

# <sup>®</sup> POLARCHEM - M8

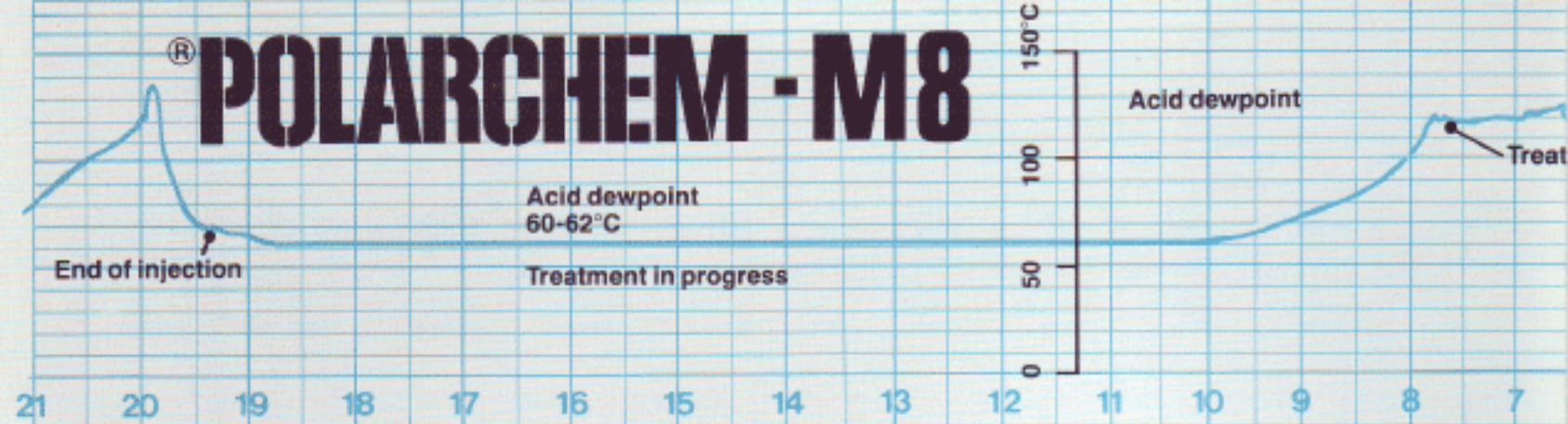
**Selective control of  
Acid Dewpoint temperature with  
continuous cleaning effect**



**Instant SO<sub>3</sub> reduction  
Maximise energy  
Minimise corrosion**



# <sup>®</sup> POLARCHEM - M8



## In boilers and furnaces

Unburnt carbon, sulphuric acid, sulphates and vanadium create problems everyday.

Polarchem have solved many of these problems with their products for chemical sootblowing by injecting product for a few minutes once or more times a day, with the result of drying all deposits and, where applicable, reducing sootblowing considerably.

However, the problem of acid dewpoint remained. Now, Polarchem-M8 allows the reduction of acid dewpoint temperature to any economical level you choose, controlling both corrosion and emissions.

### Sulphuric acid corrosion

The sulphur in the fuel will not leave the stack entirely as sulphur dioxide ( $\text{SO}_2$ ) but a part will be oxidized to sulphur trioxide ( $\text{SO}_3$ )

Where  $\text{SO}_3$  reacts with water vapour, sulphuric acid ( $\text{H}_2\text{SO}_4$ ) is formed. In low temperature zones, particularly in airheaters, ductings and stacks,  $\text{H}_2\text{SO}_4$  condenses on surfaces having temperatures below its dewpoint ( $120^\circ$  to  $160^\circ$ ) and causes corrosion.  $\text{H}_2\text{SO}_4$  corrosion can also occur in parts of a boiler where the temperature of the flue gas is above the dewpoint because the thermal insulation properties of carbon keep the temperature of heat-exchange surfaces below the dewpoint. This will result in the failure of tubes.

Where  $\text{H}_2\text{SO}_4$  would otherwise condense on heat-exchange surfaces and immediately start attacking the steel, the neutralizing action of Polarchem-M8 on  $\text{SO}_3$  protects these parts from corrosion.

### Fouling - catalytic action

The build-up of deposits on heat exchange surfaces not only reduces fuel efficiency.

Also, in the presence of iron and vanadium the deposits provide catalysts which assist the conversion of  $\text{SO}_2$  to  $\text{SO}_3$ .

The cleaning effect of Polarchem-M8 prevents fouling and thereby stops the catalytic action. Less  $\text{SO}_3$  gives a lower acid dewpoint.

### Air pollution - emissions

By neutralizing  $\text{SO}_3$  acid smutting is prevented.

### The M8 pay-out

Polarchem-M8 enables operators to:

1. Run existing plant burning the same fuel with lower final flue gas temperatures achieving better (fuel) efficiency.
2. Run existing plant burning a cheaper high sulphur fuel with higher vanadium, sodium and other impurities.
3. To have good plant availability, shorter outages for cleaning and repairs following corrosion, and therefore low maintenance costs.
4. To optimize the use of all available heat exchange capacity without the worry of corrosion.
5. To specify new boilers and furnaces with lower final flue gas temperatures and consequent high fuel efficiency.

## Measure the acid dewpoint

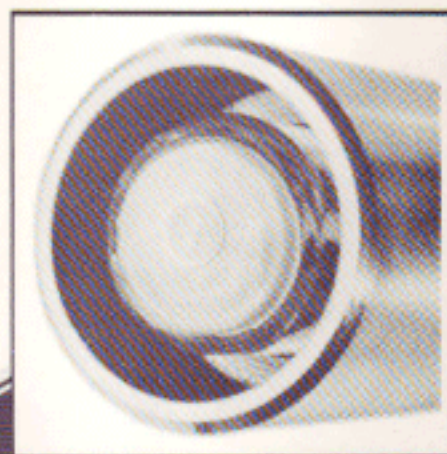
In order to operate your boiler or furnace at optimum efficiency, that is with as low an exit gas temperature as possible at the same time avoiding corrosion, it is necessary to ensure you are above the acid dewpoint.

Polarchem starts by measuring the acid dewpoint, normally using special equipment which gives continuous and accurate readings.

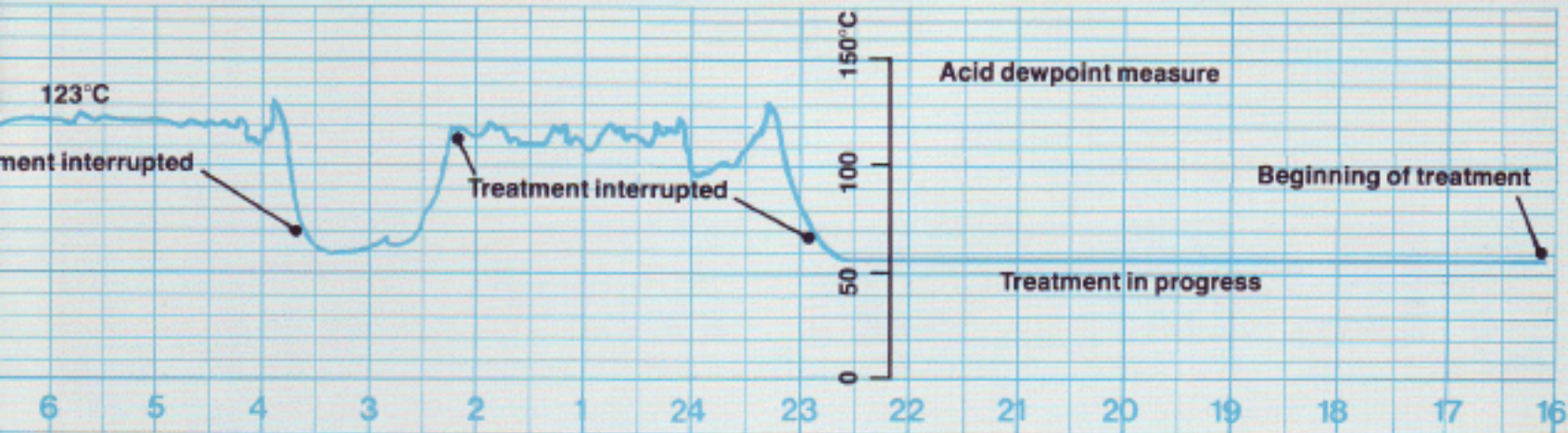
This is the most exact way of determining the problem to solve because it takes into account any changes and reactions in the flue gases which may take place in their path. Any guesses about catalytic reactions by vanadium and/or iron which cannot be calculated exactly become unnecessary.

If you do not have your own equipment or a simple method of determining the dewpoint, Polarchem will undertake periodical checks for you to ensure M8 is giving the expected results. THE M8-EFFECT IS MEASURABLE IMMEDIATELY.

Dewpoint Meter  
by courtesy of  
Land Combustion  
Limited







### Determine the quantity

Polarchem-M8 consists of various nitrates in an aqueous solution with inhibitors and pH-control. On injection into a hot atmosphere M8 will decompose and chemical reactions take place to neutralize  $\text{SO}_3$ .

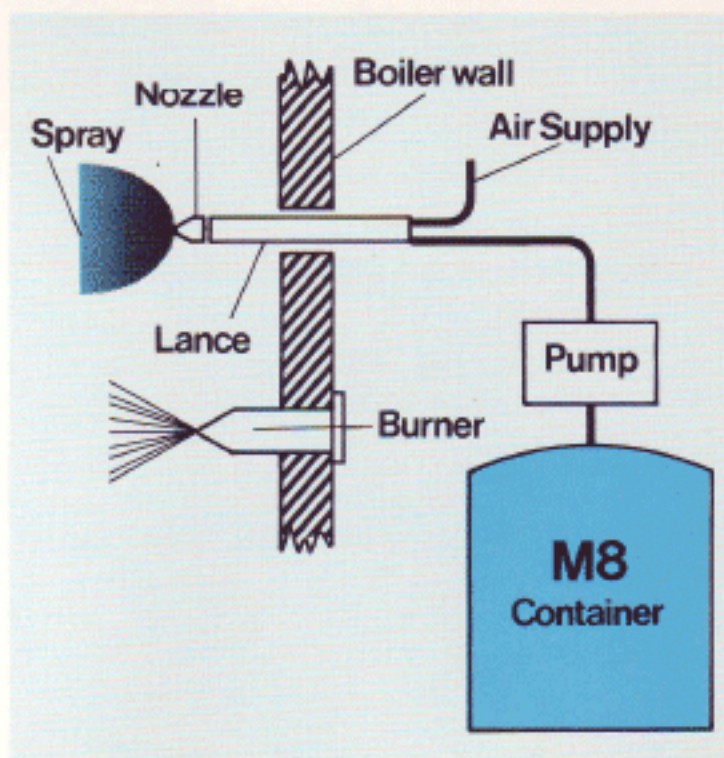
The quantity and composition may vary depending on the dewpoint measured without treatment and the dewpoint desired. The state of fouling will also be taken into consideration.

Variations in the sulphur content and quantity of fuel burnt as well as the excess air will affect the treatment.

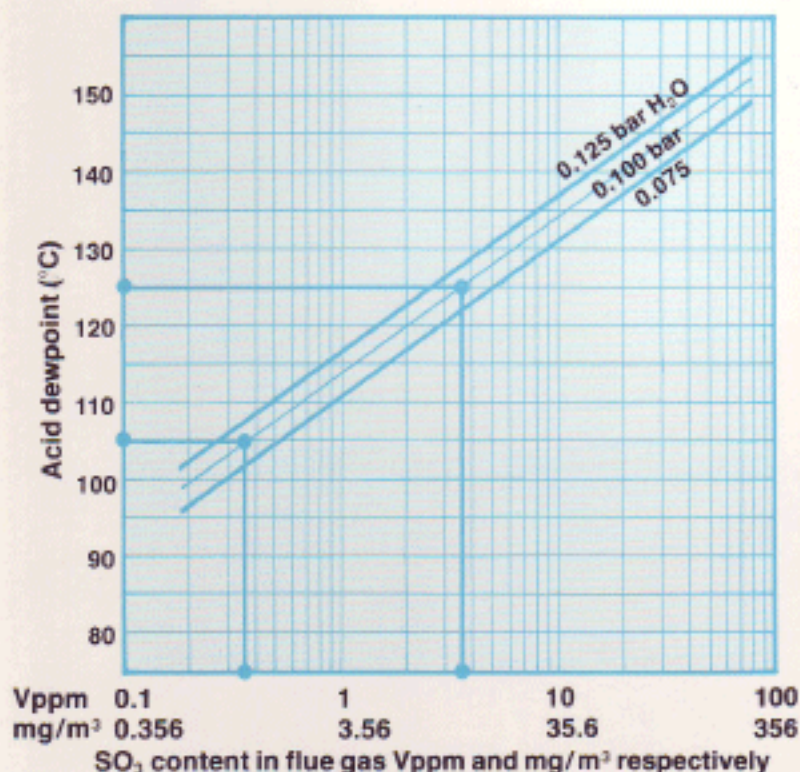
A typical calculation is shown on the back page of this leaflet but the Polarchem Representative will be able to prepare a specific treatment programme after inspection of your plant which includes measuring the acid dewpoint.

The Polarchem Representative is familiar with our range of products and will be able to advise generally on how best to benefit from a Polarchem treatment, whether for on-load cleaning, chemical sootblowing or dewpoint reduction.

### Use of Polarchem-M8



### $\text{SO}_3$ Content in Flue Gas



Polarchem-M8 is injected directly into the combustion chamber, normally above one of the burners, with simple equipment consisting of a metering pump, lance and nozzle, supplied according to the type of boiler or furnace.

The pump is operated by compressed air or electrically. The lance is permanently installed and continuously cooled by air or water.

Polarchem-M8 is non-explosive, non-toxic, non-corrosive and safe to handle. For transport purposes it is Class 9. It is delivered in standard drums of 25, 30, 100 and 200 litres but can also be supplied in larger containers or road tankers.

Patents applied for.

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**Maximise energy**  
**Minimise corrosion**

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