

SHAGANG GROUP

Trust in state-of-the-art technology for more than two decades



PLANT INFORMATION

Products	Billets: 150-160 mm sq. Steel grades: carbon/structural SBO capable
Capacity	1,500,000 t of prime billets per year
Key features	Raw material charging ratio: steel scrap with hot metal charging, in case of power shortage even 100% hot metal possible

PROJECT INFORMATION

Customer	Shagang Group
Location	Jiangsu Province, China
Commissioning	2007

PERFORMANCE, QUALITY AND PRODUCTIVITY

High end long product special grades for automotive



The meltshop operated by Zhangjiagang Hongchang Wire Rod (ZHW) has been designed to produce high end long product special grades for the expanding automotive industry in China. SMS Concast implemented a large range of special equipment features focused on outstanding performance, quality and productivity results.

EXCELLENT PARTNERSHIP BOOSTS CONFIDENCE

Since the beginning of the 1990's, SMS Concast has been a key supplier of continuous casting technology for the Shagang Group in the Jiangsu Province. In total, the group ordered as many as 71 casting strands for long products in various machines, all designed by SMS Concast. Shagang's decision to award SMS Concast with an order for a complete meltshop was taken with confidence, reached through the successful projects executed in the past.

HIGH PERFORMANCE THROUGH OPTIMALLY ALIGNED COMPONENTS

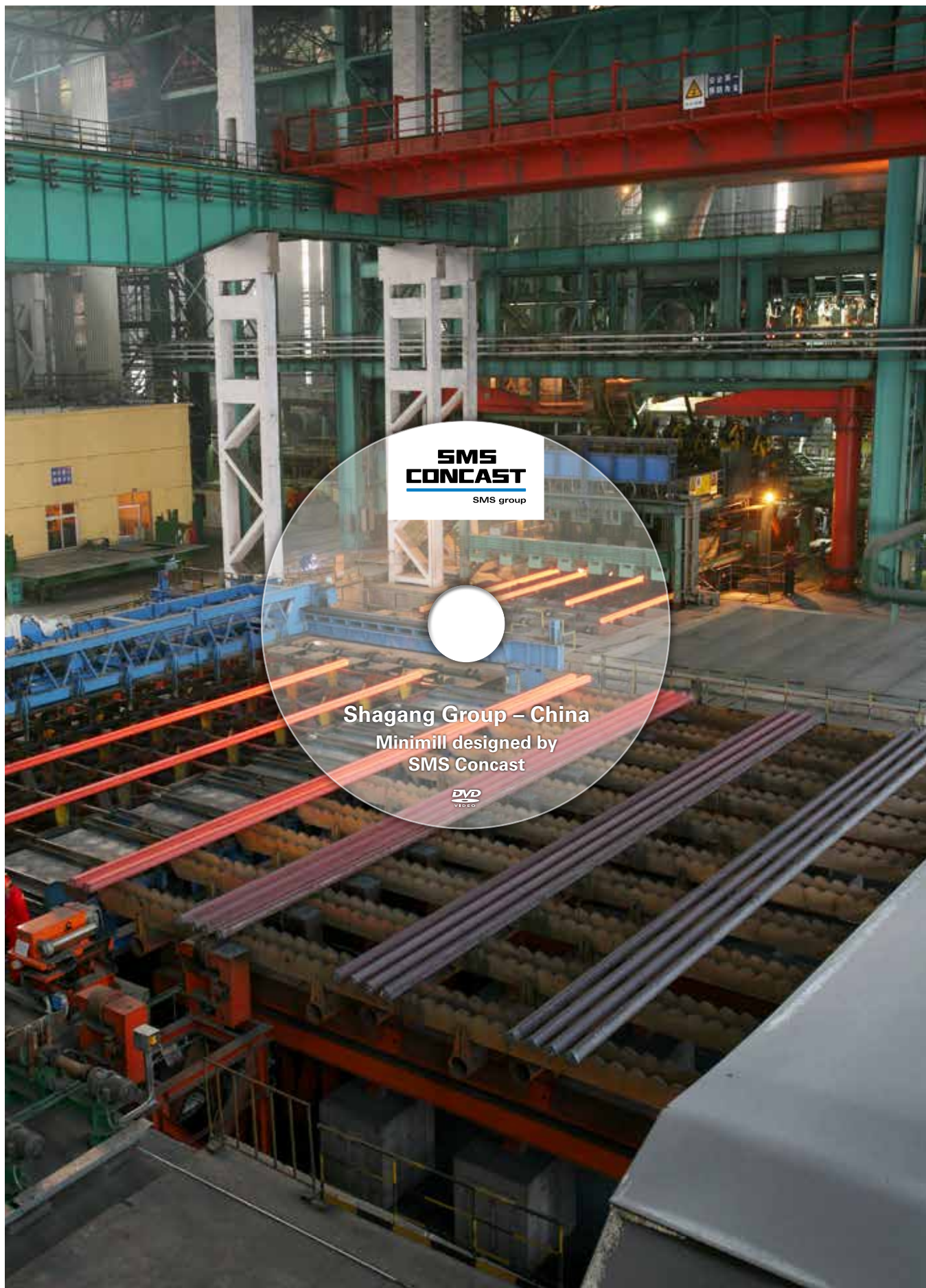
To guarantee top notch quality and efficiency, all parts of the process chain are optimally aligned with each other. The 110 t EAF features 6 CONSO burners with up to 6 MW per unit which allow for a tap to tap time of 35 minutes. This makes it a perfect match with the 110 t ladle furnace with a treatment time of 30 to 35 minutes and the 110 t twin tank vacuum degasser. The elaborate layout enables Shagang to efficiently produce highest quality steel grades.





WIDE VARIETY OF SPECIAL STEEL GRADES

STEEL GROUP	REPRESENTATIVE GRADE CODE
Common carbon steels	S185 S23JRG1
High quality carbon steels	10 45
Cold heading steels	ML35 ML20MnTiB
Bearing steels	GCr15
Spring steels	60Si2Mn 50CrV
Free cutting steels	Y35

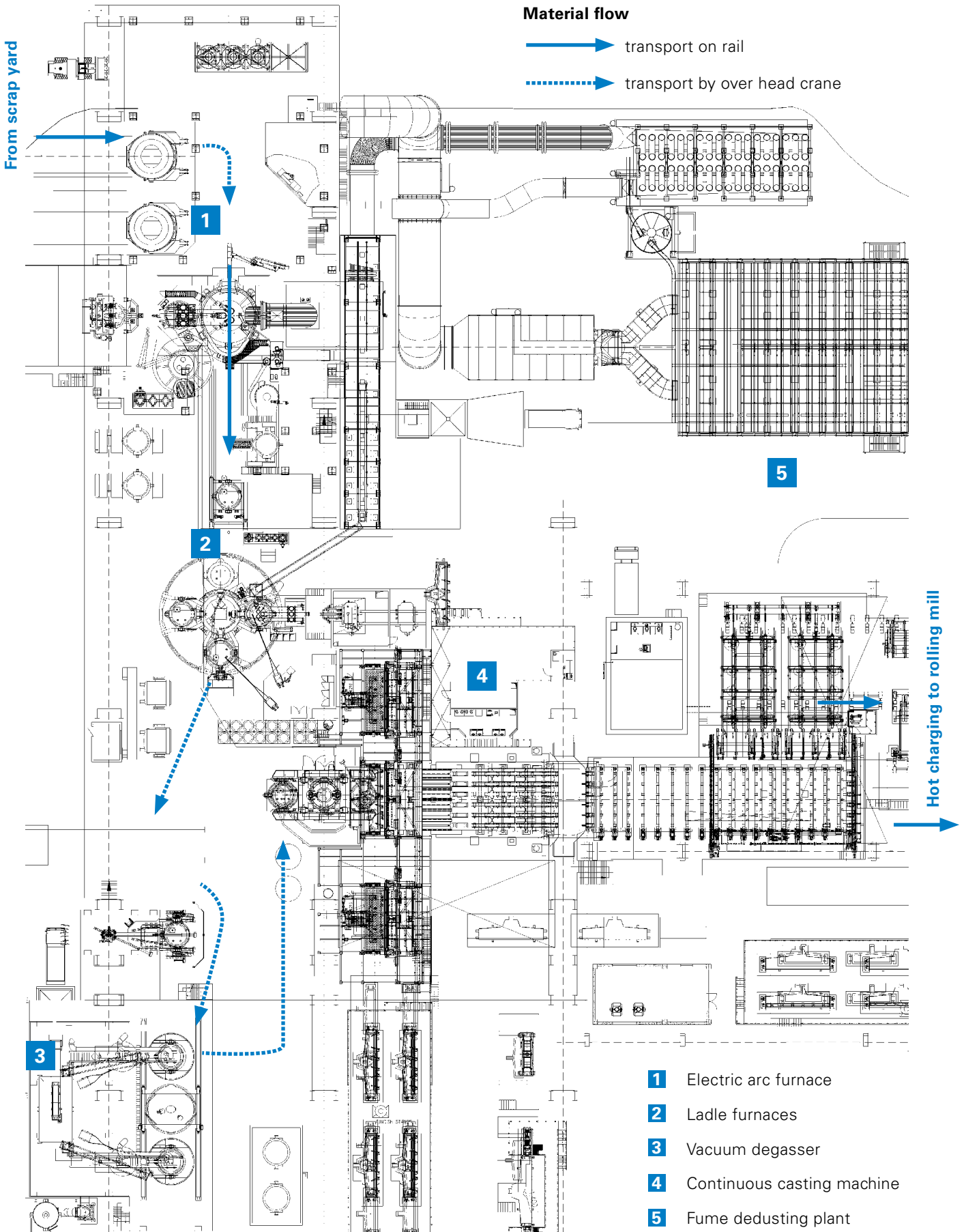


**SMS
CONCAST**
SMS group

Shagang Group – China
Minimill designed by
SMS Concast

DVD
VIDEO

PLANT LAYOUT





ELECTRIC ARC FURNACE

Total flexibility in raw material selection

The EAF is equipped with the SMS Concast Ultra High Chemical Power Concept (UHCP) which powers a total burner performance close to 40 MW and supersonic oxygen injection capacity of 21.000 Nm³/h. The furnace is extremely flexible in terms of raw material selection: it can be operated with charge mixes varying from 100% scrap to 100% hot metal.

Type	AC, EBT design, full platform with jib roof suspension
Heat size	110t nominal
Hot heel	20t
Shell diameter	6.7 m
Shell volume	130 m ³
Electrode arms	Conductive type (Cu)
Electrode diameter	610mm
Electrode regulation	Digital hydraulic type

PERFORMANCE FIGURES

Transformer	80 MVA plus 20 %
Alternative energy	6 combined CONSO injectors (5 x wall + 1 x EBT panel installation)
Max. burner power	6 MW/unit
Max. oxygen injection	2,500 Nm ³ /unit
Tap to tap time	35 min (avg.)
Power on	25 min (avg.)

CONSUMPTION FIGURES

Energy	200 kWh/t
Oxygen	43 Nm ³ /t
Natural gas	4.0 Nm ³ /t
Electrode	1.0 kg/t

LADLE FURNACE

Designed for demanding steel refining

The LF is designed to perform the most demanding and complicated steel refining activities within a limited time frame. This is achieved by extremely fast tap-to-tap cycle of the EAF. To reduce the ladle handling time among one waiting and two refining positions, a carousel table station design was selected.

Type	Inert roof design with cantilever suspension
Ladle handling	Carousel table
Nominal ladle capacity	110 t
Electrode arms	Conductive type (Cu)
Electrode diameter	406 mm
Electrode regulator	Digital hydraulic type
Transformer	16 MVA plus 20 %
Inert gas stirring	Argon, 2 x 400 NI/min
Wire feeding machine	2 x 4-strands

PERFORMANCE FIGURES

Treatment time	30 – 35 minutes
Heating rate	4.5° C/min
Energy consumption	20 – 30 kWh/t (0.45 kWh/t and K)
Electrode consumption	0.2– 0.3 kg/t (0.01 kg/kWh)



CONTINUOUS CASTING MACHINE

Guarantees perfect surface quality

Among other innovations the modern SBQ billet caster features a compact hydraulic oscillation system. This allows for remote adjustment of the oscillation parameters such as frequency, stroke or curve mode, both sinusoidal and non-sinusoidal, for perfect surface quality.

Type	CONVEX® 16 – 9 CCS
Design	9 m radius, 6 strands
Strand distance	1,300 mm
Section range	150–160 mm sq.
Casting speed	up to 4.0 m/min
Billet length	up to 16 m
Ladle support type	Butterfly type turret with lifting/ lowering and weighing system
Tundish car type	Cantilever overhead type
Tundish shape	Delta-T-type
Tundish content	35 t (800 mm working level)
Mechanical stopper	Auto start (combined with Co60 mould level detection system)
Tundish shroud	SEN (submerged entry nozzle)
Mould type	CONVEX Technology®
Mould stirrer type	Height adjustable
Power/Frequency	400 A (415 V)/1 – 10 Hz
Final stirrer type	Fixed
Power/Frequency range	500 A (415V)/5 – 15 Hz
Mould oscillation	retractable compact hydraulic oscillation
Secondary cooling	Air mist
Withdrawal	Concast Continuous Straightening (CCS)
Dummy bar	Rigid type tiltable
Cutting device	Torch cutting
Discharge	2-level with overhead
Cooling bed type	cross transfer Hydraulic turnover
Billet marking machine	1 ConMark machine
Automation	SMS Concast Level 2



VACUUM DEGASSING

High level microstructural cleanliness

Most of the steel grades produced by ZHW require vacuum degassing to ensure a proper microstructural cleanliness. The twin-tank vacuum station is equipped with a 5-stage combined steam ejector/water ring vacuum pump.

Type	Twin tank with single vacuum cover
Nominal ladle capacity	110 t
Tank diameter	5.5 m
Vacuum pump	5 stage combined steam ejector/water ring pump
Suction capacity	280 kg/h (dry air at 20° C)
Off gas cleaning	Dry bag filter
Inert gas stirring	Argon, 2 x 400 NI/min per tank

PERFORMANCE FIGURES

Treatment time	35 – 45 minutes
Degassing time	15–25 minutes
Pump-down time	5 minutes (to 0.67 mbar)
End vacuum	0.3 mbar

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MEETING your EXPECTATIONS