

The Best Partner of The Steel Industry



**SANGHO MULSAN CO., LTD**

[www.sangho.co.kr](http://www.sangho.co.kr)

Since established in 1986, SANGHO MULSAN CO.,LTD. has successfully performed stable growth with importing and supplying raw materials and many kind of equipments for steel making and car manufacturing companies in Korea.

- 1986 Established in April
- 1992 Supplied "Refractories" of Asahi Glass Company  
Supplied "Binding and counting machine" of Takigawa Kogyo  
Supplied "Magnet" of Sumitomo Heavy Industries  
Supplied "Electrode connector" of Fukuyama
- 1993 Supplied "Graphite electrodes" of Showa Denko  
(28 inches / 16 inches)  
Supplied "Artificial graphite" of Showa Denko  
Supplied "Calcined petroleum coke" of Nippon Steel Company
- 1994 Supplied "High Speed Steel Roll" of Hitachi Metal
- 1995 Joined member of Korea Trading Association in July  
Supplied "Tube mould" of Shinko Metal Product  
Supplied "Melting/Heating furnace" of Fuji
- 1996 Supplied "Bearing" of JTEKT (KOYO)
- 1998 Incorporated a firm in July
- 2000 Supplied "WC Roll" of Hitachi Metals
- 2004 Supplied "Reducer" of KOBELCO / SEISA
- 2006 Supplied "Back up Roll" of Japan Casting & Forging Corporation  
Supplied "Dividing Shear" of KOBELCO / UEDA  
Moved to the New Building of the company in July









- 2007 Installed "Reheating Furnace and Roughing Mill with 25Ton Walking Beam
- 2008 Supplied "Chopping Shear" of ISI/UEDA  
Supplied "Skid Pipe STS370" of ISI/CHUGAIRO
- 2011 Installed "BLOCK MILL" of KOBELCO
- 2012 SANGHO MULSAN COMPANY EXTENSION & MOVE
- 2012 Installed "Revamping Project for Rolling Mill" of KOBELCO
- 2012 Supplied "DIVIDING SHEAR" for KOBELCO

## Address

- 100-827  
SANGHO BLDG 373-4, Sindang-Dong, Jung-Gu, Seoul, Korea  
TEL : 82-2-2254-0857~9      FAX : 82-2-2254-0860  
<http://www.sangho.co.kr>

## ■ Main Products

### ○ Steel Manufacture

- ◆ Electric Arc Furnace..... 日精株式会社  
**NISSEI**
  
- ◆ Graphite Electrodes..... 昭和電工株式会社  
**SHOWA DENKO**
  
- ◆ Tubular Mould .... 神鋼メタルプロダクツ株式会社  
SHINKO METAL PRODUCTS CO., LTD. 
  
- ◆ Magnet..... Sumitomo Heavy Industries, Ltd.
  
- ◆ Continuous Casting ..... **KOBELCO**  
神戸製鋼グループ  **MHI** **SE**
  
- ◆ Electrode Connector..... 福山鍛鋼造機株式会社  
F.T. INDUSTRIES CO.,LTD.

# Main Products & Suppliers in Overseas

## ◎ Rolling

◆ Reheating Furnace .....



◆ Skid Pipe .....



◆ Induction Heater .....



◆ Refractories .....



◆ Roll .....



◆ Bearing .....



◆ Automatic Bundling/Counting Machine .....



◆ Reducer .....



◆ Shear .....






◆ Engineering .....



## ◎ Hot Rolling

- ◆ Skin Pass Mill.....  **KOBELCO**  
神戸製鋼グループ
- ◆ Back Up Roll .....  **JAPAN CASTING & FORGING CORPORATION**

## ◎ Casting

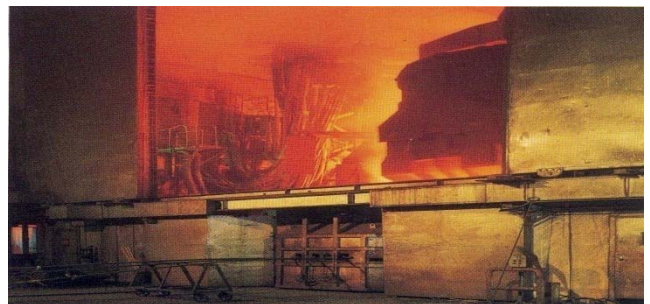
- ◆ Low/High-Frequency Crucible Furnace.....  **FUJI**  
ELECTRIC
- ◆ Heating Facilities.....  **FUJI**  
ELECTRIC
- ◆ Carurizing Materials .....  昭和電気株式会社  
**SHOWA DENKO**

### Electric arc furnace 42t 8000 KVA



### Facilities

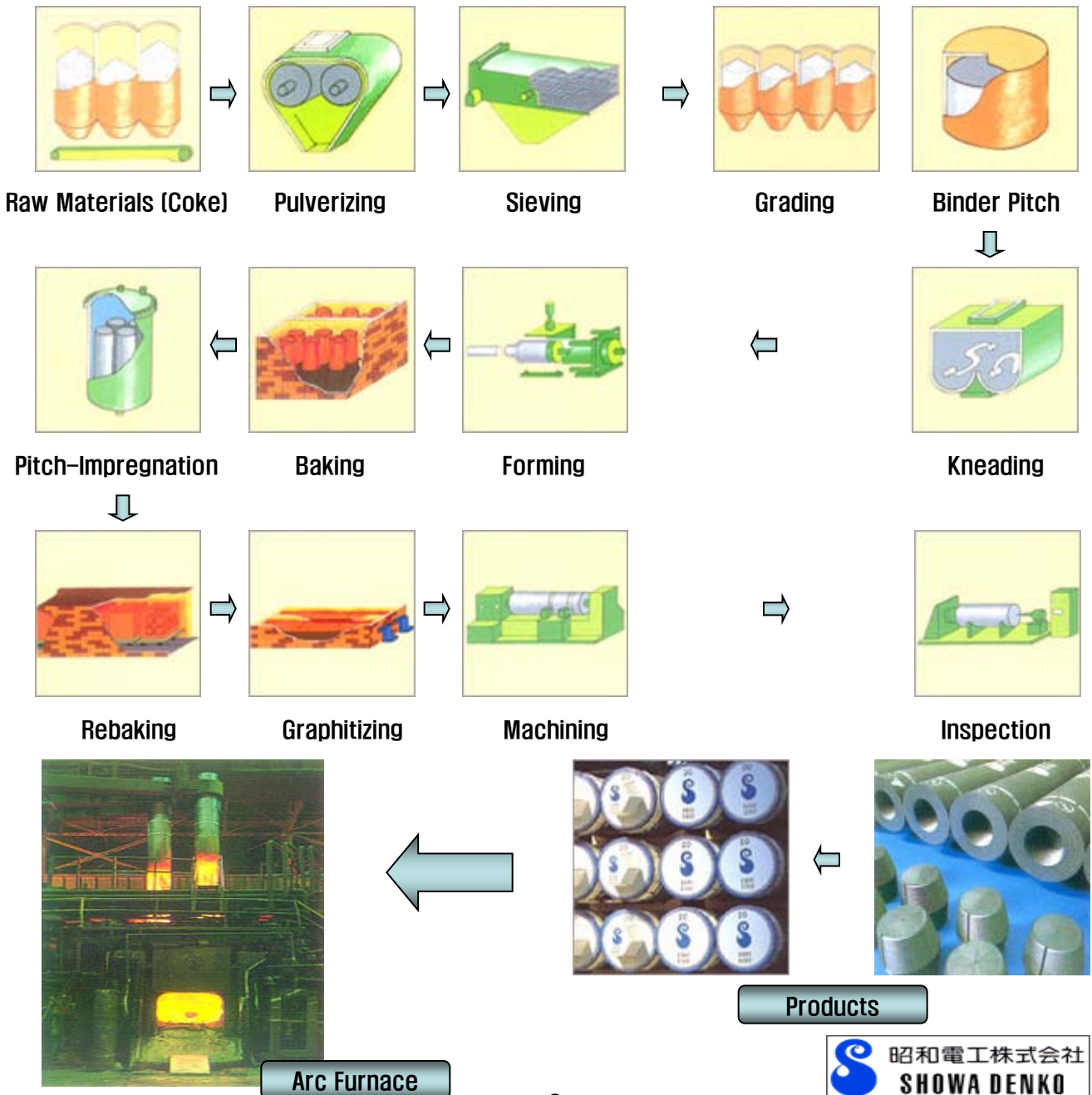
- Electric arc furnace
- Ladle Furnace
- Reheating Furnace (Pusher Type, Walking Beam Type)
- Heat-Treating furnace (electric resisting combustion)
- Dust collector
- Scrap preheating system, etc.





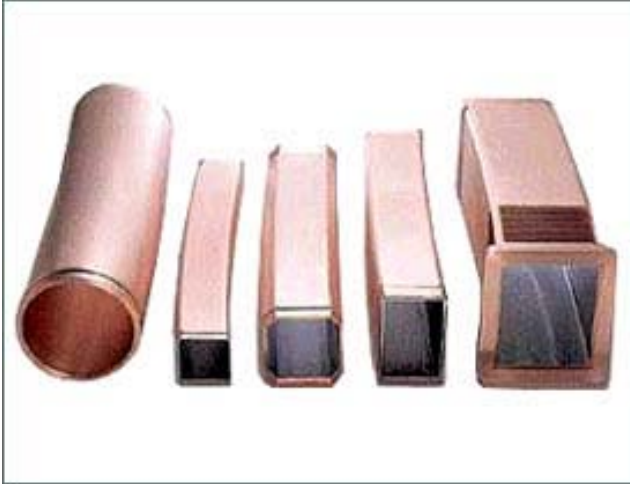
It takes about 60 days to manufacture graphite electrodes. For the long processing, the materials are converted in batches to produce by putting them through each processing stages, including baking and graphitization at elevated temperatures.

## Production Flow





Tubular Mould is a core components in the continuous casting facility for producing blooms or billets to secure high quality, high speed and high operating rate.



- Curve mold
- Square cross-section
- Rectangular cross-section
- Octagonal cross-section
- Round cross-section

## Specification

	Products	Usages
Mould	Copper Mould	Continous Casting
Copper Tube	Al/Cu Tube, Cu/Ni Tube Low-Fin Tube, Corrugated Tube, Top-Cross Tube, Copper Tube, Inner-Fin Tube, Top-Cross Tube Ni-Cu Tube, Bronze Tube Brass Tube	Thermal Power Generating, Atomic Power Generating, Petrochemical Plant, Heat Exchanger Hygiene Pluming Chemical Processing Plant



### Usages



Scrap



Sheet Steel



Slab



Pipe



Shapes & Bar Steel



Wire Rods



Coil

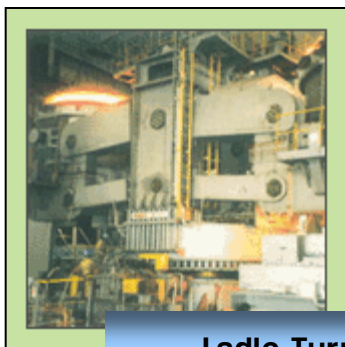
### Specification

1. Very light and strong heat resistance with aluminum magnet coils
2. Adopted high heat resistance materials for insulating. Secure high quality through the technologies and facilities
3. Ferro-manganese link chain and cover secure high resistance of abrasion
4. Prevent high temperature from the materials with adopting a double structure in under part of the coil

## Continuous Casting



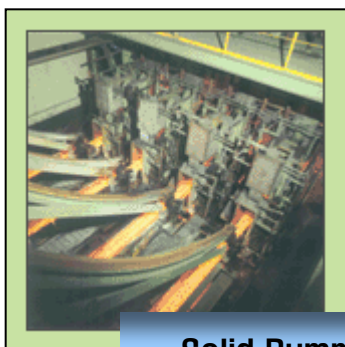
## Facilities



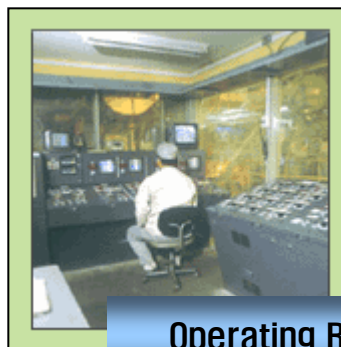
Ladle Turret



Pouring Panel



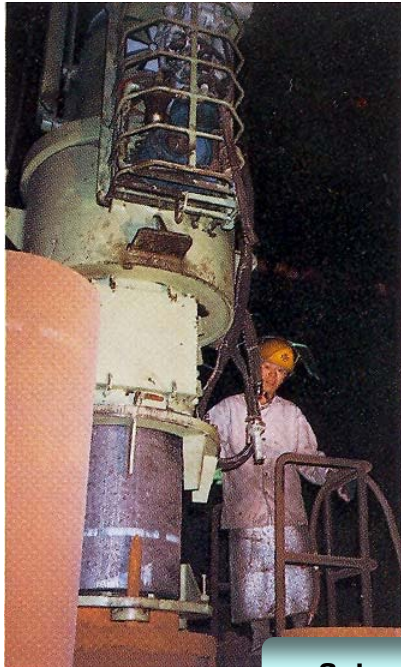
Solid Dummy Bar



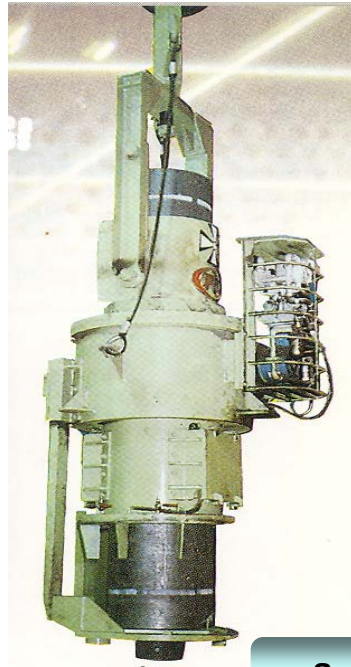
Operating Room



## Electrode Connector



Spinning



Spinner

## Specification

Electrode Size	28" $\varnothing$ 710 ~ $\varnothing$ 714 × 2800mm
Air Pressure	4kg/cm <sup>2</sup> G ~ 6kg/cm <sup>2</sup> G
Torque	28" 650mm
Speed	0~7.5 r.p.m
Weight	4,500kg



**60 Ton/hr  
Pusher type 3-zone continuous reheating furnace**



**100 Ton/hr  
Walking beam type continuous reheating furnace**



**90 Ton/charge  
Roll rapid heating furnace for roll surface**



## STS 370 / STKM13A / STKM13B

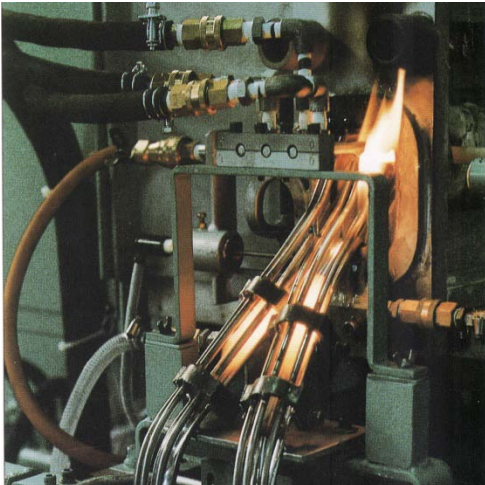




2000KW 2000/1000Hz billet heater



750KW 3000Hz modular type billet heater



100KW 9500Hz billet heater

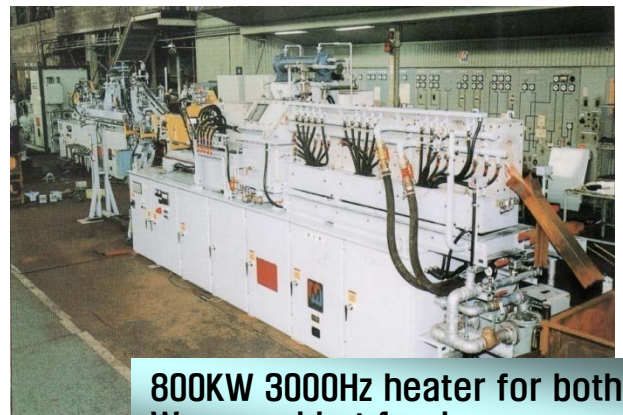
This equipment employs the newest technologies

- Direction control system
- Feeding system for two parallel billets in a single coil
- Flame curtain
- Ceramic type skid rail
- “Rabbit type” feeder
- Manipulator to transfer billets to press

This is the most suitable pre-coating system

For high speed warm forging

- Billet pre-coating device
- Easy presetting system
- Billet speed control system to synchronize
- Heater with press
- Temperature control system



800KW 3000Hz heater for both Warm and hot forging press



The CB “VESTAL” Series is comprised of Alumina–Silica fused cast refractories, which are manufactured from an aluminous material. Because of a dense and crystalline structure of corundum( $Al_2O_3$ ) and mullite ( $3Al_2O_3 \cdot 2SiO_2$ ), CB “VESTAL” refractories exhibit excellent corrosion (especially against alkalis) and abrasion resistance at high temperatures.



○ **CB-M**

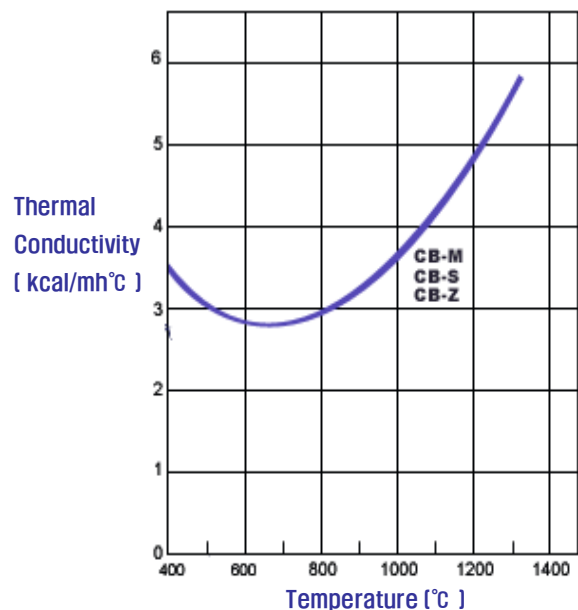
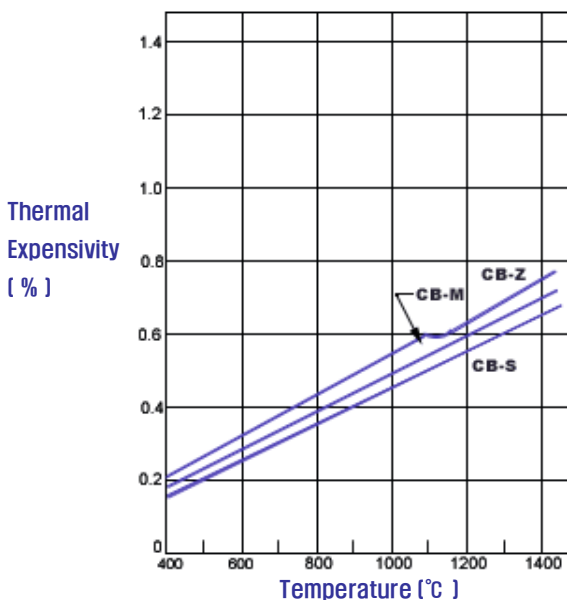
CB-M refractories are suitable for Reheating Furnace Beds and Skid Rails for steel

○ **CB-S**

CB-S are used for Glass Furnaces, Suspension Pre-heaters, Incinerators, and other general purposes

○ **CB-Z**

CB-Z are designed for Skid Rails where special spalling resistance is required



Hitachi Metals' long experience in the field of steel for steel rolling has allowed us to accumulate a wide range of reliable technologies and develop some of the industry's top products that respond to the needs of our customers.

## HI-NEX ROLL



Roughing roll for hot strip mills



Finishing rolls for hot strip mills

## Tungsten Carbide Roll



Rolls for bar and mills

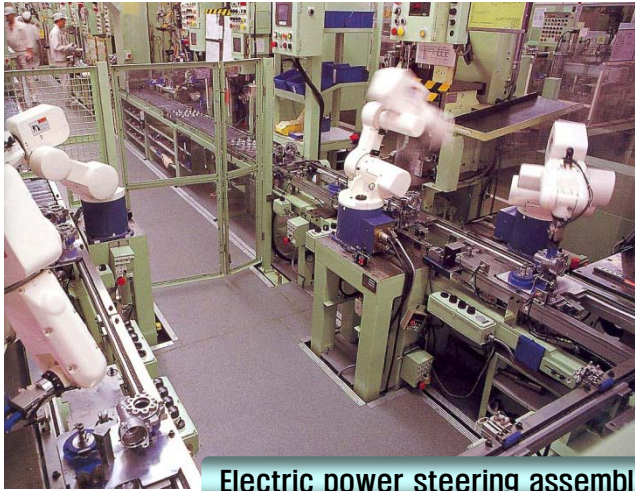


Guide roller

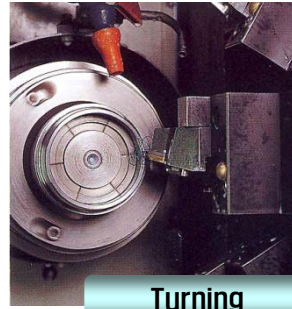


Ring rolls for Block Mills

ITEM	WORK ROLL		BACK UP ROLL	
	STEEL BAR	HOT ROLLED STEEL & PLATE	COLD ROLLING	HOT ROLLING & PLATE
MATERIAL	DCI & SHD	HSS	FORGING ROLL	
	ADAMITE	High-Cr		
	CHILLED	ICPP(Ni-Grain)		
	HSS			
MAKER	JAPAN: HITACHI		JCFC	
	CHINA: BEIJING SHOUGANG, CHANGZHOU SANXIN			



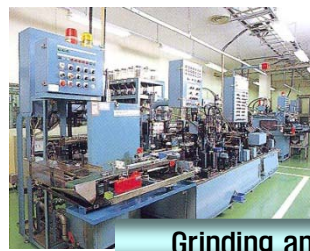
Electric power steering assemble



Turning



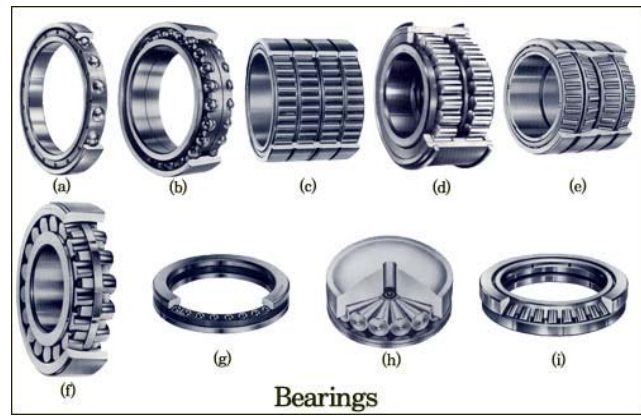
Grinding and assembly lines



Grinding and assembly lines



Heat treatment



Bearings

(a) Deep Groove Ball Bearings

(b) Angular Contact Ball Bearings

(c) Cylindrical Roller Bearings

(d) Full Complement Cylindrical Roller Bearings

(e) Tapered Roller Bearings

(f) Spherical Roller Bearings

(g) Thrust Ball Bearings

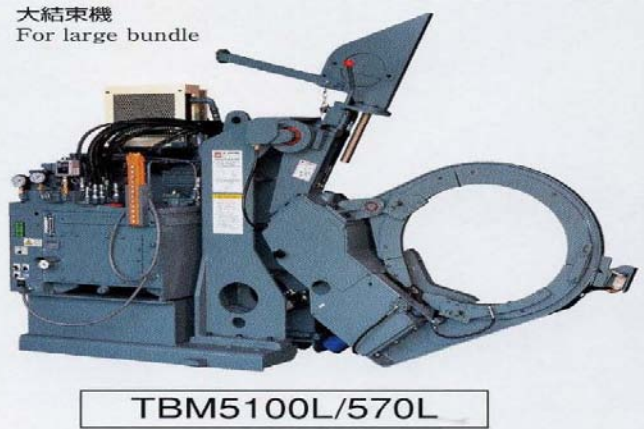
(h) Tapered Roller Thrust Bearings

(i) Spherical Roller Thrust Bearings





大結束機  
For large bundle



TBM5100L/570L

## Large binding machine

- Model TBM5100/570L
- Guidetrack I.D 1000mm/700mm
- Bundling cycle 8.5sec/7sec
- Applicable wires 5.5mm
- Motor capacity 5.5kw
- Hydraulic unit 25 l /min(105kg/cm<sup>2</sup>)
- Hydraulic tank 175 l
- Control P.L.C.

中結束機  
For medium bundle



TBM550H

## Medium binding machine

- Model TBM550H
- Guidetrack I.D 500mm
- Bundling cycle 6.5sec
- Applicable wires 5.5mm
- Motor capacity 5.5kw
- Hydraulic unit 25 l /min(105kg/cm<sup>2</sup>)
- Hydraulic tank 175 l
- Control P.L.C.



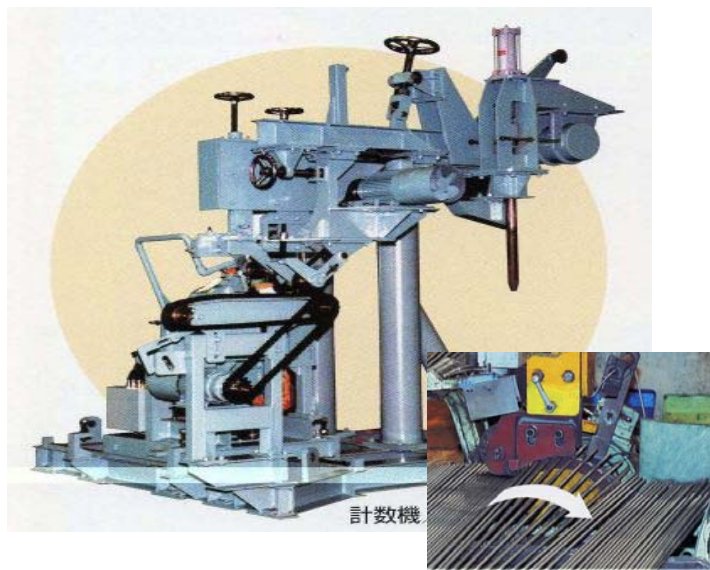
## Small binding machine

- Model TBM320/220L
- Guidetrack I.D 200mm
- Bundling cycle 2.5sec
- Applicable wires 3.2mm/2.6mm
- Motor capacity 5.5kw
- Hydraulic unit 25 l /min(105kg/cm<sup>2</sup>)
- Hydraulic tank 175 l
- Control P.L.C.



## Continuously Wrappedtype binding machine

- Model TBM5100LT
- Guidetrack I.D 1000mm
- Bundling cycle 12sec
- Applicable wires 5.5mm
- Motor capacity 5.5kw
- Tension device with attached
- Hydraulic unit 31.5 l /min(105kg/cm<sup>2</sup>)
- Hydraulic tank 175 l
- Control P.L.C.

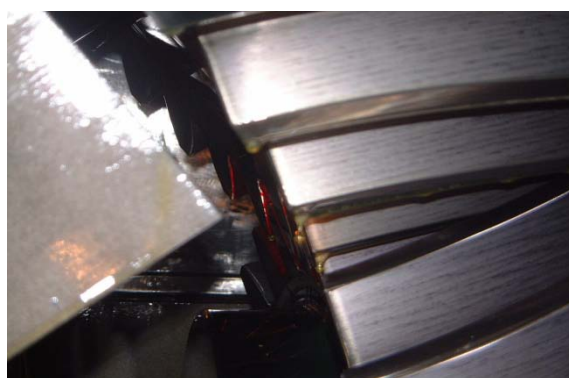


## Counting Machine

- Type TCM10R :  
Intermittent Movement  
of Motor Driven  
Sprocket Wheels
- Sprocket Wheels 32T, 24T, 16T
- Counting Speed Max10Pieces/sec
- Running Gear DC Motor 6.17Kw



## Reducer



## Specification

Type	Single stage spiral bevel gear unit
Design condition	Rated Power 1100KW Speed base input 470min <sup>-1</sup> output 470min <sup>-1</sup> max input 1200min <sup>-1</sup> output 1200min <sup>-1</sup> Ratio 1.00
Lubrication system	Forced
Oil flow rate	35L/min

## Dividing Shear

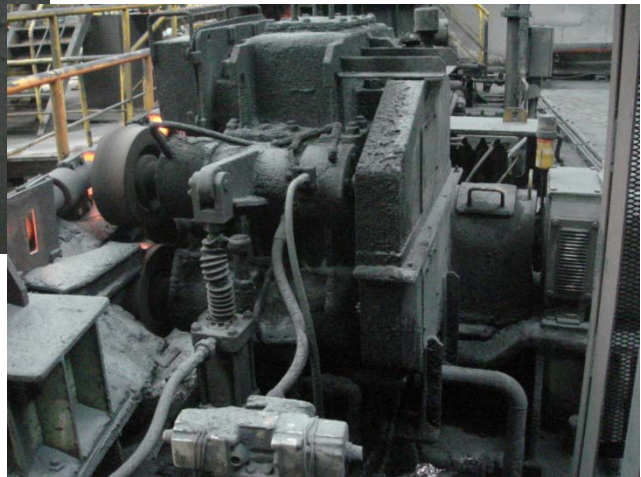


## Specification

Type	Rotary Knife driven by DC motor with dummy cut mechanism
Material Size	D10 ~ D13×2, D14 ~ D22×1, Ø10 ~ 12×2, Ø19 ~ 22×1
Material speed	8.7 ~ 25 m/s
Material temperature	550°C (Tempcore)
Shearing stress	Max 32kg/mm <sup>2</sup> (SD550 550°C)
Gear ratio	1/1.2222
Blade material	SKD61
Arm radius	355mm
Eccentric radius	40mm



## Chopping Shear



## Specification

Type	Rotary Knife driven by DC motor, Continuous drive
Service	Chopping of top/end crop and cobble cutting
Material Size	○18.9, ○21, ○21.5, ○23, ○25.3 ◇16.6, ◇21, ◇22.5
Material speed	5.41 ~ 12.73 m/s
Arm radius	240 mm
Blade width	Overall width 115mm(effective width 95mm)
Motor	DC75KW, 1200rpm × 1
Gear ratio	1/1.7576
Lubrication	Gear · Bearing : Forced Oil Lubrication

◆ KOBE STEEL, LTD.







Four-high hydraulic skinpass rolling

### Back up Roll

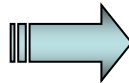
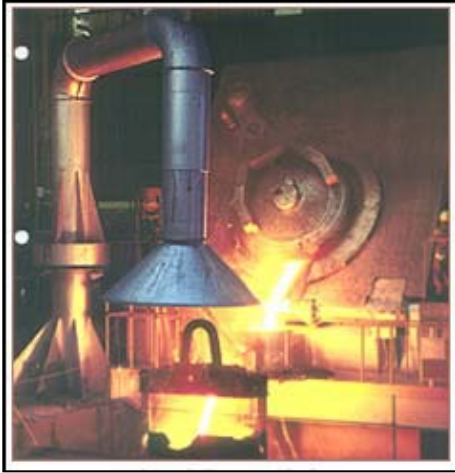


### Maximum Supply Specification

- Weight : Less than 250ton
- Dia : Less than  $\varnothing$  2,700
- Length : Less than 11,000 mm



## Low Frequency Crucible Furnace



Furnace body

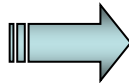
## Applications

- When large castings are manufactured
- When the operation is continuous over 2 shifts or more
- When large scraps or machining chips are melted
- As a temperature raising furnace or when the holding time is long
- As a pre furnace for cupola or adjustment of composition furnace

## Features

- Stable quality molten metal is gained
- Regulation of composition is easy
- Control of temperature is easy
- Low-grade scrap iron or returned foundry scrap is easily melted
- You can obtain clean productive working circumstances and the working environment is improved

## High Frequency Crucible Furnace



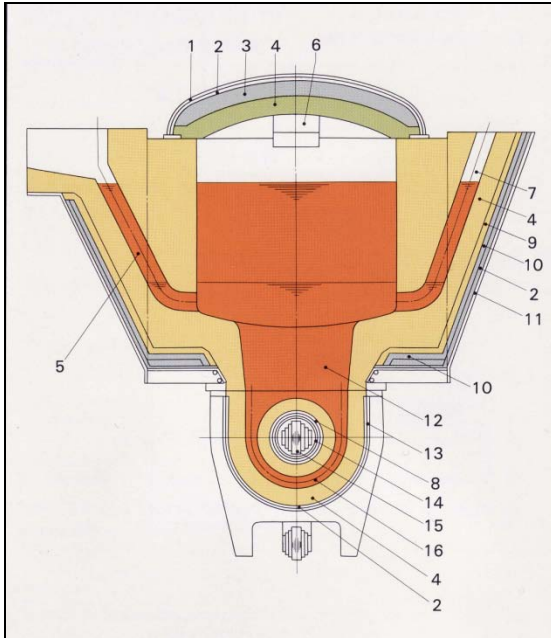
Induction furnace body

## Applications

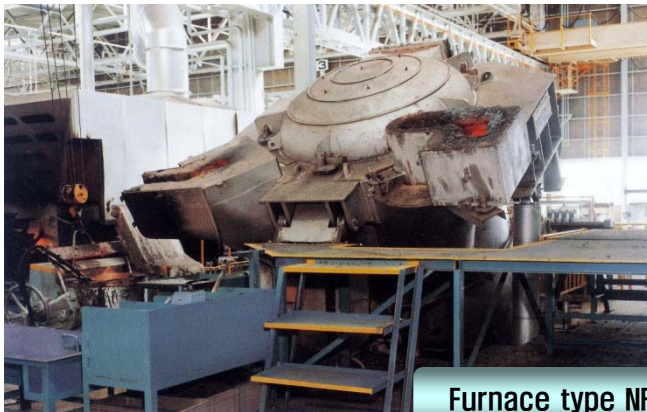
- For melting only
- For totally tapping
- For cold starting
- For less melting materials
- For frequent change of melting materials
- For melting special steel

## Features

- A rugged furnace body with a safety design
- Inverter panel arranged compactly and systematically
- Reliable electronic parts of high quality
- A built-in monitoring circuit for detection of failures
- Simple operation



1. Furnace cover
2. Insulating material
3. Refractory and insulating material
4. Refractory material
5. Pouring spout
6. Slag door
7. Receiving spout
8. Coil duct
9. Refractory brick
10. Refractory and insulating brick
11. Furnace body
12. Throat
13. Inductor case
14. Coil
15. Core
16. Secondary loop



Furnace type NFR<sub>GE</sub> 13t/10t/300kw

Melting furnace can respond to both an induction furnace and cupola.

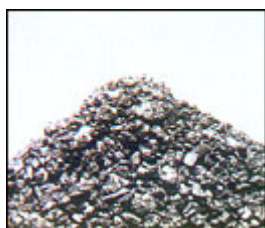
The channel type induction furnace is capable of meeting diverse purposes and needs.

- Immediate supply of constant-temperature molten metal
- Connection between melting furnace and foundry-line
- Alternate measure at cupola stop
- Provision before cupola stop when line stops
- Line start-up from the beginning of daily-work
- Stock of molten metal at night
- Uniformity of molten metal composition
- Reuse of metal overflows



Same as artificial graphite electrodes, SHOWA DENKO "SHOCARAIZER"  
 Secure stable quality and chemical composition for SHOWA DENKO'S own  
 production process and quality control

## Type



Type-L



Type-M



Type-S



Type-Pellet

## Specification

<b>Chemical Composition</b>	Reduced contents of ash, sulfur and nitrogen through processing in 3000 ° C
<b>Particle</b>	For the various usages many kinds of particles can be supplied
<b>Operating Environment</b>	To control dust with cone type processing, restraint dust and improve the efficiency of operation
<b>Usages</b>	<ul style="list-style-type: none"> <li>* Carbon additive for casting</li> <li>* Gouging carbon</li> <li>* Ingredient of refractory</li> <li>* Ingredient of Battery</li> <li>* Ingredient of welding materials</li> </ul>

# Supplying References

- Graphite Electrodes      HWANYOUNG STEEL 16 inch, 28 inch  
KOREA IRON & STEEL 20 inch, 14 inch, 8 inch
- Tube Mould                HWANYOUNG STEEL
- Magnet                    HWANYOUNG STEEL
- Spinner                    HWANYOUNG STEEL
- Reheating Furnace      KO-STEEL ( 25TON WALKING BEAM TYPE )
- Roughing Mill            KO-STEEL
- Intermediate Mill        KO-STEEL
- Skid Pipe                 HYUNDAI STEEL( STS 370 ), KO-STEEL( STKM13A )
- Refractories              SANGWON STEEL, KO-STEEL, SUNGWON STEEL,  
DONGIL INDUSTRIES, PUSAN DONGIL STEEL,  
KWANGJIN INDUSTRIES, JEIL STEEL, JINYANG STEEL,  
HWANYOUNG STEEL
- Hi Speed Steel Roll     HWANYOUNG STEEL, SANGWON STEEL, KO-STEEL,  
HYUNDAI STEEL, YK-STEEL
- Tungsten Carbide Roll   HWANYOUNG STEEL, YK-STEEL
- Bearing                  KO-STEEL, SANGWON STEEL, SUNGWON STEEL,  
HYUNDAI STEEL, HYUNDAI HEAVY INDUSTRIES,  
HWAN YOUNG STEEL
- Bundling Machine      HYUNDAI STEEL, SUNGWON STEEL, HWANYOUNG STEEL,  
POHANG STEEL
- Engineering              KO-STEEL(BLOCK MILL)  
YK-STEEL(REVAMPING PROJECT FOR No.2 ROLLING MILL)

# Supplying References

- Counting Machine & Remodeling HWANYOUNG STEEL, HYUNDAI STEEL, YK-STEEL
- Reducer HYUNDAI STEEL
- Dividing Shear HYUNDAI STEEL
- Chopping Shear HYUNDAI STEEL, KO-STEEL
- Skin Pass Mill HYUNDAI STEEL
- Back up Roll HYUNDAI STEEL A Hot Rolling : 34 TON/本  
B Hot Rolling : 42 TON/本  
C Hot Rolling : 50 TON/本
- Low-Frequency Crucible Furnace / Heating Facilities KIA MOTORS  
( CRUCIBLE FURNACE 8TON / HEATING FACILITIES 18TON )  
TAEJU INDUSTRIES
- Carburizing Materials SAMRI, YOOSUNG INDUSTRIES, KIA MOTORS,  
DUCKWON INDUSTRIES, DAEHAN CARBON, Y&T POWER TECH
- Lubricant for Brake Pad FRIXA, SANGSIN BRAKE



**SANGHO MULSAN CO.,LTD**

**100-840 SANGHO BLDG 373-4 Sindang-Dong, Jung-Gu, Seoul, Korea**

**TEL 82-2-2254-0857~9 FAX 82-2-2254-0860**

**<http://www.sangho.co.kr>**

---