

TMT

Tapping - Measuring - Technology



TAPPING TECHNOLOGY

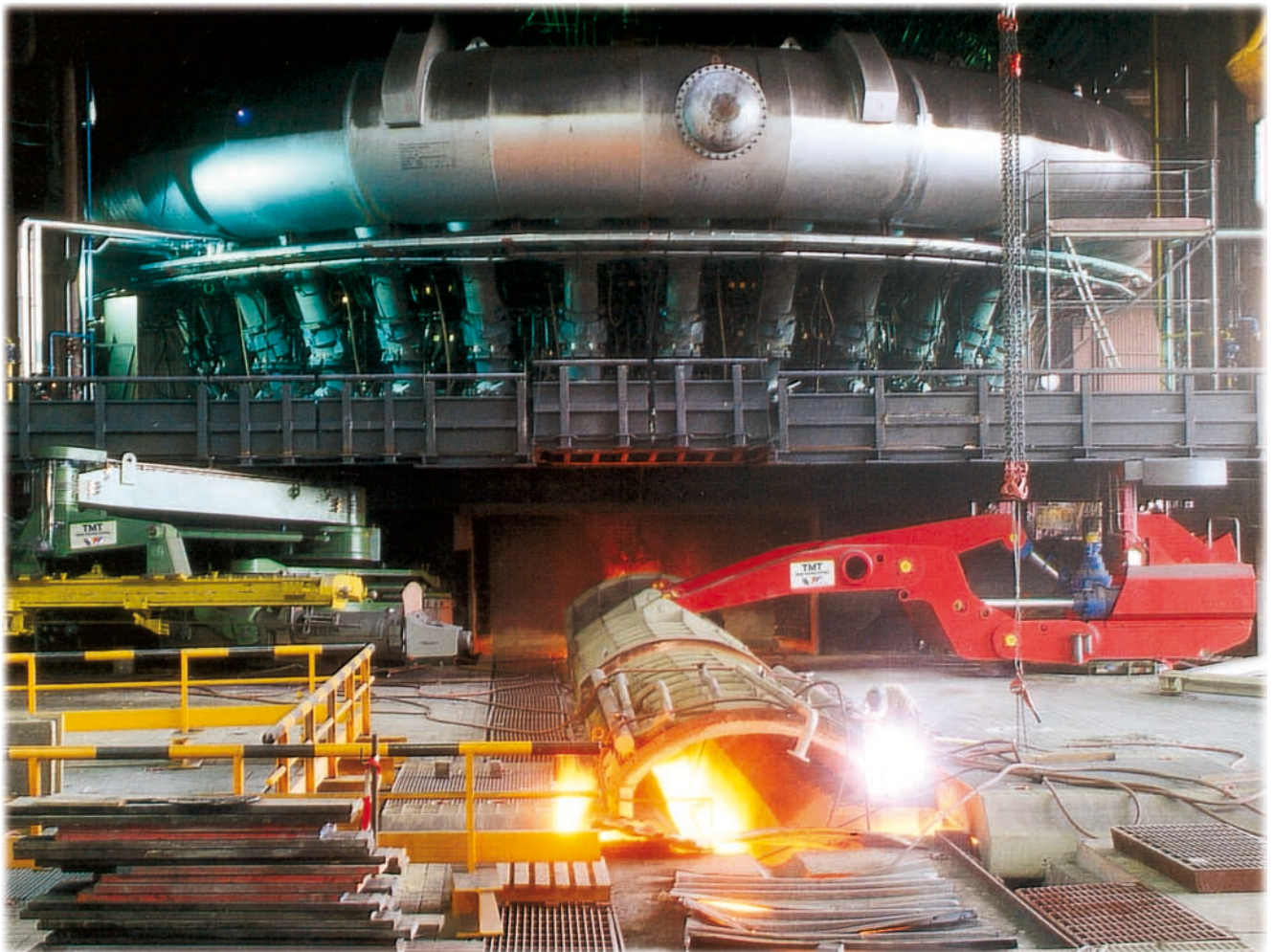
TMT - TOGETHER - ONE STEP AHEAD

For more than one hundred years, the names **DANGO & DIENENTHAL** and **PAUL WURTH** have been renowned for robust and reliable taphole technology.

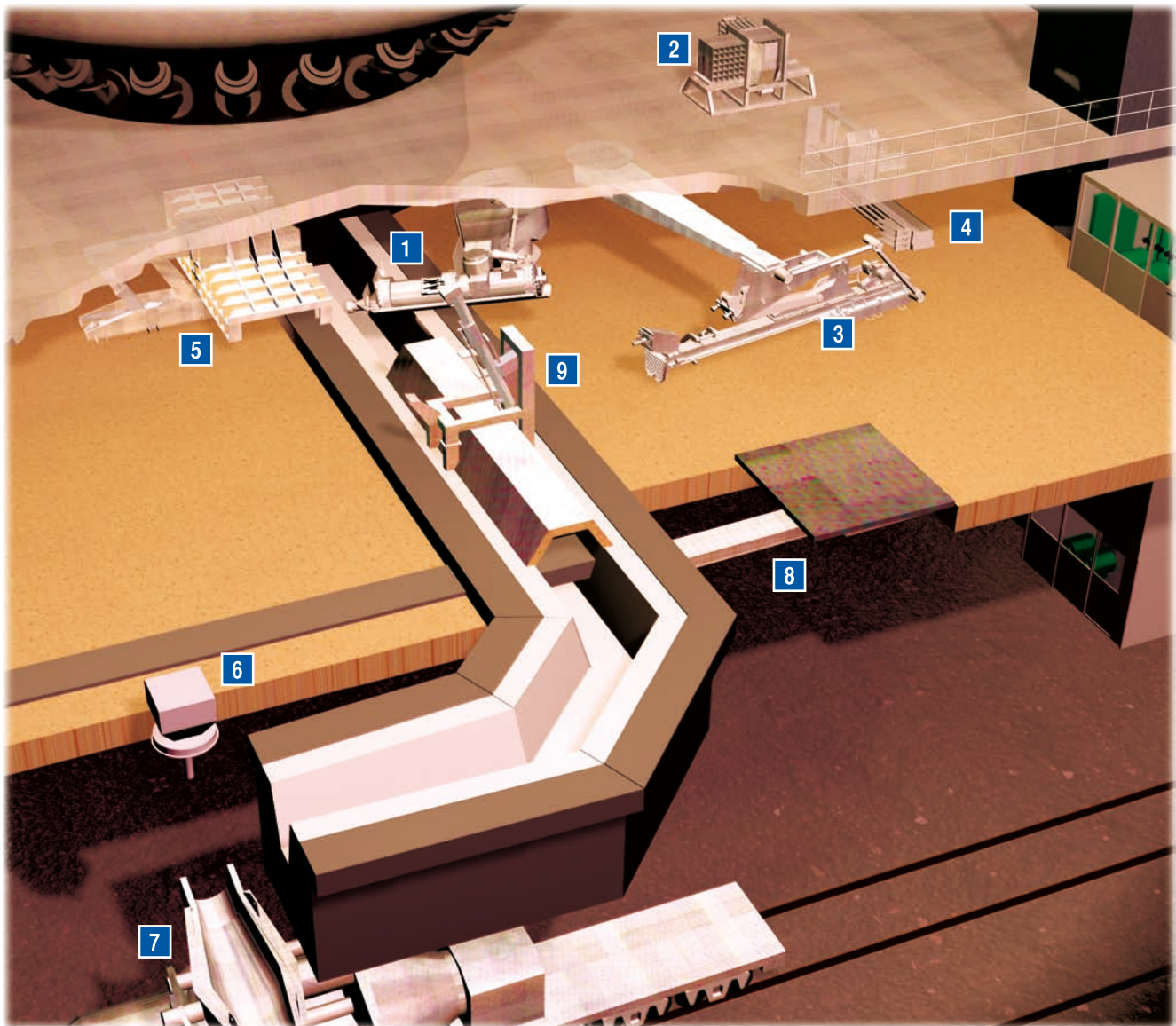
The new joint venture company **TMT** combines the experience of both **DDS** and **PW**, to contribute to the creation of taphole technology for the future.

Shared objectives are:

- » an improved price-performance ratio
- » ongoing product improvement
- » a broader distribution network
- » expanded service offering
- » taphole system solutions



Space-saving casthouse layout with Clay Gun and Taphole Drill arranged one above the other as well as a Cover Manipulator.



TMT casthouse product range

With **TMT**'s large product range, the taphole area of existing plants or new furnaces can be optimally configured by using either standard modular components or through individually designed solutions.

3D movement simulation software is used to optimize casthouse or tapping area layouts including fume collection equipment and runners or launders according to our customers' requirements.

Modern Casthouse

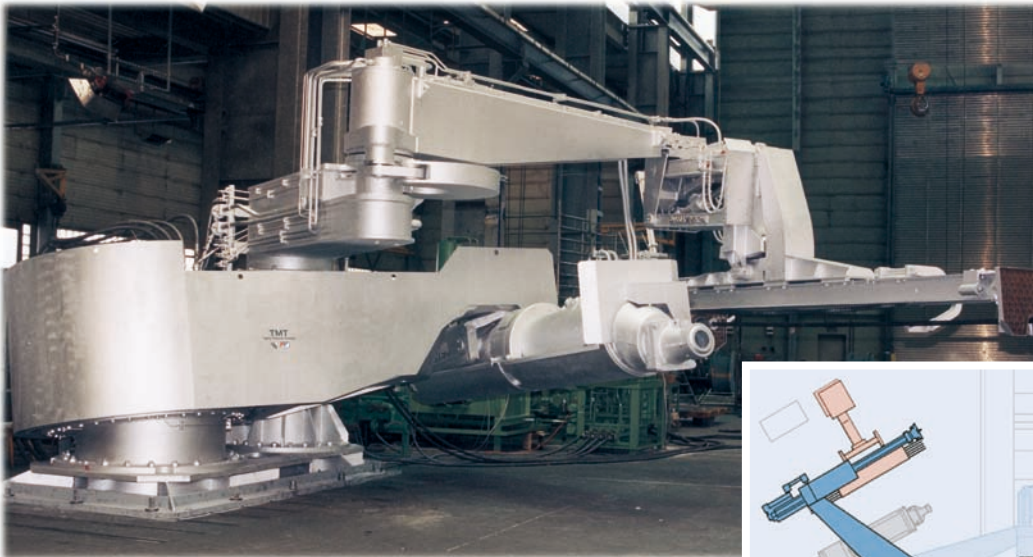
- 1** Clay Gun
- 2** Clay Gun Loader
- 3** Taphole Drill
- 4** Drill Rod Changer
- 5** Trough Cover Manipulator
- 6** Level Measuring System for Torpedo Cars
- 7** Tilting Runner
- 8** Jack Dam Drill
- 9** Temperature Measurement and Sampling

PROJECT PLANNING

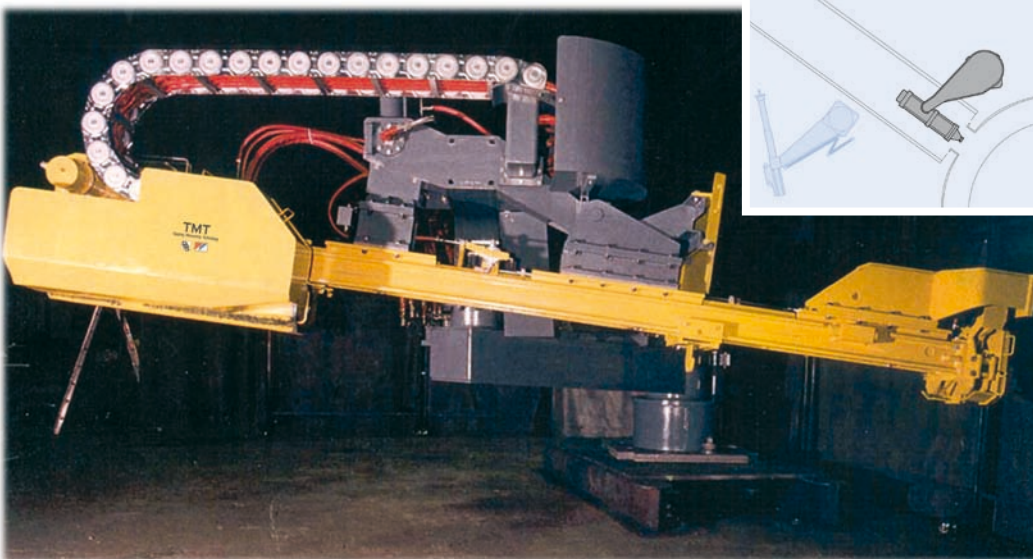
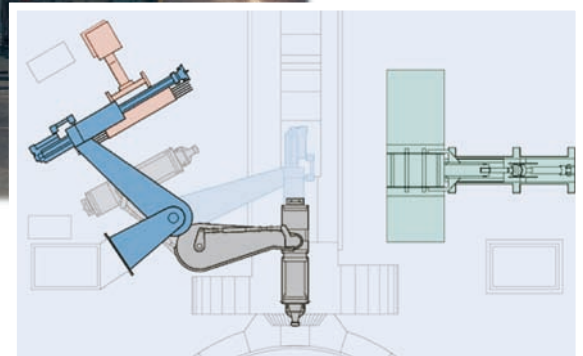
During the project planning phase, the casthouse efficiency for many years of reliable operation is determined. Efficient work processes, space utilization, the actual and planned future degree of automation, safety concepts and investment costs must be considered to design the ideal customer specific solution.

Decades of experience and several hundred successful casthouse layouts designed by **DANGO & DIENENTHAL** and **PAUL WURTH**, position **TMT** as a solid partner to ensure the overall efficiency of an installation.

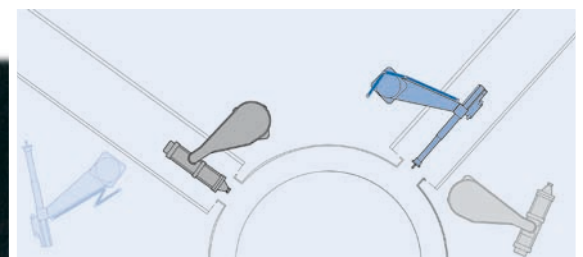
The following examples show the variety of potential layouts.

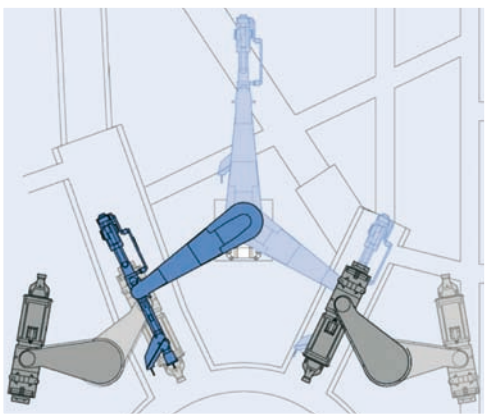


Clay Gun and Taphole Drill on one runner side with a Trough Cover Manipulator on the opposite side. Automatic drill bar changing.

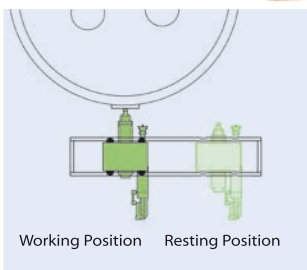
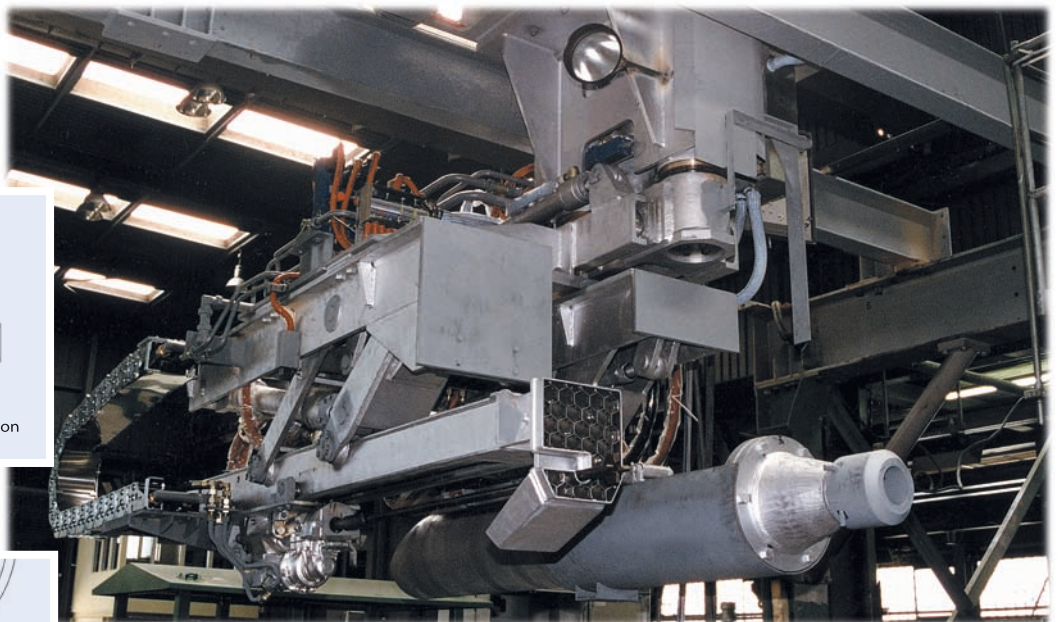


Clay Gun and Taphole Drill installed on opposite sides of the runner.

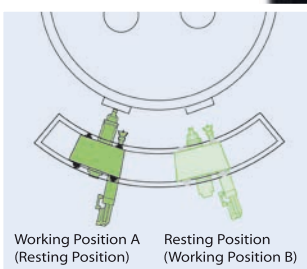




One common Taphole Drill and two Clay Guns serve two tapholes



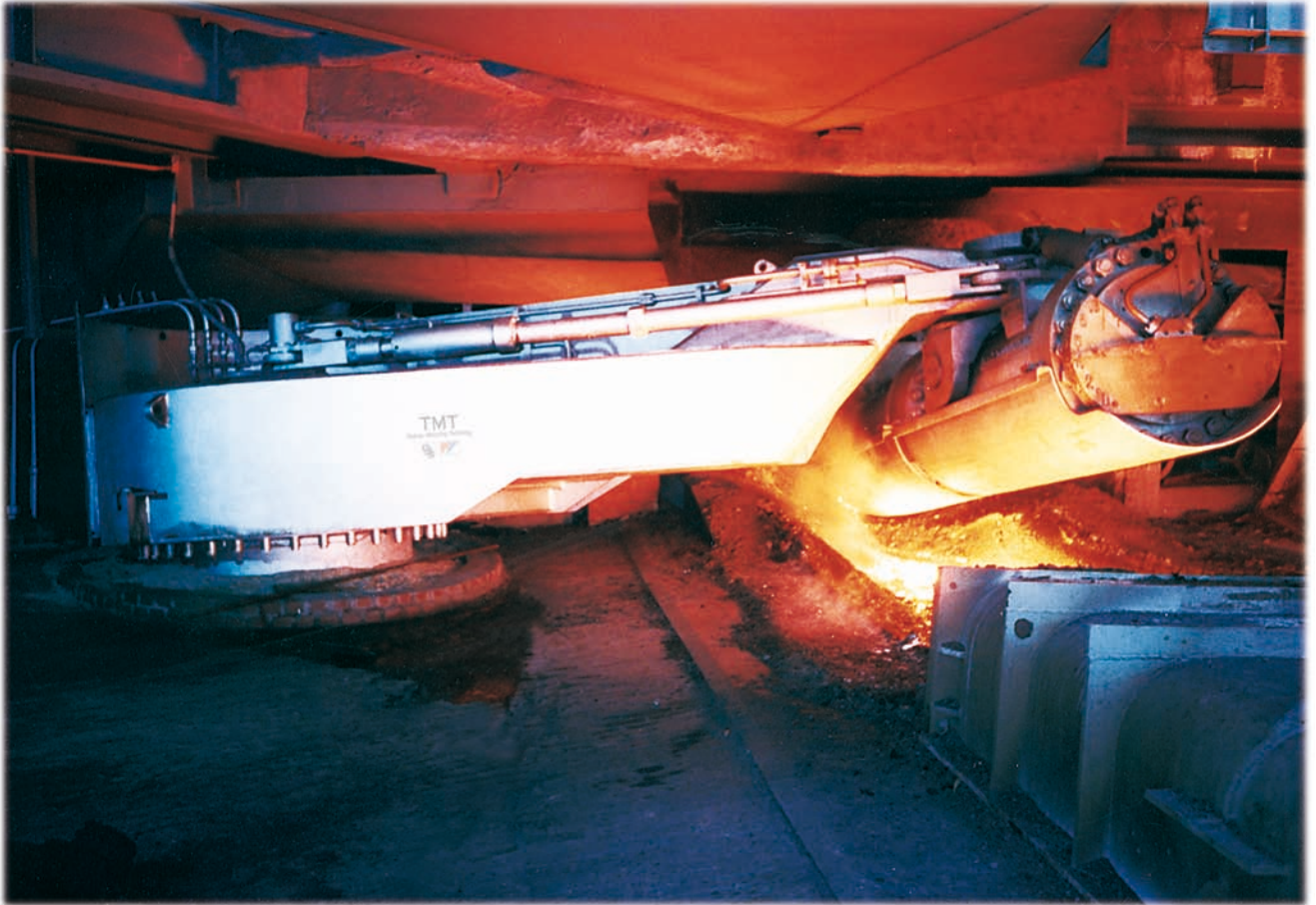
Working Position Resting Position



Working Position A
(Resting Position) Resting Position
(Working Position B)

Individual solutions for non-ferrous and ferro-alloy furnaces

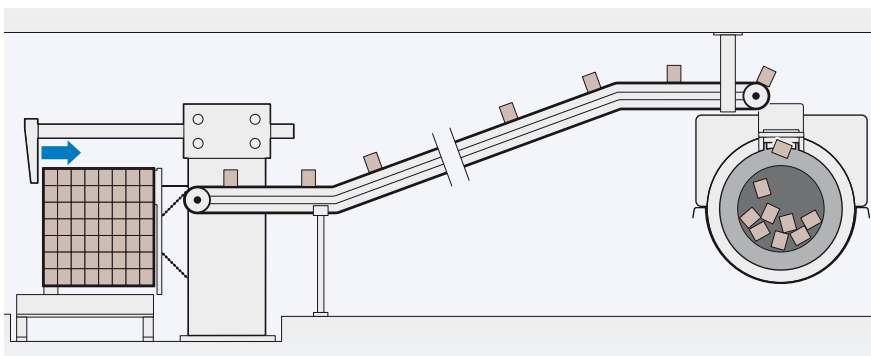
CLAY GUNS



Closing a furnace under any condition is a key safety requirement. This demands extremely high reliability and robustness from Clay Guns.

TMT Clay Guns meet these demands. Many machines supplied by **DANGO & DIENENTHAL** or **PAUL WURTH** have been in constant operation for over 20 years.

In today's blast furnace plants, tapping technology demands high performance machines allowing the use of wear resistant and quick setting clays.



*Automatic filling
of a Clay Gun*

TAPHOLE DRILLS



Economic tapping requires a high performance taphole channel. In addition to the choice of appropriate clay mass and the optimum opening strategy, optimal adjustments of the tapping parameters as well as their reproducibility are important.

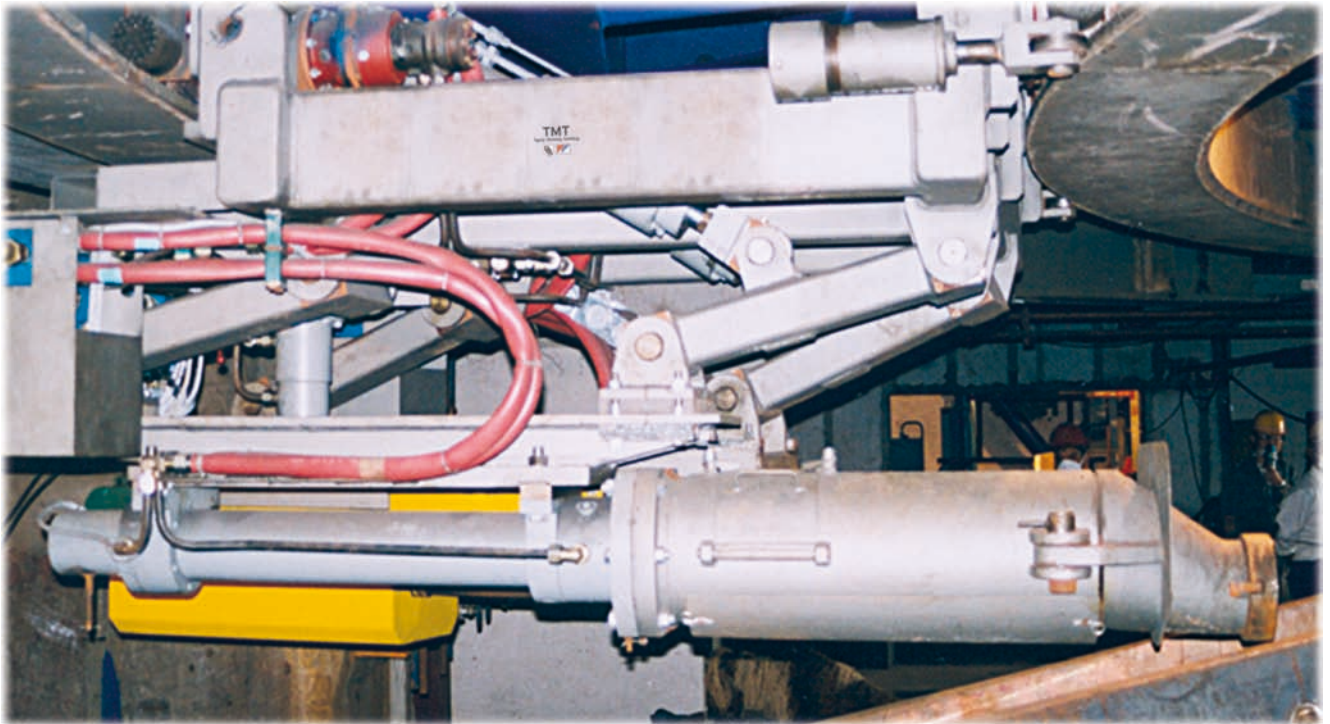
TMT Taphole Drills combine maximum flexibility with well-proven high capacity drill hammers to ensure effective drilling.

All taphole machines can be fitted with sensors suitable for the blast furnace environment. These sensors provide drilling parameter feedback for process monitoring and automation of the tapping technique.



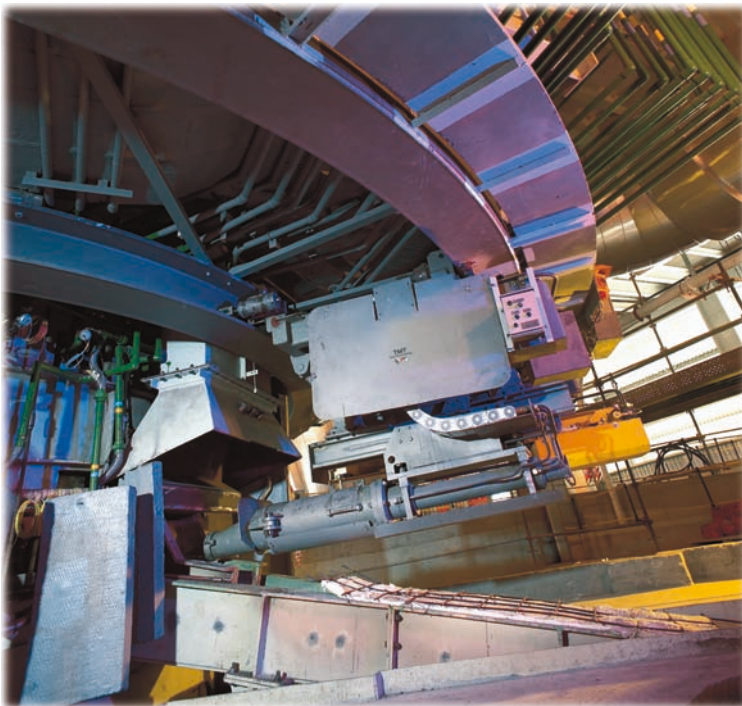
A TMT Drill Rod Changer completes drilling automation alternatives

COMBINED CLAY GUNS AND TAPHOLE DRILLS



Today, advanced tapping is essential even for reduction furnaces for ferro-alloys and nonferrous metals. Such furnaces entail the use of tapping equipment capable of operating on multiple tapholes. Extra careful taphole opening and closing is a key success factor.

The extensive experience of **TMT**, based on the know-how of **DANGO & DIENENTHAL** and **PAUL WURTH**, guarantees high performance installations that are ideally suited to this field of application.



In addition, the **TMT** range includes machines with special functions such as rodding devices or cleaning or lancing equipment that may be useful for certain furnace operations.

Rail-bound combined Gun and Drill serving multiple tapholes.

TROUGH COVER MANIPULATORS

For efficient dust and fume extraction in the cast-house, the iron runners should be covered.

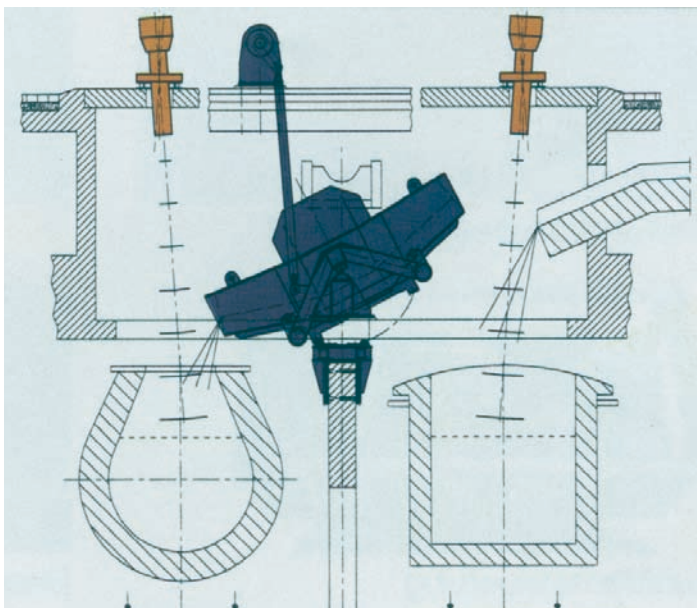
However, the tapping process and taphole maintenance require unobstructed access to the front area of the runner.

Various designs of **TMT** Trough Cover Manipulators provide flexible solutions for virtually all installation requirements.

The compact machine design enables installation in existing plants, also underneath low height tuyere platforms



TILTING RUNNERS

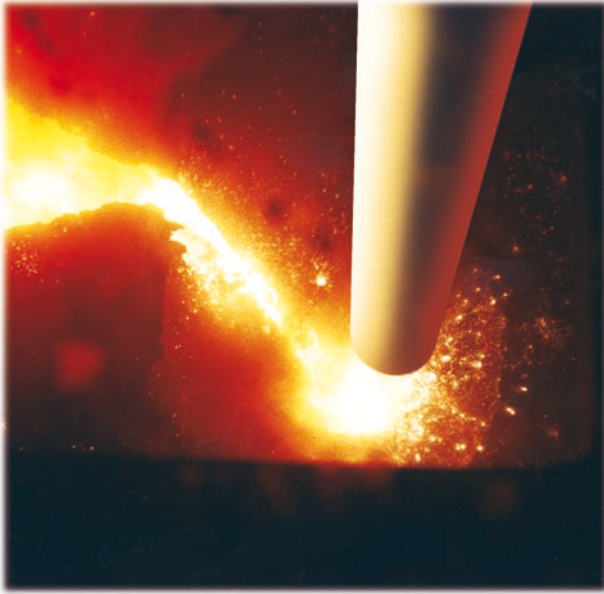


Tilting Runners complete the range of casthouse equipment. Rugged designs and well conceived contingency strategies ensure maximum operational safety.

In combination with a Level Measuring System for torpedo cars and ladles, the tilting runner operation can be automated

Tilting Runner with integrated Level Measuring System

OPTIONAL EQUIPMENT



LEVEL MEASURING SYSTEMS

Advanced electronics, effectively used and appropriately protected, form the basis of **TMT** Level Measuring Systems.



Radar electronics in a protective housing to suit steel work environments

TEMPERATURE MEASUREMENT AND SAMPLING

Lances for pig iron temperature measurement and sampling complete the range of **TMT** casthouse measuring technology.



Iron Temperature and Sampling Lance



JACK DAM DRILL

Jack Dam Drills, either portable or permanently installed, are a useful tool for every casthouse.

Example for a portable Jack Dam Drill

Several hundred blast furnaces across the world produce with our machines !

Europe

ALCHEVSK
 ARCELORMITTAL (all BF works)
 CARSID
 CORUS (UK / NL)
 DILLINGER HÜTTE
 ELKEM
 ERDEMIR
 FERROATLANTICA
 HKM
 ISDEMIR
 MMK
 NLMK
 NTMK
 OUTOKUMPU
 PRIMOREC
 RDME
 RIVA GROUP
 RUUKKI
 SAINT-GOBAIN
 SALZGITTER
 SEVERSTAL
 SSAB
 TINFOS
 TK
 TRINECKE ZELEZARNY
 TULACHERMET
 UMICORE
 US STEEL (all BF works)
 VOEST ALPINE STEEL
 ZAPSIB

Asia

ANSHAN
 ARCELORMITTAL (all BF works)
 BAOSTEEL
 BAOTOU STEEL
 BENXI
 CSC
 ESCO
 HYUNDAI
 JFE
 JINAN IRON & STEEL
 JINDAL
 LAIWU IRON & STEEL
 LAIWU IRON & STEEL
 MASTEEL
 NSC
 POSCO
 RINL
 SAIL
 SHAGANG
 SHAOGUAN IRON & STEEL
 SHOUGANG JINGTANG
 SHOUGANG QIANAN
 SUMITOMO
 TAIYUAN IRON & STEEL
 TANGSHAN IRON & STEEL
 TATA STEEL
 TIANJIN IRON & STEEL
 TIANJIN IRON & STEEL
 WISCO

North America

AHMSA
 AK STEEL
 ALGOMA
 ARCELORMITTAL SICARTSA
 ARCELORMITTAL USA (all BF works)
 INMETCO
 SEVERSTAL NORTH AMERICA
 STELCO
 STILLWATER MINING
 US STEEL (all BF works)
 WCI STEEL
 WHEELING

Latin America

ACEPAR
 ACESITA
 ARCELORMITTAL (all BF works)
 CODELCO
 CSN
 ENAMI
 FERROVEN
 GERDAU ACOMINAS
 LOMA DE NIQUEL
 SIDERAR
 USIMINAS
 VOTORANTIM

Africa

ANGLO PLATINUM
 ARCELORMITTAL (all BF works)
 ASA METALS
 ASSMANG
 HIGHVELD
 INTERNATIONAL FERROMETALS
 METALLOYS
 MOPANI
 STEELPORT
 TICOR
 TRANSALLOYS
 TUBATSE
 XSTRATA

Australia

BHP BILLITON
 BLUESCOPE STEEL
 HISMELT
 ONESTEEL
 SIMCOA

This is an extract from our reference list for blast furnace machines. Please contact us for the full list.
 On request we also will send you our reference list on ferro-alloys and non-ferrous installations.

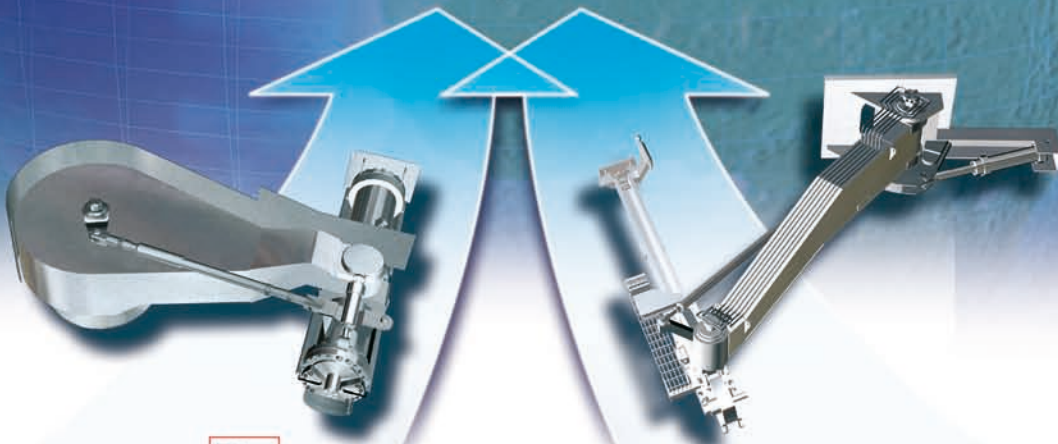
BENEFIT FROM MORE THAN 100 YEARS OF EXPERIENCE

TMT

Tapping - Measuring - Technology



- together -
one step ahead



DANGO & DIENTHAL



PAUL WURTH

TMT's product range
also includes:

- **Measuring technology**
 - Above-burden and In-burden Probes
 - Profilemeters
 - Other measuring equipment for blast furnaces
- **Consumables**
- **Services**

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