

SYSTEM & SPECIAL SOLUTIONS

FOR STEEL INDUSTRY



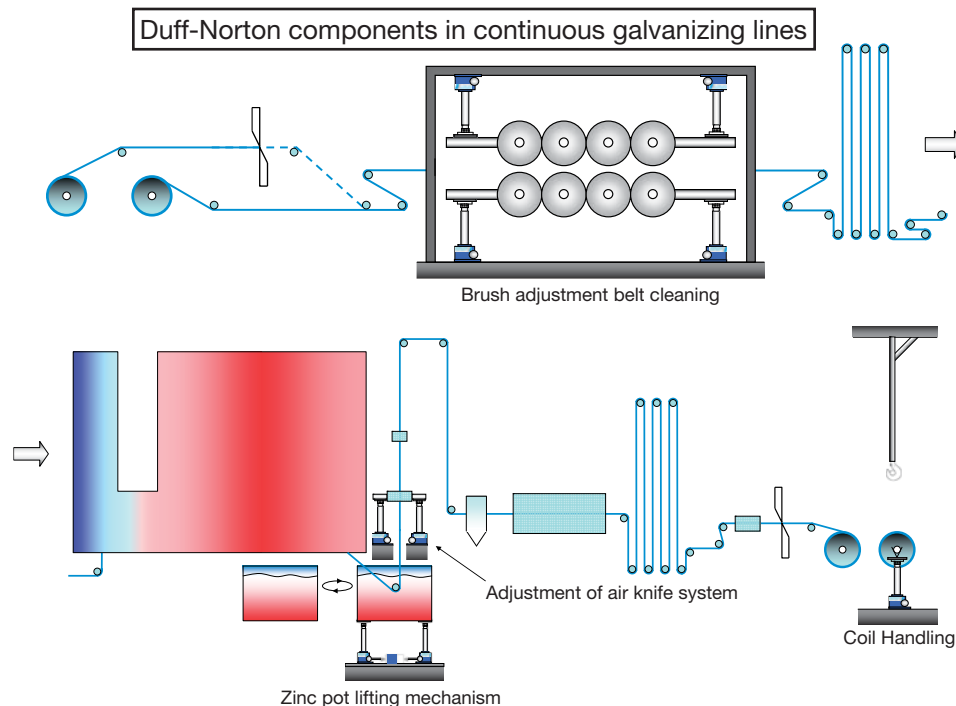
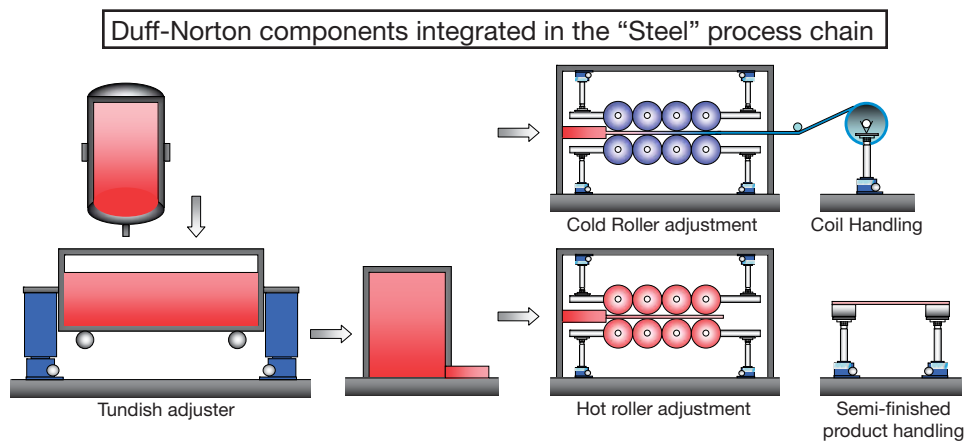
SYSTEM & SPECIAL SOLUTIONS FOR THE STEEL INDUSTRY

In steelmaking and other heavy industries, drive technology is expected to lift, move and precisely position heavy loads under extremely adverse conditions, something that requires special solutions and technical expertise. Duff-Norton has both, and for many years has been one of the world's leading providers of special drive technology components for steelmaking and heavy industrial applications.

- Standard screw jacks for loads ranging from 500 lbs to 75 tons
- Heavy-duty screw jacks for loads ranging from 100 tons to 250 tons
- Special screw jacks for special solutions
- Special screw jacks for repositioning tundishes
- Complete pot lifting systems for coating lines

The highest levels of automation and productivity are required, particularly in plant construction. This in turn means more individual lifting and lowering mechanisms, feed drives and swivel actuators, together with their interfaces to electronic control system.

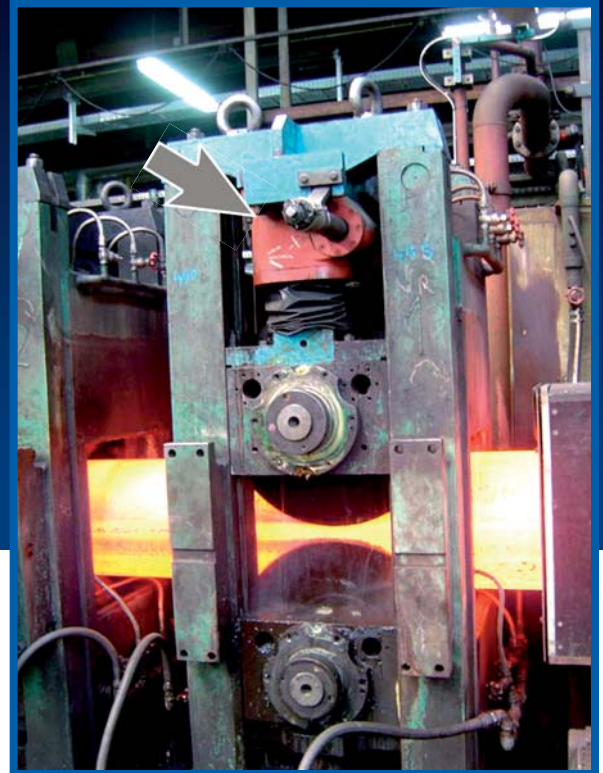
Particularly in heavy industry, the drive technology must function reliably under the harshest conditions for years and years. Duff-Norton supplies individual components as well as complete solutions for lifting systems in the steel industry. The products and services available extend from individual standard screw jacks to the development and manufacture of complete lifting systems, including the structural steel, control system, commissioning and service. The customer benefits from the highest levels of transparency in all phases of the project, starting with the conclusion of the contract to the handover of the system.



SCREW JACKS FOR THE STEEL INDUSTRY

There are many advantages of screw jacks (mechanical actuators) compared to hydraulic solutions, examples are:

- Screw jacks with self-locking capabilities (the load will not lower in event of an electrical failure)
- High repeat and position accuracy
- Robust and reliable system designs
- Total synchronization in the case of multiple screw jack lifting systems
- Ready and easy to install



Screw Jack for roll pass system in a rolling mill



Screw Jacks for roll pass system



Screw Jacks for sizing stand

SYSTEM & SPECIAL SOLUTIONS FOR THE STEEL INDUSTRY

More and more companies involved in engineering and plant construction no longer just order individual components from their suppliers, but entire assemblies that the contractors themselves mount and commission. The advantages for the OEM in ordering complete systems are:

- They can concentrate on their core activities: less pressure on internal departments
- Systems are coordinated
- Everything comes from a single source, fewer interfaces
- Best possible assembly solution results in best possible overall solution
- One point of contact
- Fast response times in the event of a stoppage
- Responsibilities clearly defined

Duff-Norton can also provide complete solutions for a broad cross-section of plant construction. Examples are:

- Bauxite / Alumina processing
- Rail Technology
- Stage engineering

One common application is Zinc pot adjustments common in certain steel producing plants. Where Duff-Norton can provide furnace lifting systems capable of handling furnaces filled with liquid zinc. As part of this process, we can design an extremely reliable mechanical lifting system that can be used in continuous galvanizing lines globally. The advantages of these furnace lifting systems with screw jacks (mechanical actuators) compared with hydraulic solutions are as follows:

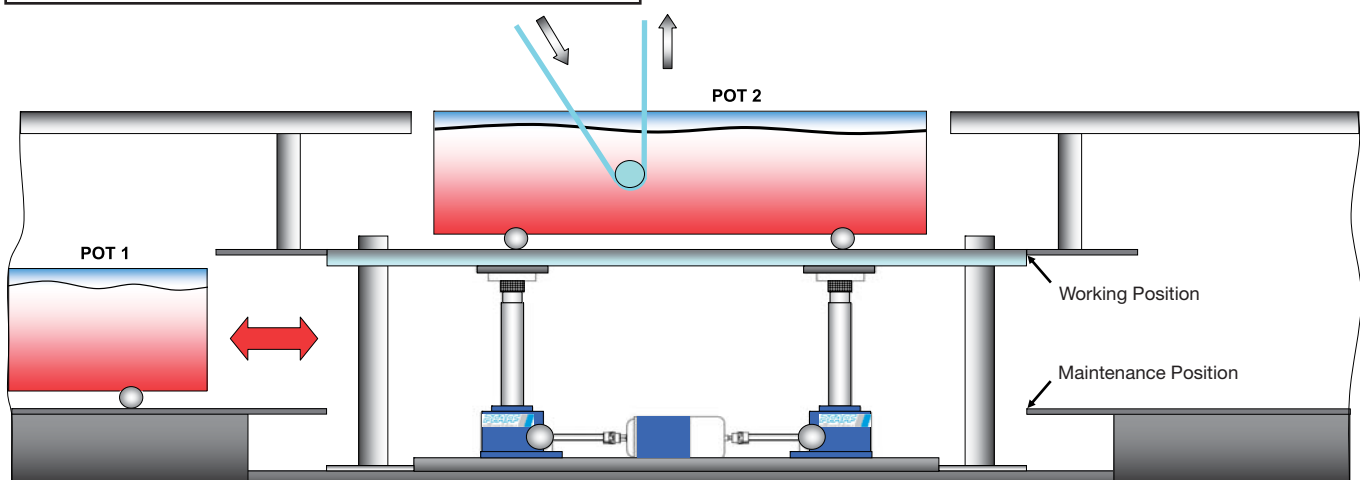
- Total mechanical synchronization
- Optional oil cooling extends duty ratios and promotes long life
- Self-locking screw jacks
- Low vibrations and oscillation, therefore no damage to the furnace insulation
- Actuators containing integrated and monitorable safety nut designs to prevent collapse due to high wear.
- Can be customized to suit individual requirements
- Comprehensive sensor system available as option

The focal point of the linear lifting system are the ultra-precise and proven screw jacks from Duff Norton. Four screw jacks systems can be used to lift and lower the zinc pot. These are mechanically attached and synchronized using mitre boxes, connecting shafts and couplings. Using our Anti-backlash feature along with our very accurate screw threaded capabilities will provide precise application positioning if desired.

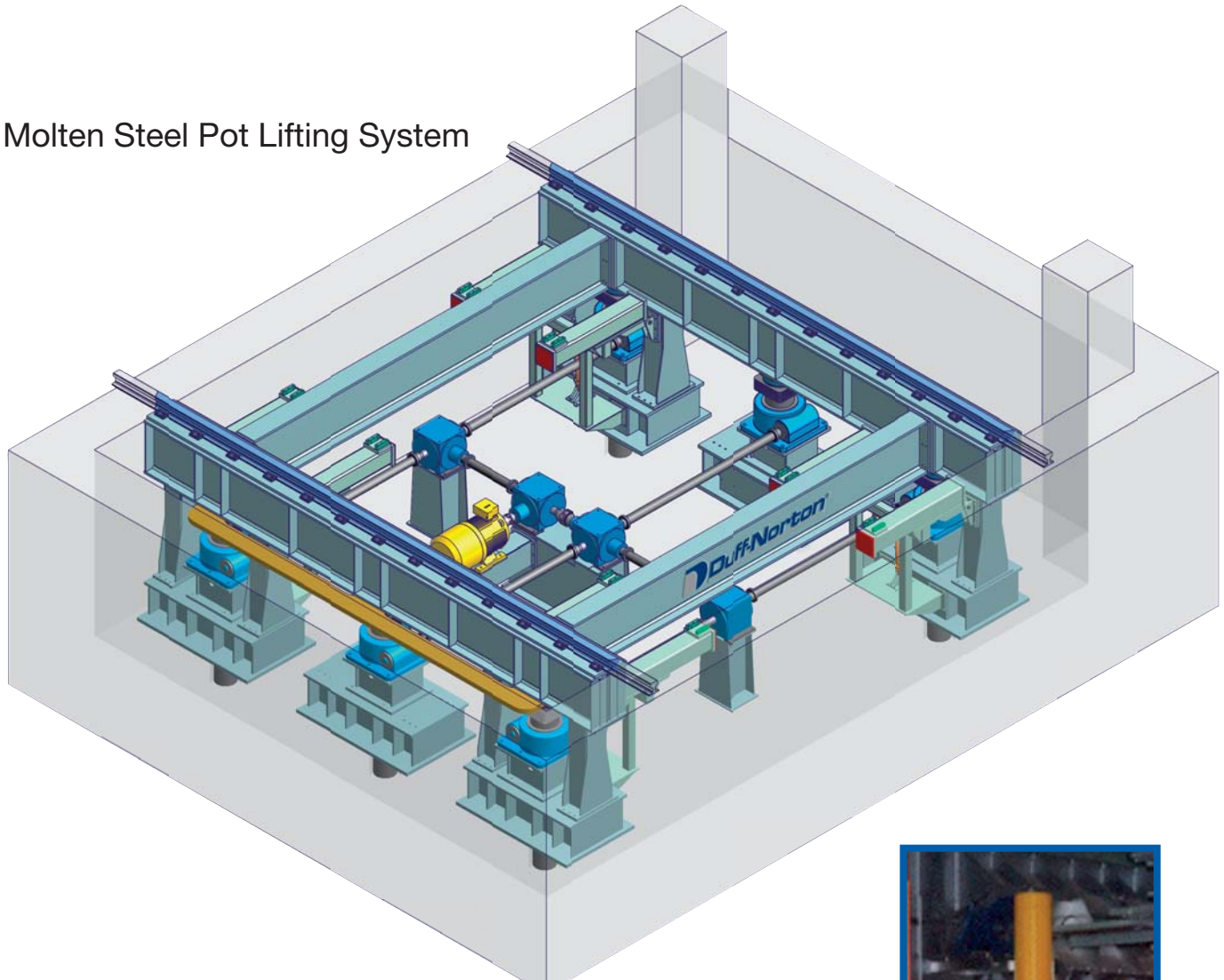
Numerous lubrication options are also available which will promote higher duty cycles and help prevent the actuators from over heating.

Our ISO 9001:2000 procedures help ensure that a well designed and functioning system is delivered ready for use.

Functional diagram of molten steel pot lifting system



Molten Steel Pot Lifting System



SCREW JACKS IN SPECIAL CUSTOMER-SPECIFIC DESIGNS

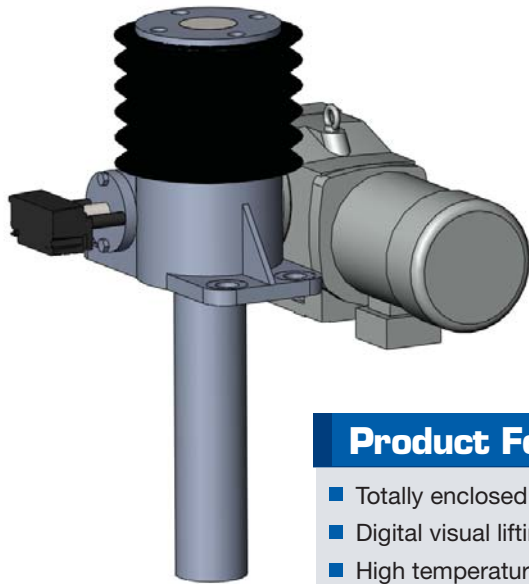
Our engineers can design special system packages to deal with the most demanding applications. Our engineering team has over 100 years of combined application experience across a broad industrial spectrum. Plant and application-specific considerations such as installation space, lubrication, dirt, high temperatures, etc. can all be accommodated.

These special solutions can, up to a point, be realized in a very cost effective manner from Duff Norton.

In these photographs the buggy is first lifted into its highest position and then positioned over the ceramic pipe, through which the molten material flows from the furnace into the buggy. Afterwards the rolling steel container is lowered so that the molten steel can be taken to the casting moulds.

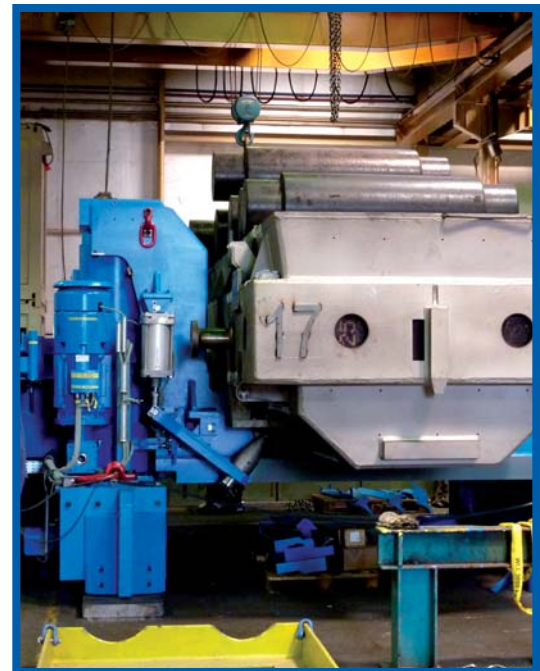
In some cases ball screw actuators can be used to help improve operating speed and due to their increased efficiency lower the system's operating power requirements. The completely sealed construction ensures complete safety, even the extreme conditions in a steelworks.

Another common application is tundish adjusting where our system component can be installed in a foundry to help transport and convey molten steel from the smelter to the casting plant. Four 50 ton ball screw actuators can be used to synchronously and quickly lift a casting gutter filled with molten steel reliably and safely even under the harshest production conditions



Product Features

- Totally enclosed
- Digital visual lifting position display
- High temperature resistant bellows boots
- Oil-Lubricated worm gear available
- Integrated anti-turn device available





9000G Series

Duff Norton's 9000G is designed with a carbon graphite bearing in place of ball bearings for difficult applications that include heat and debris that would normally shorten the life of most Rotary Unions:

- Mono flow and dual flow configurations
- Bellows seal design
- High temperature applications
- Pressure: 250 psi (water) max.
- Temperature: 375°F (water) max.
- Speed: 700 RPM max.



1500 Series

Duff Norton's 1500 Series Rotary Union is specially designed for continuous casting machines

- Mono flow and dual flow configurations
- Mounted in the shaft design
- Bronze flange housing
- Brass sleeve bearing
- Balanced seal design
- Pressure: 148 psi max.
- Speed: 100 RPM max.



8000 Series

The 8000 Series is designed for a variety of steam applications. This Rotary Union has a special carbon graphite bearing. The internal components are lubricated by the process fluid. No additional lubrication is needed.

- Graphite bearing design
- Steam pressure up to 175 psi
- Steam temperature up to 450 °F
- Speed up to 600 RPM
- Connection size up to 4"



Cold Water Rotary Union

The Cold Water Rotary Union is specifically designed for water applications with temperatures up to 200 °F.

- Mono flow and dual flow configurations
- No maintenance required
- Long service life
- High precision ball bearings
- Capable of short dry runs for initial machine start up

- Run out tables
- Benders
- Caster Sections
- Reduction Mills
- Uncoilers and recoilers



PRODUCTS FROM COLUMBUS McKINNON



Powered Hoist • Manual Hoist
Rigging Products

Duff-Norton

P.O. Box 7010 • Charlotte, NC 28241
Phone: (704) 588-4610 • (800) 477-5002
Fax: (704) 588-1994
Email: duffnorton@cmworks.com



www.duffnorton.com

VM-Steel-1
3M 04/11

© 2011 Duff-Norton. All Rights Reserved.