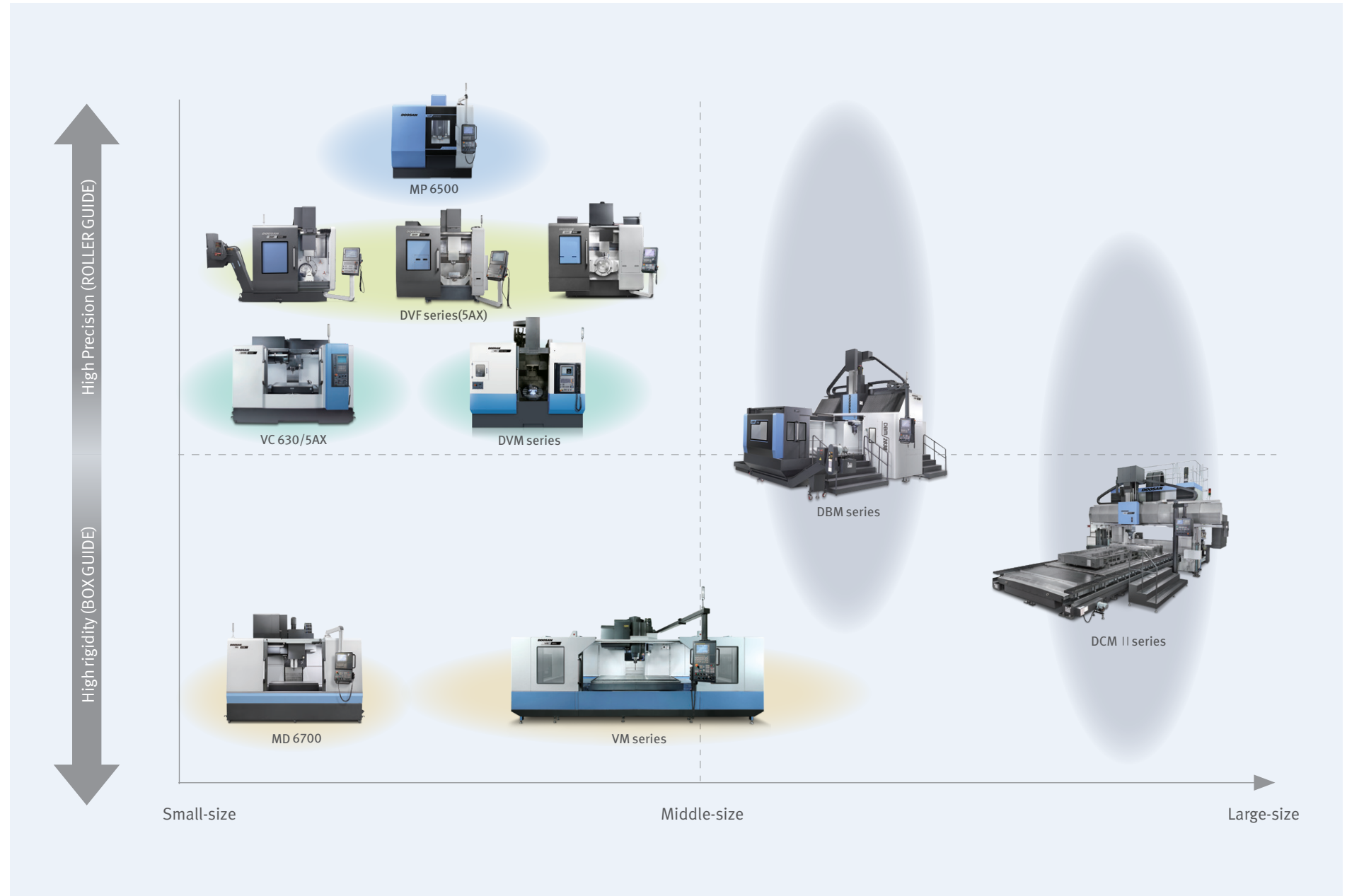
Plastic

Press

Forging

Die casting

Specialist Molds



# DOOSAN Die&Mold Function

About Die & Mold

Plastic

Press

Forging

Die casting

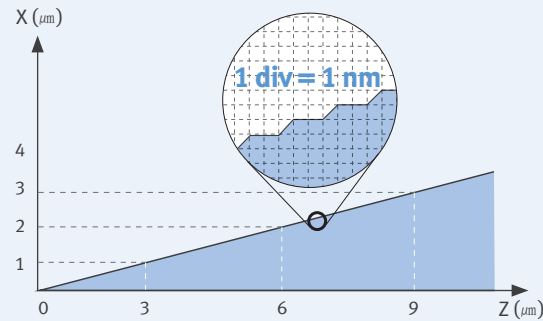
Specialist Molds

Doosan's Die&Mold technology provides optimal solutions by applying DSQ, DAFC, and DHC.

## High speed/accuracy contouring control function (DSQ : Doosan Super Quality)

- DSQ 1 : AICC II (400 block), Machining Condition Selection (R0, R1~R10 step)
- DSQ 2 : AICC II( 400 block), Machining Condition Selection (R0, R1~R10 step), Data Server 1GB
- DSQ 3: AICC II (600 block), Machining Condition Selection (R0, R1~R10 step), Data Server 1GB

### DSQ package



## Optimal feed control function (DAFC : DOOSAN Adaptive Feed Control)

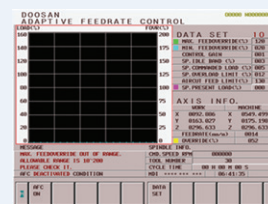
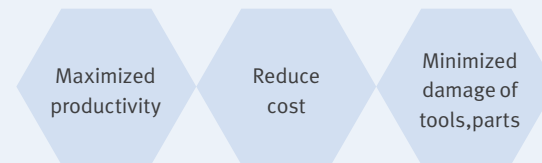
- Controls the feedrate to maintain low cutting load

### AFC System

#### • Summary

Based on the real-time spindle load detection, it calculates the optimal feedrate

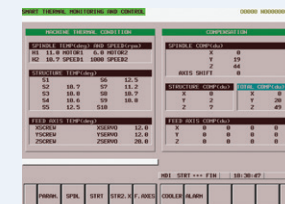
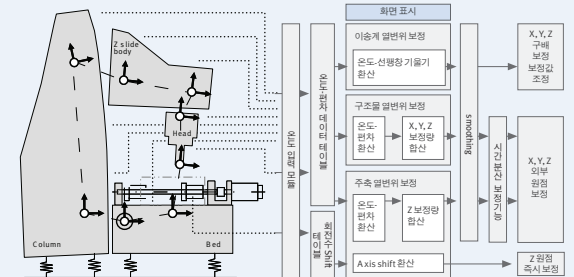
#### • Goals



## Thermal Displacement Compensation function (DHC : DOOSAN Heat Compensation)

- Spindle compensation
- Structure compensation

### Thermal Displacement Compensation System



***Plastic***



# Customer A1

About Die & Mold

Plastic

Press

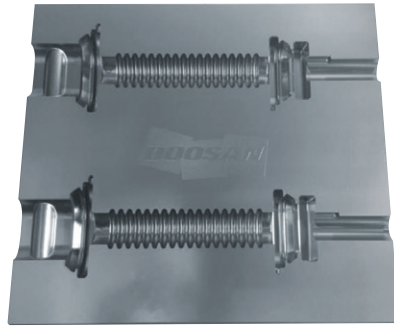
Forging

Die casting

Specialist Molds

## Workpiece

### Hose Connector



Size

**270 x 270 x 100 mm**  
(10.6 x 10.6 x 3.9 inch)

Material

**HP4M (HRC32)**

### Customer Request

Smooth surface

## Solution

### DVM 500 II, NX 6500 II

High speed & accuracy vertical machining center



\* DVM 500 II

\* NX 6500 II

### Machining Option

#### Tool length measurement

- TS27R

#### Mold Package

- DSQ3 (Data server 1GB, Look ahead 600 blocks)

### Machining Process

Finish cutting with D3 Ball Endmill

Feedrate **1200** mm/min (47.2 ipm)

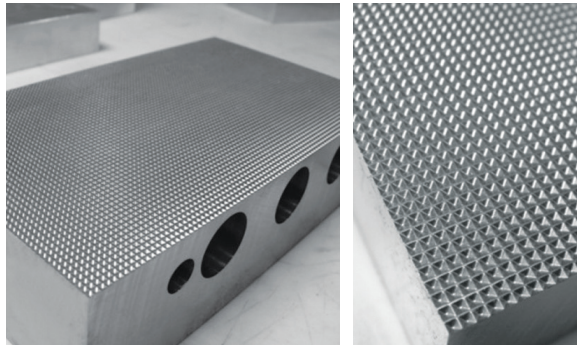
Spindle speed **15000** r/min

Machining time

**17** Hours

## Workpiece

### Embossing Pattern



Size

**170 x 95 x 43 mm**  
(6.7 x 3.7 x 1.7 inch)

Material

**NAK80 (HRC40)**

### Customer Request

Smooth surface

Sharp edge

Rigidity for Z axis

## Solution

### FM 400

Super high speed & accuracy vertical machining center



High speed spindle

Super high accuracy

High rigidity

### Machining Option

#### Tool length measurement

- TS27R

#### Mold Package

- DSQ3 (Data server 1GB, Look ahead 600 blocks)

#### Special lubrication supply for Z axis

- Repetitive Z axis movement in short stroke

### Machining Process

Finish cutting with D0.8 Ball Endmill

Feedrate **600 mm/min** (23.6 ipm)

Spindle speed **32000 r/min**

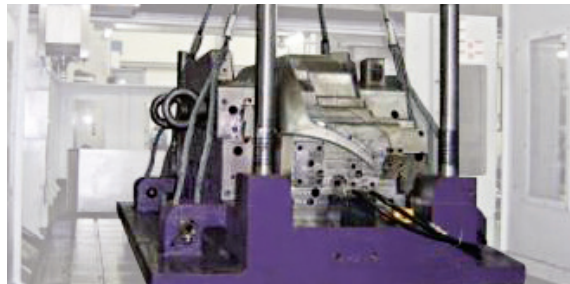
Machining time

**49 Hours**



## Workpiece

### Automotive mold



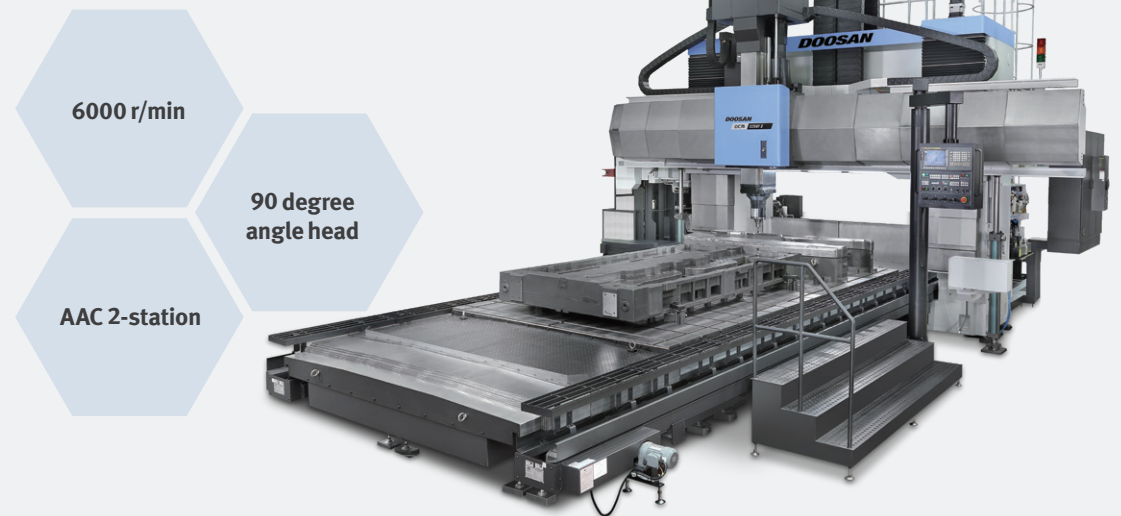
### Machining Option

Max. spindle speed	6000 r/min (22/18.5kW (29.5/24.8 Hp))
Table size (Width x Length)	2200 x 4100 mm (86.6 x 161.4 inch)
Effective size between columns (Width x Height)	2700 x 1650 mm (106.3 x 65.0 inch)
Table Load Capacity	18000 kg (39682.6 lb)
AAC	Linear shuttle 2-station
Head attachment	90 degree angle head
Semi-guard	applied

## Solution

### DCM 2740F II

High precision bridge type machining center



### Installation view



***Press***



About Die & Mold

Plastic

Press

Forging

Die casting

Specialist Molds

## **Workpiece**

### Roof punch



Size

**1650 x 1100 x 400 mm**  
(65.0 x 43.3 x 15.7 inch)

Material

**GC200**

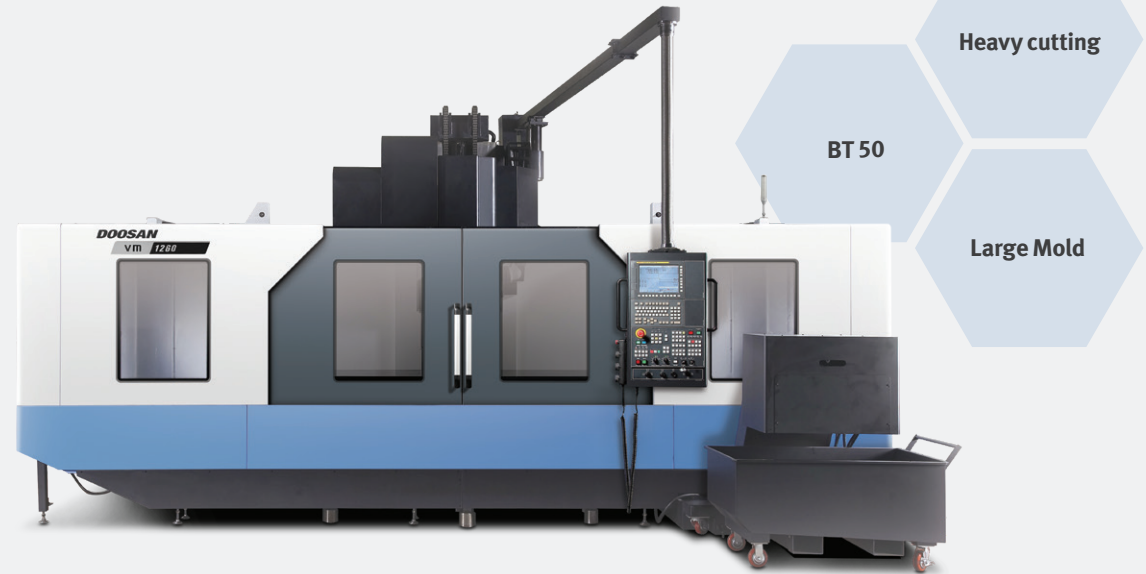
### Customer Request

Smooth surface

## **Solution**

### VM 1260 (12K RPM)

High rigidity vertical machining center



### Machining Option

#### Tool length measurement

- TS27R

#### Mold Package

- DSQ2 (Data server 1GB, Look ahead 200 blocks)

### Machining Process

Finish cutting with D16 Ball Endmill

Spindle speed **5000 r/min**

Feedrate **1800 mm/min (70.9 ipm)**

Machining time

**53 Hours**

# Customer B2

About Die & Mold

Plastic

Press

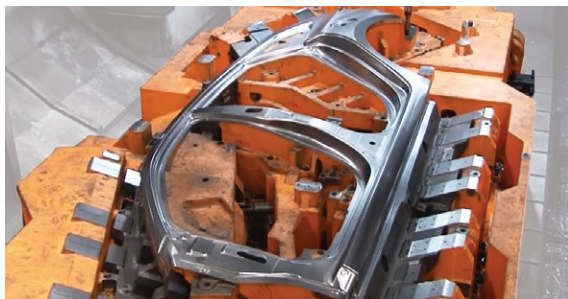
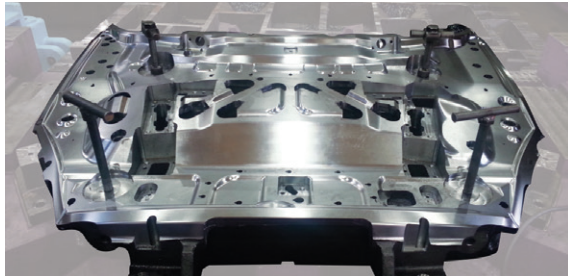
Forging

Die casting

Specialist Molds

## Workpiece

### Automotive press



### Machining Option

Max. spindle speed	6000 r/min (22/18.5kW (29.5/24.8 Hp))
Table size (Width x Length)	2700 x 5100 mm (106.3 x 200.8 inch)
Effective size between columns (Width x Height)	3200 x 2000 mm (126.0 x 78.7 inch)
Table Load Capacity	30000 kg (66137.7 lb)
AAC	Linear shuttle 4-station
Head attachment	90degree angle, Extension 6k, Universal 4k head

## Solution

### DCM 3250F II

High precision bridge type machining center

6000 r/min

AAC 4-station

90degree  
angle, Extension,  
Universal head



### Installation view



About Die & Mold

Plastic

Press

Forging

Die casting

Specialist Molds

## Workpiece

### Automotive press



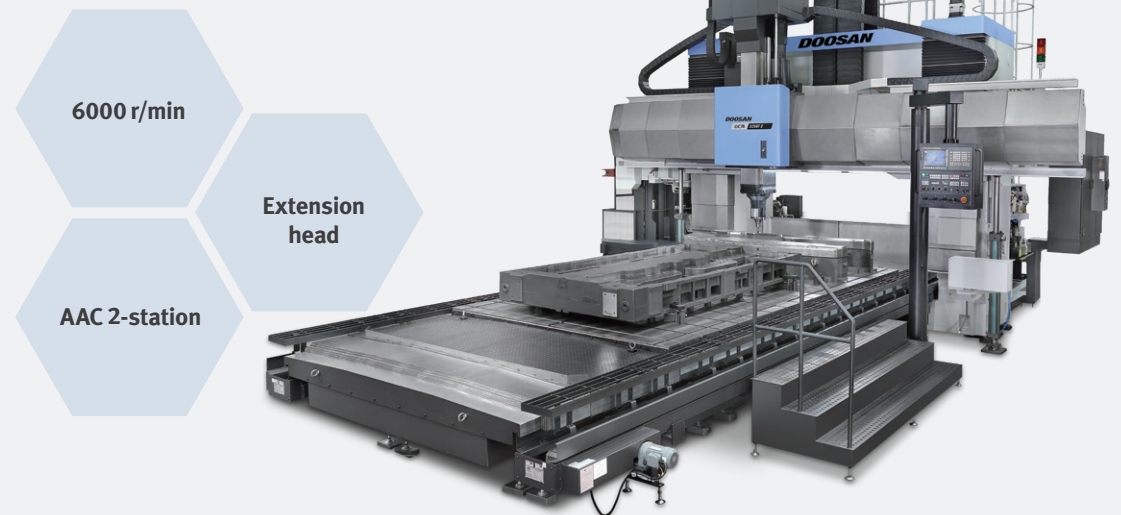
### Machining Option

Max. spindle speed	6000 r/min (22/18.5kW (29.5/24.8 Hp))
Table size (Width x Length)	2200 x 4100 mm (86.6 x 161.4 inch)
Effective size between columns (Width x Height)	2700 x 1650 mm (106.3 x 65.0 inch)
Table Load Capacity	18000 kg (39682.6 lb)
AAC	Linear shuttle 2-station
Head attachment	Extension head

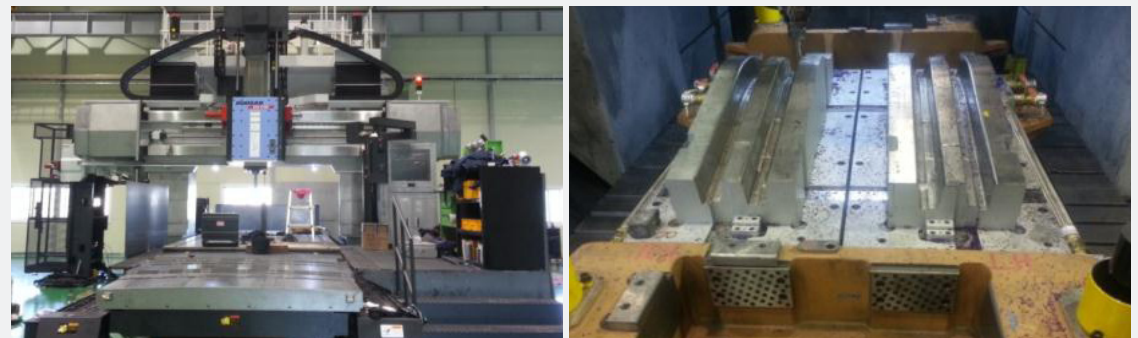
## Solution

### DCM 2740F II

High precision bridge type machining center



### Installation view



# Customer B4

About Die & Mold

Plastic

Press

Forging

Die casting

Specialist Molds

## Workpiece

### Automotive press



### Machining Option

Max. spindle speed	6000 r/min (22/18.5kW (29.5/24.8 Hp))
Table size (Width x Length)	2200 x 4100 mm (86.6 x 161.4 inch)
Effective size between columns (Width x Height)	2700 x 2000 mm (106.3 x 78.7 inch)
Table Load Capacity	18000 kg (39682.6 lb)
AAC	Linear shuttle 2-station
Head attachment	Extension 6k, Universal 4k head

## Solution

### DCM 2740F II

High precision bridge type machining center

6000 r/min

Extension,  
Universal head

AAC 2-station



### Installation view



About Die & Mold

Plastic

Press

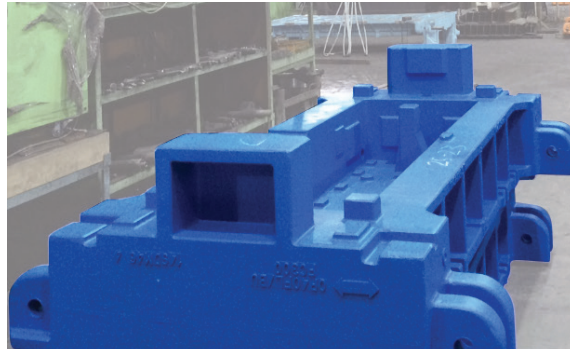
Forging

Die casting

Specialist Molds

## Workpiece

### Automotive press



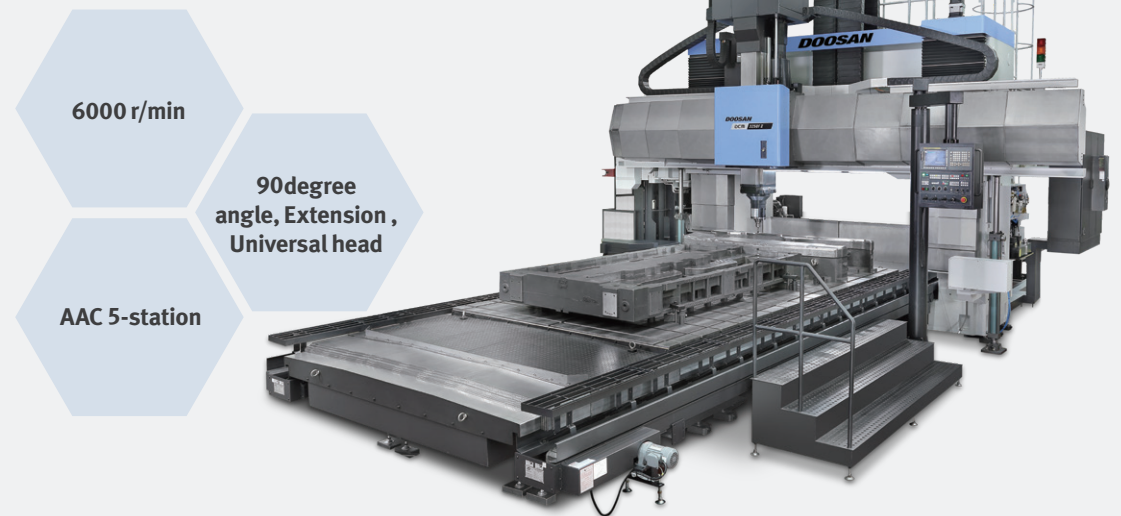
### Machining Option

Max. spindle speed	6000 r/min (25/22 kW (33.5/29.5 Hp))
Table size (Width x Length)	2700 x 6100 mm (106.3 x 240.2 inch)
Effective size between columns (Width x Height)	3200 x 2000 mm (126.0 x 78.7 inch)
Table Load Capacity	36000 kg (79365.2 lb)
AAC	Linear shuttle 5-station
Head attachment	90degree angle, Extension 6k/10k, Universal 4k head

## Solution

### DCM 3260F II

High precision bridge type machining center



### Installation view



# Customer B6

About Die & Mold

Plastic

Press

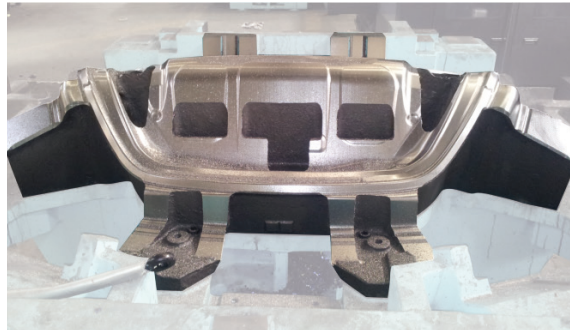
Forging

Die casting

Specialist Molds

## Workpiece

### Automotive press



### Machining Option

Max. spindle speed	6000 r/min (25/22 kW (33.5/29.5 Hp))
Table size (Width x Length)	2700 x 6100 mm (106.3 x 240.2 inch)
Effective size between columns (Width x Height)	3200 x 2000 mm (126.0 x 78.7 inch)
Table Load Capacity	36000 kg (79365.2 lb)
AAC	Linear shuttle 5-station
Head attachment	90degree angle, Extension 6k/10k, Universal 4k head

## Solution

### DCM 3260F II

High precision bridge type machining center

6000 r/min

90degree  
angle, Extension,  
Universal head

AAC 5-station



### Installation view





About Die & Mold

Plastic

Press

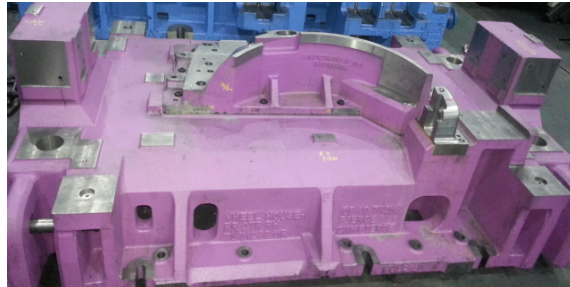
Forging

Die casting

Specialist Molds

## Workpiece

### Automotive press



### Machining Option

Max. spindle speed	6000 r/min (25/22 kW (33.5/29.5 Hp))
Table size (Width x Length)	2700 x 5100 mm (106.3 x 200.8 inch)
Effective size between columns (Width x Height)	3200 x 2000 mm (126.0 x 78.7 inch)
Table Load Capacity	30000 kg (66137.7 lb)
AAC	Linear shuttle 5-station
Head attachment	90degree angle, Extension 6k/10k, Universal 4k head

## Solution

### DCM 3250F II

High precision bridge type machining center

6000 r/min

90degree  
angle, Extension,  
Universal head

AAC 5-station



### Installation view



# Customer B8

About Die & Mold

Plastic

Press

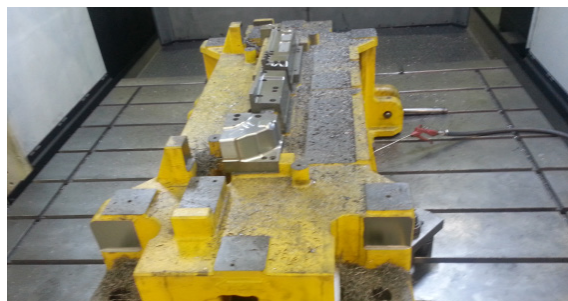
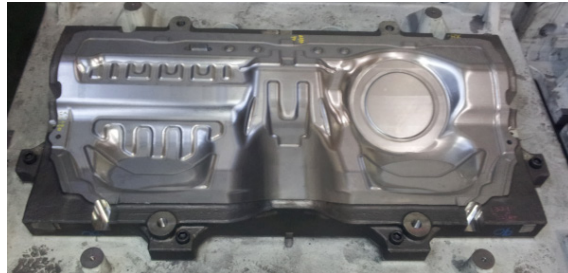
Forging

Die casting

Specialist Molds

## **Workpiece**

### Automotive press



### Machining Option

Max. spindle speed	6000 r/min (25/22 kW (33.5/29.5 Hp))
Table size (Width x Length)	2700 x 5100 mm (106.3 x 200.8 inch)
Effective size between columns (Width x Height)	3200 x 2000 mm (126.0 x 78.7 inch)
Table Load Capacity	30000 kg (66137.7 lb)
AAC	Linear shuttle 5-station
Head attachment	90degree angle, Extension 6k/10k, Universal 4k head

## **Solution**

### DCM 3250F II

High precision bridge type machining center

6000 r/min

90degree  
angle, Extension,  
Universal head

AAC 5-station



### Installation view



About Die & Mold

Plastic

Press

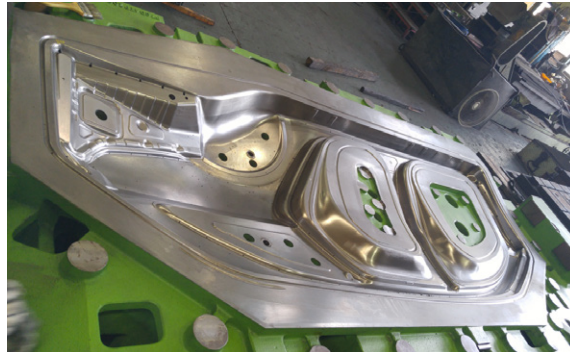
Forging

Die casting

Specialist Molds

## Workpiece

### Automotive press



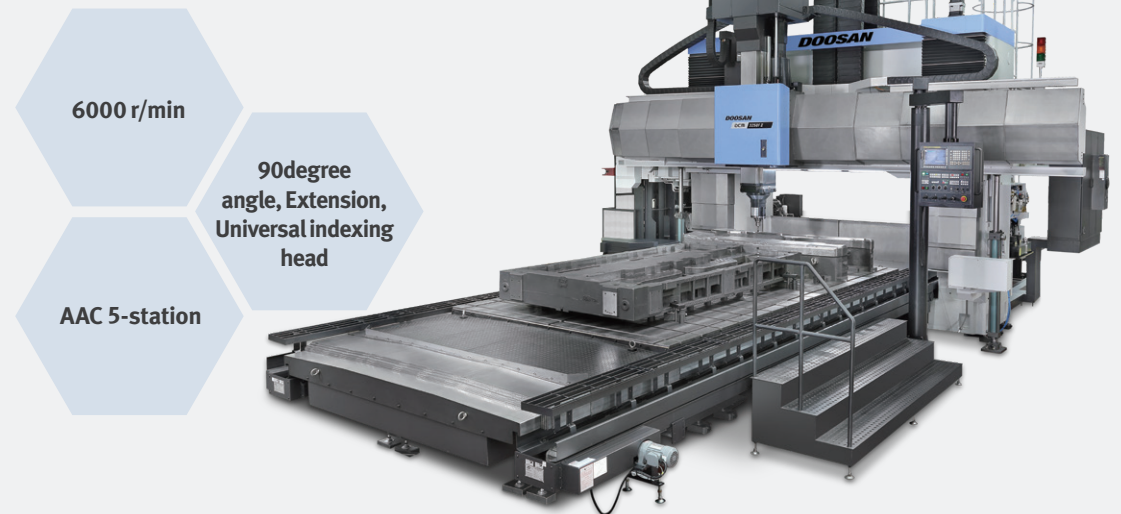
### Machining Option

Max. spindle speed	6000 r/min (25/22 kW (33.5/29.5 Hp))
Table size (Width x Length)	2700 x 6100 mm (106.3 x 240.2 inch)
Effective size between columns (Width x Height)	3200 x 2000 mm (126.0 x 78.7 inch)
Table Load Capacity	36000 kg (79365.2 lb)
AAC	Linear shuttle 5-station
Head attachment	90degree angle, Extension 6k/10k, Universal 4k indexing head

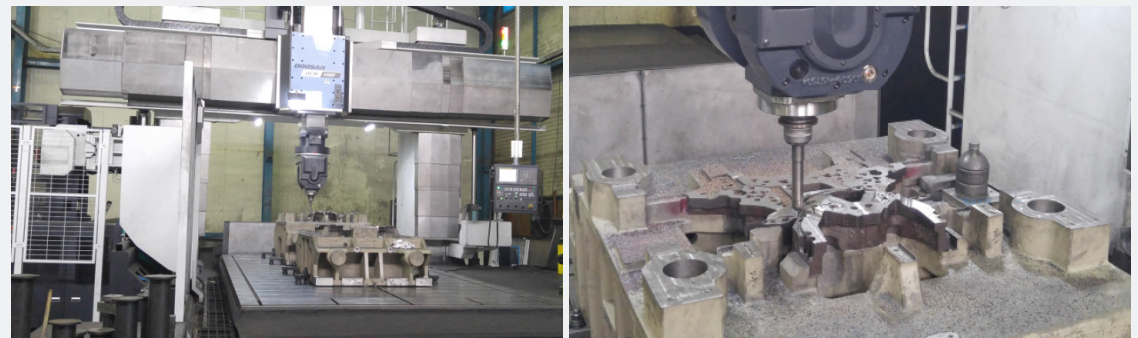
## Solution

### DCM 3260F II

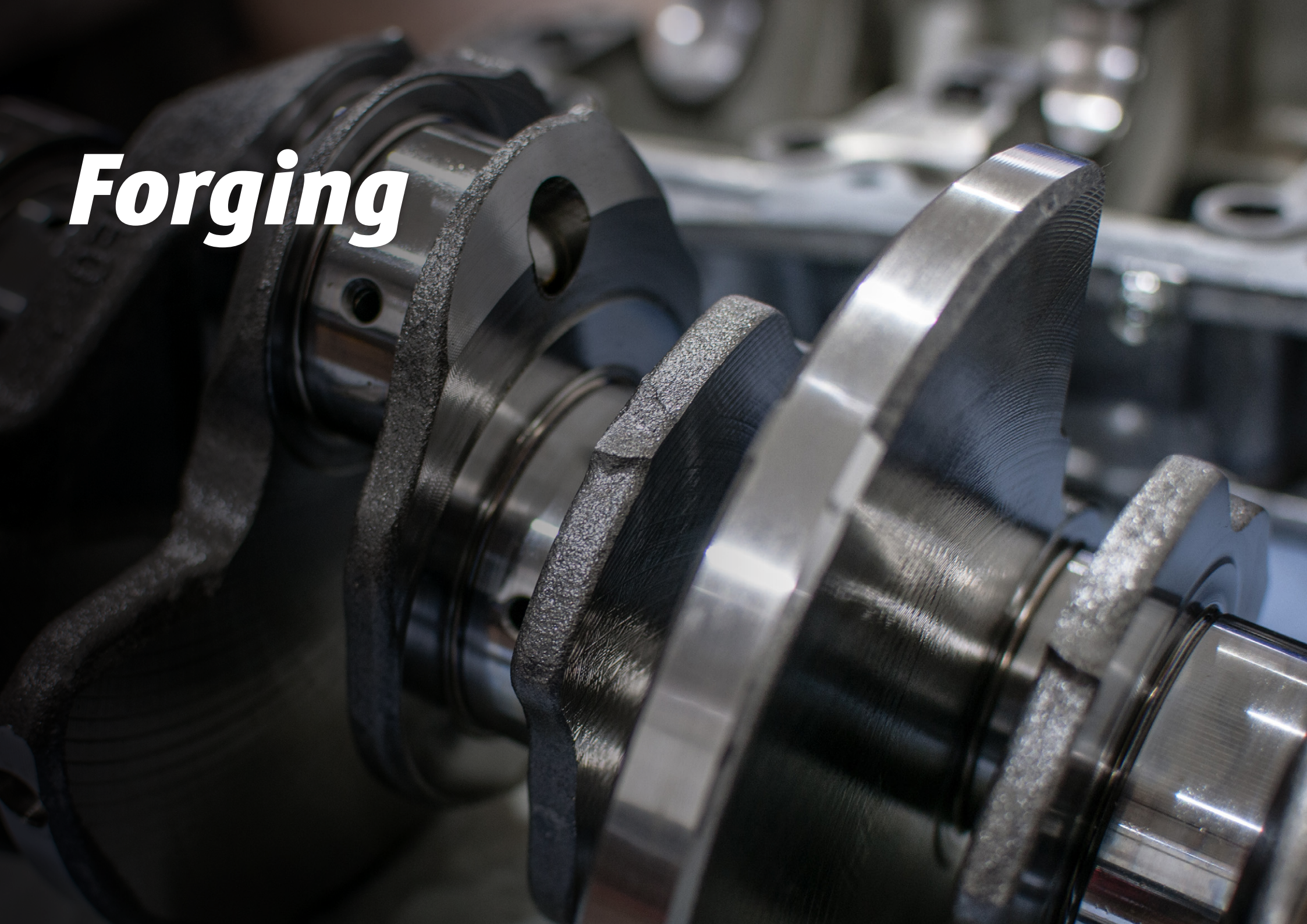
High precision bridge type machining center



### Installation view



# ***Forging***



About Die & Mold

Plastic

Press

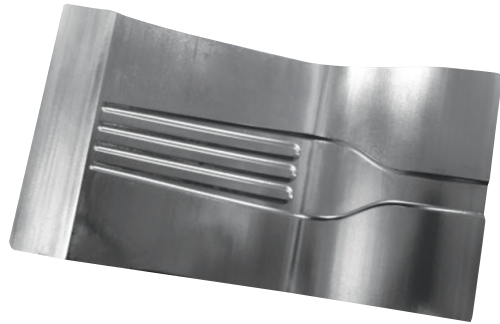
Forging

Die casting

Specialist Molds

## **Workpiece**

**Tableware** (Fork, Spoon..)



Material  
**SKD11 (HRC 56)**

### Customer Request

Smooth surface

High accuracy

Profile Tolerance : 0.03

## **Solution**

**NX 5500 II**

High speed & accuracy vertical machining center



BT 40

High speed  
spindle

High  
Accuracy

### Machining Option

#### Tool length measurement

- TS27R

#### Air dryer

#### Mold Package

- DSQ3 (Data server 1GB, Look ahead 600 blocks)

#### Thermal displacement Compensation

- Spindle & Structure

### Machining Process

#### Finish cutting with D2 Ball Endmill

Spindle speed **18000** r/min

Feedrate **600** mm/min (23.6 ipm)

#### Machining time

**2** Hours

# Customer C2

About Die & Mold

Plastic

Press

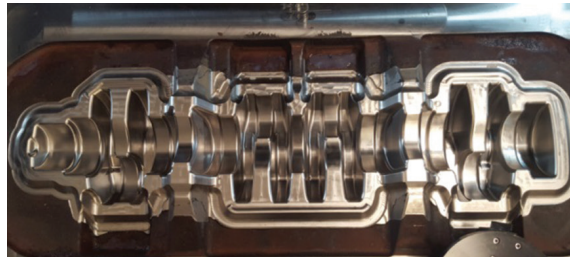
Forging

Die casting

Specialist Molds

## **Workpiece**

### Crank Shaft



Size

**1700 x 700 x 300 mm**

(66.9 x 27.6 x 11.8 inch)

Material

**8NiCrMo (HRC58)**

### Customer Request

Surface < Ra1.6

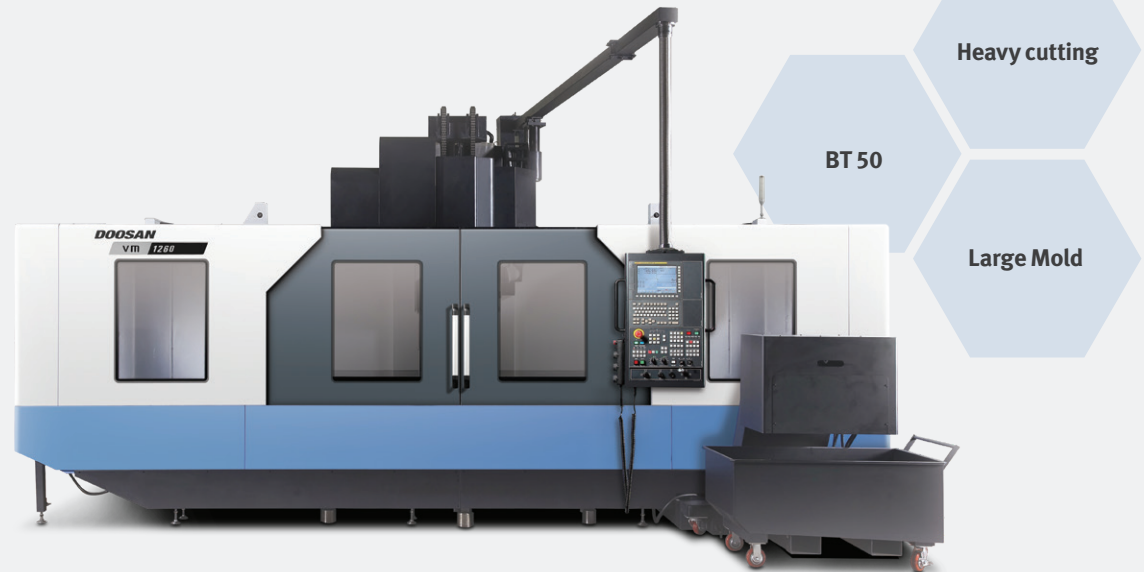
High accuracy

Profile Tolerance : 0.1mm

## **Solution**

### VM 1260 (8K RPM)

High rigidity vertical machining center



### Machining Option

#### Tool length measurement

- TS27R

#### M.Q.L Coolant unit

#### Mold Package

- DSQ3 (Data server 1GB, Look ahead 600 blocks)

#### Shrink in Tooling System (MST)

### Machining Process

Finish cutting with D12 Ball Endmill

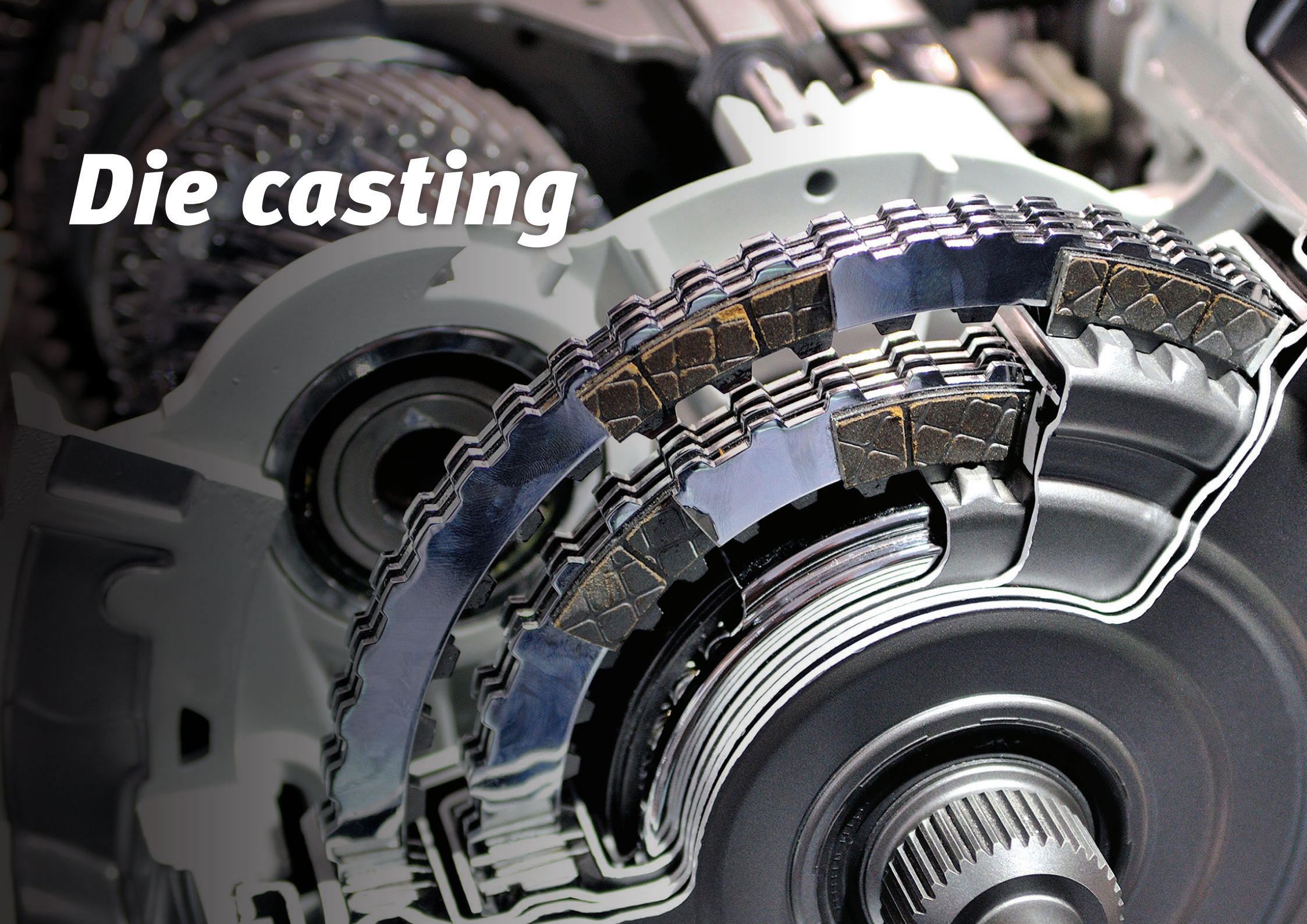
Feedrate **4200** mm/min (165.4 ipm)

Spindle speed **1500** r/min

Machining time

**80** Hours

# ***Die casting***



About Die & Mold

Plastic

Press

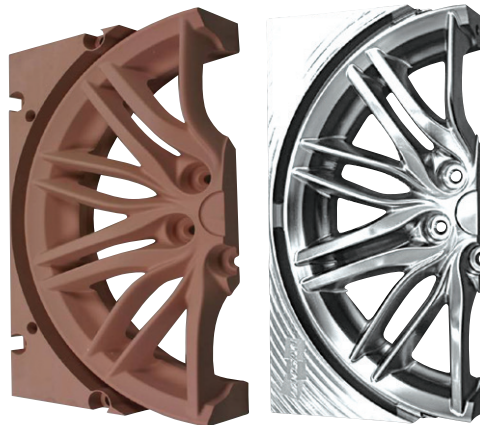
Forging

Die casting

Specialist Molds

## Workpiece

### Wheel 17"



Material

**NAK80 (HRC 40),  
Chemical wood**

### Customer Request

Smooth surface

## Solution

### DVM 500 II

High speed & accuracy vertical machining center



BT 40

High speed  
spindle

High  
Accuracy

### Machining Option

#### Tool length measurement

- TS27R

#### Air blower

#### Mold Package

- DSQ2 (Data server 1GB, Look ahead 200 blocks)

### Machining Process

#### Cutting condition For NAK80 (D6 Ball Endmill)

Feedrate	1200 mm/min (47.2 ipm)
Spindle speed	14000 r/min
Machining time	21 Hours

#### Cutting condition For Chemi wood (D6 Ball Endmill)

Feedrate	2400 mm/min (94.5 ipm)
Spindle speed	1800 r/min
Machining time	13 Hours



About Die & Mold

Plastic

Press

Forging

Die casting

Specialist Molds

## Workpiece

### Wheel Hub



Size

**D490 x 130 mm**  
(D19.3 x 5.1 inch)

Material

**SKD11**

### Customer Request

Smooth surface

## Solution

### DVM 500 II, NX 6500 II

High speed & accuracy vertical machining center



\* DVM 500 II

\* NX 6500 II

### Machining Option

#### Tool length measurement

- TS27R

#### M.Q.L Coolant unit

#### Mold Package

- DSQ3 (Data server 1GB,  
Look ahead 600 blocks)

### Machining Process

Cutting condition For NAK80 (D6 Ball Endmill)

Feedrate **1200 mm/min** (47.2 ipm)

Spindle speed **12000 r/min**

Machining time

**29 Hours**

About Die & Mold

Plastic

Press

Forging

Die casting

Specialist Molds

## Workpiece

### Transmission Case



Material  
**SKD61 (HRC 56)**

### Customer Request

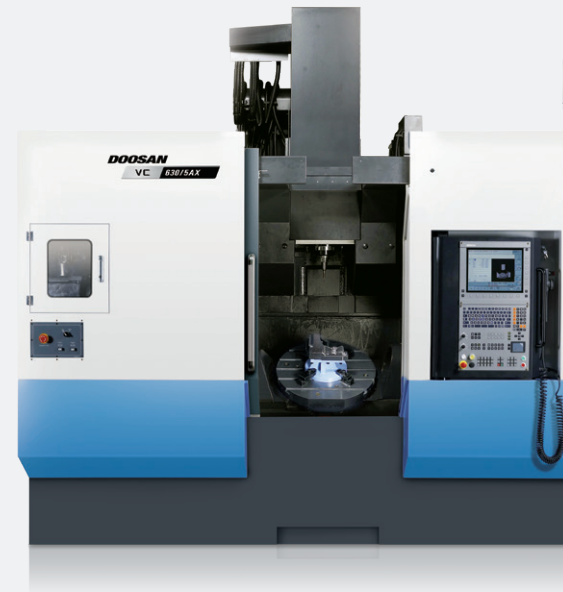
Smooth surface

Profile Tolerance : 0.03

## Solution

### VC 630-5AX

High speed & accuracy Simultaneous 5-axis machining center



High Accuracy

High speed spindle

5-axis

### Machining Option

#### Tool length measurement

- TS27R

#### Touch probe (OMP60), Datum ball, Dcp-i

#### Mold Package

- DSQ3 (Data server 1GB, Look ahead 600 blocks)

#### Thermal displacement Compensation

- Spindle & Structure

### Machining Process

#### Cutting condition For Finishing

Feedrate **1500** mm/min (59.1 ipm)

Spindle speed **10000** r/min

#### Machining time

**35** Hours

**Roughing is customer scope**

# Customer D4

About Die & Mold

Plastic

Press

Forging

Die casting

Specialist Molds

## Workpiece

### Automotive die casting



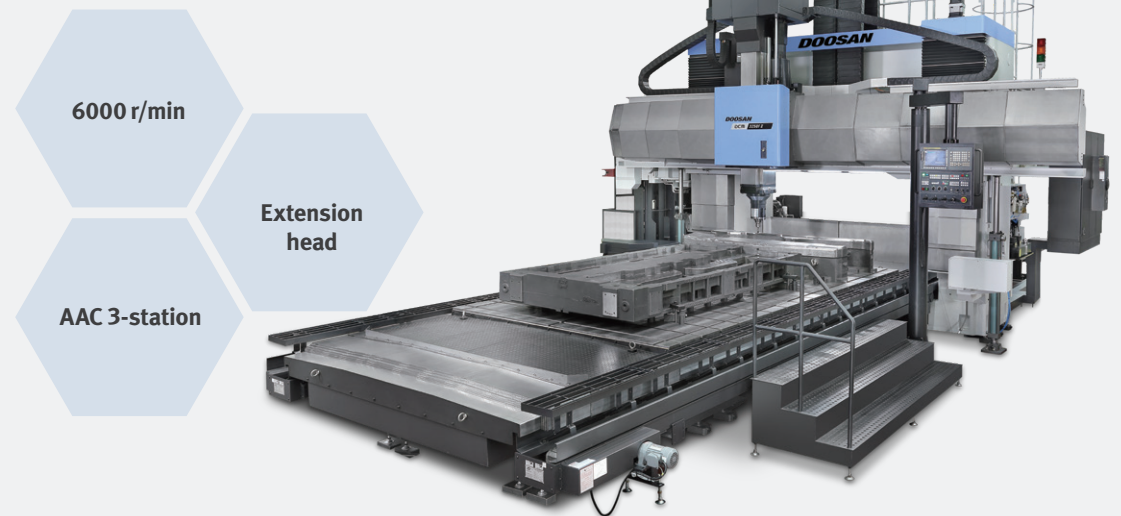
### Machining Option

Max. spindle speed	6000 r/min (22/18.5 kW (29.5/24.8 Hp))
Table size (Width x Length)	2200 x 4100 mm (86.6 x 161.4 inch)
Effective size between columns (Width x Height)	2700 x 1650 mm (106.3 x 65.0 inch)
Table Load Capacity	18000 kg (39682.6 lb)
AAC	Linear shuttle 3-station
Head attachment	Extension head
Semi-guard	applied

## Solution

### DCM 2740F II

High precision bridge type machining center



### Installation view



About Die & Mold

Plastic

Press

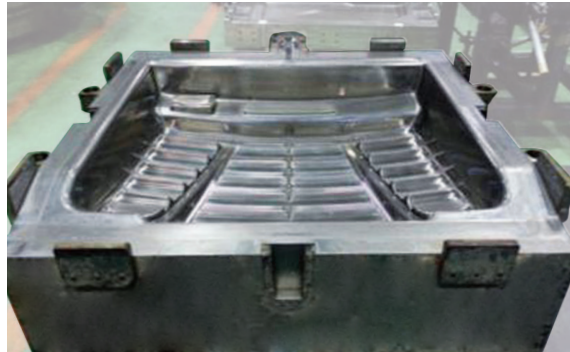
Forging

Die casting

Specialist Molds

## Workpiece

### Automotive die casting



### Machining Option

Max. spindle speed	6000 r/min (25/22 kW (33.5/29.5 Hp))
Table size (Width x Length)	2200 x 4100 mm (86.6 x 161.4 inch)
Effective size between columns (Width x Height)	2700 x 1650 mm (106.3 x 65.0 inch)
Table Load Capacity	18000 kg (39682.6 lb)
Semi-guard	applied

## Solution

### DCM 2740F II

High precision bridge type machining center

6000 r/min



### Installation view



A close-up, black and white photograph of a tire tread pattern. The tread features a series of parallel longitudinal grooves with sipes (small slanted grooves) between them, designed for water evacuation and traction. The lighting creates strong highlights and shadows, emphasizing the three-dimensional texture of the rubber.

***Specialist  
Molds***

About Die & Mold

Plastic

Press

Forging

Die casting

Specialist Molds

## Workpiece

### Tire Mold



Material

**Steel, Chemical wood,  
Aluminum**

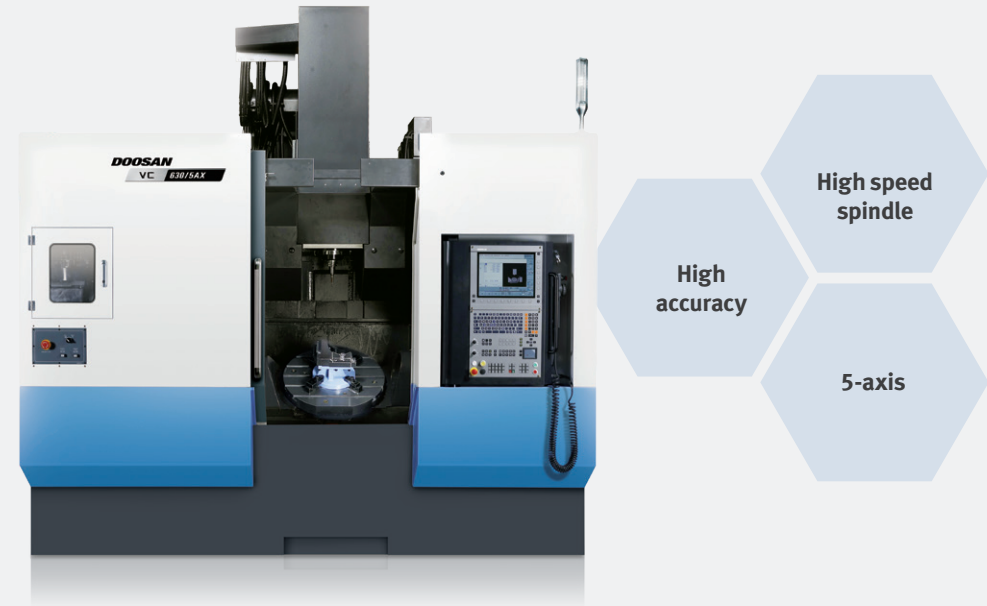
### Customer Request

Smooth surface

## Solution

### VC 630-5AX (20K)

High speed & accuracy Simultaneous 5-axis machining center



### Machining Option

#### Tool length measurement

- TS27R

Touch probe (OMP60), Datum ball, Dcp-i

#### Mold Package

- DSQ3 (Data server 1GB,  
Look ahead 600 blocks)

### Machining Process

Finish cutting with D4xR0.5 Bull nose Endmill

Feedrate **2500** mm/min (98.4 ipm)

Spindle speed **14000** r/min

Machining time

**43** Hours

# Doosan Machine Tools in the World

In an effort to provide solutions that fit each partners' unique needs, we constantly innovate our thinking, processes, and the way we do business. These optimal solutions lay the foundation for the success of our partners, which adds value to our partners' businesses.

## Global Sales and Service Support Network

**4** Corporations

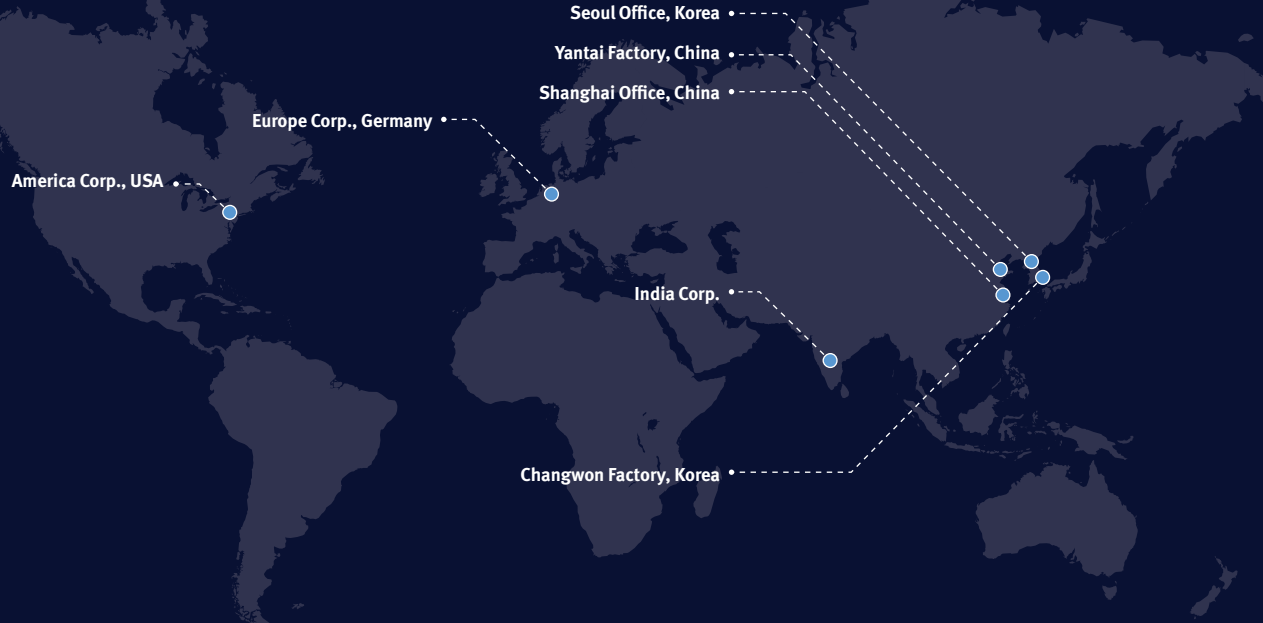
**167** Dealer Networks

**51** Technical Centers

**200** Service Post

**3** Factories

Technical Center: Sales Support, Service Support, Parts Support



## Supplying Parts

- Supplying parts without charges
- Supplying parts with charges
- Parts repair



## Field Services

- On-site services
- Installment and trials
- Scheduled maintenance/ Preventive maintenance
- Repairs with/without charges



## Technical Support

- Supporting machining technology
- Responding to technical inquiries
- Providing technical materials



## Training

- Programming / Machine operation
- Maintenance
- Application engineering

## Doosan Machine Tools

[www.doosanmachinetools.com](http://www.doosanmachinetools.com)



### Head Office

22F T Tower, 30, Sowol-ro 2-gil, Jung-gu, Seoul, Korea, 04637  
Tel +82-2-6972-0370 / 0350  
Fax +82-2-6972-0400

### Doosan Machine Tools America

19A Chapin Rd., Pine Brook, NJ 07058, U.S.A.  
Tel +1-973-618-2500  
Fax +1-973-618-2501

### Doosan Machine Tools Europe

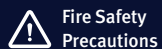
Emdener Strasse 24, D-41540 Dormagen, Germany  
Tel +49-2133-5067-100  
Fax +49-2133-5067-111

### Doosan Machine Tools India

No.82, Jakkur Village, Yelahanka Hobli, Bangalore-560064

### Doosan Machine Tools China

Room 101,201,301, Building 39 Xinzhuan Highway No.258 Songjiang District,China Shanghai(201612)  
Tel +86-21-5445-1155  
Fax +86-21-6405-1472



Fire Safety Precautions

There is a high risk of fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting use coolants and modifying the machine without the consent of the manufacturer. Please check the SAFETY GUIDANCE carefully before using the machine.

- \* For more details, please contact Doosan Machine Tools.
- \* The specifications and information above-mentioned may be changed without prior notice.
- \* Doosan Machine Tools Co., Ltd. is a subsidiary of MBK Partners. The trademark **DOOSAN** is used under a licensing agreement with Doosan Corporation, the registered trademark holder.