PENTOL

Power plant optimisation made in Germany

PENTOMAG® 2550

Anti Slagging Coal Additive

Clean combustion chamber and super heater

Increase heat transfer efficiency

Antislagging coal additive

Improvement of boiler service safety

Cleaning a boiler during its outage is a hard physical work, requiring scaffolding to be built inside the boiler and personnel trained for such operation.

Application of PentoMag® 2550 eliminates most of works hazardous for the service and maintenance personnel.

Advantages of additives in slurry form

Antislagging additives have already been used for many years, initially in powder form. Practical experience was, however, not satisfactory, first of all because of relatively high particle size of powder components (typically 150 microns). The smaller the particle the greater the active surface.

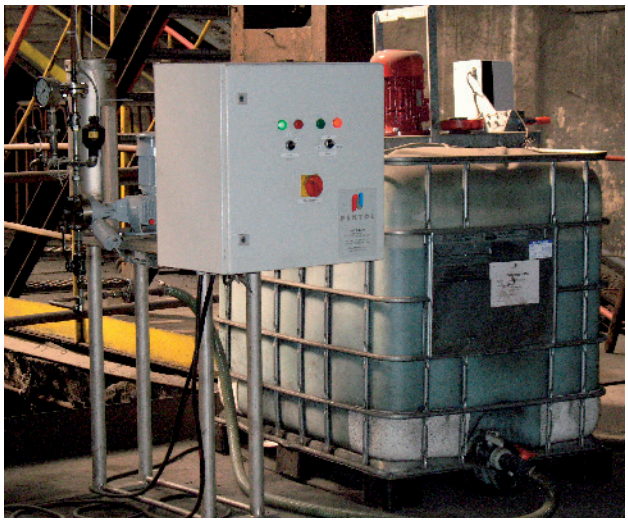
Pentol is the first manufacturer who developed production of fuel additives in form of stable slurry containing micronized active substances in oil suspension. Slurry is also resistant to water (powder will agglomerate in contact with moisture and its efficiency will be strongly limited). Also storage of additives in slurry form is easier and dosing more precise.

High efficiency of PentoMag® 2550

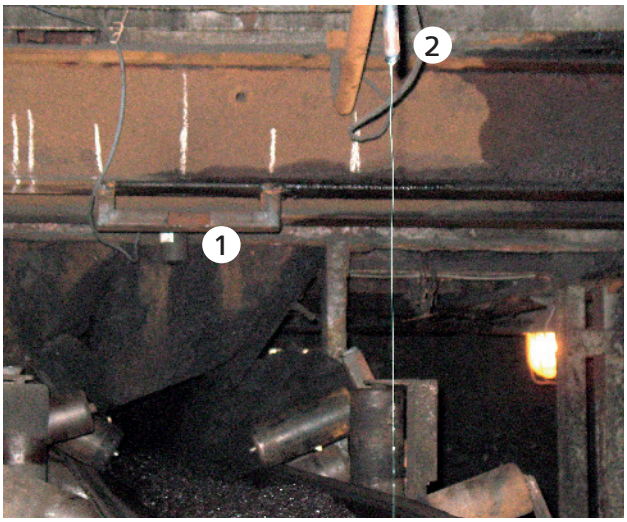
Sophisticated manufacturing and stabilisation of the slurry containing up to almost 70 % of active substances enables application of very low dosing rates. In most cases 1 liter of PentoMag® 2500 is efficient to treat 50 tons of coal. Actual dosing rate is always adjusted according to practical experience during initial dosing period.
To properly evaluate dosing efficiency the cost of treatment per ton of coal is the key indicator rather than additive unit price.

Reliable dosing plant

Pentol develops and produces reliable dosing equipment specifically for its range of additives. The pictures below show a fully automated dosing skid for small and medium size boilers with a coal flow detector to adjust dosing rate. The product is usually added to the coal before the mills.



Fully automated PentoMag® 2500 dosing skid.



Dosing of PentoMag® 2500 on a coal belt
1) Coal flow sensor 2) Dosing point

40 years of pentol's experience

Pentol was founded in 1969 and has more than 40 years of experience with additives for coal and fuel oil fired boilers and furnaces. Since that time, composition and manufacturing process were continuously improved. High concentration and stability of slurry additives were achieved. Additives can be stored for a long time without losing their properties.

Development of Low-NOx burners became a particular challenge as they often lead to more intensive slagging. Long term experience has confirmed full feasibility of PentoMag® 2500 to prevent from fouling of boilers equipped with low-NOx burners.

Application of PentoMag® 2500 does not cause any negative side effects for boiler operation.

Slagging

PentoMag® 2550 is a modern coal additive serving to prevent coal slagging (fouling). Term “slagging” is understood as formation of hard, sticky deposits covering evaporator and superheater heat exchange tubes inside the furnace.

Usually the slagging starts on the firebox tubes or around the burners, then, once a first layer has formed, fouling occurs rapidly as the outside of the tubes is not “cooled” sufficiently anymore. As the temperatures begin to increase, ashes with higher melting points also start to melt. Thus more deposits are formed, higher temperatures obtained and also a shifting of temperatures towards the super-heaters can be noticed. During operation of the boiler, the ash is sticky and in molten form. It cannot be removed by soot-blowing.

The actual time of built-up of such deposits varies from boiler to boiler and depends largely from the firebox design and temperatures.

Starting PentoMag® 2550 dosing on a clean boiler fully prevents slag formation. In the most unfavorable conditions (burning coal with strongly slagging properties in a firebox of very high heat transfer rate), the slagging process will proceed much more slowly and mildly.

Photographs below show the same area of the boiler wall. The first one was made on the untreated boiler after five days of operation since previous cleaning. The wall is almost fully covered by thick layer of hard deposits (fully covering the manhole). The second picture shows the wall almost free of deposits after 12 days of operation with PentoMag® 2550 treatment. Only small quantity of friable and easy to remove deposits remained on the wall.

View of strongly fouled firebox after 5 days operation of untreated boiler.

View of the same area after 12 days of operation with PentoMag® 2550 dosing.

Easy removal of slag residuals

PentoMag® 2550 changes the structure of the molten ash deposits. Instead of solid deposits with very high density, slag residuals will be soft and friable. Their removal will usually not require the maintenance personnel to enter the firebox. Sootblowing will be sufficient.

Improvement of availability and reliability

Intensive slagging leads to (sometimes frequent) boiler outages for cleaning. In the best case boiler operation can continue with reduced load. In any case, slagging leads to significant losses due to lost production.

Slagging is also dangerous as big agglomerations (eyebrows) can fall down from above the burners or superheaters and damage the bottom tubes. It has also led to boiler tripping when big lumps of ash fall into the water-cooled ash collectors, which results in the formation of steam and a pressure increase in the firebox.

Regular dosing of PentoMag® 2550 allows uninterrupted boiler operation without load limitation - in the most difficult cases periods between outages will be significantly longer and outage periods respectively shorter.

Improvement of boiler efficiency

Boiler fouling obstructs heat exchange in the areas suffering deposit formation, leading to change in flue gas temperature distribution. Intensive deposits in the evaporator area may cause increase of flue gas exit temperature while fouling of superheater surfaces may result in too low steam temperature on boiler exit.

In both above cases thermal losses can be expected. Experience shows that PentoMag® 2550 dosing may give noticeable fuel savings by preventing such losses.

PentoMag is safe

Chemical composition and production process of PentoMag® 2550 minimizes safety hazards related to transport, storage and use of the additive.

Fulfilling elementary procedures described in the Material Safety Data Sheet prevents any danger from personnel being in touch with the product.

Modern and enviroment friendly production line

Pentomag fuel additives are manufactured on a modern, fully automated production line in Grenzach-Wyhlen, a small town on the bank of Rhine in the south of Germany, just next to Swiss border.

Pentol GmbH – the manufacturer of additives is ISO9001 and ISO 14001 certified.

Pentol is dedicated to an operating philosophy that includes environmental compliance as an important component of its overall management philosophies and procedures. All employees are committed to a system of continual improvement to ensure pollution prevention and source reduction whenever and wherever possible.

We offer solutions, not only products

This phrase fully corresponds to comprehensive offer of Pentol. It covers all stages of relations with our Customer beginning from diagnosis of existing problem through selection of optimum treatment, delivery of dosing plant, staff training, optimisation of dosing rate, up to service during entire period of additive application.

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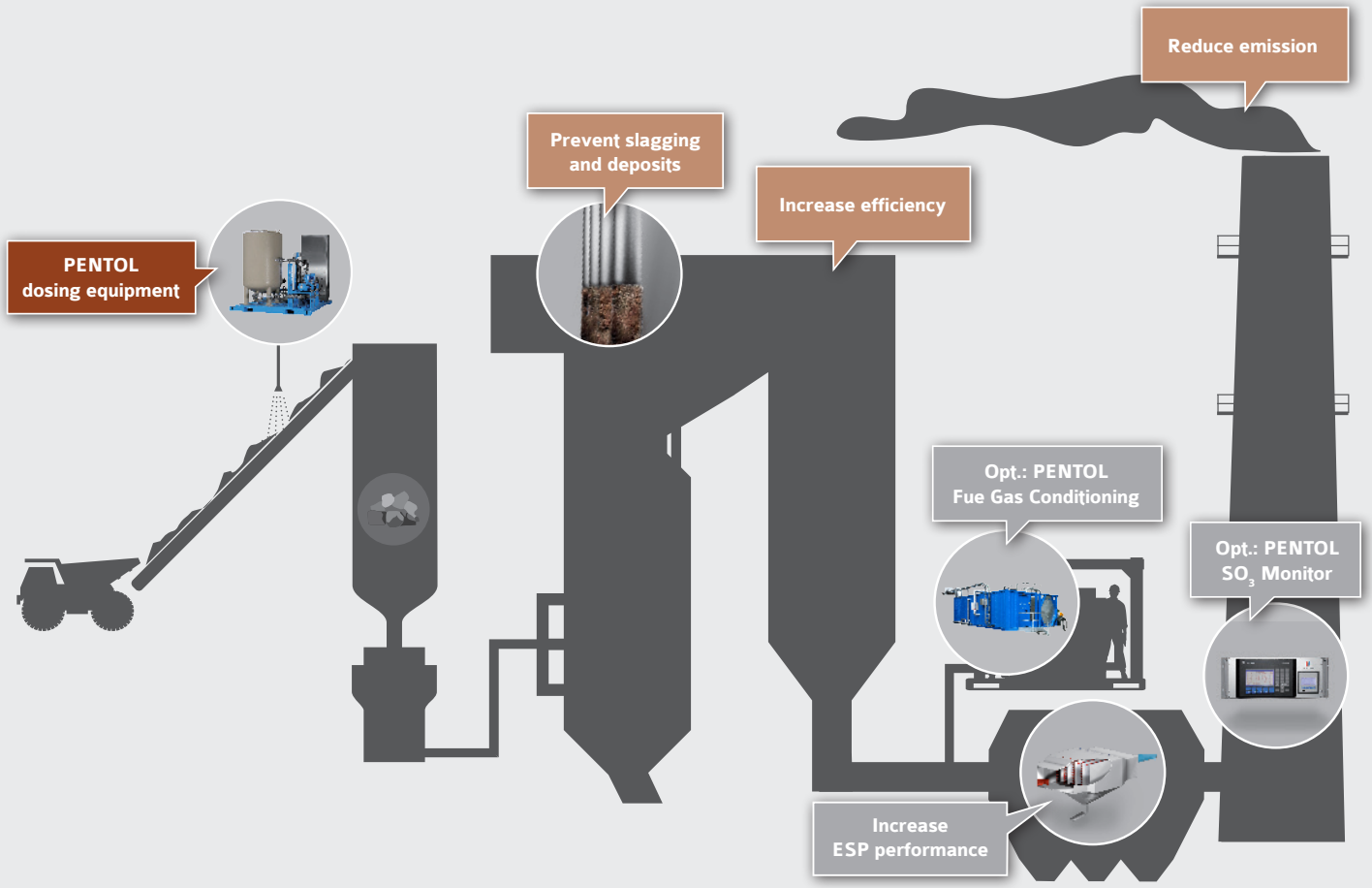
www.pentol.net

PENTOMAG® 2550

For Coal Fired Plants



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