



ENVIRONMENTAL REPORT 1998

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THIS IS PERSTORP

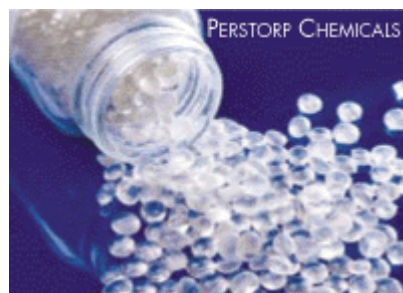
THE PERSTORP GROUP

Perstorp is a shareholder-oriented, global group that focuses on growth, profitability and new business opportunities. It is a world leader in segments of the markets for specialty chemicals, biochemicals, laminate flooring and other surface materials. The Group has annual sales of about SEK 11 billion, with 6 000 employees. Perstorp shares are listed on the Stockholm and London stock exchanges.

PERSTORP CHEMICALS

Perstorp Chemicals is a leading global producer of specialized chemical products for industrial customers. The division includes the operations of the Specialty Chemicals, Chemitec and Construction Chemicals business units.

For many years, the division has had the highest level of profitability within the Group and maintained strong positions in the global market. The development of new products and geographic expansion are important components in the strategy established for polyols, formalin technology, thermosets, resins, composites and construction chemicals.

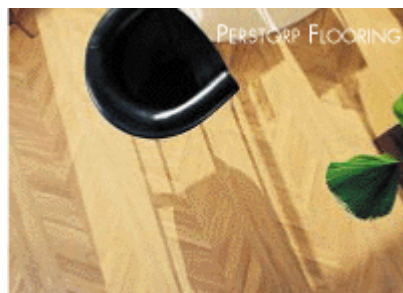


PERSTORP FLOORING

Perstorp Flooring is a world-leading producer of laminate flooring for residences and institutional environments.

The bulk of sales are in Europe and the U.S., where the Pergo® brand holds a strong position, and to a lesser degree, products are sold in parts of Asia and South America.

The laminate flooring concept was developed by the Group and is based on Perstorp's many years of experience with chemicals and surfaces. Since its launch, laminate flooring has rapidly attained a not insignificant share of the flooring market on both sides of the Atlantic.



SURFACE MATERIALS

Perstorp Surface Materials is one of the world's leading manufacturers of paper-based decorative surfaces. The division produces a quality range of decorative laminates, decorative foils and printed paper and is being developed into a surface materials company that can deliver complete surface solutions within well-defined areas of application.

The division's customers mainly operate within the furniture and construction-related industries in Europe, South and North America and Asia.

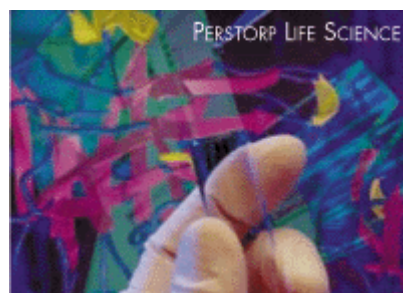


PERSTORP LIFE SCIENCE

Perstorp Life Science operates in the fields of biotechnology and medical technology - two areas characterized by strong growth and intensive research and development.

The division is a leading supplier of media and instruments for process optimization in biopharmaceutical production, as well as biochemicals, reagents and methods to increase speed and safety in the area of biotechnology research.

The division holds strong positions in the area of medical technology, particularly regarding aids and implants for ENT treatment. Perstorp's Board of Directors proposes that Perstorp Life Science be listed on the stock exchange and be spun off to Perstorp shareholders in autumn 1999.



WORDS FROM THE CEO, 1998

Continuous improvement is the motto for the safety, health and environment work of the Perstorp Group. We must never rest on our laurels, but always strive for risk minimization, improved efficiency and higher resource utilization. It is not enough to focus only on our processes. We must also incorporate environmental concerns right from the drawing board, in the product development stage and in our dialogues with suppliers and customers. Doing things right the first time is another goal of our work for safety, health and the environment.



The products and know-how of the Perstorp Group are sold to customers all over the world. It is increasingly important for us to remain competitive by staying ahead at all times. More and more of our customers are demanding qualified information on the environmental performance of our products. This calls for continued efforts to make life-cycle assessments (LCAs) of the Group's products. This method was introduced in the Perstorp Group in the middle of the 90s.

Environmental management systems are being implemented throughout the Perstorp Group. Being ahead of the crowd to gain certification for our environmental management system still gives us a competitive advantage. But this head start will last only for a few years. We must continue our proactive work in safety, health and the environment. Our products, our know-how and our service must be environmentally adapted and contribute to a more resource-efficient society.

The 1998 environmental report is being published on the Internet and should be seen as a complement to the environmental information presented in the annual financial report of the Perstorp Group. We hope that this publication will promote a dialogue on important issues related to safety, health and the environment.

A handwritten signature in black ink, appearing to read 'Åke Fredriksson'.

Åke Fredriksson
President and CEO

CORPORATE POLICY FOR SAFETY, HEALTH AND THE ENVIRONMENT

Perstorp's business operations are based on chemistry and materials technology applications, with production units in several countries. The Group prioritizes continuous improvement in the field of safety, health and the environment in order to achieve sustainable development. Important features of safety, health and environment (S.H.E.) work include emissions to air and water, the occurrence of waste and the handling of chemicals.

Perstorp strives for:

- A safe and sound working environment in which special priority is assigned to the physical and psychological health of employees. Personal development and commitment, stimulated through interesting work assignments, training and communications. Active cooperation with employees in S.H.E. issues.
- Continuous improvements of processes and products to prevent accidents and minimize their environmental impact. A closed-cycle approach and economization of natural resources shall be prioritized.
- High level of safety standards through risk analyses, preventive measures, emergency preparedness and a long-term technical approach.
- Effective management systems for S.H.E. issues through continuous improvements based on new objectives and action programs to attain high standards in the internal and external environment.
- Active research and development work that generates know-how for selections of raw materials, processes and transports to limit harmful impact on health and the environment.
- Fulfilling legislated requirements by a broad margin.
- Open and continuous communication with neighbors, authorities, customers, mass media and other stakeholders.
- Subjecting suppliers and subcontractors to the same rigorous demands in S.H.E. matters as those applied to the Perstorp Group as a whole.

This revised environmental policy applies to the entire Perstorp Group effective March 1, 1999. Perstorp's policy, objectives and work in the S.H.E. area are presented annually in the Group's environmental report on the Internet and in separate reports by various Group units.

VICE PRESIDENT - CORPORATE SAFETY, HEALTH & ENVIRONMENT



The overall S.H.E. objectives for the Perstorp Group have been the force behind the continued environmental work of 1998. In this work we have striven for a holistic view on environmental issues and increased cooperation and exchange of knowledge among the units of the Group.

During 1998 we reduced the emissions to water at the Perstorp site by replacing an old allylic ether plant with a new, modern one. In 1999 various process improvements will further decrease the emissions to water at the Perstorp site. At the Italian site, water-related emissions will decrease thanks to significant improvements in the local water treatment plant.

Emissions to air decreased during 1998. Moreover, decisions have been made to introduce gas cleaning devices at the Surface Materials facilities in Brazil and the UK.

The Group's emissions of cooling agents are still above the targeted levels, so additional self-monitoring and preventive measures will be required.

The overall level of waste is more or less constant, while the amount of hazardous waste has decreased and the amount of other waste has increased. Within the Chemicals Group, the amount of hazardous waste will be reduced in 1999 when an extraction facility for recycling phenols goes into operation at the UK plant. In the next two years efforts will be made to reduce the amounts of waste per unit produced. These reductions will mainly be achieved through process improvements and increased efficiency.

The number of occupational accidents in the Perstorp Group has remained more or less constant, with an LTI-value of 18 (LTI = Lost Time due to Injuries per one million working hours). Several working environment projects have been initiated in order to improve the working environment and to reduce the risk of work-related injuries.

In 1998, the facilities of the Chemicals Division in Sweden achieved certification in accordance with ISO 14001. The objective to implement the S.H.E. management system at all facilities by the end of the year 2000 remains.

A handwritten signature in black ink, appearing to read 'Jan Petersson'.

Jan Petersson
Vice President, Corporate S.H.E.

PERSTORP'S S.H.E. OBJECTIVES

Compared with 1997 levels, the following objectives must be achieved by the end of the year 2000.

Perstorp Chemicals

- Air emissions must be reduced by 10%
The objective has been achieved and efforts for further decreases are continuing.
- Leakage of coolants (CFC/HCFC) must be reduced to less than 4% of the installed amount
- Hazardous waste (excluding methanol) must be reduced by 25%
- Other waste (excluding mother lyes) must be reduced by 10%
The objective has been fulfilled and efforts for further decreases are continuing.
- The number of work-related injuries resulting in absence from work must be reduced by 25%
- The S.H.E. management system must be implemented at all units
Of the remaining units, six will receive certification in 1999 and the remaining eight during 2000. In total, Chemicals has 22 units covered by the management system.

Perstorp Flooring

- Leakage of coolants (CFC/HCFC) must be reduced to less than 4% of the installed amount
The objective has been fulfilled and efforts for further decreases are continuing.
- The amount of non-hazardous waste per unit of flooring must be reduced to <0.12 kg/kg of flooring.
- The number of work-related injuries resulting in absence from work must be reduced by 25%
- The S.H.E. management system must be implemented at all units
Flooring's units in Perstorp and Trelleborg have introduced the management system.

Surface Materials

- Emissions to the air must be reduced by 50% compared with 1997.
- Leakage of CFC/HCFC coolants must be reduced to less than 4% of the installed amount
- Hazardous waste and other waste must be reduced per surface unit to the following levels:
- Hazardous waste g/kg: <9.7
- Other waste g/kg: <140
- The number of work-related injuries resulting in absence from work must be reduced by 25%
- The S.H.E. management system must be implemented at all units

Perstorp Life Science and other operations

- The S.H.E. management system must be implemented at all units

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CORPORATE SUMMARY



Safety, health and environment are prioritized areas within the Perstorp Group, and active environmental work is seen as a prerequisite for running the business in a responsible way. Consequently, the Group strives for continuous improvements towards its established goals and sustainable development.

Changes during the Year

- Acquisition of the Metalurgica Albrãs Ltd. in São Paulo, Brazil. Their business areas are decorative papers and foils.
- Acquisition of the Amersham Pharmacia Biotech facility in Milwaukee, Wisconsin, USA. This facility produces molecular biological reagents and raw materials for the production of DNA.
- Acquisition of the Selborne Biological Services business in New Zealand. They manufacture high quality serum for cell cultivation.
- Acquisition of new technology in chemiluminescence, used to detect proteins.
- Acquisition of a product line in the area of voice filters for victims of larynx cancer.
- Divestment of National Plastics Corporation in Port Gibson, Mississippi, USA.
- Divestment of R-Cube Composites Inc. in West Jordan, Utah, USA.
- Divestment of Contronic Development Inc.
- Divestment of Perstorp Plastic Systems.
- Divestment of remaining minority share in Collins & Aikman Holding Inc.

Contacts with Authorities

The Perstorp Group has production units in fifteen countries in Europe, North and South America and in Asia. In Sweden, Perstorp has about twenty operations for which special permits are required and valid permits are currently held for the production of, for example, polyalcohols, formalin, formic acid, resins, moulding compounds and flooring laminates. Moreover, there are two activities requiring notification to authorities: the manufacturing of laminated flooring and the production of medical-technical products.

At the end of the fiscal year, applications for operating permits in Sweden were transferred to the new Environmental Court. For the Perstorp Group, this transfer affected applications for increased production capacity regarding neopentyl glycol, formic acid, flooring laminates and Remel. An application for the erection of a dendritic polymer plant in Perstorp was submitted at the end of 1998. Final emission permits for the Perstorp Group wastewater treatment plant in Perstorp, Sweden are expected in 1999.

Environmental Reports

In accordance with Swedish law, each unit produces an annual environmental report, which is approved by the authorities.

Environmental Awards

Pierce Chemical Company of Rockford, Illinois, USA, received the 1998 "Gold Award" for their achievements regarding wastewater. The Perstorp unit in Florence, Massachusetts, USA, was awarded for reducing the number of industrial injuries.

External Environmental Impact

Production activities within the Perstorp Group have an impact on the external environment mainly through emissions to air and water and through generation waste and noise. The consumption of natural resources should also be added to this picture. Many of the Perstorp Group environmental targets are therefore focused on these areas.

Emissions to Air

During 1998 the emissions to air were reduced compared to previous years. At the Perstorp Surface Materials site in Bürstadt, Germany, a new cleaning plant (swing-term) has been installed to reduce emissions to air. The catalyst plant in Perstorp has installed a wet-scrubber in order to reduce its emissions of ammonia and the Perstorp Flooring plant in Perstorp has connected another part of the production facilities to catalytic cleaning systems. The 1997 transition from oil to natural gas at the Brazilian sites meant lower emissions (e.g. of sulfur dioxide) to the atmosphere in 1998.

Cooling Agents

Leakage of cooling agents (e.g. CFCs and HCFCs) was reduced during 1998. The Corporate goal to limit leakage to 4% of the installed amount by the year 2000 has not yet been reached. However, work continued during the year to improve internal control and substitution of CFCs and HCFCs for HFCs.

Water

During the year, a new allylic ether plant (TMPDE) was built in Perstorp, Sweden. This has meant considerable reductions in emissions of organic compounds and salts to the Perstorp wastewater treatment plant. Also in Perstorp, the formic acid plant implemented process improvements and the resin plant installed a stripper column, further reducing the waterborne emissions to the wastewater treatment plant.

Waste

The amount of hazardous waste was reduced in 1998, while the amount of other waste increased marginally.

Soil

A study was made of the impact on soil of the penta plant in Perstorp and corrective and preventive measures were taken.

Noise

Several noise evaluations were performed, e.g. in Perstorp and Trelleborg, Sweden, and in Christchurch, England. During the year, noise-reduction measures were implemented at certain units.

Energy Conservation

A number of projects are currently underway to increase energy efficiency and energy conservation within the Perstorp Group.

Health and Working Environment

Within the current working environment program, a number of measures were taken to improve procedures and to actively develop preventive health care. In 1998, there were 614 (719 in 1997) reported work-related injuries in the Perstorp Group. Out of these, 168 (260) were serious enough to cause at least one day of sick-leave.

The Swedish Labour Inspectorate has pointed out some shortcomings of the Perstorp site, including health controls and registration of staff dealing with certain chemicals. The shortcomings have now been dealt with, but the case is being tried under the Working Environment Act.

Safety

New controlling and electrical devices, enabling safer operations, have been installed at the Penta plant in Castellanza, Italy. Perstorp Chemitec in Aycliffe, England, has installed sprinkler systems in the resin plant, a safety tank for the reactors and a new controlling system that will raise the safety level of the plant. Risk assessments have been completed at several Perstorp Group production units.

Fines, Complaints, Accidents

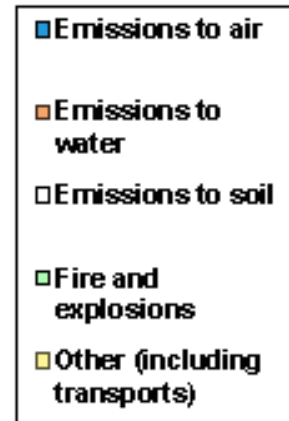
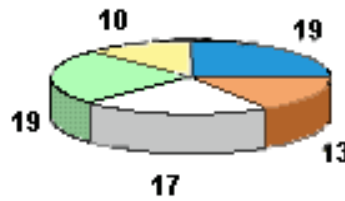
Two of the Group's units in USA were fined for exceeding limits on pH levels in their wastewater. The Belgian unit was obliged to pay small fines for having mixed hazardous waste with other waste.

Complaints from the general public were directed at two production units, in France and the USA respectively. The complaints focused on odours, dust and noise. Through local authorities, complaints from the public were also directed at the Perstorp site, where the perceived

problem was the outdoor storage of sodium formate in big-bags. There was also a complaint through regional authorities from a private citizen regarding odours from waste transport.

During 1998, there were 59 environmental accidents and 19 fires/explosions reported within the Perstorp Group. None of them was of a serious magnitude.

Environmental and fire-related incidents - Perstorp Group 1998



BRIEF ANALYSIS OF THE SURROUNDING WORLD

In Sweden, new environmental legislation went into effect on January 1, 1999, entailing more comprehensive demands for obtaining operating permits. There are also new environmental quality norms, environmental sanction fees, and extended liability for treatment of polluted soil. In addition, the general rules for showing consideration have been enacted as laws.

Within the European Union, the so-called Seveso II Directive goes into effect during 1999, with stricter demands on large-scale handling of chemicals and prevention of major accidents. The USA will also introduce stricter demands in this area in 1999.

Also within the EU, stricter environmental legislation (in the form of Integrated Pollution Prevention and Control / IPPC) is expected in 1999. Further, an EU Directive regarding Safety Advisors will go into effect in 2000. This Directive requires recruitment of a Safety Advisor at companies whose operations involve loading, transport or unloading of hazardous goods.



S.H.E. MANAGEMENT

Since 1994, the Perstorp Group has been working to introduce a management system for safety, health and environment - S.H.E. Management. The company has been performing internal environmental audits since 1989 and preliminary environmental review in connection with acquisitions since 1985.

S.H.E. Management is based on the international ISO 14001 standard in combination with the EU regulation EMAS (Eco Management and Audit Scheme). The system also incorporates the commitments made by the Perstorp Group through its participation in the chemical industry program Responsible Care, as well as the Business Charter for Sustainable Development of the International Chamber of Commerce. Swedish Safety at Work Act (internal controls of the working environment) are another of the pillars in the management system.

Since the start back in 1994, the system has been developed in cooperation with a number of "pilot study" plants in Sweden. The management system is continuously being changed and improved. The experience gains will now benefit the remaining units in the Perstorp Group as the focus is shifted from operations in Sweden to the Group units worldwide.

In 1998, Perstorp Polyols, together with the resin and moulding compounds plants of Perstorp Chemitec, all located in Perstorp, Sweden, were certified in accordance with ISO 14001. This means that 75 % of the activities in Perstorp have achieved ISO 14001 certifications and the remaining units are expected to be certified in 1999.

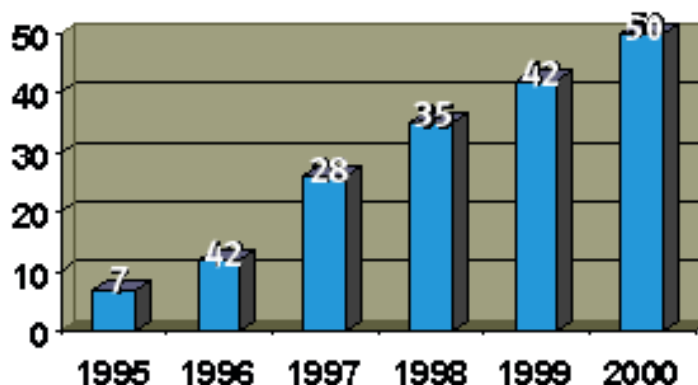
The implementation of the management system starts with the completion of an initial S.H.E. review at each unit. This means making a description of the present situation to identify and prioritize actions needed to implement S.H.E. Management. Since 1995 there have been 35 initial S.H.E. reviews. The remaining reviews will be conducted in 1999-2000, which means that all units in the Perstorp Group will have initiated the implementation of S.H.E. Management before the end of the year 2000.

In parallel with implementing S.H.E. Management, the Perstorp Group puts considerable effort into the training of employees.

Internal audits of the management system are conducted annually at already-certified units. Moreover, external auditors check the system twice a year.

The implementation of S.H.E. Management is an important Management Performance Indicator of the Perstorp Group.

Accumulated total S.H.E. preparatory reviews in the Perstorp Group with forecasts for 1999-2000



ISO 14001 Certified Units

Sweden

Perstorp Flooring, Trelleborg
Perstorp Flooring, Perstorp
Perstorp Chemitec, Perstorp (Resins and Moulding Compounds plants)
Perstorp Polyols, Perstorp (TMP, Penta, Neo, TMPDE and DiTMP plants)

Italy

Perstorp Polyols, Castellanza

Units expecting certification in 1999

Sweden

Perstorp Regeno, Perstorp
Perstorp Formox, Perstorp

USA

Perstorp Polyols, Toledo

United Kingdom

Perstorp Chemicals, Aycliffe
Perstorp Warerite, Aycliffe
Perstorp Unidur, Christchurch

France

Perstorp Chemitec, Brebières

During 1998, two plants belonging to Perstorp Chemitec of the Perstorp Chemicals Division were among those that achieved ISO 14001 certification.

Mrs Agneta Bosson-Hartwall,
S.H.E. manager of Chemitec, comments:

- Certification went swiftly and smoothly, largely thanks to the fact that environmental issues have for a long time been a natural part of the plant management. Moreover, the plant had an operational quality system in place, ISO 9001, which always facilitates the implementation of ISO 14001 since it is based on a similar structure.
- The Moulding Compounds plant in Perstorp followed a somewhat different scenario. There was also a quality system in place here, but S.H.E. work was focused on the working environment, so quite extensive documentation on the external environment had to be established.
- One important prerequisite for the successful implementation of S.H.E Management has been the clear and explicit commitment of top management. The implementation of S.H.E. Management has resulted in a sharper focus and a better structure regarding issues related to the external and working environments. This makes continuous improvement possible.

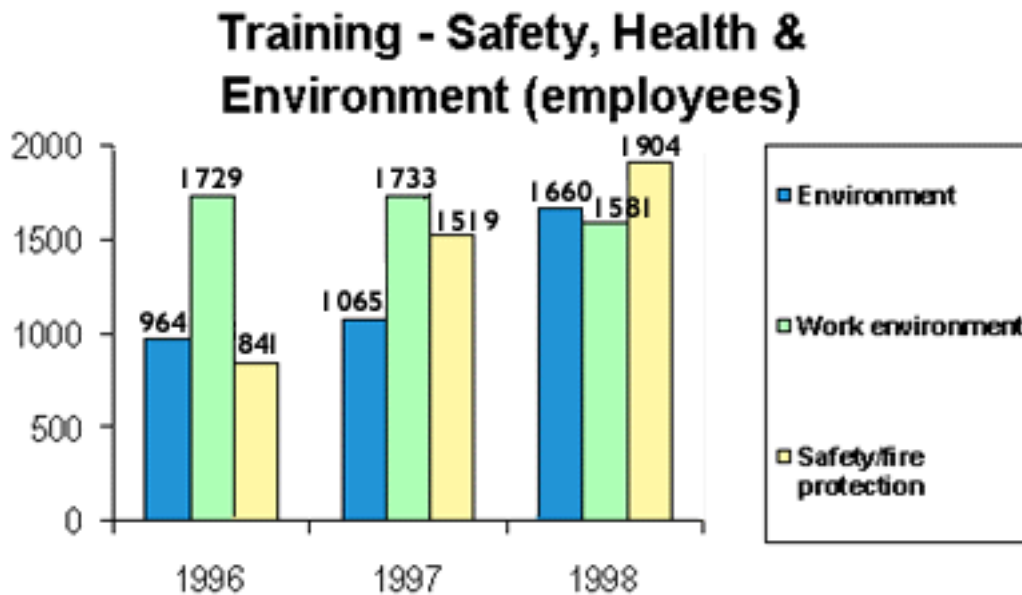


INFORMATION AND TRAINING

Information on Perstorp's environmental work is presented in voluntary environmental reports, annual financial reports, and through the press. Some units that submit annual environmental reports to the authorities, e.g. the units in Perstorp, Sweden, conduct active programs of press information in conjunction with publication of their reports.

Questions and complaints from the general public are received and dealt with according to procedures in the Corporate S.H.E. management system.

Employees are informed through training, internal work materials, the Corporate intranet (PlusNet) and newsletters.



GREENHOUSE EFFECT - INFLUENCE ON CLIMATE

The mechanism causing the greenhouse effect is believed to work as follows: The atmosphere lets through the short-wave radiation of the sun, but greenhouse gases prevent long-wave heat radiation, emitted from the Earth's surface, from returning to space. The greenhouse gases thereby risk disrupting the Earth's climate system by increasing the average global temperature.

The most important greenhouse gases are carbon dioxide, methane, dinitrogen oxide, sulfur hexafluoride, fluorocarbons and CFC/HCFC/HFCs. As carbon dioxide is emitted on such a large scale, it is considered to be the principal contributor to the greenhouse effect. Carbon dioxide is formed in the combustion and decomposition of organic matter. Fossil fuels such as oil, coal and natural gas add "new" carbon dioxide, formerly chemically bonded to the Earth's crust for millions of years, to the atmosphere. The carbon dioxide released by biofuels is already part of natural cycles and is therefore not considered to cause a net addition of the gas.

Carbon Dioxide - Perstorp Group 1998 (tons/year)

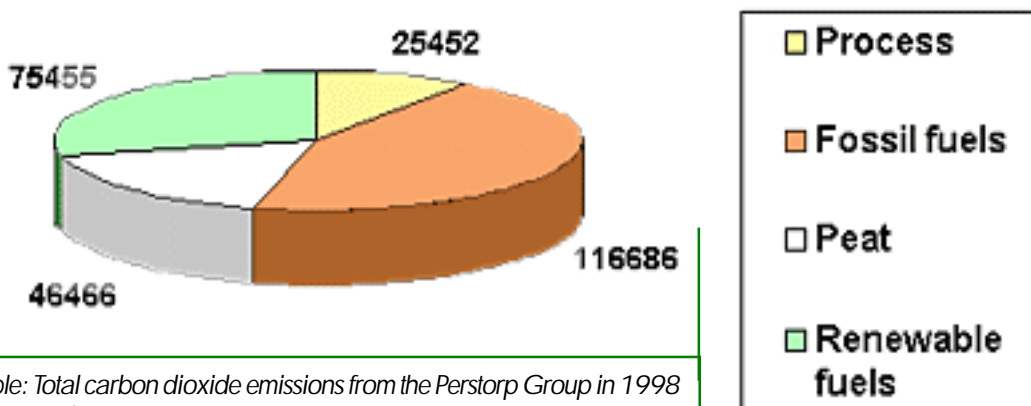


Table: Total carbon dioxide emissions from the Perstorp Group in 1998 (tons/year)

Perstorp's work to reduce its contribution to the greenhouse effect started several years ago. One important measure was to reduce the use of fossil fuels. Back in 1991 a new biofuel boiler was installed at the Perstorp unit, replacing a coal-fuelled facility. The biofuel boiler, together with oil-fuelled reserve boilers, supply some twenty plants in Perstorp with steam. This facility constitutes the single largest Corporate emission source of carbon dioxide. During 1998, the share of fossil carbon dioxide emissions from the units in Perstorp, Sweden was, however, less than 20% and came from the reserve boilers.

Work is underway to increase the efficiency of the Perstorp Group's energy use.

During 1998, the total Corporate carbon dioxide emissions increased somewhat, to 264 060 tons, compared to 263 380 tons in 1997. Carbon dioxide from transports is not included in these statistics.

Total emission of carbon dioxide and contribution to the greenhouse effect from the Perstorp Group 1998

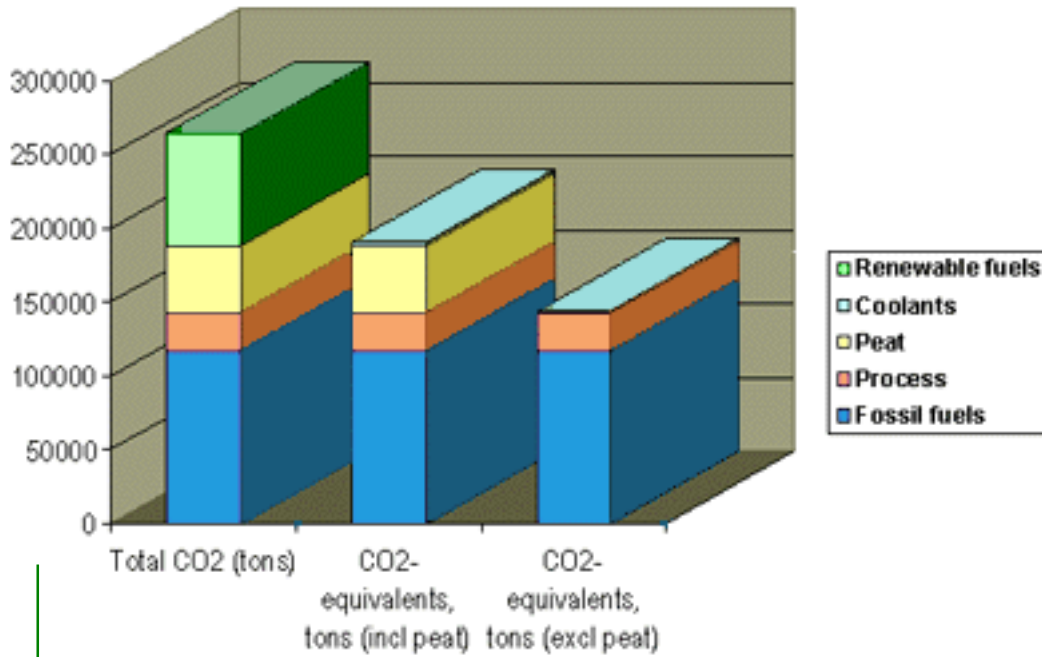
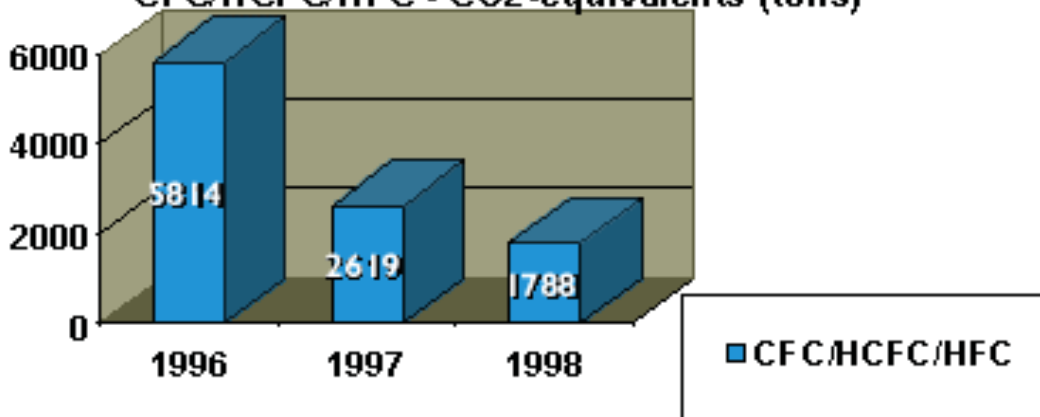


Table: Total carbon dioxide emissions (in tons) of the Perstorp Group in 1998 and contribution to climate change from carbon dioxide and cooling agents (CFC/HCFC/HFC), expressed as CO₂-equivalents using GWP (100) factors.

In addition to carbon dioxide, the Perstorp Group releases greenhouse gases like CFC/HCFC/HFC (see the separate "Ozone Layer" section).

Reduction in contribution to the greenhouse effect (Global Warming Potential/GWP) CFC/HCFC/HFC - CO2-equivalents (tons)



THE OZONE LAYER

Stratospheric ozone (O₃), formed by ultraviolet radiation from the sun, is essential to life on Earth, as the stratospheric ozone layer protects us from harmful levels of the sun's ultraviolet radiation.

Chlorofluorocarbons (CFCs) and hydrated chlorofluorocarbons (HCFCs) are assumed to operate as catalysts for the degradation of ozone in the upper atmosphere. It is believed that a stratospheric CFC molecule is split under the influence of UV-radiation and emits a free chlorine atom that in turn attacks an ozone molecule. Every chlorine atom can destroy about 10 000 ozone molecules. As a result, the ozone layer is degraded. Moreover, CFCs are stable compounds that can continue to do damage for a long time.

A thinner ozone layer can influence the conditions of life on Earth. For humans, this may lead to higher frequencies of skin cancer and cataracts. For animals, plant life and microorganisms, the balance between species may be shifted, favouring the ones more resistant to UV-radiation.

Within the Perstorp Group, CFCs and HCFCs are found in for example air-conditioning and cooling facilities. For several years there has been an ongoing effort to find substitutes for CFCs and HCFCs. Today, a number of Corporate units are totally CFC-free, as cooling agents are substituted and old equipment is replaced. At the same time, leak testing, maintenance and training efforts continue to be improved.

Within the Perstorp Group at the end of 1998, the installed amount of CFCs amounted to about 0.24 tons. This amount was distributed among facilities in the USA, New Zealand, Brazil and Thailand. During 1998, the total leakage of CFCs reached about 0.05 tons.

The installed amount of HCFCs in the Perstorp Group was about 5.47 tons and leakage amounted to 0.61 tons, i.e. about 11%. The leakage was primarily due to technical breakdowns at some units, resulting in non-recurrent emissions.

The installed amount of HFC within in the Perstorp Group was about 2.90 tons, with leakage of about 0.44 tons, i.e. about 15%. HFC is not considered to contribute to the depletion of the ozone layer.

Halons (another group of ozone depleting compounds) used to be used as fire extinguishing agents within the Group. All halons were phased out from the Swedish units by the end of 1997. Other parts of the Perstorp Group still use 0.086 tons of Halon 1211.

Coolant leakage to the air - Perstorp Group (tons/year)

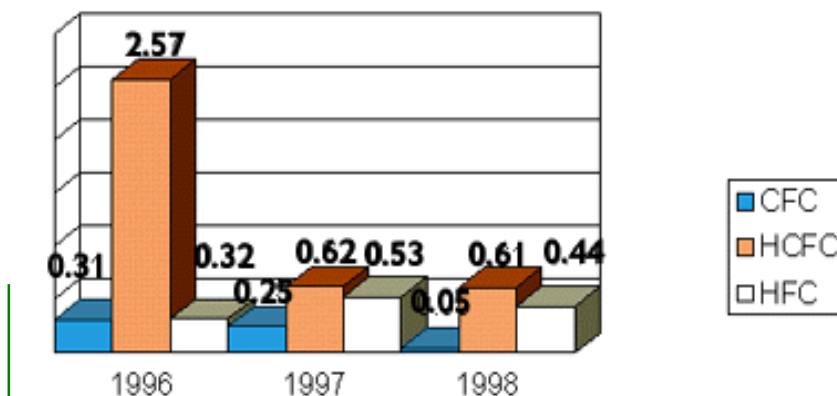


Table: Leakage of CFC/HCFC/HFC to the atmosphere from the Perstorp Group (tons/year)

Leakage of CFCs in the Perstorp Group 1998 (kg/year)

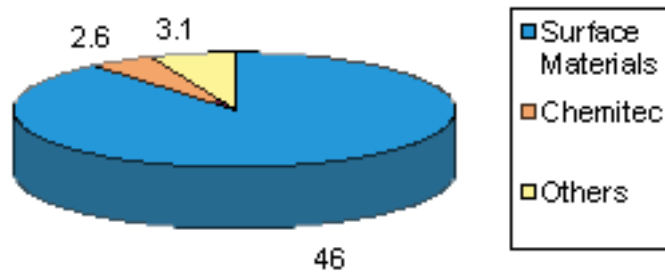


Table: Distribution of CFC leakage to the atmosphere from the Perstorp Group in 1998 (kg/year)

Leakage of HCFCs in the Perstorp Group 1998 (kg/year)

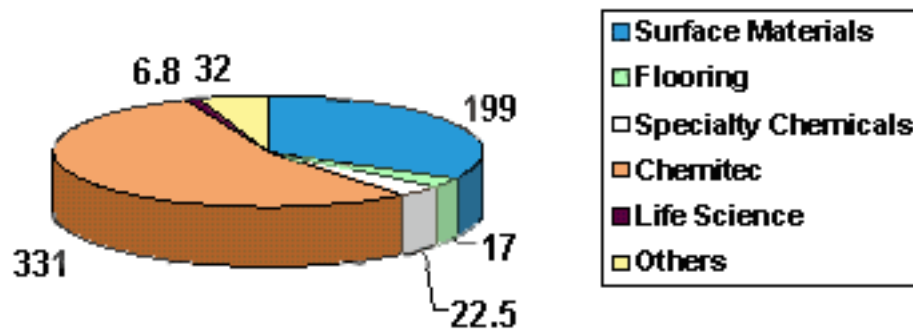


Table: Distribution of HCFC leakage to the atmosphere from the Perstorp Group in 1998 (kg/year)

Ozone Depletion Potential / ODP

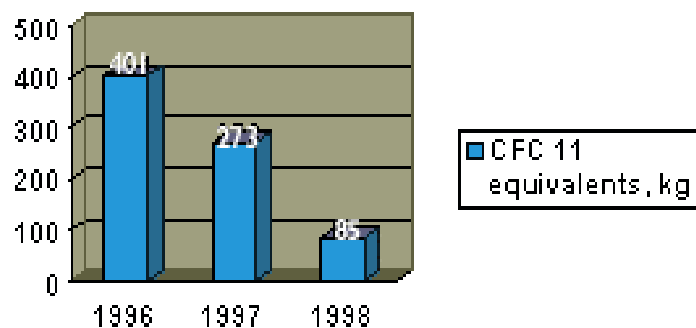


Table: Contribution to ozone depletion from the Perstorp Group, expressed in kg CFC11-equivalents, according to Best Estimate ODP (WMO/World Meteorological Organization). CFC 11 och 12= 1. HCFC 22=0,055.

FORMATION OF PHOTOCHEMICAL OXIDANTS

- GROUND LEVEL OZONE

Nitrogen oxides and volatile organic compounds (VOCs) from vehicular traffic, electricity and heat production and from industrial facilities may under certain meteorological conditions, and under the influence of sunlight, contribute to the formation of photochemical oxidants, among which ozone is the dominating substance.

An increased ozone concentration in the troposphere may, for example, damage plant life. The effects are mainly local or regional.

Regarding emissions of nitrogen oxides from the Perstorp Group, see the section dealing with Acidification.

Emissions to the atmosphere - Perstorp Group

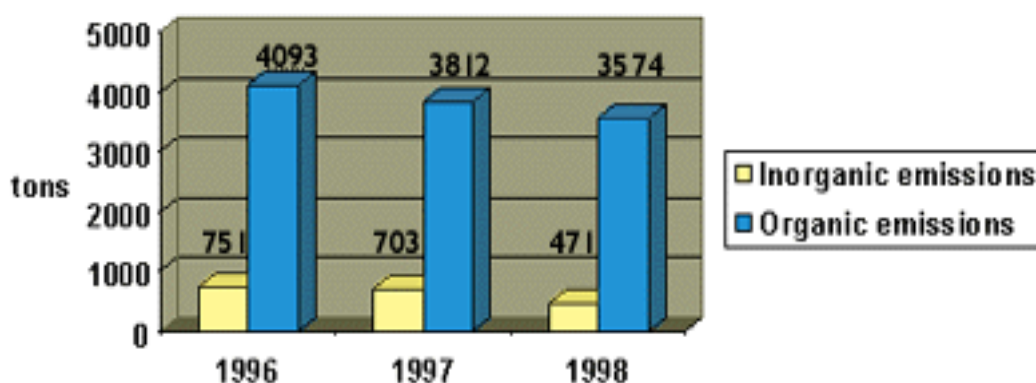


Table: Perstorp Group emissions to the atmosphere of organic and inorganic substances.

Emissions of volatile organic compounds (VOCs) from the Perstorp Group mainly come from the waste gas from production plants. Since 1985, most plants have been connected to emission control systems (mainly catalytic or thermal combustion facilities). Some plants are still waiting in line, mainly within the Surface Materials division. In 1999, the plants in São Paulo, Brazil and Aycliffe, United Kingdom, will be connected to systems to reduce VOC emissions.

During 1998, the VOC emissions of the Perstorp Group were lower than in 1997. At the Surface Materials plant in Bürstadt, Germany, a new gas cleaning device (swing-term) was installed. Perstorp Flooring reduced its methanol emissions by connecting another part of its production facilities to a catalytic emission control unit.

Organic emissions (tons/year)

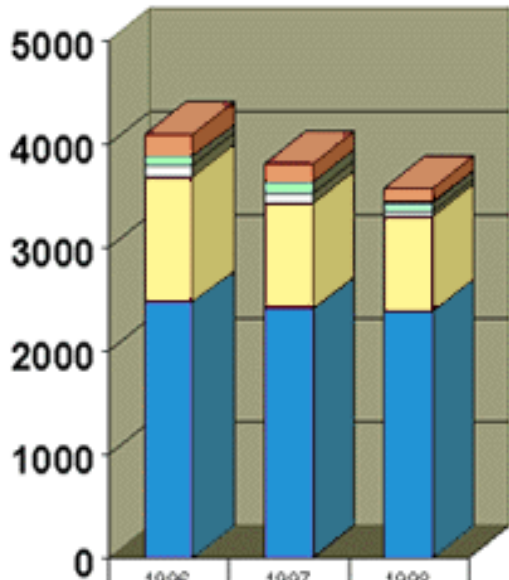


Table: Volatile organic (VOC) emissions from the Perstorp Group amounted to 4 093 tons (1996), 3 812 tons (1997) and 3 574 tons (1998)

Chemitec	215	173	139
Life Science	1	1	5
Speciality Chemicals	86	120	88
Flooring	114	95	49
Others	1212	1020	910
Surface Materials	2465	2402	2383

Chang Alvim,

Manager of the Chemitec and Laminate plants in São Paulo, Brazil:

"The most important environmental issue during 1998 was the planning and final decision to install a new emission control facility with thermal combustion of exhaust gas," says Chang Alvim. "The facility is to be installed by mid-1999 and will reduce VOC emissions by about 80%. So we expect that our emissions for 1999 will be 40% lower than for 1998. And this investment is only the first step in optimizing the efficiency of our emission control facility," Chang Alvim explains.



Organic emissions 1998 (tons/year)

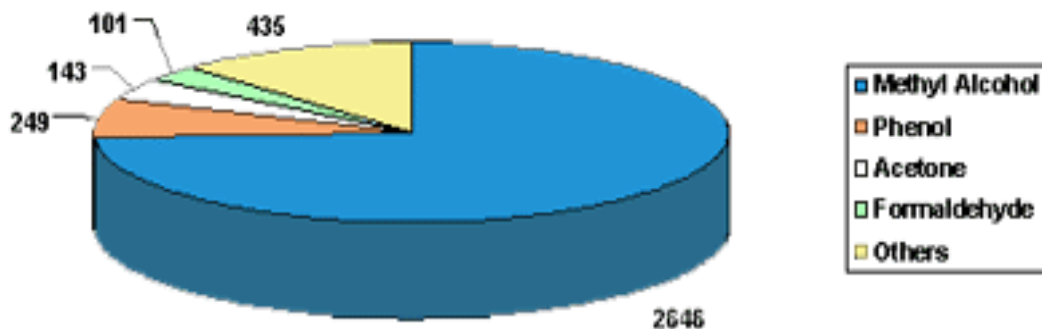


Table: Methanol was the dominating component in the Perstorp Group's atmospheric VOC emissions in 1998.

ACIDIFICATION

Acidification is caused by emissions of sulfur dioxide and nitrogen compounds (nitrogen oxides and ammonia), which in turn cause acid rain.

Combustion of sulfur-containing fuels (coal, oil, etc) releases sulfur that can react with oxygen in the air to form sulfur dioxide. This substance reacts further to form the sulfuric acid that dissolves and is spread by rain.

Nitrogen oxides are emitted from traffic and from incineration plants via a reaction between nitrogen and oxygen. They react further to nitric acid, which also acts as a nutrient in soil, streams and lakes.

Acidification potential - Perstorp Group

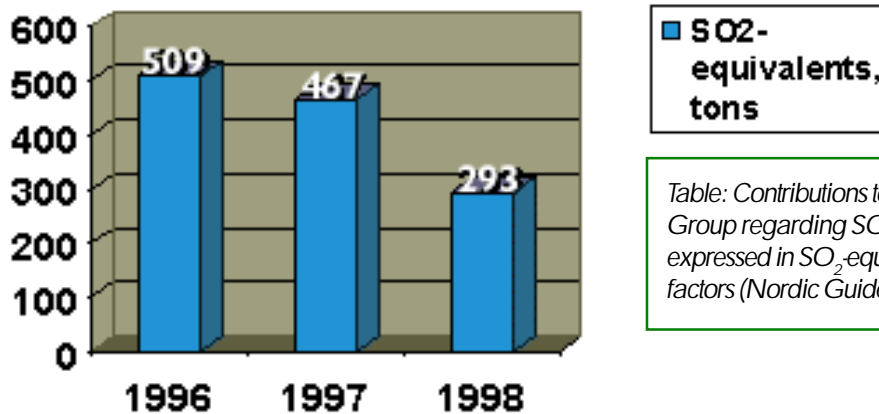


Table: Contributions to acidification from the Perstorp Group regarding SO₂, NO_x, HCl and NH₃ expressed in SO₂-equivalents using acidification factors (Nordic Guidelines, Best Estimate).

The emissions of sulfur dioxide from the Perstorp Group mainly stem from the combustion of sulfur-containing fuels. Back in 1991, the former coal-fueled boiler at the largest unit in Perstorp was replaced with a new boiler, optimized for renewable biofuels. Some years ago, the Perstorp unit in Brazil substituted their oil fuel for natural gas, reducing emissions of sulfur and nitrogen oxides.

The Perstorp Group emissions of nitrogen oxides mainly originate from Corporate combustion facilities.

During 1998, the total Perstorp Group emissions of ammonia were less than 7 metric tons.

Inorganic emissions to the atmosphere from the Perstorp Group 1998 (tons/year)

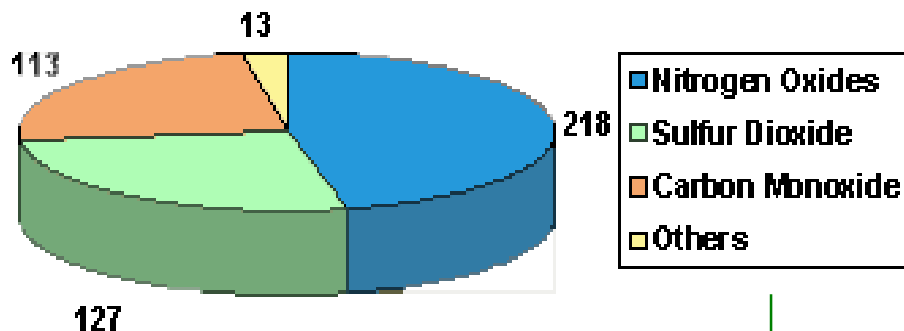
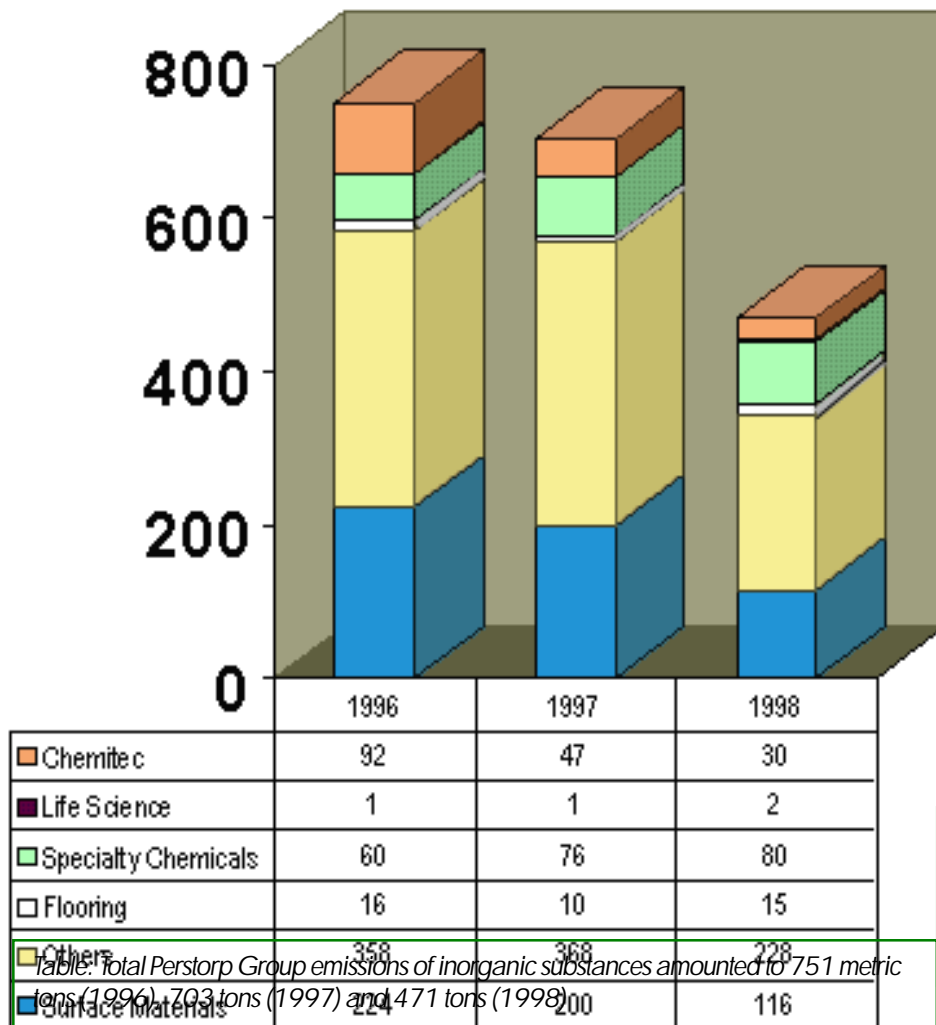


Table: Total emissions of inorganic substances in 1998 amounted to 471 metric tons.

Measures to reduce acidification include using the best available cleaning and combustion technologies, using energy from renewable energy sources and practicing good housekeeping of energy resources.

Inorganic emissions (tons/year)



EMISSIONS TO WATER

Organic substances emitted to lakes and streams or leaching from the soil consume oxygen as they decompose, thereby lowering the oxygen content in the water, which may adversely affect plant and animal life.

During 1998, the waterborne emissions of organic substances from the Perstorp Group units decreased from 1997 levels. Reductions were achieved at the Brazilian unit and at the Aycliffe and Christchurch units in England. At the Perstorp unit, reductions were achieved at the polyol plants (Penta, TMP, TMPDE), at Perstorp Resins and at Perstorp Pharma.

The plants in Perstorp and Brazil treat their wastewater in their own wastewater treatment plants. The cleaning efficiency of the Perstorp Group wastewater treatment plants is typically about 90%. Some units, including those in Kolho, Finland and Bürstadt, Germany, have internal facilities for treatment of process wastewater before it is released to municipal wastewater treatment plants. Most of the remaining units are connected to municipal wastewater treatment plants. The wastewater from the Brebières unit in France is incinerated. Certain units, e.g. the units in Aycliffe, England and Brebières, France, send concentrated wastewater to external facilities for hazardous waste treatment.

During the year, a new allylic ether plant (TMPDE) was erected in Perstorp. This has meant reductions in emissions of organic compounds and salts to the Perstorp wastewater treatment plant. In Perstorp, the formic acid plant implemented process improvements and the Resins plant installed a stripper column for cleaning of process distillate, reducing waterborne emissions to the Perstorp wastewater treatment plant. At the Brazilian unit, the cleaning efficiency of the wastewater treatment plant was improved. In Aycliffe, England, a facility for recycling of phenol from process wastewater is expected to be operational in 1999. In Castellanza, Italy, a stripper column, for recycling of methanol and formaldehyde from process wastewater, is currently being installed. Moreover, a major cooperation project for a new wastewater treatment plant is in progress.

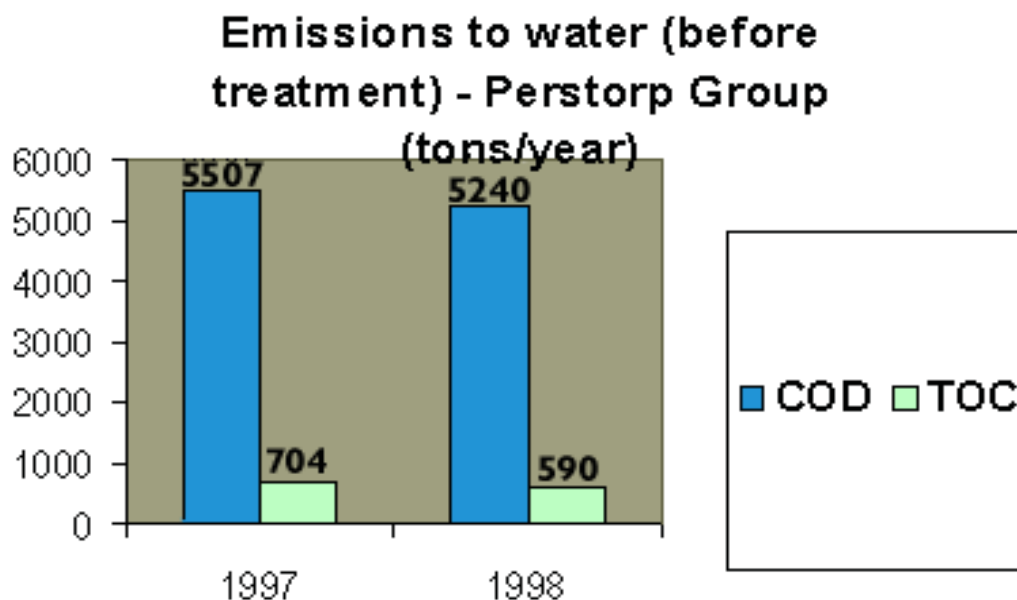
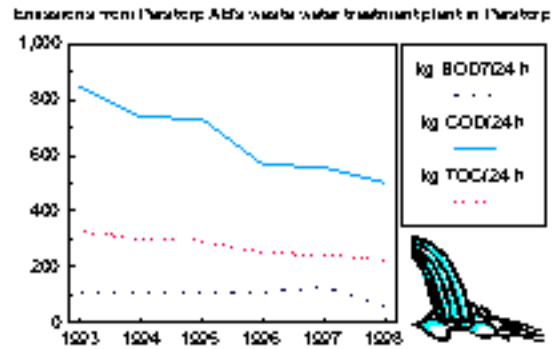


Table: Waterborne emissions of the Perstorp Group, before treatment, during 1997 and 1998 (tons/year)

Most waterborne emissions from the Perstorp Group are released from the Perstorp Specialty Chemicals division. The largest emission sources are the polyol plants in Toledo, USA; Castellanza, Italy; and Perstorp, Sweden.

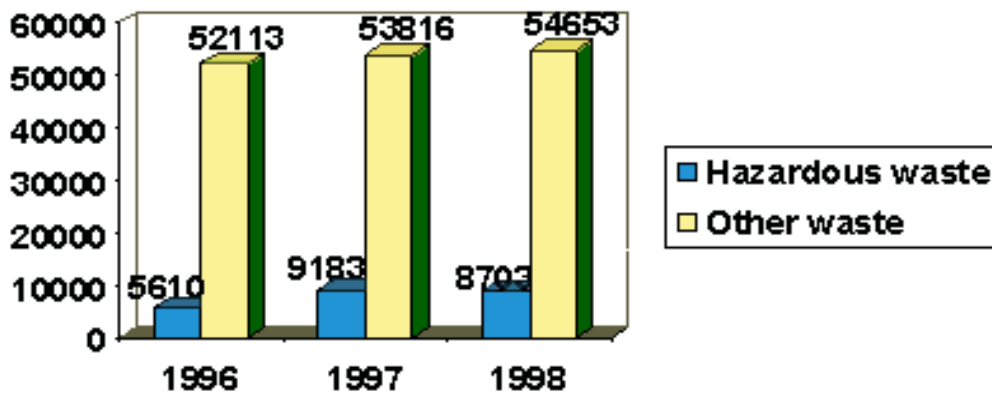
Table: Emissions from the wastewater treatment plant of the Perstorp unit.



The Perstorp Group's emissions of nitrogen and phosphorous are low. As an example, the emissions of nitrogen (Kjeldahl) from the units in Perstorp amounted to 12.7 tons during 1998. The corresponding phosphorous emissions (P-tot) totalled 0.35 tons.

TOTAL CORPORATE WASTE

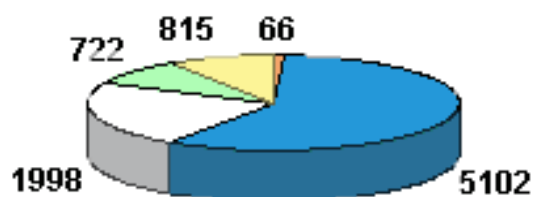
Waste - Perstorp Group (tons/year)



Hazardous waste (in accordance with legal definitions):

During 1998, the amount of hazardous waste was reduced by almost 500 tons. Specialty Chemicals achieved the largest reduction in hazardous waste.

Perstorp Group: Hazardous waste 1998 (tons/year)

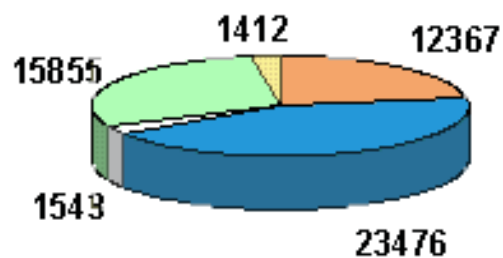


- Recycling
- Incineration with energy recovery
- Incineration without energy recovery
- Landfill
- Others

Other waste:

The total amount of other waste increased somewhat during 1998. There were increases in for example Specialty Chemicals and Flooring

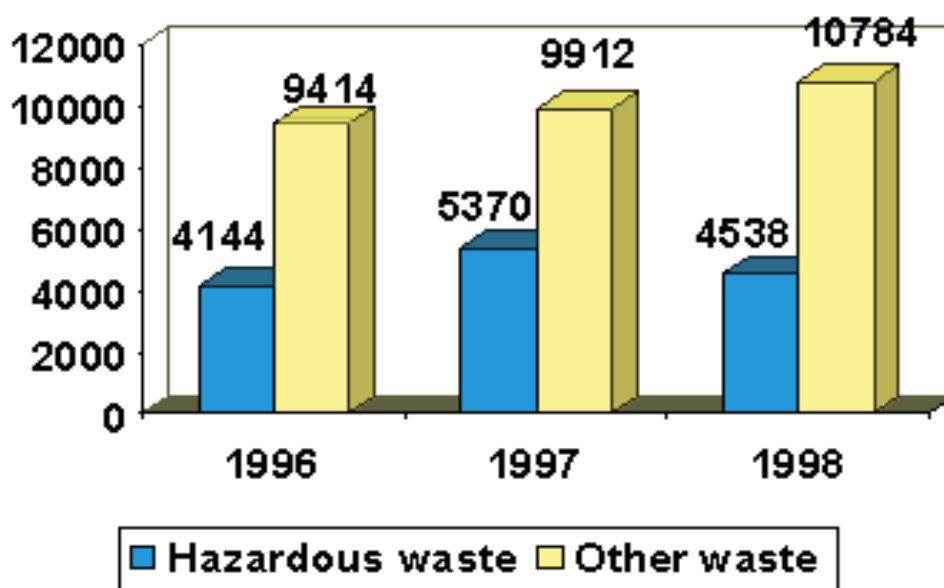
Perstorp Group: Other waste 1998 (tons/year)



- Recycling
- Incineration with energy recovery
- Incineration without energy recovery
- Landfill
- Others

Waste - Specialty Chemicals

Waste - Specialty Chemicals (tons/year)



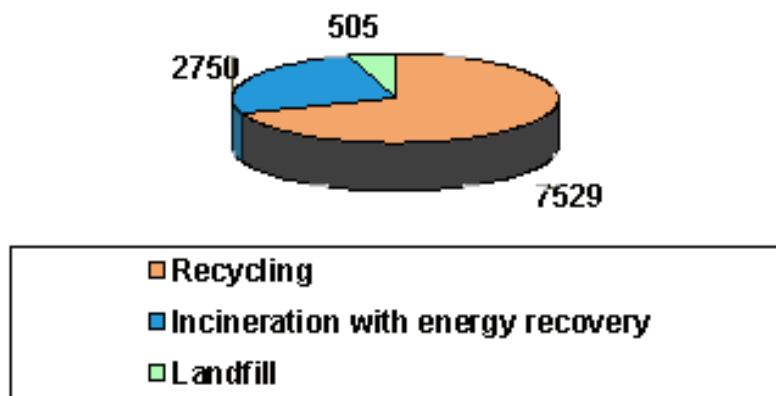
Hazardous waste:

The volume of hazardous waste from Specialty Chemicals decreased during 1998. The greater part of this waste consists of methanol that is separated during production. At the unit in Sweden, the methanol obtained is used as a replacement for oil in thermal incineration, i.e. the energy is recovered.

Other waste:

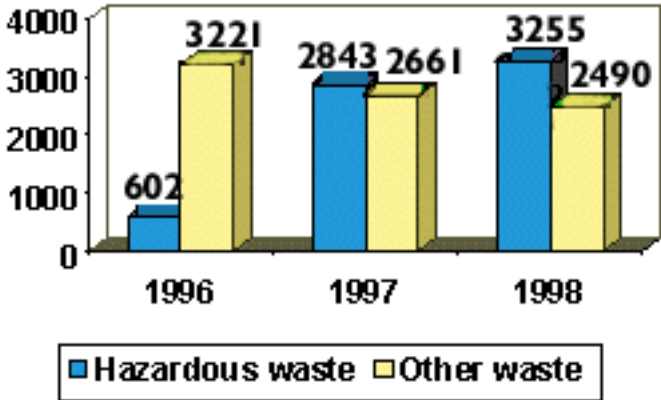
The amount of other waste increased during the year. The Neo and TMP plants in Sweden account for most of the increase (sodium formiate solution).

Specialty Chemicals: Other waste (non-hazardous) 1998 - tons/year



Waste - Chemitec

Waste - Chemitec (tons/year)



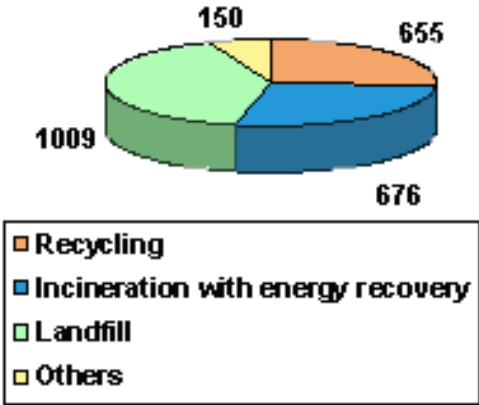
Hazardous waste:

Chemitec’s amount of hazardous waste was greater in 1998 than in 1997. The increase was because wastewater containing phenol had been temporarily diverted to incineration at the unit in Aycliffe, England.

Other waste:

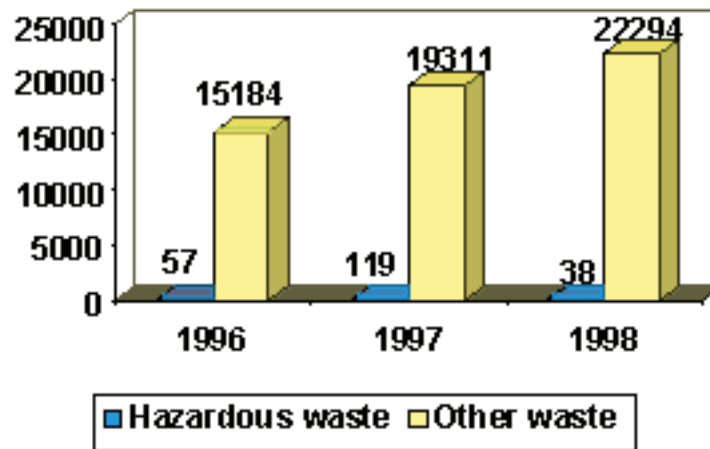
The amount of other waste decreased in 1998, partly thanks to reductions at the Moulding Compounds plant in Perstorp, Sweden and at the unit in Florence, Massachusetts, USA.

Chemitec - Other waste (non-hazardous) 1998 - tons/year



Waste - Flooring

Waste - Flooring (tons/year)



Hazardous waste:

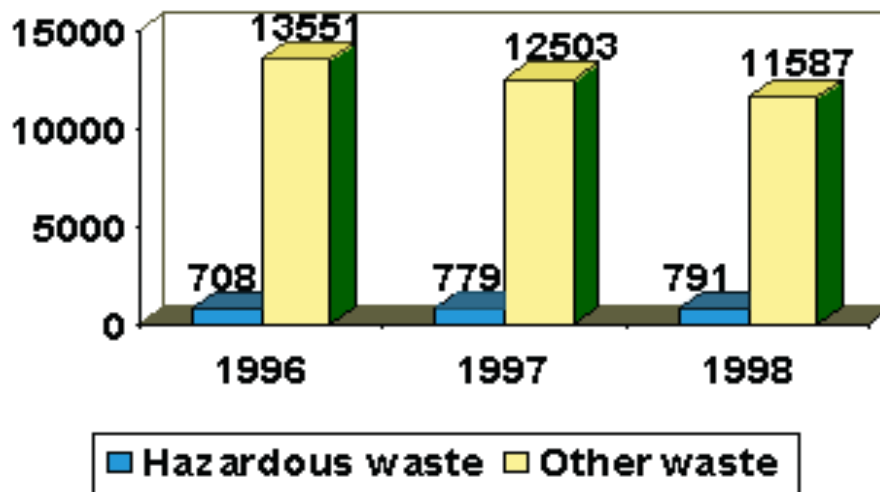
The amount of hazardous waste decreased in 1998.

Other waste:

The amount of other waste increased in 1998.

Waste - Surface Materials

Waste - Surface Materials (tons/year)



Hazardous waste:

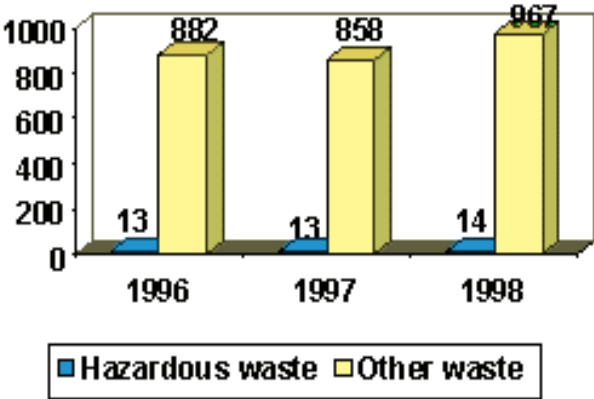
There was only a marginal increase in the share of hazardous waste from Surface Materials during the year.

Other waste:

Other waste decreased during the year thanks to successful waste-reduction projects at several plants.

Waste - Life Science

Waste - Life Science (tons/year)



Hazardous waste:

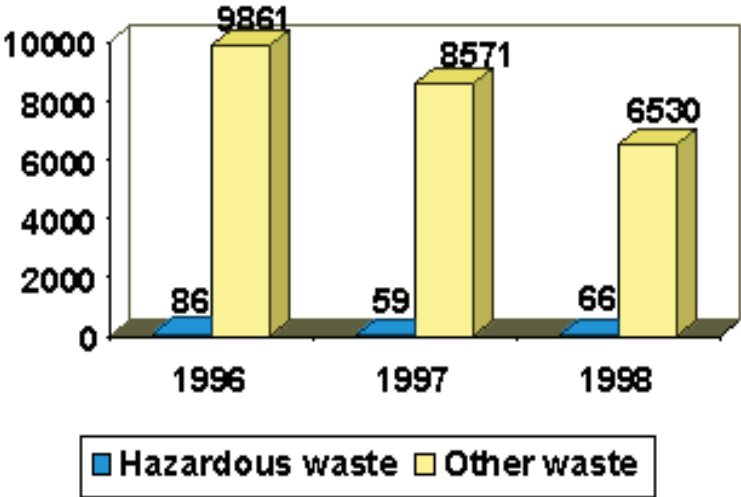
The volume of hazardous waste from Life Science during the year remained essentially unchanged.

Other waste:

Other waste increased during the year.

Waste - Other plants

Waste - Others (tons/year)



Hazardous waste:

The share of hazardous waste from the Group's other activities increased slightly during the year.

Other waste:

Other waste decreased during the year for various reasons, e.g. reduced volumes of sludge from the Group's wastewater treatment plant.

SOIL

During 1997 and 1998, investigations were started on the soil and water situation in the vicinity of the polyol plants in Perstorp, Sweden, and Castellanza, Italy. It could be verified that the areas surrounding the plants were somewhat polluted. This problem has been dealt with and samples are taken regularly to follow up the results of the investigations.

In connection with new acquisitions, the Perstorp Group always conducts investigations regarding safety, health and environment. One of the most important steps in these investigations is the mapping of possible polluted soil.



ENERGY

During 1998, the use of fossil fuels has decreased within the Perstorp Group compared to 1997, due to reduced oil consumption. Nevertheless, the total energy consumption of the Perstorp Group increased from 1997 to 1998.

Energy use in the Perstorp Group (GWh)

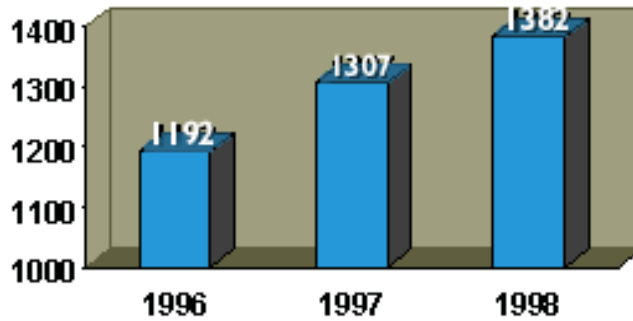


Table: The Perstorp Group Energy Consumption from 1996 to 1998 (GWh)

Several Corporate projects to increase energy efficiency and reduce energy consumption are in progress. One example is that the Perstorp Flooring plant in Perstorp, Sweden, has implemented energy recovery for one of the presses and started an energy conservation project to reduce energy consumption by 10%. A reconstruction of the cooling system of the central boiler plant in Perstorp has resulted in better secondary use of waste heat. The formalin plants in Perstorp have also carried out energy conservation projects.

Energy use in the Perstorp Group 1998 - total 1 382 GWh

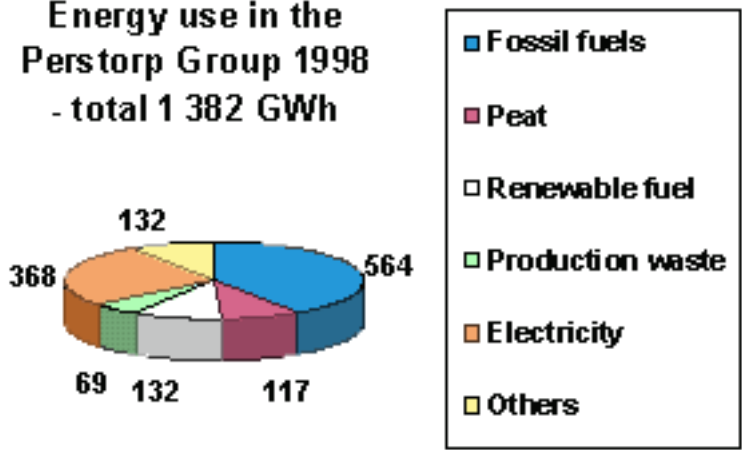


Table: Distribution of energy use within the Perstorp Group for 1998 (GWh)

Use of fossil fuels (GWh) in the Perstorp Group 1998

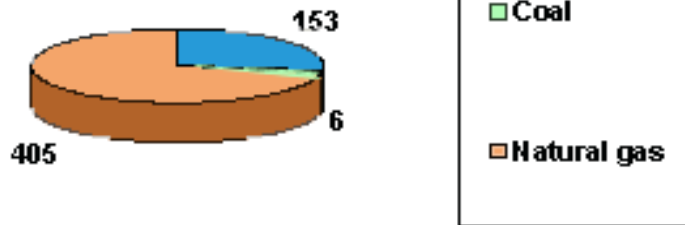


Table: Use of fossil fuels within the Perstorp Group for 1998 (GWh)

WORKING ENVIRONMENT

Working Environment

During the year, several measures were taken to improve procedures related to the work environment and preventive health care.

At the Perstorp site, the Swedish Labour Inspectorate has pointed out shortcomings in health control and registration of people dealing with certain chemicals. The shortcomings have been rectified but the case is presently being tried under the Act on the Working Environment. At the same time a number of initiatives have been taken to increase the emphasis on the working environment and preventive health care within the Corporate S.H.E. management system. This includes continuous adaptation to the laws of different countries on the working environment.

New Chemicals Council

At the largest Corporate site in Perstorp, Sweden, improved procedures have been introduced regarding personal protective equipment, medical examinations, registration of chemicals and CE-labelling of machinery. A Chemical Council has been established for the evaluation and handling of new chemical substances.

Reduction in Heavy Lifting

At the Chemitec facilities in Brazil, the United Kingdom and Sweden, investments in bag handling have been made to reduce heavy lifting. Continued rationalization of Perstorp Flooring's laminate production has reduced the need for monotonous manual work, which formerly meant strain on backs and shoulders. At the Moulding Compounds plant in Sweden, the noise level has been reduced by making two ball mills belt driven. Several Corporate units have conducted systematic programs to improve the working environment and increase working place safety. Many of these programs have included training of managers and employees.

Systematic Quality Work

The area of stress and comfort has been brought forward and more systematically incorporated into the preventive health work. At several units, climate analyses have been performed and evaluated, both through local S.H.E. committees and individual efforts. This is an integral part of quality work, as defined in the Corporate Business Excellence model, where "People Satisfaction" is defined as one of the important success factors.

Preventive Health Care

The Perstorp company doctor is actively developing the preventive health care at the Perstorp site.

Industrial Injuries

During 1998, there were 614 industrial injuries reported within the Perstorp Group (719 in 1997). Out of these, 168 (260 in 1997) were serious enough to cause at least one day of sick-leave.

1998	Number of injuries per million working hours	Lost Time due to injury %	Hours of absence per industrial injury case
Surfaces	27,5	0,21	76
Life Science	2,5	0,07	257
Flooring	20,1	0,11	54
Chemicals	18,2	0,30	187
Others	11,3	0,28	247
Perstorp AB	18,3	0,22	122

RISK MANAGEMENT

During the past few years, the Risk Management work at Perstorp has been undergoing considerable changes as a consequence of a new and changed risk situation.

Risk Management is part of the general management responsibilities of each company within the Group. The Corporate Risk Management unit works with development, coordination, training, counseling, communication and evaluation of risk and insurance matters.

Objective

The purpose of Risk Management is to systematically work for increased safety and protection against injury to people, as well as damage to the environment and property. The objective of the Corporate Risk Management unit is to limit the total risk exposure of the Perstorp Group.

Working Methods

During the past few years, the tasks within Risk Management have changed, partly as a consequence of the new and changed risk environment. Developments in the environmental area and IT, particularly those relating to the Y2K problem, can be mentioned as important examples of the changed risk environment.

The work of the Corporate Risk Management unit is mainly conducted in steps, through risk analysis, risk treatment and risk transfer in form of current activities, special activities and projects.

Current Activities

Current activities may be regarded as traditional Risk Management work, including treatment of static risks, e.g. through loss prevention and loss limitation measures, purchasing of global and local insurances, claims handling and follow-up of risks and insurances.

Special Activities

Special activities comprise surveys and risk analyses of projected company acquisitions and divestments, follow-up of issues arising from completed surveys, risk analyses and participation in Corporate S.H.E. work.

Projects

The Risk Management unit has participated in several projects during the year, notably the introduction and carrying out of an information system/database for risk information, projects dealing with integrated transport purchases and Perstorp's year 2000 project, P2K.

Losses

During 1998 no major property damages have occurred.



THE YEAR 2000 PROJECT

Perstorp's year 2000 project, called P2K, is being conducted in collaboration with IBM in order to prepare the Perstorp Group administrative and embedded computer systems for the transfer to the year 2000. The project is running on schedule. All feasible and necessary measures are being taken to complete the project well before the turn of the millennium.

P2K covers some 600 defined and planned projects for administrative systems and about 700 projects for embedded systems. The majority of these projects have already been completed with good results.

In the end of 1998, a comprehensive effort was initiated to carry out a total risk evaluation, i.e. to analyse and when necessary take action regarding any risks that might remain after completion of the year 2000 adaptation of computerised systems within P2K.



PRODUCT STEWARDSHIP

The introduction of an environmental management system is a continuous process that mainly focuses on production and the individual production plants. At the same time, it is important to study the product itself from an S.H.E. perspective. This is why there is continuous Corporate development work in the field of Product Stewardship.

Product Stewardship addresses work and care for a product during its entire life-cycle, seen from a holistic eco-cycle perspective (i.e. from product development, through production processes to the user phase and ending in the disposal of the worn-out product). The Perstorp Group's Product Stewardship work includes chemical controls, risk assessments, life-cycle assessments, environmental declarations, material safety data sheets and, finally, environmental and safety aspects of transports.

Chemical controls and risk assessments

Chemicals included in the Perstorp Group products must be clearly understood. This is accomplished by effective chemicals control. These build knowledge on the inherent properties of a substance, e.g. whether it is dangerous to inhale, whether it causes allergies or whether it is dangerous to aquatic organisms. However, as chemicals control do not necessarily reveal whether a substance is dangerous once it is incorporated into a product, this is where the Perstorp Group puts the emphasis. It is acceptable that a substance has inherently hazardous properties when it is an important process component that results in a final product with specific desirable properties. On the other hand, the final product must not cause exposure to environmental, health or safety risks when it is used by consumers.

That is why the product is subjected to a risk assessment. Emissions are monitored and related to the inherent properties of the substance. After that, the risk for health and environmental effects is assessed. If an unacceptable risk is revealed, the product will not proceed from the development stage to a commercial product.

LCA studies

An LCA (Life-Cycle Assessment) evaluates the environmental impacts of a product, from cradle to grave. It includes evaluations of all potential effects a product may have on the environment, from substances released during production of the product and its raw materials, to the transport involved in production, to the user phase and finally to the disposal phase. A product may contribute to several environmental problems, e.g. the greenhouse effect, acidification, depletion of the stratospheric ozone layer and formation of ground-level ozone.

Such a study produces a lot of valuable knowledge that will form the base for future product improvement. LCA studies also constitute the base for Perstorp's Product Stewardship work and eco-cycle adaptation. Perstorp actively cooperates with major Swedish industrial corporations and the Chalmers University of Technology in a forum called the Centre for Environmental Assessment of Product and Material Systems (CPM), whose purpose is to build a common framework on how to conduct LCA studies and how to make them operational both in Sweden and worldwide. Perstorp is also involved in a project called Material Use in Products of the Manufacturing Industry (VAMP), started in 1999 by the Swedish National Board for Industrial and Technical Development (NUTEK) for the purpose of organizing material recycling systems for polymeric fibre composites.

Environmental Declarations

When a product is released on the market, it is important that the product information is easy for the customer to understand. An LCA study is a comprehensive document that cannot be communicated directly to customers. Environmental product information for customers is therefore communicated through environmental declarations. These declarations include the environmental impact of the product, the proportion of renewable resources in raw materials and the amount of energy needed to produce the product etc. Perstorp has issued environmental declarations for a number of construction products and actively participates in the work of the Swedish Environmental Management Council to formulate future criteria for certified environmental product declarations.

Material Safety Data Sheets on Chemical Products

For dangerous chemical products it is required to supply the customers with material safety data sheets, containing information on the health and environmental properties of the product. Moreover, the product must be labelled to inform the customer about potential risks. The Perstorp Group has recently invested in a new global system that deals with material safety data sheets and labels. This facilitates the printing of data sheets and labels in many different languages. The system will be introduced in 1999.

Transports

In 1999, Perstorp will work actively to implement an EU directive regarding safety advisers for the transport of dangerous goods. Perstorp's commitment goes beyond this directive, however, incorporating all types of transports and the development of procedures for securing of all cargo, whether hazardous or not.

International Exchange

Perstorp monitors chemical legislation and risk assessments made by international bodies by taking part in international programs and conferences. Through active work in different European bodies, such as the European Chemical Industry Ecology and Toxicology Centre (ECETOC) and the European Chemical Industry Council (CEFIC) Perstorp has the opportunity to express views on risk assessments and proposed legislation before they are completed and enacted. On the national level Perstorp also participates actively in the work of the Association of Swedish Chemical Industries.

ENVIRONMENTAL ASPECTS OF RESEARCH AND DEVELOPMENT

New needs of customers and users as well as increased awareness about global resource issues make environmental aspects increasingly important in Perstorp's innovation process.

Research, development of the business concept and product development are primarily governed by market demands and mainly dealt with by the different divisions and business units, which have the expert knowledge about market demand.

The Innovation Process

In order to stimulate the flow of ideas and to utilize knowledge and technology synergies, the Perstorp Group emphasizes its innovation process. This applies to process and product development as well as the long-term build-up of knowledge and technology, in which environmental values are often included.

Design for Environment

Perstorp responds to the interest in environmentally adapted products by creating new processes and products. Perstorp Chemicals is developing specialty chemicals that enable the manufacture of a number of environmentally adapted products, e.g. solvent-free lacquer systems and biologically degradable lubricants. New composite materials are being developed to replace metal in vehicles, thereby helping to reduce weight and fuel consumption (see below).

Perstorp Surface Materials is developing new, environmentally adapted systems for surface treatment of foils and new adhesives for laminates. Moreover, 1998 saw the introduction of a new fire-retardant high-pressure laminate, containing a flame retarder based on simple nitrogen and phosphate compounds.

Environmental Catalysts

During 1998 Perstorp Formox continued the development of a brand new type of catalyst - the mesh catalyst. This product ensures effective and economical reduction of CO and NOX emissions from boilers and gas turbines. The introduction is scheduled to take place in 1999. Perstorp Formox is also placing greater emphasis on catalysts used to reduce VOC and other pollutants from gas flows. These catalysts not only enable the elimination of VOC emissions etc from the Perstorp Group facilities, but from other industries as well.

New Product with Positive Environmental Features

Perstorp will be the first company in the world to offer dendritic polymers, to be marketed under the brand name Boltorn®. These compounds give other polymers unique features and improvements in numerous applications, e.g. paints, glues and construction plastics. In many cases these improvements are accompanied by a reduction in the environmental impact. For industrial paints and printing inks, it will be possible to replace chemicals that are hazardous to human health and the environment. Moreover, it will become increasingly convenient to replace metals in vehicles with stronger construction plastics, thereby reducing weight and fuel consumption.



ENVIRONMENTAL COOPERATION WITH SUPPLIERS



Perstorp is continuously and systematically working to reveal how the different units deal with safety, health and environment issues regarding raw materials, packaging and transports etc. This is an integral part of the certification and implementation of the S.H.E. management system at each unit.

Chemical Raw Materials

During 1998, the Perstorp Group contacted a number of important suppliers of strategic chemical raw materials in order to evaluate whether relevant environmental aspects are being assessed within the established purchasing routines. This work has produced some new Corporate procedures and intensified cooperation with a smaller

number of principal suppliers. This is part of a continuous process to incorporate stricter demands into the S.H.E. efforts of the units in question.

Packaging

The consumption of packaging material for Perstorp products is both environmentally and economically important. As a supplier, Perstorp strives for continuous development of low-waste and environmentally adapted packaging. Developments in this area are mainly governed by customer demands and the quality aspects that apply to each product. In the last few years, focus on environmental aspects has increased, as both customers and suppliers are becoming more environmentally aware.

Perstorp makes conscious efforts to ship its products as bulk cargo. Whenever this is not possible, big-bag and/or some form of return system is desirable. Perstorp Chemicals, for example, has organized a return system for big-bags for one polyol product, in cooperation with suppliers. The system was recently introduced in Europe and is in effect in Perstorp, Sweden and Castellanza, Italy.

Transport Purchasing with S.H.E. Demands

Since 1996, the Perstorp Group's purchases of outward-bound transports among the European units has been coordinated in the EcoFreight project. Transport purchases for 1998 involved approximately 350 000 metric tons of goods, divided into mixed cargo (55%), container shipments (25%) and tank or bulk transports (20%). The value of these transports amounted to about SEK 200 million.

Shipments by sea have been negotiated with demands for 1999. Experience shows that environmental work is beginning to be taken seriously by global shipping companies. Several major players are working to achieve certification in accordance with ISO 14001. Many have already achieved certification for some of their ships, in accordance with the ISM code, the environmental and safety management system of the shipping business. The process of purchasing of shipments by sea utilized shipping agent evaluation methodology developed within the EcoFreight project.

Follow-up and evaluation of the shipping agents was done throughout the year in the form of limited spot checks and total evaluations during specific periods. These follow-ups revealed that many shipping agents, contrary to demands, had failed to install the appropriate safety equipment in their trucks.

Outward-bound transports are mostly by truck. On longer routes, shipping companies sometimes send trailers by rail. Since the share of in-bound transports by rail remains high, rail transport accounts for a relatively large share of the Perstorp Group's total transports: 60% by truck, 22% by sea and 18% by rail.

During the year, Perstorp has actively contributed to the work of acquiring more knowledge within the area of "Efficient and Environmentally Adapted Transport of Goods", in which Sweden has invested public research funds to increase awareness of material flows and capacity utilization.

Transport Purchasing with S.H.E. Demands

It is difficult to estimate the emissions from Perstorp's transports, since there are not yet any reliable international emission databases. In making its evaluations of transport-related emissions, Perstorp used the database published in the Autumn of 1998 by NMT (the Swedish Network for Transport and the Environment). This database may be found on the Internet (www.ntm.a.se).

ENVIRONMENTAL-RELATED FINANCIAL DATA

Over the past few years, Perstorp has published environment-related financial data in a separate environmental report. These costs and investments are shown below by division for the calendar years 1997 and 1998. In order to secure a closer connection between the environment-related financial details and the ordinary financial report, the same accounting principles have been used, to the extent possible, when compiling the information. In order to facilitate analysis, operations divested during 1998 are in no way included in this compilation. The figures for 1997 have been adjusted to allow for divested units. Associated companies are not included in any respect.

Concerning costs, there was an increase in the number of S.H.E. personnel and consultants, which is a result of the intensified work to prepare management systems. The increased investments for safety and fire protection are largely attributable to improvements at the Perstorp Chemicals units in Perstorp, Sweden, and Castellanza, Italy.

Costs and investments SEK m (excluding divested units)	Chemicals		Flooring		Surface Materials		Life Science		Other		Group total	
	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997
Costs for fresh water	10	10	1	1	3	4	0	0	3	2	17	17
Costs for energy	208	206	28	21	42	45	4	4	12	7	294	283
Costs for hazardous waste	8	10	1	1	2	2	0	0	0	0	11	13
Costs for other waste	6	4	3	2	4	5	0	0	1	1	14	12
Costs for wastewater	30	23	0	0	1	2	0	0	0	1	31	26
Costs for S.H.E. personnel and consultants	17	11	5	4	3	3	2	2	8	6	35	26
Investments in safety and fire prevention	31	14	2	0	1	1	1	1	1	0	36	16
Investments in the work environment	22	23	3	1	4	3	2	0	2	3	33	30
Investments in the external environment	17	34	3	1	8	2	0	3	4	1	32	41
Total S.H.E. costs	279	264	38	29	55	61	6	6	24	17	402	377
Total costs S.H.E. investments	70	71	8	2	13	6	3	4	7	4	101	87
Total investments	388	261	173	201	115	55	79	48	104	31	859	596

ORGANIZATION FOR SAFETY, HEALTH AND ENVIRONMENT

The Corporate staff function for safety, health and environment, Corporate S.H.E., is located at the Perstorp Group headquarters in Perstorp, Sweden. This function is headed by Mr Jan Petersson.

Perstorp's S.H.E. work is supervised by a steering committee. The chairman of the committee is Mr Jerker Hartwall, a member of the Executive Committee (Corporate Management) and the head of the Chemicals Division. The other persons on the steering committee are Mr Jan Pettersson; Mr Jan-Erik Bergström, head of the Surface Materials division; Mr Per-Axel Nilsson, the Corporate risk manager; and the Corporate environmental controller, Ms Margareta Midenstam.

The overall responsibility for S.H.E. issues rests with the Corporate Board and the CEO, while the legal and operational responsibilities are largely delegated to the line organization. Every division has its own S.H.E. manager and every production unit has its own S.H.E. coordinator, who remain in constant touch with Corporate S.H.E.

For additional information regarding safety, health or environmental matters related to the Group or operations conducted in Perstorp, please contact jan.petersson@perstorp.com or margareta.midenstam@perstorp.com

Corporate Safety, Health & Environment
PERSTORP AB
SE-284 80 Perstorp
SWEDEN
Phone: +46 435 38000
Fax: +46 435 38010

Organization - Steering committee

Jerker Hartwall

President of Chemicals Division
Member of Executive Committee
Phone: +46 435-38767
Telefax: +46 435-37330
E-mail: jerker.hartwall@perstorp.com



Jan Petersson

Vice President Corporate Safety,
Health & Environment
Phone: +46 435-38594
Telefax: +46 435-38010
E-mail: jan.petersson@perstorp.com



Jan-Eric Bergström

President of Surface Materials Division
Phone: +46 435-38668
Telefax: +46 435-37171
E-mail: jan-eric.bergstroem@perstorp.com



Organization - Steering committee

Per-Axel Nilsson
Risk Manager
Phone: +46 435-38239
Telefax: +46 435-38711
E-mail: per-axel.nilsson@perstorp.com



Margareta Midenstam
Environmental Controller
Phone: +46 435-38292
Telefax: +46 435-38010
E-mail: margareta.midenstam@perstorp.com



Organization - S.H.E. Managers Divisions

Tomas Andersson
Site Manager
Specialty Chemicals/Chemicals
Phone: +46 435-38318
Telefax: +46 435-38807
E-mail: tomas.andersson@perstorp.com



Agneta Bosson-Hartwall
S.H.E. Manager Chemitec
Chemitec/Chemicals
Phone: +46 435-38617
Telefax: +46 435-38805
E-mail: agneta.bosson-hartwall@perstorp.com



Leif Hagberg
Director Manufacturing & Logistics
Surface Materials
Phone: +46 435-37331
Telefax: +46 435-37666
E-mail: leif.hagberg@perstorp.com



Björn Martinsson
Controller
Life Science
Phone: +46 435-38914
Telefax: +46 435-38303
E-mail: bjoern.martinsson@perstorp.com



Organization - Corporate Safety, Health & Environment

Jan Petersson

Vice President Corporate Safety,
Health & Environment
Phone: +46 435-38594
Telefax: +46 435-38010
E-mail: jan.petersson@perstorp.com



Margareta Midenstam

Environmental Controller
Phone: +46 435-38292
Telefax: +46 435-38010
E-mail: margareta.midenstam@perstorp.com



Michael Bengtsson

Certified Environmental Auditor
Phone: +46 435-38353
Telefax: +46 435-38010
E-mail: michael.bengtsson@perstorp.com



Lennart Andersson

Product Stewardship
Phone: +46 435-38290
Telefax: +46 435-38010
E-mail: lennart.andersson@perstorp.com



Henrik Ny

Environmental Engineer
Phone: +46 435-37956
Telefax: +46 435-38010
E-mail: henrik.nyh@perstorp.com



Harald Granath

Occupational Health Physician
Phone: +46 435-38710
Telefax: +46 435-37844
E-mail: harald.granath@perstorp.com



Göran Ström

Safety Manager
Phone: +46 435-37967
Telefax: +46 435-37110
E-mail: goeran.o.stroem@perstorp.com



Leif Hylander

Fire Officer
Phone: +46 435-38480
Telefax: +46 435-37770
E-mail: leif.hylander@perstorp.com



PRESENTATION PRINCIPLES

Information on emissions, waste, etc. for the calendar year 1998 comes from the Perstorp Group production units. The information was collected electronically, by distributing questionnaires to the units via intranet. The S.H.E. coordinator at each production unit filled in the questionnaires and sent them to be authorized by the manager with legal responsibility. The authorized questionnaires were then checked and compiled at the Corporate S.H.E. department in Perstorp. The company's internal auditor has made spot checks to assure that Corporate S.H.E. has handled the figures correctly. In addition, a follow-up investigation is done at Corporate level every six months, with regard to parameters specified in the environmental objectives.

Data on emissions and waste for companies partly owned by the Perstorp Group are adjusted before being presented in the annual environmental report, which includes only the proportion of the emissions and waste corresponding to the share of Perstorp's ownership.

The environmental report includes units owned by Perstorp in the calendar year of 1998. Acquisitions and sales are not included.

The indicators for 1996 and 1997 have been adjusted in order to be comparable to the Perstorp Group operations of 1998.

During 1998, the Group was restructured by divesting Perstorp Plastic Systems, among others. Moreover, two divisions - Flooring and Surface Materials - were formed from the former Surfaces division. The implementation of the S.H.E. management system continued throughout 1998 and this required reformulation of the Group objectives. Focus has been put upon the major objectives of the individual units, as identified by the procedures of the management systems.



GLOSSARY

AOX	Absorbable Organic Halogens. An umbrella term for chlorine (or other halogens) that is chemically bonded to an organic substance.
Biofuels	Fuels from the vegetable kingdom, like firewood, chips, bark, wooden pellets, energy forest, etc. Renewable fuels.
BOD	Biochemical Oxygen Demand. An indicator of the amount of oxygen consumed in biological decomposition of organic compounds in water (normally measured during 7 days).
Bunded areas (dikes)	A concrete basin or the like, in which a storage tank is placed, enabling the collection of spillage without leakage to ground and waterways.
Carbon dioxide (CO₂)	Colourless gas found in natural ecological cycles. It is formed in natural processes as well as in the combustion of various fuels. Carbon dioxide accounts for more than half of the greenhouse effect. Combustion of fossil fuels gives a net addition of carbon dioxide to the atmosphere.
Catalytic combustion	Technique for cleaning process exhaust gases with a typical cleaning efficiency of more than 99 %. The cleaning takes place in a catalytic bed at a temperature between 200 and 400 °C.
CFC	Chlorofluorocarbons. Cooling agents contributing to the depletion of the stratospheric ozone layer, and to the greenhouse effect.
CFC 11	The most common CFC compound. It is mainly used in industrial air conditioning and as a blowing agent for flexible foams.
CFC 11-equivalent	The ozone-depleting potential of one kilogram of CFC 11.
CO₂	See carbon dioxide.
CO₂-equivalent	The contribution to the greenhouse effect equal to one kilogram of CO ₂ .
COD	Chemical Oxygen Demand. An indicator of the amount of oxygen needed for complete (chemically induced) decomposition of organic material to carbondioxide and water.
EMAS	Eco Management and Audit Scheme. An EU ordinance for environmental management and environmental auditing.
Energy recovery	Secondary use of heat emitted from waste incineration, use of heated cooling water for heating purposes, etc.
Environmental conventions	Environmental treaties between several countries (e.g. the Montreal Protocol (1987), limiting the use of CFC/HCFC and halons, the Rio conference (1992) and the climate conference in Kyoto (1997)/ the Kyoto Protocol, on the reduction of greenhouse-gas emissions.
Environmental - management systems (EMS)	A method to integrate the environmental work in the overall management system (e.g. ISO 14000 and EMAS).
Fossil fuels	Oil, coal, natural gas. Fuels consisting of organic hydrocarbons from sediments (i.e. remnants of pre-historical animal and plant life). A finite resource.
Gigawatt hour (GWh)	An indicator of energy consumption, mostly used to measure electrical energy. One GWh equals one million kilowatt hours (kWh).
Greenhouse effect	Some gases have the ability to absorb heat radiation, which is feared to promote global warming. The principal greenhouse gases are carbon dioxide, methane, dinitrogen oxide (N ₂ O) and CFC compounds.
GWP	Global Warming Potential. The ability of a substance to contribute to the greenhouse effect. GWP is measured in CO ₂ -equivalents, i.e. carbon dioxide has a GWP of 1.
Halogenated	Hydrocarbons in which one or more hydrogen atoms are substituted for fluorine, chlorine or bromine. These compounds, used in a variety of applications such as cooling agents and aerosols, contribute to the depletion of the stratospheric ozone layer and to the greenhouse effect.
Halon	Brominated fluorocarbons. Used as fire extinguishing agents, for example. Halons are harmful to the stratospheric ozone layer.

Hazardous waste	Waste that has been classified as a threat to health or the environment. Hazardous waste is handled and disposed of in accordance with specific rules.
HCFC	Hydrochlorofluorocarbons. Chlorofluorocarbons in which the halogenation is incomplete. These compounds are harmful to the stratospheric ozone layer but have less ozone-depleting potential than CFCs.
HFC	Hydrofluorocarbons. Incompletely halogenated fluorocarbons. These compounds have no ozone-depleting potential but they contribute to the greenhouse effect.
Hydraulic load	Flow-related load (e.g. m ³ /day)
Inorganic substances	Substances that do not contain carbon (e.g. salts, metals and minerals).
ISO 14000	A series of international standards for environmental management systems, life cycle assessments, environmental audits, etc.
Kilowatt hour (kWh)	Energy unit equal to 1000 watts for 1 hour.
Landfill	Isolated area for final disposal of waste. Hazardous waste is not suitable for a landfill.
Liquefied Petroleum Gas (LPG)	Propane and butane gas compressed into the liquid state.
Life-Cycle Assessment (LCA)	Method estimating the environmental impact of products over their entire lifecycle - from raw material to waste.
LPG	See liquefied petroleum gas.
Nitrogen (N)	An element. Emissions to air may cause eutrophication, which in turn may lead to oxygen deficiencies as dead plants decompose.
Nitrogen oxides (NO_x)	Umbrella term for nitrogen monoxide (NO), nitrogen dioxide (NO ₂) and some other nitrogen oxides. NO _x is formed in combustion, and traffic is a major source for emissions of the substance. Among other things, it contributes to acidification, eutrophication and ground-level ozone formation.
NO_x	See nitrogen oxides
ODP	Ozone Depletion Potential. The ability of a substance to deplete the stratospheric ozone layer. ODP is measured in relation to CFC-11, which has an ODP of 1.
Organic compounds	Compounds containing carbon.
Ozone	A gas consisting of three oxygen atoms per molecule (O ₃). The stratospheric ozone layer protects the earth from harmful levels of ultraviolet radiation from the sun. Ground-level ozone, however, is considered to be a pollutant. Among other things, it can harm plant life.
Phosphorous (P)	An element. Emissions to water may cause eutrophication, which in turn may lead to oxygen deficiencies as dead plants decompose. Phosphorous is widely used in fertilizers.
Recycling	Housekeeping of resources by utilizing leftover or used materials in the manufacturing of new products.
Renewable energy	Energy from solar heat, wind power, hydropower and biofuels. An infinite resource.
Responsible Care	A global program for continuous environmental improvement, initiated by the chemical industry.
S.H.E.	Safety, Health and Environment
Sulfur dioxide (SO₂)	Formed in the combustion of sulfur-containing fuels like coal, oil and peat. SO ₂ contributes to acidification.
Sulfur hexafluoride (SF₆)	Isolating gas in electrical interlocks. One of the most aggressive greenhouse gases (very high GWP).
Suspended solids	Water-borne substances, mainly consisting of particles.
TOC	Total Organic Carbon. The amount of organic, carbon-containing material in water measured as elemental carbon.
Watt (W)	Unit of power, energy per unit time, J/s.
VOC	Volatile Organic Compound.



Perstorp AB
SE-284 80 Perstorp
SWEDEN
Telephone +46 435 380 00
Fax +46 435 381 00
www.perstorp.com

