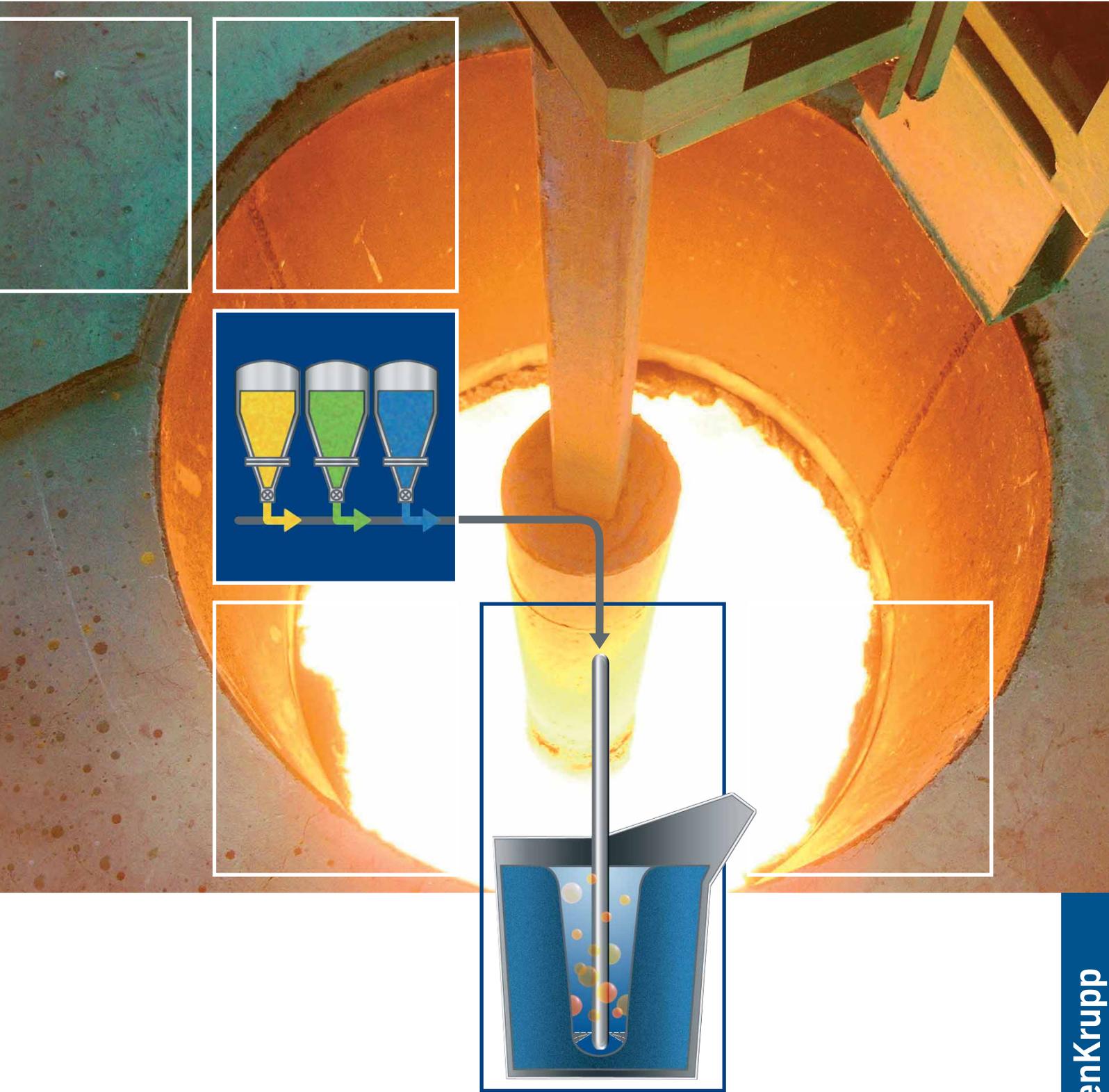


Hot metal desulphurisation plants.



A company of
ThyssenKrupp
Technologies

Polysius



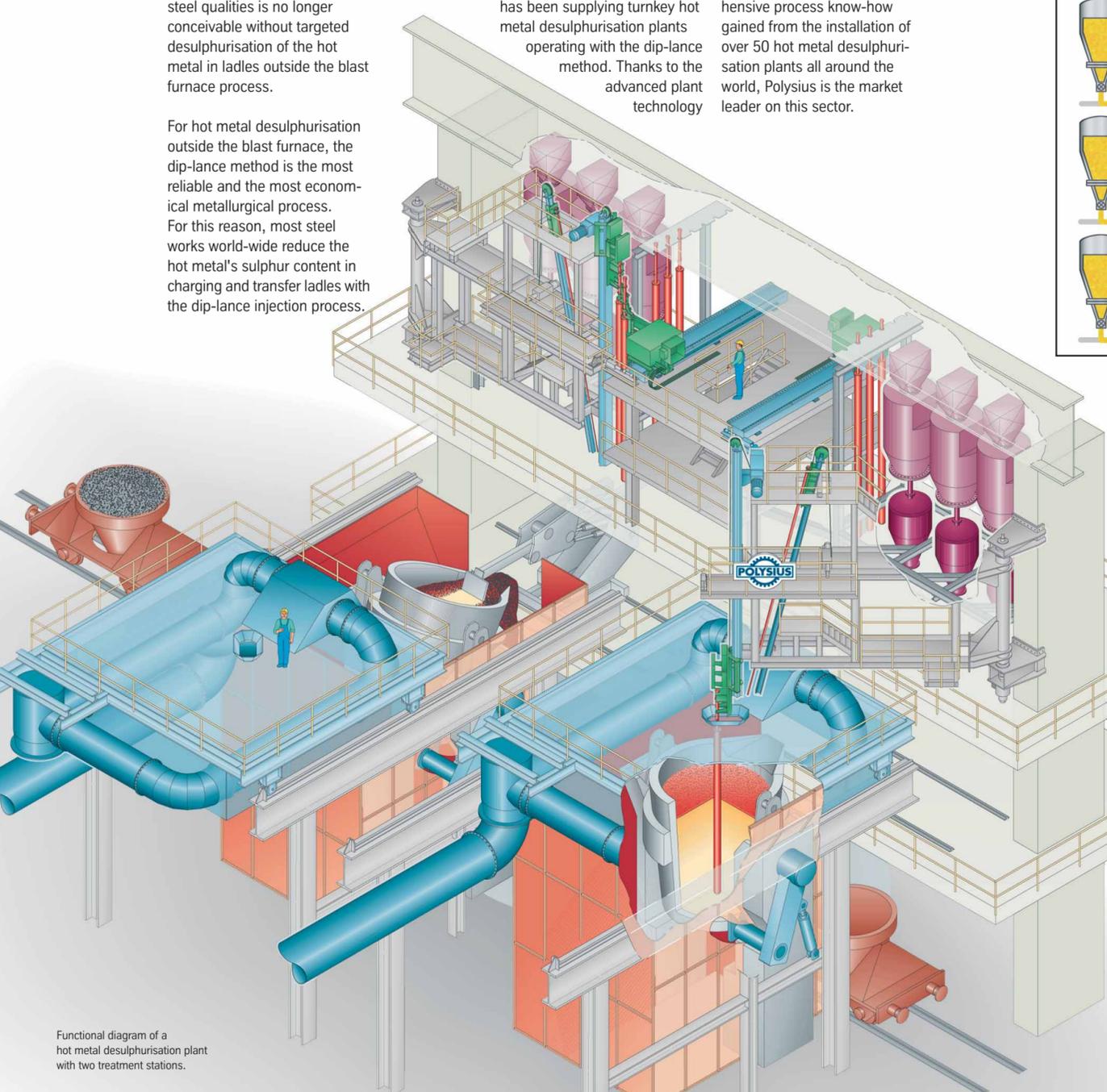
ThyssenKrupp

Economical hot metal desulphurisation plants from Polysius – the market leader.

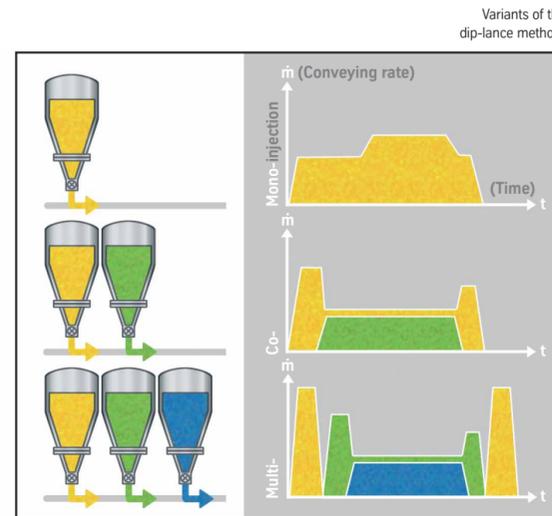
The production of high-grade steel qualities is no longer conceivable without targeted desulphurisation of the hot metal in ladles outside the blast furnace process.

For hot metal desulphurisation outside the blast furnace, the dip-lance method is the most reliable and the most economical metallurgical process. For this reason, most steel works world-wide reduce the hot metal's sulphur content in charging and transfer ladles with the dip-lance injection process.

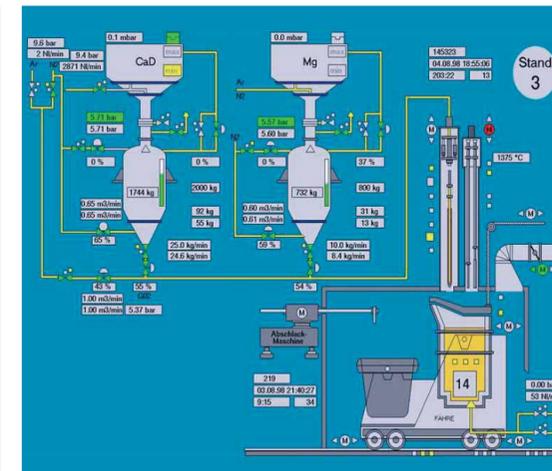
For more than 35 years Polysius has been supplying turnkey hot metal desulphurisation plants operating with the dip-lance method. Thanks to the advanced plant technology and our company's comprehensive process know-how gained from the installation of over 50 hot metal desulphurisation plants all around the world, Polysius is the market leader on this sector.



Functional diagram of a hot metal desulphurisation plant with two treatment stations.



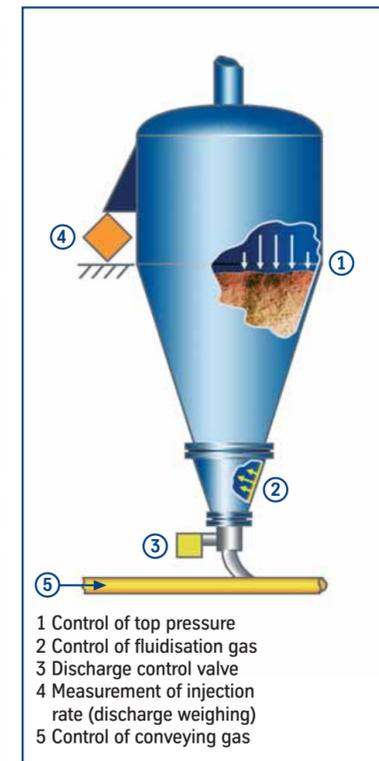
Variants of the dip-lance method.



Mask of a Coinjection plant.



Coinjection dispenser in a Chinese steel plant.



MEPOL principle.

Process technology

What makes the dip-lance process so effective for hot metal desulphurisation is the pneumatic injection of fine-grained desulphurisation reagents into the molten metal with high dosing precision via refractory lances. This causes an intimate mixing of the desulphurisation reagents with the hot metal. The dip-lance method can reliably reduce the sulphur content of the hot metal to figures as low as 0.001%.

It allows the use of several desulphurisation reagents, such as lime, calcium carbide and magnesium, which remove the sulphur from the hot metal by chemical reaction and convert it to the slag.

There are many ways of controlling the dip-lance process to minimise the operating costs. One is to vary the desulphurisation reagent injection rate, which must take account of the fact that the effectiveness of

hot metal desulphurisation is proportionally opposite to the desulphurisation reagent injection rate.

Another way is to inject different desulphurisation reagents during one hot metal treatment session. The reagents can be injected into the molten metal individually, simultaneously or at injection intervals with the Monoinjection, Co-injection or Multi-injection processes.

Which of the above processes causes the lowest operating costs depends on the operating and production conditions (such as the weight, temperature and sulphur content of the hot metal, the required final sulphur content, the blast furnace slag and the injection time), which can vary from charge to charge.

For the selection of the optimum injection process according to the production conditions a comprehensive knowledge of the metallurgy of the hot metal desulphurisation process is required.

In today's computer-aided hot metal desulphurisation plants, selection of the optimum process is performed by a metallurgical process computer. The quality of the process is thus determined by the quality of the metallurgical process computer and thus by the »programmed process knowhow«.

Due to the large number of plants already supplied, Polysius possesses comprehensive metallurgical know-how. This is implemented in the metallurgical process computer – which is an in-house development – and thus benefits our numerous customers all around the world. The metallurgical program contains all mathematical equations which reflect the regularities of hot metal desulphurisation, so that every hot metal charge is individual desulphurised with the optimum process.

Plant technology

To minimise the operating costs of the hot metal desulphurisation process, Polysius offers a special injection technology under the proprietary name MEPOL.

The core item of the MEPOL technology is the pressure-vessel conveyer with five harmonised measurement and control units for measuring, monitoring and controlling all operating parameters that have an influence on the process and the dosing precision.

Thus the Polysius MEPOL technology ensures a high dosing accuracy for each desulphurisation reagent during the whole injection process.

Combined with the metallurgical process computer the MEPOL systems ensure the cost-optimised desulphurisation of each hot metal charge.

High operating reliability and plant availability in combination with favourable operating costs and high process flexibility are the most important criteria for the quality of the hot metal desulphurisation plant:

In plants designed by Polysius, such important components as the discharge control valve and the pressure controller are made of wear-resistant ceramic to ensure a high plant availability. At wear-intensive locations (e.g. at pipe bends) MEFLEX hoses are used.



Top left: Outlet control unit of a MEPOL conveyor.



Wear-resistant discharge control valve.



MEFLEX hose for particularly abrasive materials.

...from a single source – right down to the details.



Injection lance in the lance insertion unit after the injection procedure.

Hot metal desulphurisation in an Austrian steel works with two treatment stations.



Delivery programme

Polysius offers turnkey hot metal desulphurisation plants which are precisely tailored to the production range of the respective steel works.

All the plant components come from a single source, ranging from the tank vehicle unloading station via the silos for storing the desulphurisation reagents, the dispensers, the injection systems, the lance insertion and lance changing units, the slag skimming machines right up to the control room and electrical equipment, the MEPOL pressure-vessel conveyors and the metallurgical process computers.

The Polysius scope of supply also includes the extension, modernisation and optimisation of existing hot metal desulphurisation plants, as well as field assembly, commissioning and such services as plant and process inspection.



Metallurgical process computer in the control room. (Centre) Slag skimming machine – also remotely controllable from the control room.

Ladle car with tilting device.

