

HOT TRANSPORT CONVEYOR (HTC) SYSTEM

BENEFITS OF CHARGING HOT DRI (HDRI)

MIDREX
Designed for Today,
Engineered for Tomorrow™

THE MIDREX SHAFT FURNACE DISCHARGES DRI HOTTER THAN COMPETING TECHNOLOGIES, ENABLING HIGHER TEMPERATURE PRODUCT TO BE DELIVERED TO THE MELTSHOP.

There are two main benefits of charging hot DRI (HDRI) to the EAF: lower specific electricity consumption and increased productivity. The energy savings occur because less energy is required in the EAF to heat the DRI to melting temperature, resulting in a shorter overall melting cycle.

The rule-of-thumb is that electricity consumption can be reduced about 20 kWh/t liquid steel for each 100° C increase in DRI charging temperature. Thus, the savings when charging at more than 600° C can be 120 kWh/t or more. An additional benefit of electricity savings is a reduction in electrode consumption.

The increased productivity from HDRI charging is significant. Use of HDRI reduces the tap-to-tap time, resulting in a productivity increase of up to 20% versus charging DRI at ambient temperature.

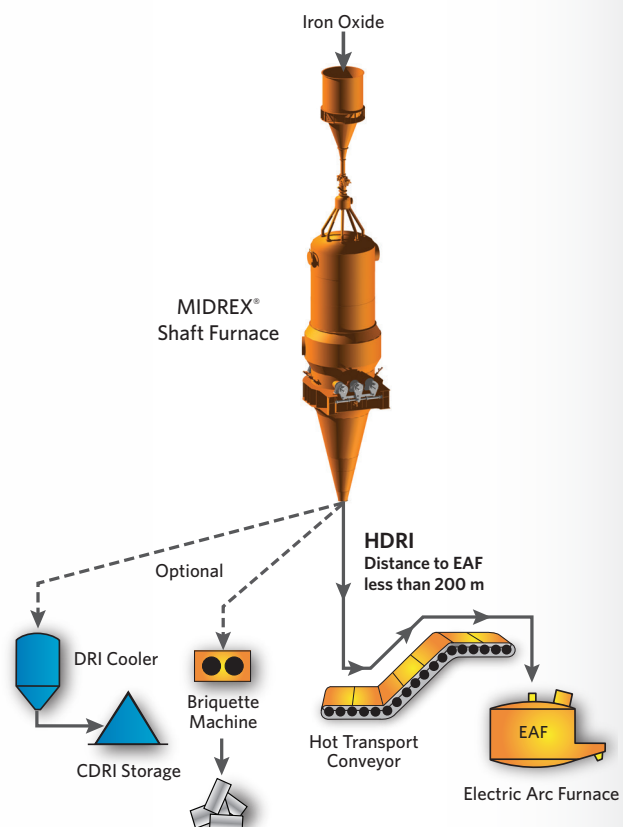
There are environmental benefits of HDRI charging as well. Retaining the sensible heat in the DRI rather than cooling prior to furnace discharge lowers overall emissions in two ways. First, lower electricity demand reduces power plant emissions per ton of steel produced. Second, in mills depending on charge carbon, reduced energy requirements in the EAF result in less CO₂ emissions.

HOT TRANSPORT CONVEYOR

HOT TRANSPORT CONVEYOR FOR HOT CHARGING DRI

MIDREX® Hot Discharge Plants can be equipped with a hot transport conveyor (HTC) system to minimize temperature loss and to prevent re-oxidation of HDRI while being transferred to an EAF meltshop up to a distance of 200 meters. The proven hot transport conveyor supplied by Aumund Fördertechnik GmbH has been used successfully with impressive results at multiple installations.

The HTC system has several advantages over a pneumatic transport system including lower investment cost, lower energy and maintenance costs - and less fines generation.



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HADEED MODULE E

Hadeed Module E is a 1.76 million ton per year MIDREX® Plant that features a hot transport conveyor (HTC) developed by Aumund Fördertechnik GmbH in cooperation with Siemens VAI and Midrex.

Hot DRI (HDRI) is discharged from the MIDREX® Shaft Furnace into a mechanical conveyor, which uses specially designed buckets to transport the HDRI to the melt shop over a distance of 95 meters with a lift of 48 meters.

HDRI is fed to two insulated bins above the meltshop and metered into the EAF. Each bin is sized to contain at least one

complete HDRI charge for the EAF. As one bin is emptied into the EAF, the other is filled with fresh HDRI, which allows for continuous DRI production.

Hadeed's Module E MIDREX® Plant has an optional external cooler to produce cold DRI (CDRI) at times when the meltshop does not require HDRI. The DR plant can quickly be switched from production of HDRI to CDRI without disruption to plant operation. As a combo plant, Module E can produce up to 100% HDRI or vary its HDRI and simultaneous CDRI production as desired.



Hadeed Module E, Hot Transport Conveyor and EAF Meltshop.

Hadeed Meltshop Results Using 100% HDRI

	May 2008	June 2008
DRI into EAF		
Metallization (%)	95	95.4
Carbon (%)	2.1	1.8
Temperature (°C)	579	599



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