



Pollution Control from Lechler



Our aim is an improved environment...

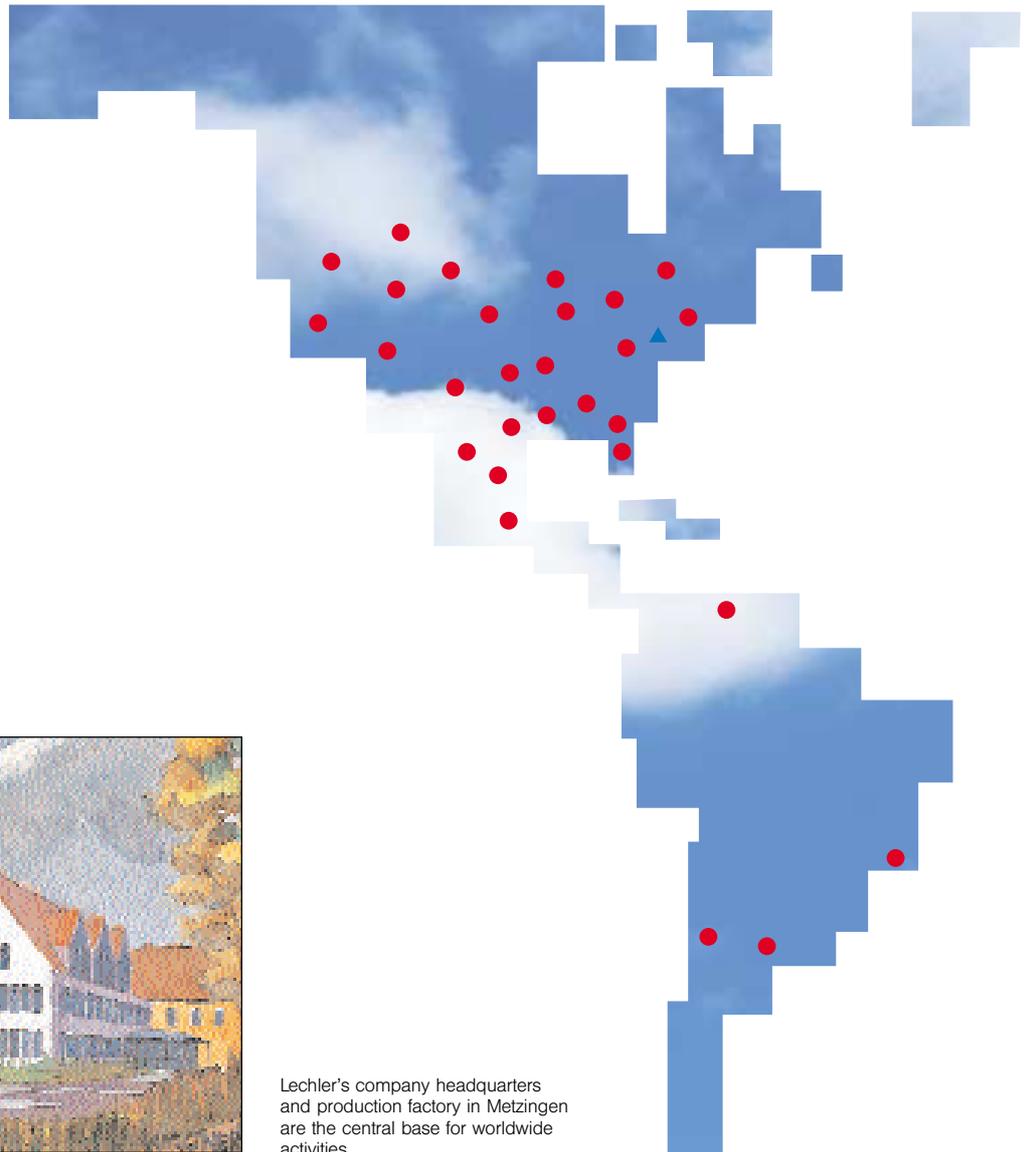
Competence is a combination of experience and commitment.

When it comes to effective protection of our environment, know-how, a sense of responsibility and commitment are imperative. Lechler fulfils all these requirements. Again and again, the company has proven willing and able to look beyond the bounds of the



fields of science in which it is involved and to develop new technologies. The Lechler company's worldwide reputation as a specialist for nozzle engineering goes back over more than 100 years. Lechler's remarkable knowledge and experience in this field is successfully applied in many areas of environmental engineering and technology. For flue-gas desulphurisation, for example, Lechler supplies special ceramic nozzles and high-performance droplet separators. Lechler established its Pollution Control division many years ago, with due regard to the fact that nozzles or nozzle systems are also employed in other areas of industrial gas treatment to wash out pollutants with the required efficiency. This division's international staff of

engineers and technicians is permanently concerned with evolving efficient solutions to problems in conjunction with the customers and opening up new areas of applications. The use of worldwide databases and cooperation with external specialist institutes provide just the type of interdisciplinary knowledge base which is required to solve the complex problems of today. Our partners include the renowned German and international plant construction companies. We supply many of these companies with components designed for optimum performance which integrate into their systems. Numerous production facilities in many parts of the world guarantee that close ties are maintained with our customers and provide the basis for international partnership.

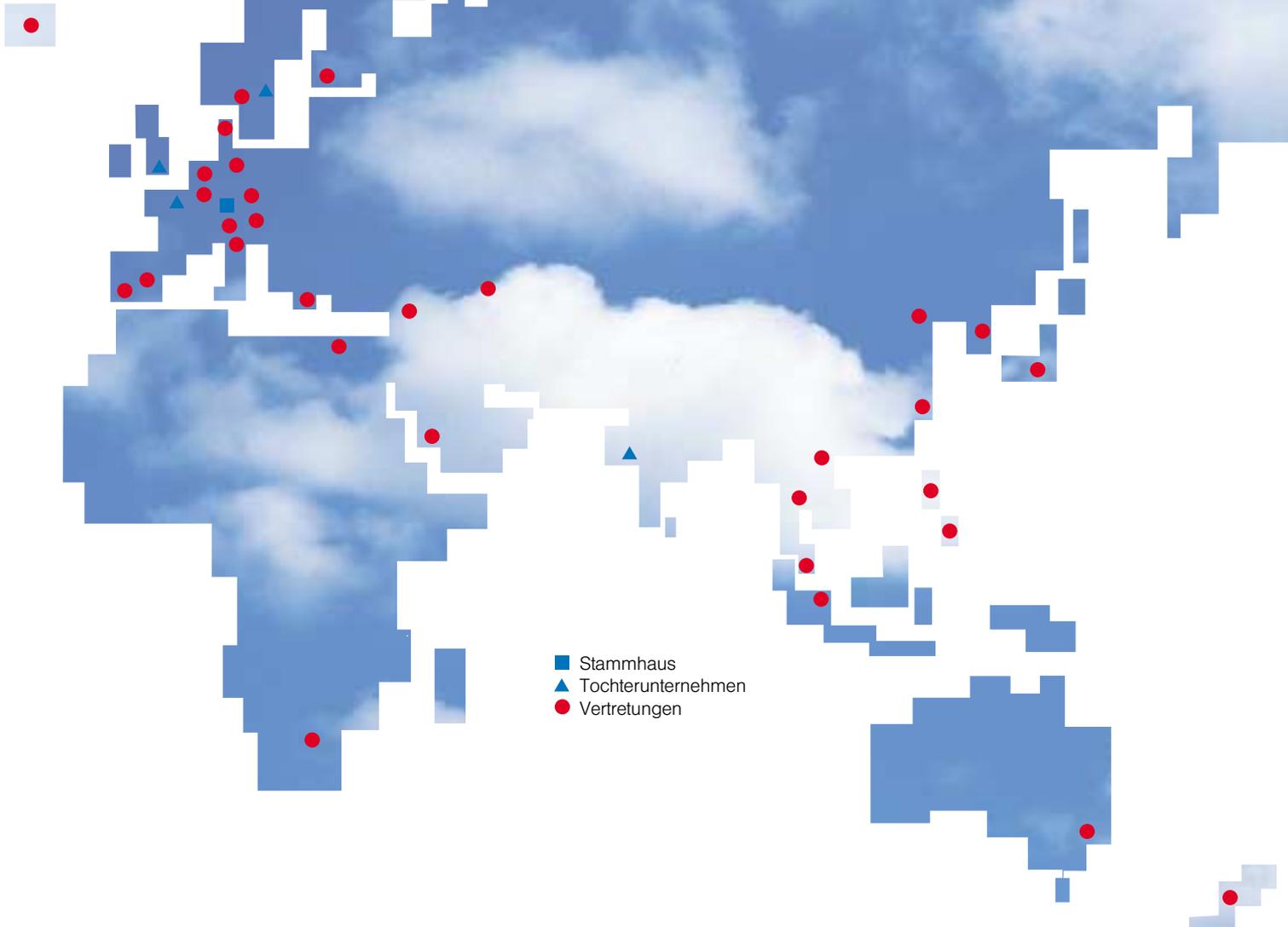


Lechler's company headquarters and production factory in Metzingen are the central base for worldwide activities.

Experts in helping companies meet environmental requirements. Lechler is committed to helping find the best solution.



... and here we offer you the most advanced technologies



Products that are all-important for clean air.

At the time of introduction of the wet flue-gas desulphurisation process in Germany, Lechler carried out pioneering work in its capacity as a partner to the plant construction companies. The fruits of this work were nozzles in highly wear-resistant and corrosion-proof silicon carbide which took due account of the very highest operational requirements (e.g. optimal droplet spectrum).

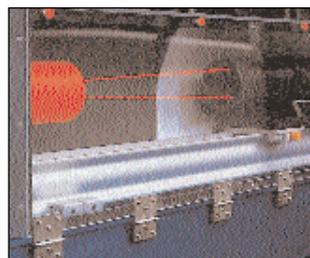
A company which knows so much about the development and generation of droplets is, of course, all the better equipped to provide the best droplet-separating facilities. The product line of droplet separators has thus been adopted into

the company's product range. In introducing this line, Lechler has responded to the wish voiced by many customers to have all components which have a decisive influence on the efficiency and functional safety of a plant supplied by one and the same company. This ensures the optimum configuration of the components and the complete integration of all relevant parameters.

The Pollution Control division now embraces the product groups FGD nozzles, nozzle lances, droplet separators and mist eliminators.



Research and development play a central role at Lechler.



State-of-the-art testing facilities guarantee superior quality and optimum efficiency.

Special Nozzles for wet flue-gas desulphurisation

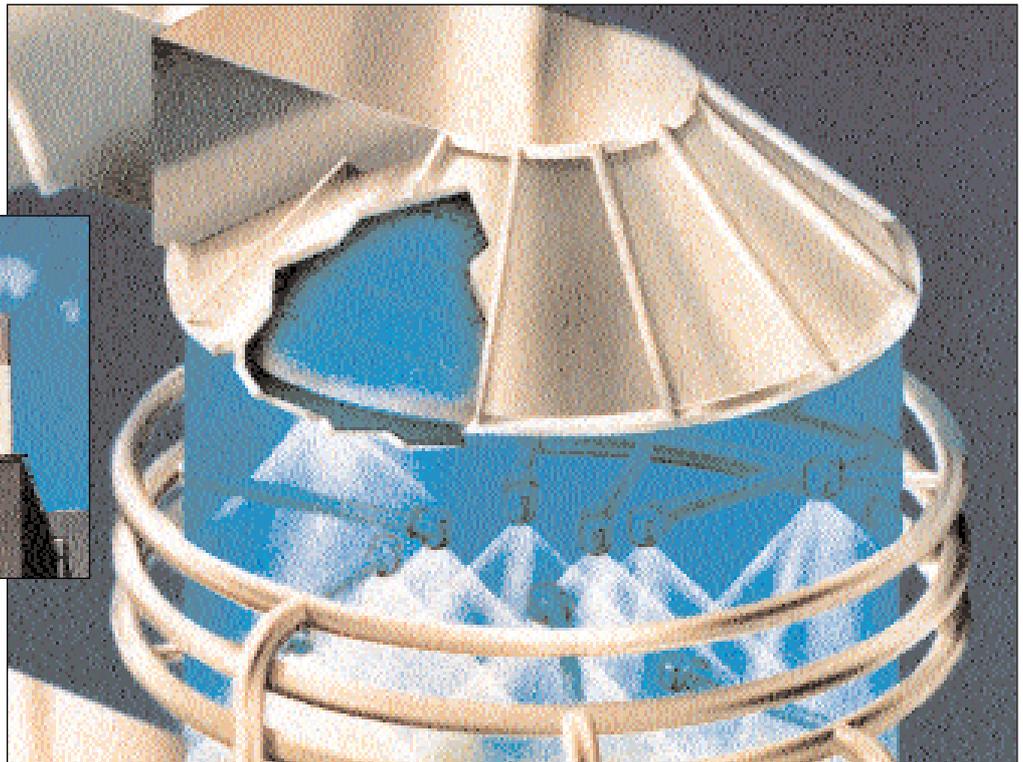
Maximum precision under the most extreme conditions.

Emissions from industrial plants, power stations and refuse incineration plants



represent a serious source of pollution. As a result of the increasing awareness of this problem area and more stringent statutory requirements, every operator of such a plant is today required to undertake extensive measures to minimize air pollution. Effective flue-gas desulphurisation plays a central role here.

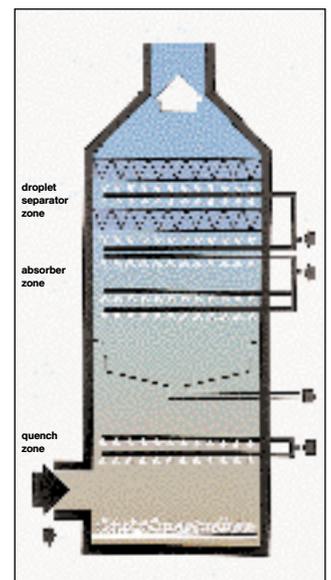
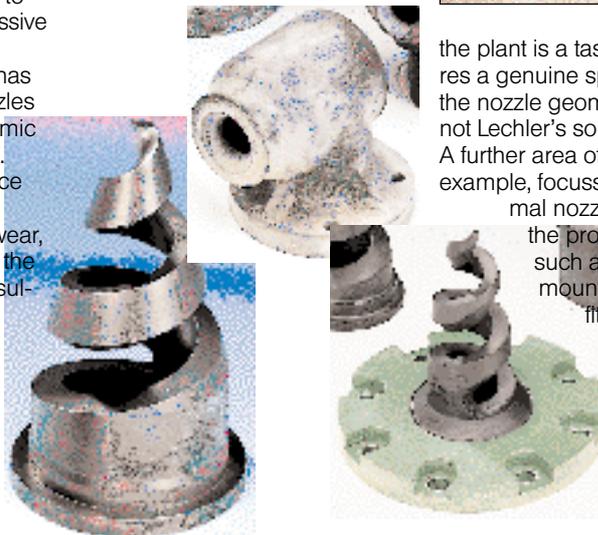
The flue-gas desulphurisation process requires nozzles which guarantee precise functioning over prolonged periods and are also able to withstand extremely aggressive environmental conditions. For this purpose, Lechler has developed atomizing nozzles in one of the hardest ceramic materials - silicon carbide. These nozzles attain service lives of 30,000 operating hours without significant wear, and represent the state of the art today in the field of desulphurisation engineering.



The range of nozzle types which Lechler produces in this high-performance material includes full cone, hollow cone and spiral nozzles, even in the most difficult nozzle geometries. Exact configuration of the nozzle geometry in accordance with the functional data of



the plant is a task which requires a genuine specialist. But the nozzle geometry is not Lechler's sole concern. A further area of work, for example, focusses on the optimal nozzle mounting for the process involved, such as special flange mountings for certain fitting situations.



Lechler offers the right solution for every problem – developed by specialists and produced with state-of-the-art technology.

VarioCool® Systems and Nozzle Lances for efficient gas conditioning

The right technology for every application.

Lechler offers the full range: from nozzle lances up to complete gas conditioning systems VarioCool®, including pumps, regulation units and electronic controls. As the only manufacturer worldwide Lechler supplies gas conditioning systems equipped with spillback nozzle lances as well as twin fluid nozzle lances.

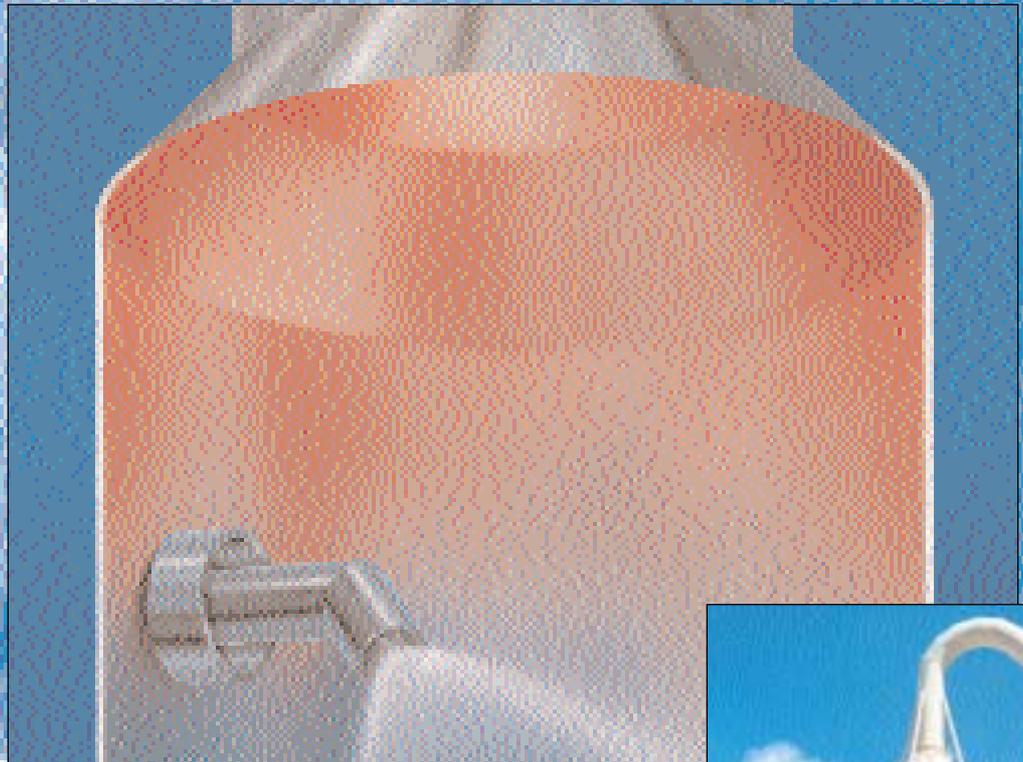
The „coupled with the engineers“ experience gained through numerous installations worldwide, enables tailor-made solutions to be designed and implemented.



A primary prerequisite for gas conditioning is the capability to generate extremely fine droplets and to distribute these as evenly as possible in the gas flow. The nozzle lances employed for this purpose must be configured in accordance with the precise requirements of the plant concerned.

Here again, Lechler is able to offer a broad range of equipment with different modes of functioning and different characteristics. These lances are the result of many years of development work, using state-of-the-art design and simulation processes and facilities.

A fundamental distinction is made between two types of droplet generation: pneumatic



atomisation with compressed air (twin-fluid nozzle lances) and pressure atomisation (airless process, spill-back nozzle lances).

Twin-fluid nozzle lances from Lechler are available in two variants – with internal or external mixing of gas and fluid.

The range of applications includes NOx control, dedusting humidification, spray drying or spray absorption for example. Lechler deploys spill-back nozzle lances to fulfil the specific requirements of processes which are subject to a constantly fluctuating gas volume and changing gas temperatures.

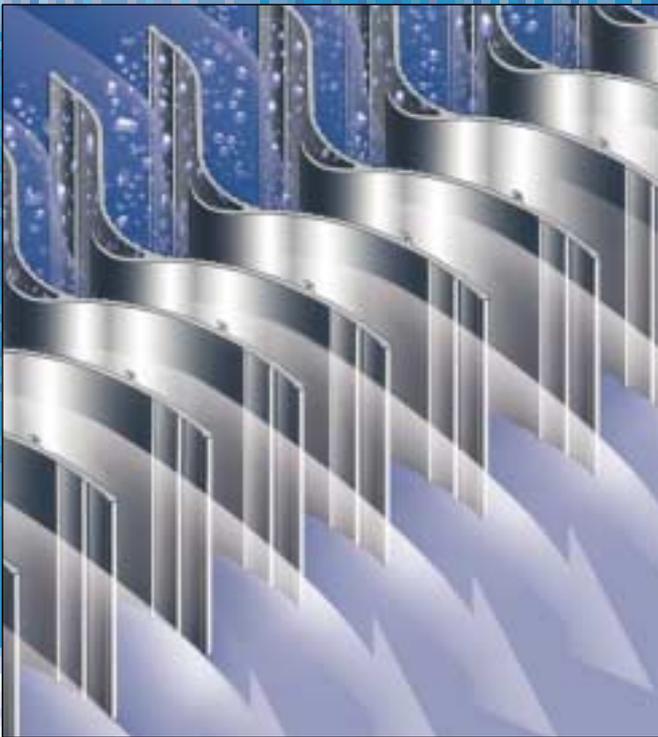


Typical applications are production processes in the cement industry, refuse incineration plants, LD converters or glass manufacturing industries.

Spill-back nozzle lances permit a constant fluid pressure and thus guarantee atomisation of uniform fineness over a broad volumetric flow range.



Droplet Separators for horizontal and vertical gas flow

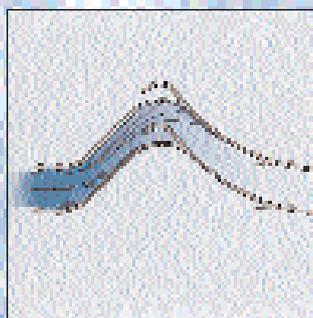


Vane-type separators tailor-made to your specifications.

High-performance droplet separators are employed to ensure that the pollutants which have been washed out of the flue gas are effectively separated with the droplets and not released into the environment.

Vane-type droplet separators from Lechler have been developed in close co-operation with users and scientific institutes. They are deployed whenever droplets require to be separated from the gas flow in a reliable manner.

Vane-type separators from Lechler have become firmly established components in the field of pollution control. They are used in conjunction with flue-gas desulphurisation plants and are to be found in the chemical and woodpulp industries, and as an integra-



Deposition of droplets with horizontal gas flow.

ted functional element for cooling towers and evaporative condensers.

Each of these fields of application has its own individual requirements. Vane-type droplet separators from Lechler are thus tailor-made to meet the specific requirements of each plant. Extensive specialist knowledge is required to this end – on the precise process involved in the gene-

ration of droplets and the movement of droplets in a gas flow, for example. A thorough understanding of the occurrence and behaviour of droplets in the industrial process concerned is also necessary.

On the basis of pioneering research, Lechler has been able to develop various methods for separating contaminated droplets within a gas flow, whereby a basic distinction is made between separators with horizontal or vertical gas flow.

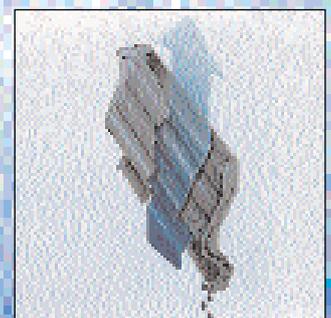
Each method possesses its own special features and advantages. The exactly defined profile of the baffle vanes and the vane spacing additionally influence the attainable separating capacity. In these areas too, Lechler proceeds according to scien-

tific methods in order to find the optimal concept which is fully in line with the technical and design requirements of the application on hand.

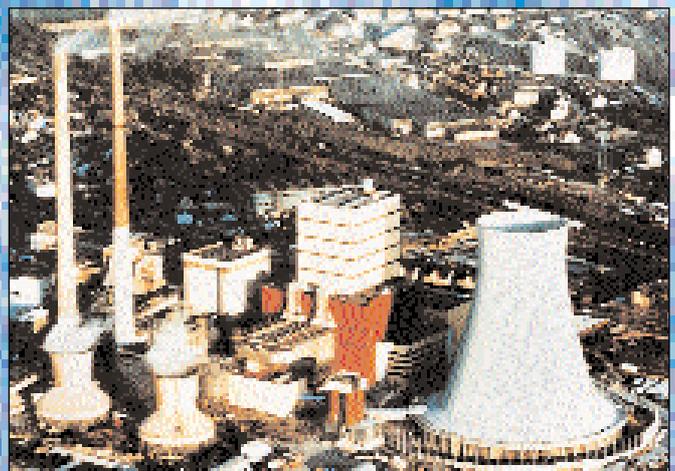
Vane-type droplet separators from Lechler can be produced in the most diverse range of shapes and are available in special steel, plastic or aluminium. They are supplied as component units ready for installation or as individual vanes.



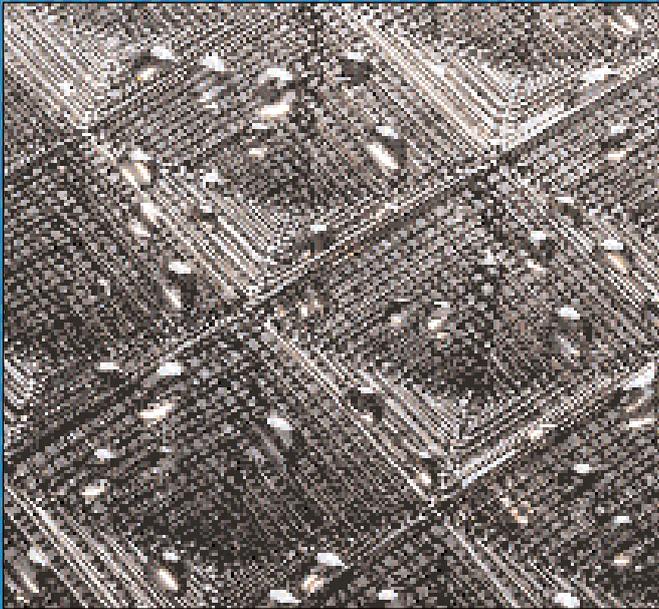
Functional principle of horizontal separation.



Functional principle of vertical separation.



Aerosol Separation Systems



Fibre pack with regulated structure

Under special conditions it can be necessary to separate droplets which are much smaller than the limit drop size of a vane-type separator. In those cases fibre packs with regulated or unregulated structure are used as aerosol separator or as aerosol agglomerator in combination with vane-type separators.

For horizontal gas flow: Agglomerator and vane-type separator

This combination of a fibre pack agglomerator in the first stage and a vane-type separator at the second stage offers special advantages. The high allowable gas velocity of the vane-type separator results in smaller flow areas. A single aerosol separator would not be able to handle this high gas velocity as a stand alone system. The aerosol separator catches the high speed droplets and guides them to the vane-type separator as agglomerated larger drops.

For vertical gas flow: Vane-type separator and aerosol separator

For vertical gas flow Lechler uses a vane-type separator as the first and an aerosol separator as the second stage. This combination has a higher separation performance as the single components alone. For example the sensitivity of aerosol (fibre pack) separators faced with a high water content is quite unproblematic

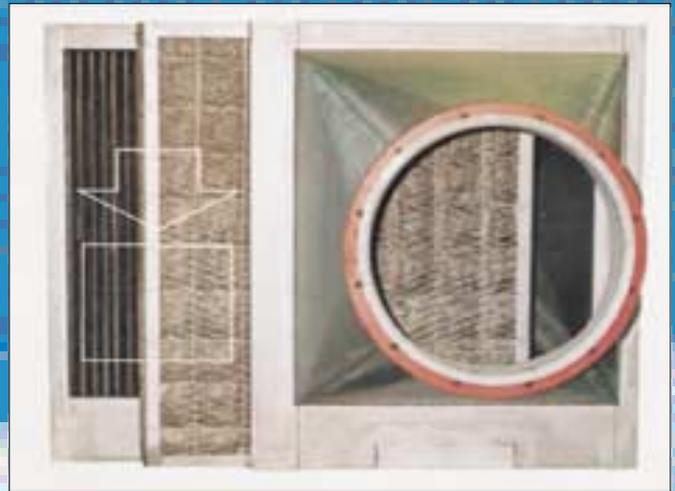
in this combination. The first stage of a vane-type separator removes the largest droplets before they can reach the aerosol separator. The aerosol separator can then be used with much higher gas velocities as it is possible in a stand alone situation. This results in very high separation efficiencies even for the finest drop sizes.

Lechler delivers this separation concept in pre-fab units

with the type nomenclature »Demisec«, for mounting on your support systems. When covering larger areas, the units can be connected with each other.

Lechler is able to deliver the described separation systems in various materials and combinations.

This offers a wide working spectrum and the possibility of the system adaption to the actual demands.



Horizontal gas flow: vane-type separator with agglomerator



Vertical gas flow: Demisec



Lechler GmbH
 Precisions Nozzles · Droplet Separators
 P.O. Box 1323
 D - 72544 Metzingen / Germany
 Telephone (0 71 23) 962-0
 Telefax (0 71 23) 962-301



Lechler is your competent partner when it comes to exhaust-air cleaning and gas conditioning plants. Know-how from over 100 years of experience is available to all companies which manufacture or operate such plants.

Don't settle for less than the best when it comes to protecting the environment. Consult with the specialists from Lechler for the best application of nozzles, nozzle lances or droplet separators. A series of brochures is available to provide you with an initial insight. These brochures contain the comprehensive data and performance specifications which you will require in planning and maintaining your plant.

Lechler Ltd.
 1 Fell Street, Newhall
 Sheffield, S9 2TP
 Great Britain
 Phone: (01 14) 2 49 20 20
 Fax: (01 14) 2 49 36 00
 E-mail: info@lechler.com

Lechler Inc.
 445 Kautz Road
 St. Charles, IL. 60174
 USA
 Phone: (630) 3 77 66 11
 Fax: (630) 3 77 66 57
 E-mail:
 GeneralMgr@lechlerUSA.com

Lechler France, S.A.
 Immeuble CAP2 C51
 66-72, Rue Marceau
 93558 Montreuil, France
 Phone: (1) 49 88 26 00
 Fax: (1) 49 88 26 09
 E-mail: info@lechler.fr

Lechler AB
 Box 158
 68324 Hagfors
 Sweden
 Phone: (46) 56 32 55 70
 Fax: (46) 56 32 55 71
 E-mail: info@lechler.se

Lechler S.A./N.V.
 Avenue Mercatorlaan, 6
 1300 Wavre, Belgium
 Phone: (10) 22 50 22
 Fax: (10) 24 39 01
 E-mail: lechler@skynet.be

Lechler S.A.
 Avda. Somosierra,
 12 dcha., 1º G
 28700 San Sebastián de
 los Reyes (Madrid), Spain
 Phone: (34) 91 658 63 46
 Fax: (34) 91 658 63 47
 E-Mail: info@lechler.es

Lechler (India) Pvt. Ltd.
 Plot # A-109 · Road # 18
 Wagle Industrial Estate
 Thane-400 604, India
 Phone: (22) 5 82 11 96
 Fax: (22) 5 82 12 62
 E-mail:
 lechler@lechlerindia.com

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- Nozzles for flue-gas desulphuration**
- VarioCool®**
- Twin Fluid Nozzle Lances**
- Spill-back Nozzle Lances**
- Droplet Separators**