



CSP-Line and RHF

1. Introduction

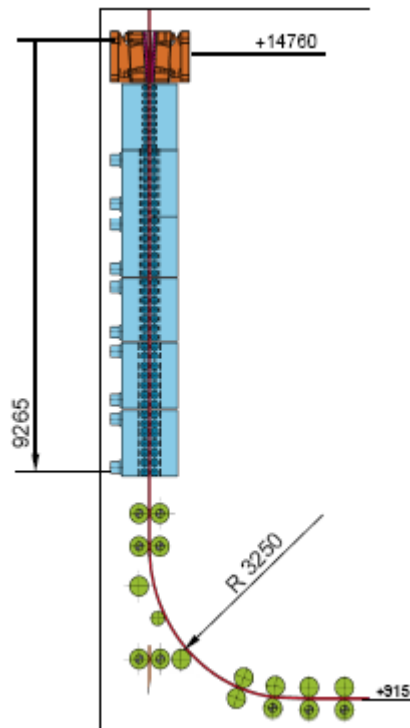
Compact Strip Production (CSP) Technology was developed by SMS Demag in the 1980s. It is an advanced manufacturing technology in the present iron and steel industry, which produces hot strips using a short production line.

CSP-Line and Roller Hearth Furnace (RHF), as follows:

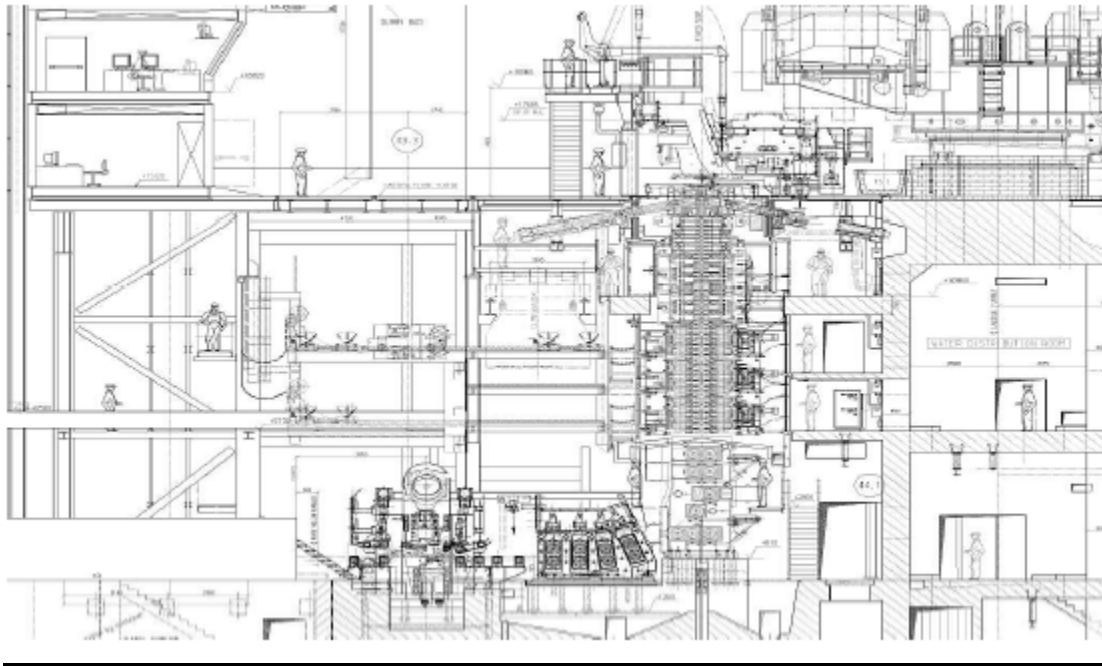
- Manufacturer: SMS Demag AG
- Year of manufacture: 2001 ; Removed from service 2007
- Weight (estimated): approx. 2500 t
- Supplier of electrical / control system: Ansaldo
- Plant state: dismantled warehouse storage condition (2007)
- Documents: included as available
- Availability: readily available for inspection & shipment

2. CSP-Line : Main Data

- Ladle turret capacity : 2 x 280 t – 180 t liquid steel
- Tundish capacity : 25 t – working level 1000 mm
- Caster type : VSB – vertical solid bending
- Mould type/width : funnel shaped / 1000–1560 mm
- Length of mould : 1100 mm
- Thin slab thickness : 70/60 mm or 60/50 mm
- LCR (Liquid Core Reduction)
- Metallurgical length : 9265 mm – 5 segments
- Casting speed : 5.1 m/min – 63 mm thickness
- Bending radius : 3250 mm

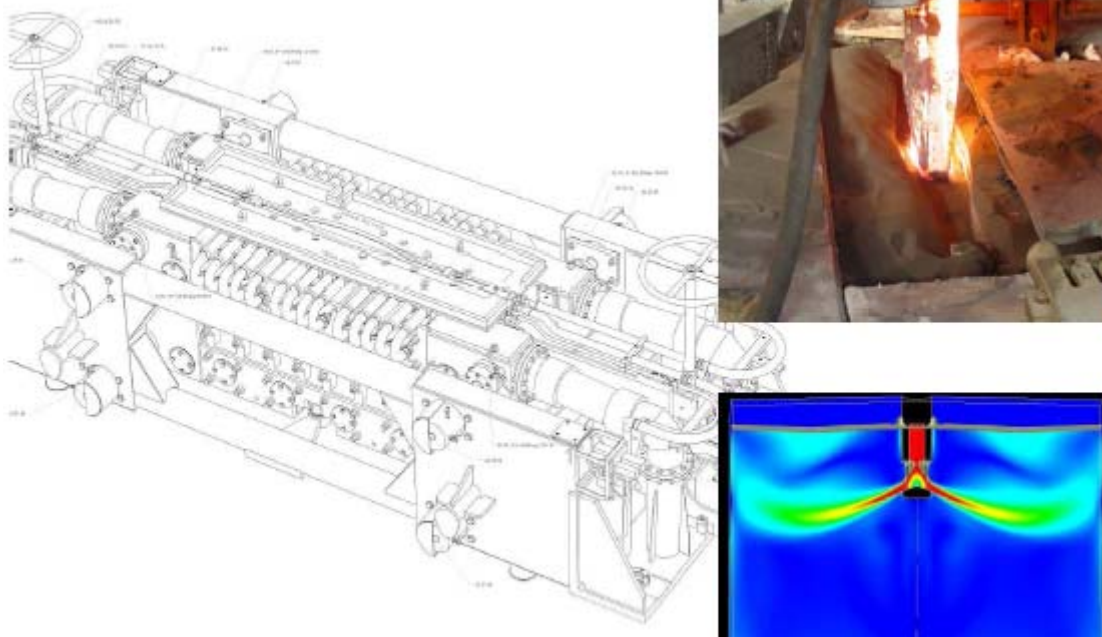


3. CSP-Line : Cross section



4. CSP-Line : Funnel-Mould

GRAPHIC IMPRESSIONS OF FUNNEL MOULD



5. Roller Hearth Furnace: RHF Main Data

- Length : 240 m
- Roller pitch : 1016 mm
- Roller diameter : 340 mm
- Maximum slab heating temperature : 1300 °C
- Slab temperature uniformity : ± 10 °C
- Minimum speed : 2.8 m/min
- Maximum speed : 60 m/min
- Buffer time : 30 min

6. Build-up of CSP-Line: RHF (1/2)

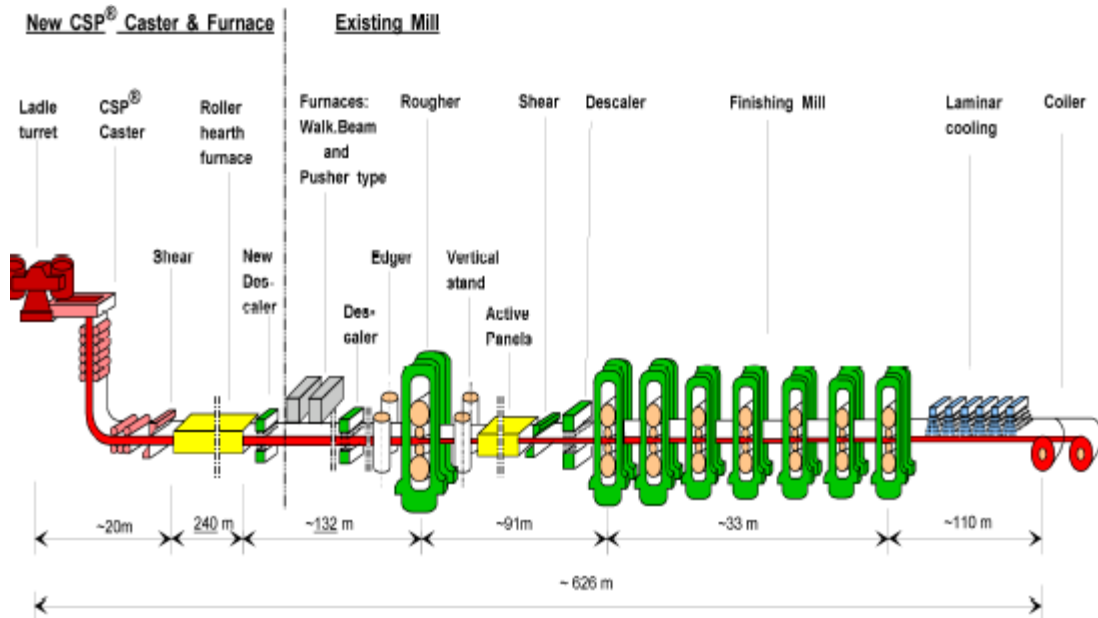


6. Build-up of CSP-Line: RHF (2/2)



7. Overview of CSP integrated in Hot Strip Mill:

SCHEMATIC OF PROCESS



8. Production Data CSP (1/2)

Development of Volumes since start-up of the CSP-Caster:

- Year 2001/02 92.987 ton
- Year 2002/03 167.926 ton
- Year 2003/04 153.229 ton
- Year 2004/05 208.280 ton
- Year 2005/06 259.884 ton
- Year 2006/07 (up to 31.08.07) 172.538 ton

Production Mix since start-up of CSP-Caster:

- | | AISI 300 | AISI 400 | Elec. Steel/Carbon |
|----------------|----------|----------|--------------------|
| • Year 2001/02 | 74% | 9% | 17% |
| • Year 2002/03 | 87% | 2% | 11% |
| • Year 2003/04 | 93% | 3% | 4% |
| • Year 2004/05 | 77% | 12% | 11% |
| • Year 2005/06 | 98.5% | 0.5% | 1% |
| • Year 2006/07 | 80.9% | 4.4% | 14.3% |



8. Production Data CSP (2/2)

Development of Volumes since start-up of the CSP-Caster:

- Year 2006/07 (up to 31.08.07) 172.538 ton

Production Mix CSP-Caster INOX 2007:

- 300 – Series (mostly 304) 139.581 ton
- 400 – Series (mostly Str12/1.4003) 7.519 ton

Production Mix CSP-Caster CARBON 2007:

TOTAL CARBON 21.413 ton

Of that	AST	EN	
	Fe510C	/S355JO	41%
	Fe360B	/S355JR	34%
	AC20BA	/22MNB5	7%
	28MN6A	/28MN6	5.5%
	Fe55	/FE55	5%