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Howden

COMMITMENT TO THE FUTURE

THROUGHOUT THE WORLD, HOWDEN AFTERMARKET SERVICES ARE ENHANCING THE PERFORMANCE AND EXTENDING THE LIFE OF AIR AND GAS HANDLING EQUIPMENT

ENGINEERING EXCELLENCE WORLDWIDE

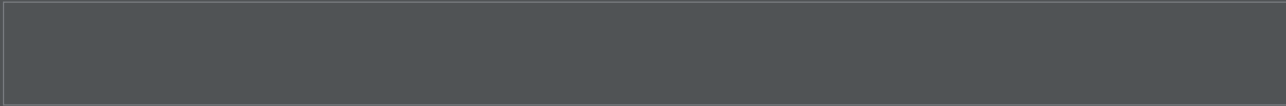
HOWDEN PRODUCTS AND EXPERTISE UNDERPIN INDUSTRIAL PROCESSES AND POWER GENERATION IN VIRTUALLY EVERY PART OF THE WORLD. IN THE MOST EXTREME, DEMANDING AND HOSTILE ENVIRONMENTS, OUR AIR AND GAS HANDLING EQUIPMENT GOES ON PROVIDING THE ROBUST, RELIABLE PERFORMANCE THAT PEOPLE DEPEND ON WHEN THE APPLICATION IS CRITICAL. WE ARE COMMITTED TO KEEPING IT THAT WAY. THE DRIVING FORCE BEHIND HOWDEN'S SUCCESS IS HOWDEN TECHNOLOGY. FOR 150 YEARS, WE HAVE BEEN AT THE LEADING EDGE OF ENGINEERING RESEARCH. NO OTHER COMPANY APPROACHES OUR CAPABILITIES IN APPLICATIONS LIKE AERODYNAMICS, ACOUSTICS, ROTOR DYNAMICS AND STRESS AND VIBRATION ANALYSIS. THIS EXPERTISE IS CONTINUALLY BEING APPLIED TO NEW PRODUCTS. BUT IT IS ALSO BEING USED TO EXTEND THE ACTIVE LIFE OF INSTALLED EQUIPMENT IN ALL KINDS OF SITUATIONS, IN COUNTRIES THROUGHOUT THE GLOBE. HOWDEN ENGINEERING CAN GIVE EXISTING PLANT NEW LIFE AND NEW RELIABILITY.

HOWDEN

Howden global service covers a comprehensive range of rotating equipment, heat exchangers and related products.



The world relies on Howden technology in a surprising breadth of applications, including Power generation // Petrochemicals // Tunnel ventilation // Chemical engineering // Iron and steel manufacturing // Mining // Cement manufacturing // Metals and minerals // Wind tunnels // Transport // Sugar processing // Pulp and paper manufacturing // Environmental industries // Industrial gases // Nuclear technology



KNOW-HOW

OUR AFTERMARKET SERVICES INCLUDE:

- Spare parts supply
- Spare part repairs
- Retrofits – new equipment in existing installations
- Refurbishment – restoration to 'as new' performance
- Revamping – improving the output and/or efficiency of the plant
- Preventive maintenance programs and contracts
- Site surveys, inspection and plant evaluation
- Troubleshooting – a wide range of different types of testing and analysis.

TOTAL GLOBAL SUPPORT

When we design and build air and gas handling equipment, whether it is part of our pre-engineered range or produced specifically for a customer application, we back the product with a service that starts with the order and continues throughout the life of the installation. Through expert maintenance and the use of certified parts and carefully planned upgrading, that life can be surprisingly long.

WE ARE UNIQUELY EXPERIENCED. For one and a half centuries, since the early days of air and gas engineering, we have been building an unrivalled resource of skills and knowledge. We understand the unique conditions and circumstances that prevail in the wide diversity of industries in which we operate. We profoundly understand air and gas handling equipment,

no matter who made it or who installed it, and we will apply the same care and insight to protecting and prolonging its productive life.

WE ARE UNIQUELY GLOBAL. Howden companies operate on every continent. In each of our specialist areas, our local engineers have behind them a powerful bank of facilities, research, experience and capabilities, on which they can draw at any time.

Howden aftermarket support is a response to your needs. We will always offer you the most cost effective, long-term and technically excellent solution to the problems of ageing plant or changing conditions.

LOCAL/GLOBAL



CLOCKWISE FROM TOP LEFT:

Howden Hua design office in Beijing, China

Reconditioning work being carried out at Howden Hua's factory in Weihai, China

Element line at Howden Spain's factory in La Union

Howden South America design office in Sao Paulo, Brazil

Inspection of silencers for axial fans in Howden's factory in Johannesburg, South Africa

Howden Turbowerke office in Coswig, Germany

AERODYNE FANS • AEREX FANS • A
AMERICAN BLOWER • BERRY FANS •
CORBLIN COMPRESSORS • CANADIAN
CLEMCORP FANS • DAVIDSON FANS •
FANS • FANTECNIC FANS • GODFREY
HOWDEN BUFFALO • HOWDEN • SIR
JAMES HOWDEN • JOY GREEN FANS • M
NOVENCO VARIAX • PITSTOCK FANS •
FANS • REAVELL CENTRIFUGAL • SAFA
SIROCCO SOFRAIR BLOWERS • STORK
TALLERES SANCHEZ LUENGO (TSL)
VENTILATEURS NEU • VENTILATOREN
WALLER WESTINGHOUSE FANS • W

PRODUCT KNOWLEDGE

Howden has grown steadily over the years to become the global force in air and gas handling. We have, during that time, acquired, incorporated or formed partnerships with many other companies. Each one was chosen because it added a particular specialisation, technology or advantage to the service we could offer. The list covers celebrated names and formidable reputations.

IRSCREW • AIRTECH FANS •
BUFFALO FORGE • BURTON
BLOWER • CARTER FANS •
DONKIN BLOWERS • ENGART
BLOWERS • HISON FANS •
OCCO FANS AND HEATERS •
AJAX FANS • NORDISK FANS •
PHOENIX FANS • POWERMAX
NCO FANS • SHELDON FANS • **PRODUCT**
FANS • STURTEVANT FANS •
• TURBOWERKE MEISSEN
SIROCCO • VOITH FANS •
OLF FANS • WHEELER FANS

POSITIVE PLANNING

Plant failure can be very expensive, especially when you are unprepared for it. Unexpected and unscheduled outages can have enormous consequences.

HOWDEN CAN RESPOND IMMEDIATELY TO YOUR EMERGENCIES. A vast number of spare and replacement parts can be supplied, delivered and when necessary fitted by Howden engineers as a matter of urgency. When you have a crisis, we're on call.

BETTER, THOUGH, TO AVOID THE UNEXPECTED. We can advise you about, or carry out, inspections and servicing designed to keep your equipment trouble free. From your maintenance record, we can recommend critical interventions or suggest upgrades that will improve performance or economy.

We regard the supply of parts as a core activity, and we treat it with the same care that we bring to new installations. Enquiries and orders are handled by specialist staff, to ensure that they accord with your service records and our understanding of your needs. Whether they are for Howden installations or third party equipment, they are meticulously checked to make sure they are appropriate. And, where possible, we will advise you on new technologies or developments that might raise the performance, longevity or economy of your equipment.

Main image: Inspection of variable pitch axial flow fan at Ensted Power Station, Denmark.

MAINTENANCE



CLOCKWISE FROM TOP LEFT:

Maintenance inspection at Matla Power Station, South Africa

Replacement of axial fan cast iron blades at Asnaes Power Station, Denmark

Axial fan inspection at Avedoere Power Station, Denmark

Axial blade balancing at Howden UK's factory in Belfast, Ireland

Inspection of air preheater elements at Ensted Power Station, Denmark

QA inspection of piston compressor at Howden BC Compressor's factory in Nogent, France

TECHNOLOGY THAT NEVER STANDS STILL

Product development is a continuous process of improvement. It follows that all equipment will eventually become outdated.

Most Howden installations involve our products working seamlessly with other equipment. The finished, integrated plant is a major custom-built project that represents an enormous investment of time and money. We do not believe it should be left to run into obsolescence.

THAT'S WHY WE ARE DEDICATED TO GIVING ALL EXISTING INSTALLATIONS, WHEREVER POSSIBLE, THE BENEFITS OF THE MOST UP-TO-DATE HOWDEN TECHNOLOGY. Through careful upgrades and retrofits, we can vastly improve the performance of old products or equipment that is not meeting the demands

made on it. Whether or not the plant was made or installed by Howden, we can advise you on the most cost-effective route to improved performance.

We regularly inject new economy and efficiency through interventions such as designing new impellers to fit existing casings, reducing noise, re-coating surfaces to protect against erosion or corrosion, enhancing air or gas heaters, or introducing improved seals to reduce heat loss. Each action is carefully planned to meet all the parameters of the existing situation.

Main image: Manufacturing of axial fan casing at Howden Hua's factory in Weihai, China.

ADVANCED



CLOCKWISE FROM TOP LEFT:

Manufacturing of centrifugal fan impeller at Howden Hua's factory in Weihai, China

Performance testing of a Howden screw compressor at Howden's compressor plant in Glasgow, UK

Balancing of axial fan impeller at Howden Hua's test facilities in Weihai, China

Manufacturing of elements for air preheaters Howden Spain's factory in La Union

Laboratory testing of enamelled elements

Polishing of cooling fan blades at Howden Hua's cooling fan factory in Weihai, China

THE RIGHT PLACE AT THE RIGHT TIME

Howden have become the acknowledged global experts by maintaining a local presence. Our aim is to do everything in our power to keep your plant operational and free from unscheduled stoppages. We can work alongside your own personnel, training your staff and building a partnership that lasts throughout the life of the equipment. During that time, we can carry out regular monitoring, inspection, servicing and repairs. We can advise on upgrades, and carry them out at the most convenient time. We can maintain a meticulous installation and service record, an invaluable tool in planning and ensuring the future safety and reliability of the equipment.

EVERY HOWDEN SUPERVISOR OR ENGINEER WORKING ON-SITE HAS THE WHOLE OF HOWDEN'S GLOBAL EXPERTISE TO DRAW ON.



ON-SITE



CLOCKWISE FROM TOP LEFT:

Howden inspectors at Weihai Power Station, China

Screw compressor package assembly

Inside Ensted Power Station in Denmark

On-site at Matla Power Station, South Africa

Inspection at Avedoere Power Station, Denmark

Test assembly of cooling fan

UNDERSTANDING THE BIG PICTURE

Howden's reputation as the pre-eminent experts in air and gas handling is widely acknowledged. In building that reputation, we have had to acquire a comprehensive understanding of other people's businesses.

Our equipment is, almost invariably, an integral part of a complex installation. To design for optimum performance, we have to understand the interplay of the various elements, and the ways in which noise, vibration, flow, power supplies, insulation and a whole host of other variables act throughout the plant. We have made it our business to master the big picture as it applies to each of the industries in which we operate.

In this process, the contribution made by our Howden Technology division has been invaluable. Howden Technology operates at the cutting edge, carrying out research into a broad spectrum of inter-related technologies.

The whole investigative and intellectual resource that Howden represents is frequently called upon to explore the complex problems that can crop up in complex installations. When the problem has to be found before it can be addressed, or where interacting factors stand in the way of optimum efficiency, we can bring a holistic approach and an unrivalled depth of understanding.



PERFORMANCE



CLOCKWISE FROM TOP LEFT:

FGD gas-gas heater at Ensted Power Station, Denmark

On-site at Lethabo Power Station, South Africa

Howden supplies a variety of fans for tunnel ventilation, ranging from jet fans to large axial exhaust fans

Cement plant in Algeria

Centrifugal fans installed at German Petrochemical plant

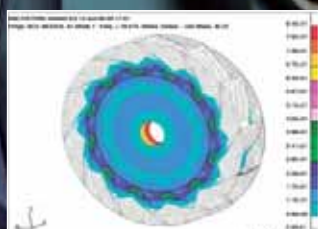
Axial surface fans at Khutala mine in South Africa

TROUBLE SHOOTING

Every Howden company can, when addressing advanced troubleshooting issues, draw on the unparalleled expertise of Howden Technology. A unique resource offering world-class research and problem-solving, it provides unmatched insight in highly specialist, operationally critical areas such as.

- STRESS ANALYSIS USING FINITE ELEMENTS
- ADVANCED ACOUSTIC ANALYSIS IN BOTH LABORATORY AND ON-SITE CONDITIONS
- DIGITAL ACOUSTIC INVESTIGATION USING SYSNOISE SYSTEMS
- ANALYSIS OF COMPLEX STRUCTURAL DYNAMICS IN STATIC AND ROTATING COMPONENTS
- ADVANCED ANALYSIS OF METAL FATIGUE AND FRACTURE MECHANICS
- HIGH-TEMPERATURE METAL CREEP EVALUATION
- INVESTIGATION OF ROTOR DYNAMICS IN MULTIPLE SHAFT SYSTEMS
- SITE STRAIN GAUGING AND TESTING UP TO TEMPERATURES OF 300°C
- DESIGN AND MANUFACTURE OF SPECIALIST ELECTRONICS
- DYNAMIC SURVEYS OF SITE VIBRATION PROBLEMS
- ON-SITE FAN PERFORMANCE TESTING IN ACCORDANCE WITH INTERNATIONAL STANDARDS.

TECHNOLOGY



CLOCKWISE FROM TOP LEFT:

Finite element analysis of centrifugal fan impeller

Howden supervisors meets regularly to discuss troubleshooting issues and share knowledge

Performance analysis at Lethabo Power Station, South Africa

Howden South America design office

Air preheater design software

Screw compressor vibration analysis at Howden's Glasgow factory

Committed to quality assurance

We are committed to integrating quality into all aspects of our business. Our companies have been awarded a range of quality assurance accreditations. Most have quality management systems that meet the requirements of ISO 9001:2000, and many have already gained accreditation to ISO 14001 for environmental management.

Committed to health and safety

We are committed to maintaining the awareness of all employees through training and setting of management objectives. We seek continual improvement in health and safety and there is an ongoing challenge for all our managers to achieve this. Many of our companies are already in compliance with or accredited to OHSAS 18001.

For further information, contact your local representative, visit our website or contact any of the companies listed below.



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