

Ladle Furnace

Training Course – Siemens VAI MT

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1. Introduction

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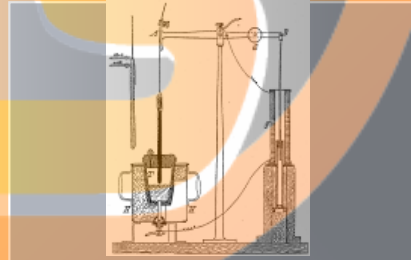
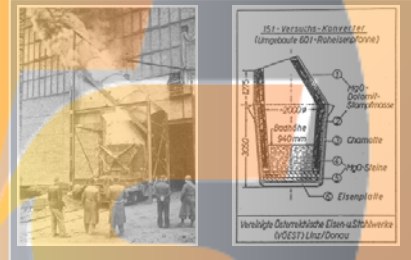
Introduction



**ONE reliable partner for
the entire life cycle of
your plants!**



**“Continuing the Tradition of
Technological Innovation
in Iron and Steelmaking!”**



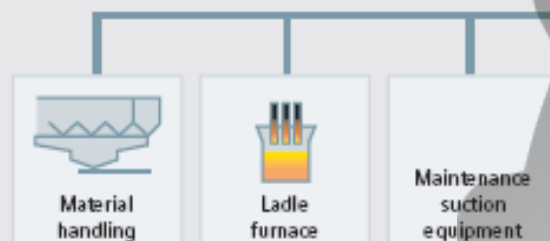
Introduction

1880:	1907:	1956:	1968:	1977:	1982:	1991:	1999:	2001:	2003:	2006:
First electric arc furnace Sir William Siemens	First electric reversing drives	LD/BOF Technology	Continuous casting technology	Largest DC rolling motor	1. comb. pickling-tandem line	First neural networks in metals	FINMET® technology	Cooling model for modern steel grades	Local positioning system	FINEX® Plant Start up
										
125 YEARS OF METALS INNOVATION										
										
Valve-gear patent for heavy plate mills (Davy, Sheffield)	Siemens-Martin furnace	Dual-chamber regenerative gas-DC-pusher furnace for billet	Twin drive for flying shear	First SVC for EAF	Introduction of direct converters	COREX® Technology	Fuchs EAF technology	"Smart Crown®" system for profile and flatness control	Sinat contactless flatness measurement	"Power collier" for heavy bending tasks
1874:	1885:	1920:	1956:	1973:	1980:	1989:	1996:	2001:	2002:	2005:

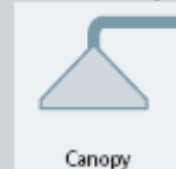
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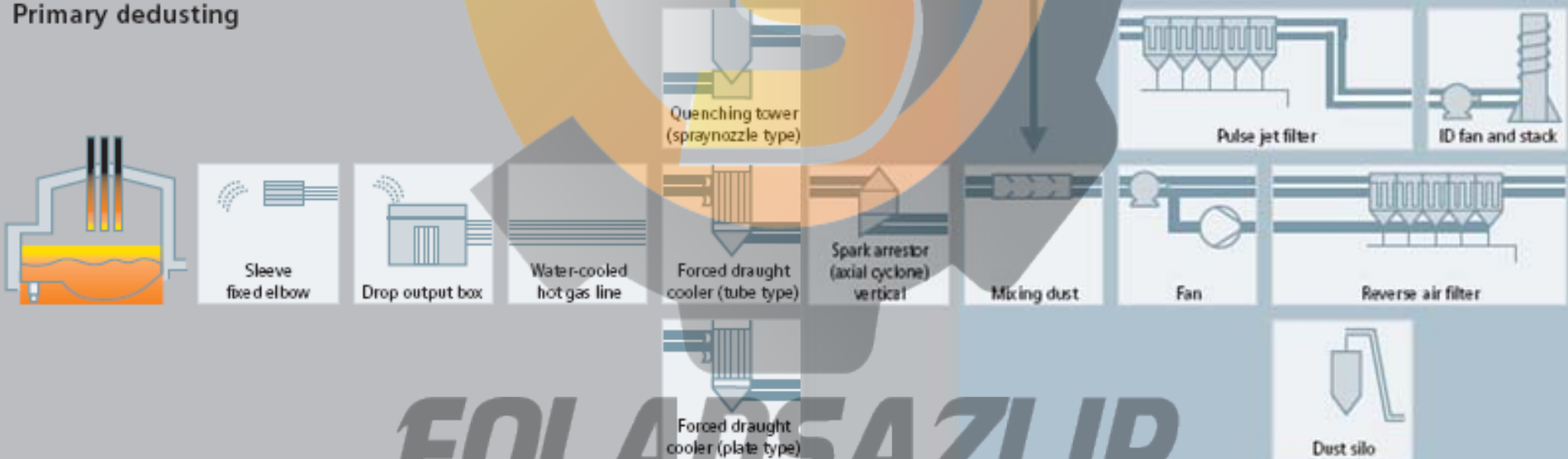
Auxiliary dedusting



Secondary dedusting



Primary dedusting



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Introduction

Charge materials

Reduction

Steelmaking

Secondary metallurgy

Continuous Casting

Ores:
dressed
pelletized
sintered

Reducing agents:
coke
natural gas
coal

Fluxes

Blast
furnace

Basic oxygen
converter

Ladle
treatment

Vacuum
treatment

Slab
Continuous Casting

Direct
reduction
plant

— Solid metallic materials
— solid charge materials
— hot metal
— liquid crude steel

Electric
arc furnace

Ladle
treatment

Vacuum
treatment

Billet/bloom
continuous casting

Ingot casting

Steel scrap

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Ladle Furnace

Designed for the Highest Standards

Installation of a ladle furnace between the melting and casting areas is vital to assure quality and/or productivity improvements in steelmaking.

Ladle furnace arrangements include single stations (with fixed/swiveling gantries or with ladle cars/turrets) and also twin stations (two roofs) with one swiveling electrode gantry

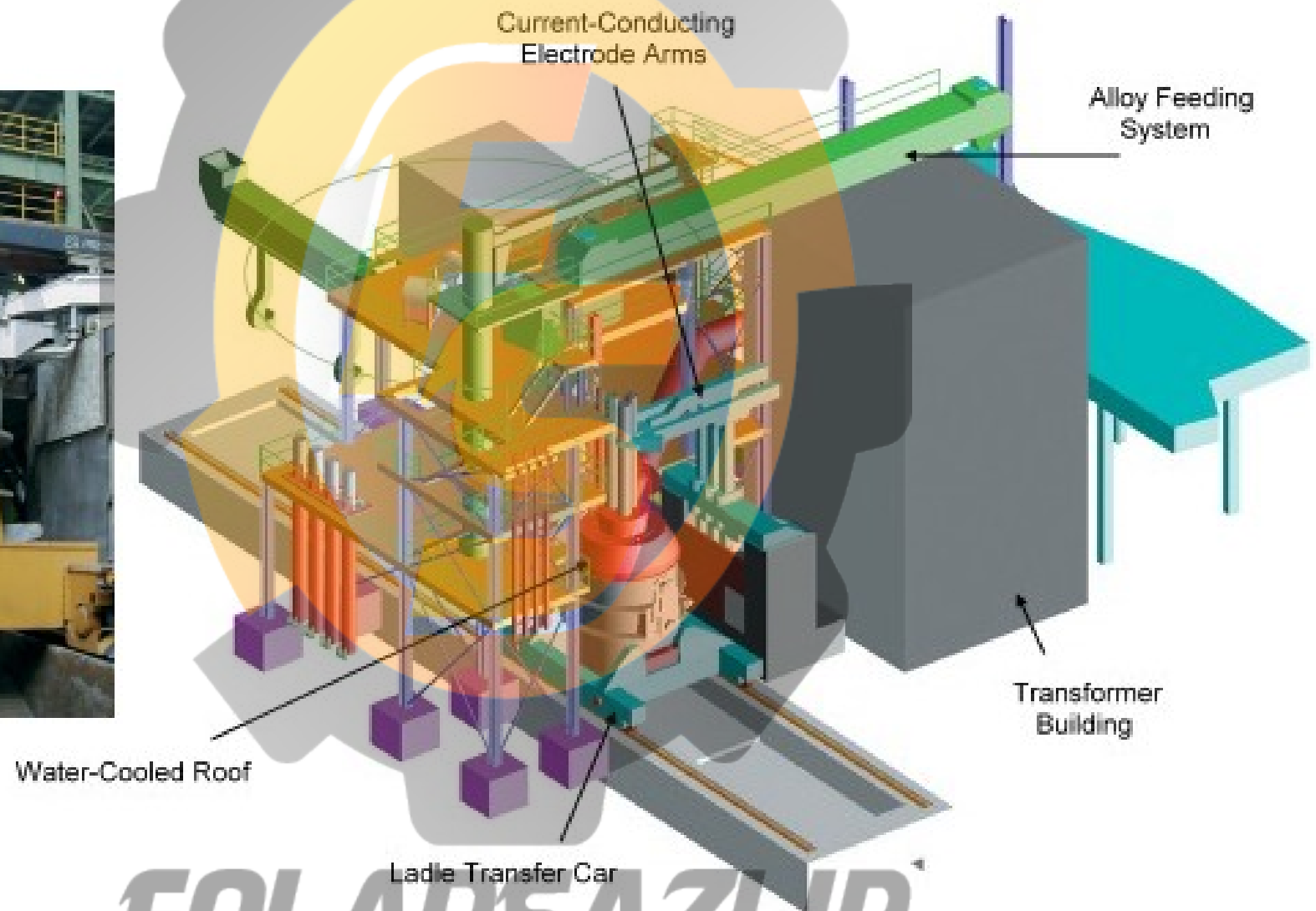
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The LF is designed to ensure the following main purpose:

1. Easier secondary metallurgy operations
2. Optimal and through homogenisation process
3. Accurate analyses for the CCM
4. Improved castability in the CCM
5. Achievement of cleaning steel
7. Reduction of the EAF operating times
8. Increase in the productivity of the whole line EAF-LF-CCM

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- Same outstanding design features as in VAI FUCHS EAFs
- Water-cooled roof without refractory lining in center area
- Automatic lance manipulator for temperature measuring and sampling
- Automatic lance manipulator for stirring and/or powder injection
- Wire feeding for deoxidization and microalloying
- Automatic coupling system for stirring gas
- Easy access to the roof and for electrode replacement
- Inert gas stirring system (porous plugs and/or purging lance)

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- "Buffer function" between melting and casting Reduced
- EAF refining time and tapping temperature
- Exact temperature adjustment for continuous casting
- Steel purification and homogenization
- Exact adjustment of the steel composition (metallurgical fine-tuning)

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- Substantial improvements in steel quality
- Substantial reduction in refractory consumption
- Substantial increase in casting yield
- Substantial reduction in total costs
- Substantial increase in productivity 100-t Ladle Furnace

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Introduction

- ANYANG (China)
- ARVEDI (Italy)
- AvestaPolarit (Sweden, Finland)
- HADEED (Saudi Arabia)
- JUSHURALMASH (Russia)
- NORTH STAR BHP (USA)
- PETROSTAL (Russia)
- PREUSSAG (Germany)
- SHOUGANG (China)
- STEEL DYNAMICS (USA)
- SUEZ STEEL (Egypt)
- voestalpine Stahl (Austria)

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End Introduction

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