

FOR THE BEST WE ARE

PENTOMAG®

COMBUSTION OPTIMISATION



PENTOL

INCREASE EFFICIENCY



PentoMag products are magnesium oxide based fuel oil additives designed to fulfil these tasks:

REDUCE CORROSION

PentoMag's main property is to reduce high and low temperature corrosion. Reduced corrosion means extended life time of high and low temperature sections in the flue gas duct.

REDUCE FOULING

Reduced fouling increases heat transfer in superheater and air heater sections and reduces down-time for cleaning.

REDUCE EMISSIONS

SO₃ emission and the visible white chimney plume are reduced.

REDUCE MAINTENANCE WORK

Cleaning intervals for air heater and superheater are reduced. Dosing equipment designed by Pentol is of rugged design and requires minimum maintenance.

INCREASE PLANT AVAILABILITY

Reduced corrosion and deposits mean extended lifetime of high and low temperature sections, allows longer cleaning intervals and less unexpected down-time.

INCREASE BOILER EFFICIENCY

Improved heat transfer, lower O₂ and atomising steam consumption, less soot blowing and particularly the possibility to reduce final gas temperature to a minimum, resulting in a substantial increase in boiler efficiency.

PRODUCT OVERVIEW

Each boiler requires specific treatment to gain optimum results and to maximise savings. For this reason, Pentol offers a full scope of products to meet these needs.

	PentoMag® 2000	PentoMag® 2015	PentoMag® 5500 KW	PentoMag® 4100	PentoMag® PentoMuls® Dual Fuel Treatment
Protection against:					
Low temperature corrosion	+++	+++	++++	+	++++
High temperature corrosion	+++	+++	+++	++	++++
Deposits	+	+	++	+++	++++
Acid smut fallout	+++	+++	+++	++	++++
Allows:					
Increased ash pH after air heater to	> 4	> 4	> 4	> 3.5	> 4
Reduction of exit gas temp. up to	> 30°C*)	> 30°C*)	> 30°C*)	> 10°C*)	> 30°C*)
Reduction of solid emission up to	—	~40%	—	~40%	> 80%
Cleaning of heavy fuel oil system	—	—	—	++++	++++
Reduction of SO ₃ emission	+++	+++	++++	++	++++
Additional PentoMuls® benefits:					
Reduction of NO _x					++++
Reduction of O ₂ level					++++
Reduction of atomising					++++
Steam consumption					++++

+ : competitive, ++ : good, +++ : very good, ++++ : outstanding

*) Where technically possible by reducing air inlet temperature to the air heater

PENTOMAG 2000

Stable suspension of magnesium oxide in oil. With MgO particles of submicron size, this slurry is applied without problems to boilers of all sizes. It is injected directly into the fuel oil or into the combustion chamber with injection systems designed and supplied by Pentol.

PENTOMAG 2015

Based on PentoMag 2000. Inorganic cerium and manganese additionally serve as powerful catalysts. Therefore, solid emission can be widely reduced.

PENTOMAG 5500 KW

Specially designed for optimal results together with PentoMuls. The newest product in the Pentol scope is optimised for maintenance-free dosing and favours the formation of a water-in-oil emulsion. (See separate PentoMuls documentation.)

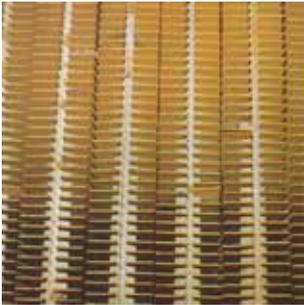
PENTOMAG 4100

Oil soluble, organometallic blend of magnesium, iron and asphaltene dispersants. Very efficient combustion improver.

**PENTOMAG/PENTOMULS
DUAL FUEL TREATMENT**

PentoMuls/PentoMag dual fuel treatment offers the best protection and combustion optimisation available on the market today. Ask for a separate leaflet about this technology.

TECHNICAL ASPECTS



Economiser



Boiler tubes



Ljungström air heater

At metal temperatures above 600 °C, the fly-ash components with a low melting point (vanadium, sodium, lead, potassium) form hard tenacious and corrosive deposits.

Cleaning is difficult, but these deposits cause high draft losses, decreased heat transfer and lower combustion efficiency.

The metallic oxides in the PentoMag increase the melting point of the above mentioned fuel oil components by approx. 300 °C to temperatures which are well above the boiler temperatures.

As a result, the high temperature section remains clean and free of corrosive deposits. The deposits are dried out, fried and of neutral to alkaline pH. Excess powder is taken away in the gas stream or can easily be blown away by soot blowers.

Further to providing protection against fouling and corrosion, PentoMag helps to maintain the heat transfer at the most economical level.

ECONOMICAL ASPECTS

Fuel oil contains sulphur. In the past, this led to uneconomical boiler operation with high exit gas temperatures between 140 and 180 °C. While fuel oil was cheap, this method was the easiest and least expensive way to avoid cold end problems.

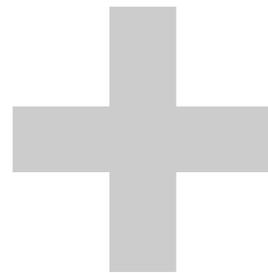
Today however, this method is no longer economical due to the high fuel prices.

PentoMag allows surprisingly high reductions in exit gas temperatures and still protects the back end against corrosion and plugging. In most cases, the fuel oil saving resulting from the reduced exit gas temperature pays for the PentoMag treatment, let alone the cost reduction due to shorter down-time and improved availability of the rated capacity of the plant.

REDUCE SOLID EMISSION

REDUCE NO_x EMISSION

REDUCE CO EMISSION



PREVENT CORROSION IN THE BACK END

PREVENT PLUGGING IN THE BACK END



INCREASE EFFICIENCY OF THE PLANT



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