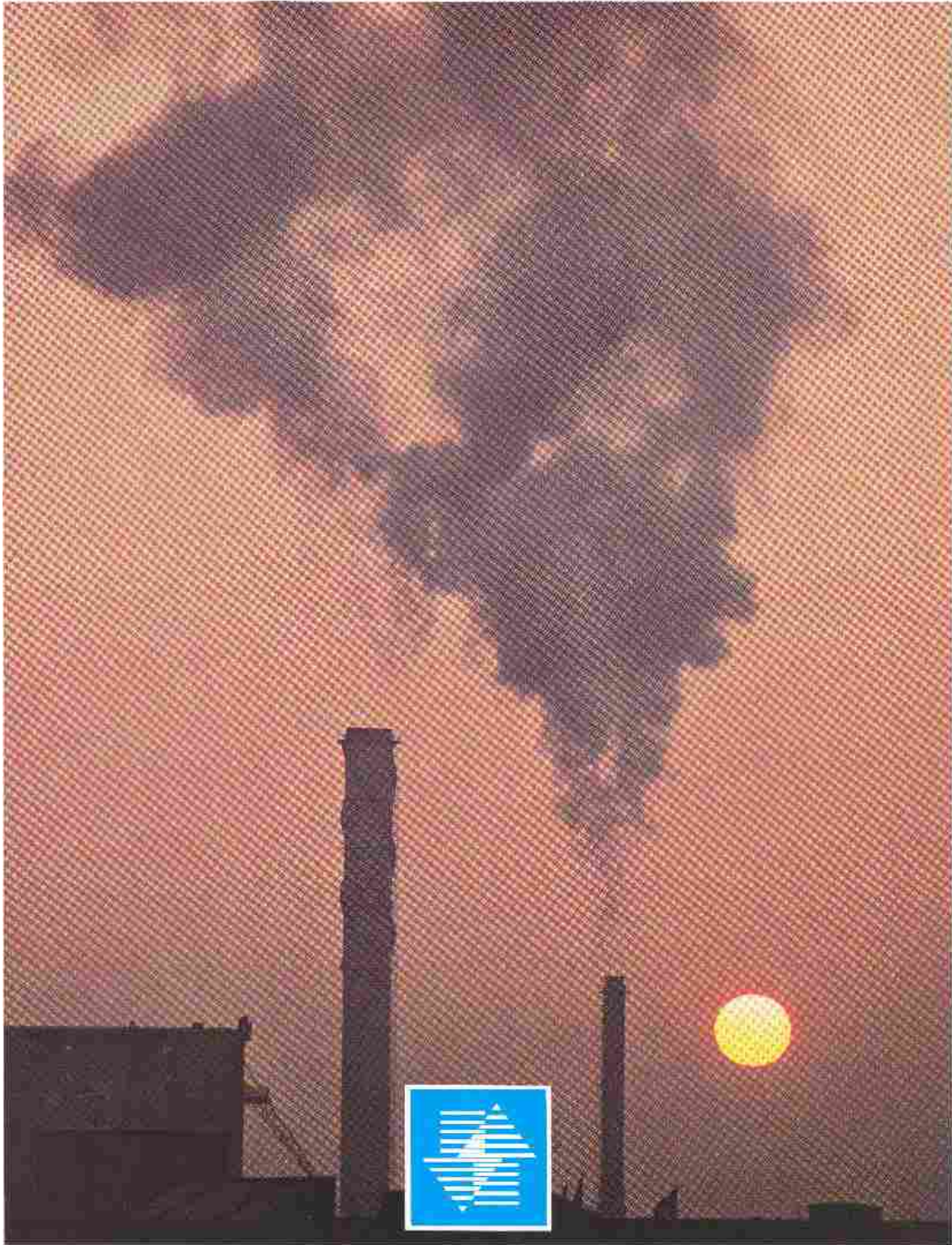


Save energy and keep your flue gases clean:

AIR FRÖHLICH **Flue Gas Desulphurization System!**



AIR FRÖHLICH

FUMEX[®] - Flue Gas Desulphurization System

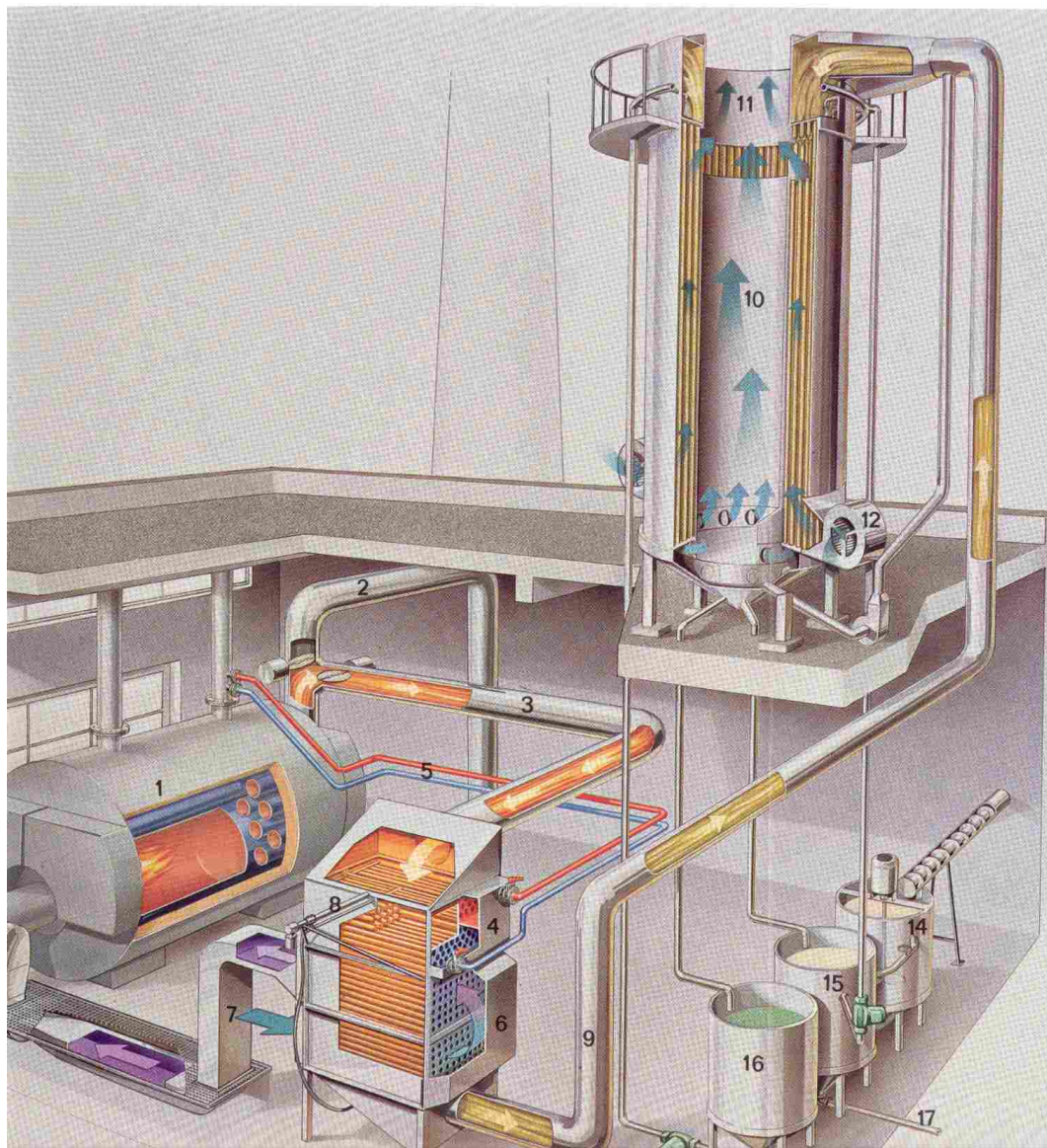
FUMEX - the skillfully designed system for flue gas desulphurization

The AIR FRÖHLICH FUMEX system allows a highly energy efficient utilization of the heat of exhaust gases generated through cooling, required by flue gas scrubbers. Flue gases from any firing equipment first flow through an acid resisting heat recovery section which is equipped with an efficient cleaning system. The entire heat extracted from the flue gases is fully reutilized. This leads to considerable energy savings in the boiler itself, or in any other heating process.

The cooled flue gases are then conducted to the FUMEX condensate gas scrubber, where they are cleaned of noxious matters, particularly of SO₂, SO₃, chlorides, fluorides, dust etc. This is done by a wet process involving the addition of neutralizing agents, such as, lime suspensions or caustic soda.

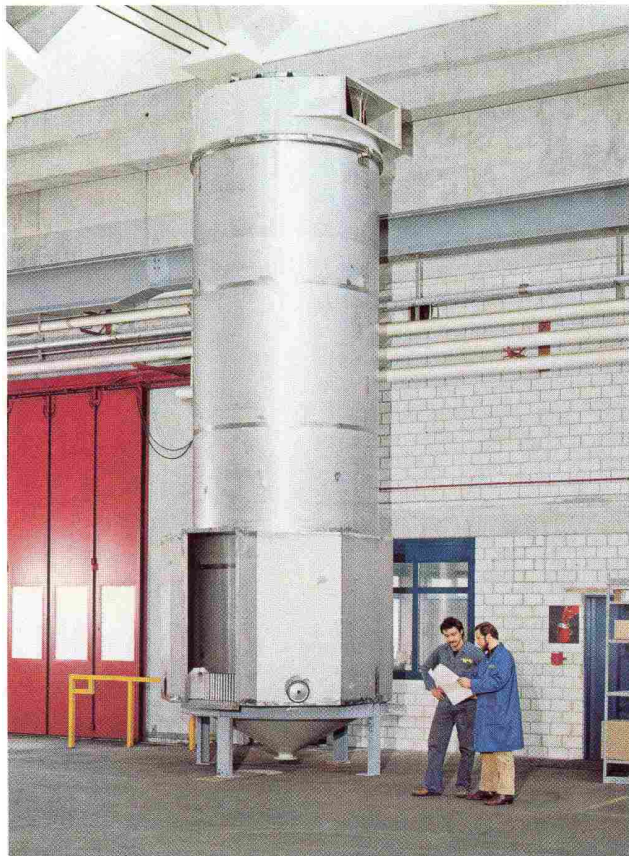
The scrubbed flue gases are at the same time condensed in a bundle of tubes by the secondary air cooling. The thus heated secondary air is mixed with the purified and cooled flue gases. The pure gas can hence be led off without causing any cloud formation, mostly without an additional flue gas stack. Preventing sedimentation (incrustation) in the entire system through variable modes of operation, the patented multistage design warrants reliable and trouble-free performance.

The waste products are processed into ecologically compatible forms, so that they may either be safely disposed of, or recycled.



- 1) Boiler/Firing process
- 2) Flue gas duct to chimney
- 3) Flue gas duct to heat exchanger
- 4) Flue gas/water heat exchanger
- 5) Heat recovery for hot water
- 6) Flue gas/air heat exchanger
- 7) Heat recovery for combustion air
- 8) Heat exchanger cleaning system
- 9) Cooled flue gas to FUMEX
- 10) FUMEX condensate gas scrubber
- 11) Mixing zone for pure gas/secondary air
- 12) Secondary air blower
- 13) Container for neutralizing agent
- 14) Processing of neutralizing agent
- 15) Neutralization cycle
- 16) Acid cycle
- 17) To disposal

FUMEX[®] - economical and reliable



FUMEX condensate gas scrubber being assembled at the AIR FRÖHLICH Works in Arbon/Switzerland

Flue gas desulphurization is economical

The recovery of energy present in flue gases, on the one hand, and the possible use of cheaper fuel (containing more noxious elements), on the other, are two interesting economic components of the FUMEX system. The total saving of fuel costs that can be realized often allows redemption of the flue gas treatment plant within a few years. When namely working with lime suspensions, the operating costs of the FUMEX system are so low that they are practically negligible in comparison with the attainable saving of costs.

Field-proven

The AIR FRÖHLICH FUMEX system is particularly suitable for application in district heating plants and for industrial boilers and furnaces with a heating capacity of 5-100 MW. Several plants are already being successfully operated in various countries, such as Denmark, the Federal Republic of Germany, USA, Switzerland etc. to remove sulfur and other noxious elements from flue gases produced by heavy oil and coal firing plants. High economy, low maintenance expenses, operating safety, and high extraction rates of noxious elements have been demonstrated in practice and confirmed in various reports.

Achieved extraction rates

The high extraction rates of noxious elements is substantiated by series of measurements carried out on installed plants:

Extraction rate for SO_x: 85-95%

Extraction of fluorides/ chlorides/ organic odorous substances/solids: 50 to over 90%.

A heavy oil or coal firing plant, equipped with the FUMEX system thus emits considerably less noxious matters than does a conventional firing with, for example, fuel oil EL.

AIR FRÖHLICH - your reliable partner

AIR FRÖHLICH has decades of experience in planning and construction of equipment for recovery of heat from exhaust air and flue gases. AIR FRÖHLICH plants are being successfully operated all over the world. The company employs its own technical specialists for planning and execution of such installations. The know how acquired world-wide is placed completely at the customer's disposal. The comprehensive experience gained from thousands of plants is an important component of a successful partnership. AIR FRÖHLICH Heat Exchangers and Flue Gas Treatment installations are manufactured in modern production facilities in Arbon, Switzerland, using special glass, high temperature resistant synthetics, stainless steel and various other high quality materials. Faultless AIR FRÖHLICH products are guaranteed by highly qualified development and construction teams, as well as by a qualified technical staff on the production site.



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