

# WASTEWATER APPLICATIONS

technical catalogue

RD  
RG  
RB  
RE  
RC  
HD  
HG  
RS  
VERTICAL  
CANTILEVER  
RN  
TS  
RAM

**SR** SALVATORE  
ROBUSCHI  
PUMPS

# Pompe centrifughe per ogni esigenza Centrifugal pumps for any need

Uno dei settori in cui le pompe Salvatore Robuschi sono largamente utilizzate è quello del trattamento reflui, sia civili che industriali. Le nostre macchine vengono anche utilizzate sui processi di filtrazione e chiarificazione, nei flottatori, nell'ultrafiltrazione e nell'osmosi inversa. Grazie alle diverse tipologie di giranti, chiuse – aperte – arretrate – canali, possono essere movimentati liquidi sia puliti che contenenti solidi in sospensione con dimensioni fino a 150 mm.

I nostri prodotti trovano inoltre impiego nel trattamento dei digestati e dei reflui industriali mediante l'utilizzo di evaporatori (ZLD system).

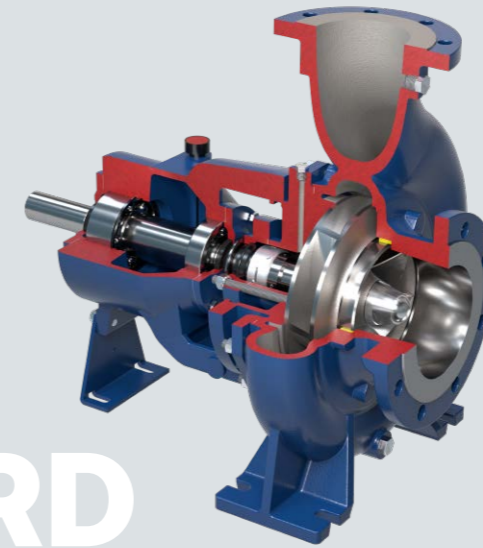
La gamma Salvatore Robuschi include anche pompe verticali e cantilever per l'installazione su vasche interrate e pozzi di raccolta reflui come alternativa alle pompe sommergibili.

Salvatore Robuschi pumps are employed in the waste-water treatment field, in both civil and industrial plants: the pumps can be used for filtering and clarifying process, flotation units, ultrafiltration and reverse osmosis. Through different impellers type (closed, open, vortex and channel impeller) the pumps can handle clean or dirty medium with suspended solids up to 150 mm.

The pumps are suitable for the digestate processing and industrial effluents through evaporators (ZLD system). As an alternative to submersible pumps, Salvatore Robuschi range includes vertical and cantilever arrangement/solutions to be installed in tanks and wastewater collection sumps.

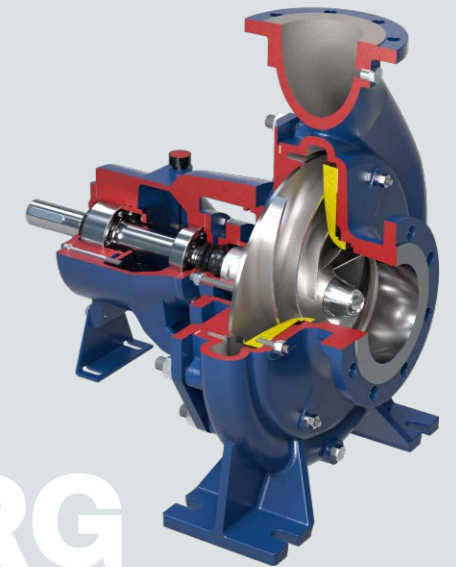


## PROCESS



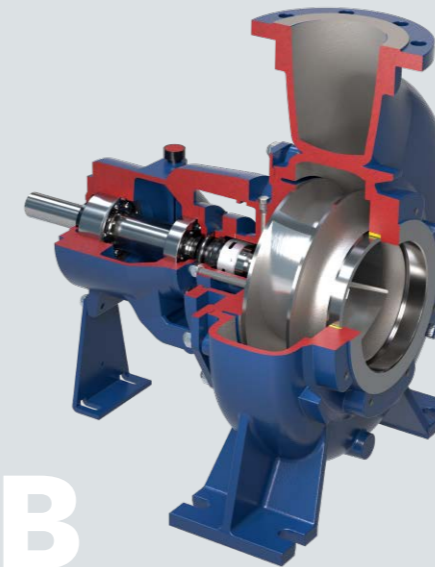
### RD

Closed impeller ISO 2858



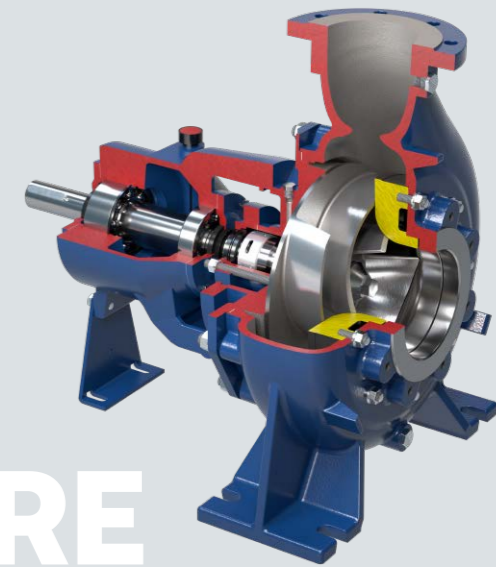
### RG

Open impeller ISO 2858



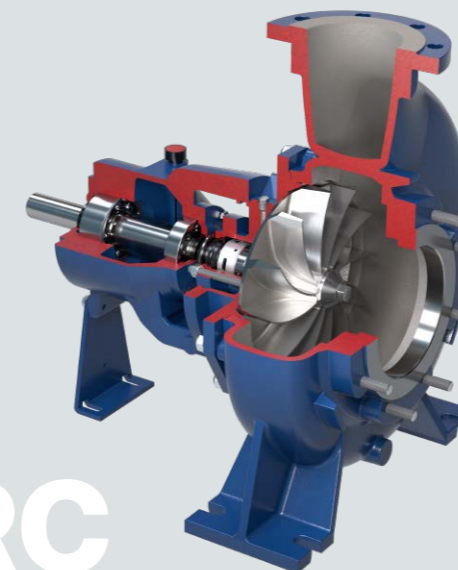
### RB

Channel impeller



### RE

Open channel impeller



### RC

Vortex impeller



**VERTICAL**

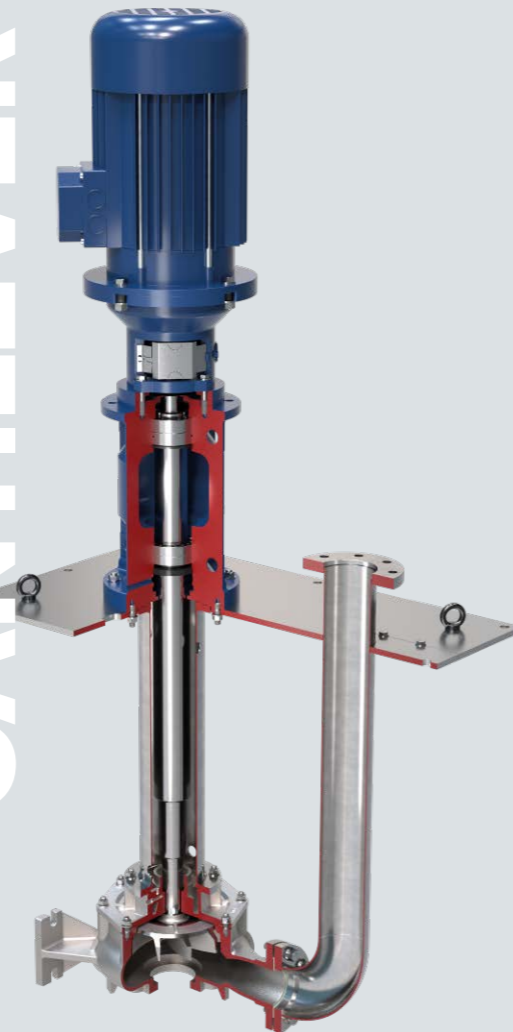
Closed, Open, Channel and Vortex impeller

**VERTICAL**

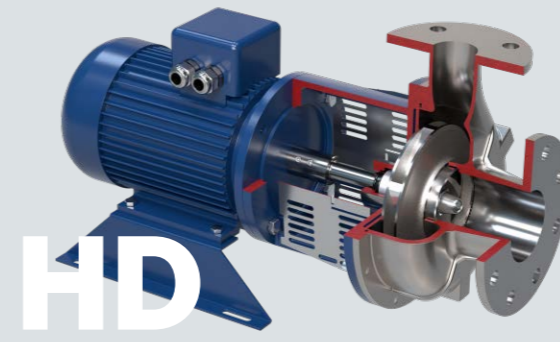


Vortex and Channel impeller

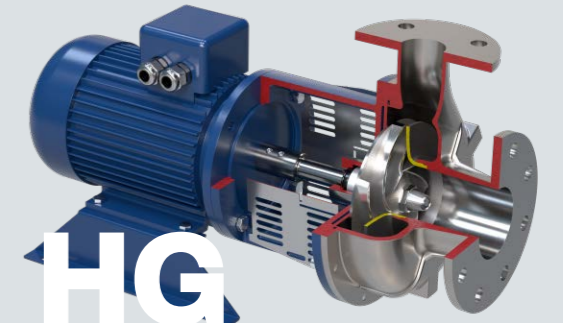
**CANTILEVER**



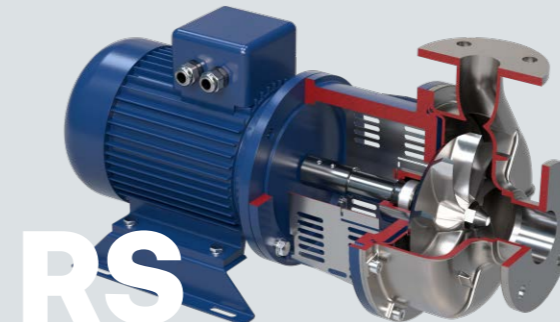
**CLOSE COUPLED**



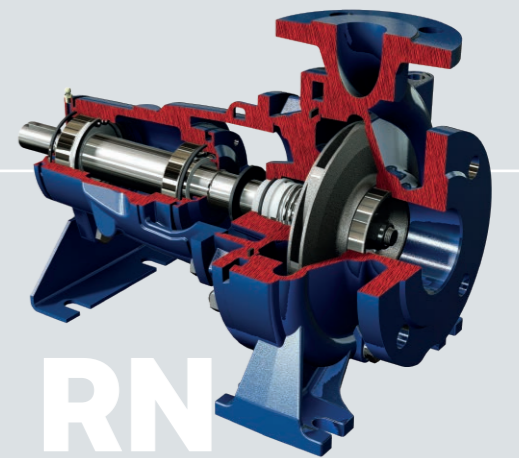
**HD**  
Closed impeller



**HG**  
Semi-Open impeller

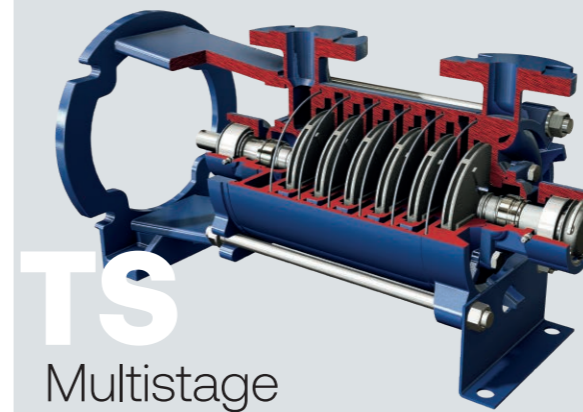


**RS**  
Vortex impeller

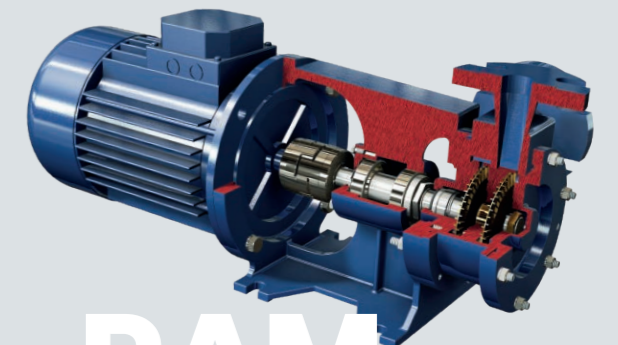


**RN**  
Closed impeller

**WATER**



**TS**  
Multistage



**RAM**  
Peripheral impeller



Conventional wastewater treatment consists of a combination of physical, chemical, biological processes and operations to remove solids, organic matter and, sometimes, nutrients from wastewater.

There are two wastewater treatment plants namely chemical or physical treatment plant, and biological wastewater treatment plant.

General terms used to describe different degrees of treatment, to increase the treatment level, are preliminary, primary, secondary, and tertiary and/or advanced wastewater treatment.

RB

### PRELIMINARY SCREENING

Screening is the first step in wastewater treatment process. This step involves the removal of large objects for example nappies, cotton buds, plastics, diapers, rags, sanitary items, face wipes, broken bottles or bottle tops that in one way or another may damage the equipment.

Rotary drum filters are ideal for the removal of fine suspended solids in recirculating systems where water reuse strategies are imperative.

Our RB pumps, thanks to the channel impeller, can move **without clogging problems and with high efficiency** large quantities of water containing small suspended solids.



RC

### PRIMARY TREATMENT

Primary treatment process involves the separation of macrobiotic solid matter from the wastewater. This process is done by pouring the wastewater into big tanks for the solid matter to settle at the surface of the tanks. The sludge, the solid waste that settles at the surface of the tanks, is removed by large scrapers and is pushed to the center of the cylindrical tanks and later pumped out of the tanks for further treatment.

Our RC vortex impeller pumps are installed at the primary treatment tank where solids are removed from raw water before the secondary treatment, activated sludge process. The liquid contains high concentrations of large solids that can be handled only using pumps with vortex impeller (solids up to 110 mm).



RB

### CIRCULAR CLARIFIER

Secondary or biological treatment is performed in a tank containing a "soup" of starved microbes called activated sludge. Like us, these microbes require air to live (they are aerobic organisms) and thus air is pumped into the tank. Microorganisms in this aeration tank use the dissolved and particulate organic matter as food, producing more microorganisms.

Our RB channel impeller pump are recirculating biological sludge in a circular clarifier with surface skimmer where solids are removed from raw water.

The pump is able to guarantee, thanks to the use of the channel impellers, high efficiencies even with dirty liquids.



RS

### DISSOLVED AIR FLOTATION (DAF)

DAF technology refers to the method of liquid-solid separation by air introduction. The fat and grease along with light solids are moved to the surface creating a sludge blanket. Thus, it can be continuously removed via scum scraping.

Our RS, thanks to the semi-open impeller and special seal arrangement, can work with a solution of water and air up to 10%. Air drum for saturating the pressurized effluent water with air is not required.



RB

### ULTRAFILTRATION

Ultra-filtration (or UF in short) is one of the pressure-driven membrane processes. The ultra-filtration process uses a membrane - a simple permeable material - which, in the case of ultra-filtration, only allows particles smaller than 20 nm to pass through it.

UF is extremely suitable as pre-treatment in the preparation of drinking water or process water. It has excellent properties for removing suspended matter and bacteria. It is frequently the preferred choice of filtration after Dissolved Air Flotation (DAF) and prior to Reverse Osmosis (RO).

Our RB channel impeller pump are recirculating water in waste oil emulsions from metal working processes in a UF system to recover and degrease water to reduce costs for waste handling. The pump is able to guarantee, thanks to the use of the channel impellers, high efficiencies even with dirty liquids.



RD

### DEMINERALIZATION (UF AND RO)

Reverse Osmosis (RO) solution is an extremely successful way of demineralising water by moving it through a fine 'RO membrane' under pressure, leaving the impurities and contaminants on one side and the 'purified' water on the other. The pressure exerted during the process depends upon the type of water being treated, be it fresh or salt water.

Pre-treatment of RO system is designed to prevent fouling of the membrane, maintain performance of the system, and extend the lifetime of the membranes. A system designed with an ultrafiltration as pre-treatment prior to reverse osmosis system has been referred to as an Integrated Membrane System (IMS).

Several RD pumps are installed in a demineralisation plant for river water treatment. Our pumps are used in both processes of integrated membrane system: ultrafiltration for river water feeding and at the end of reverse osmosis for demi water storage.



Anaerobic Digestion converts organic matter into biogas, a source of renewable energy, and a nutrient rich organic fraction known as digestate.

Currently the majority of AD facilities recycle the digestate to local agricultural land as an organic fertiliser.

The concentrated digestate will be used as a biofertiliser while the water which is taken off will be cleaned and used for land irrigation.

RG

DIGESTER RECIRCULATION

The digester is heated and mixed mechanically or with gas-mixing systems to keep the solids suspended. The purpose of mixing is to keep the reaction medium homogeneous, in order to attenuate the effects of load fluctuations. Mixing is carried out by mechanical agitation.

Our RG pumps with semi-open impeller can recirculate digestate containing 6-8% affine particles with high efficiency.

Pumps are used to increase digester efficiency by recirculating and mixing the tank contents.



RB

ANAEROBIC DIGESTATE CONCENTRATION

To concentrate digestate or increase dry solids content, evaporation can be applied. Evaporation utilises thermal energy (heat) to release the moisture within the digestate and increase both nutrient and solids concentration.

Our RB pumps are one of the key points of the plant as they must ensure the movement of the product in heavy conditions, in terms of vacuum, viscosity and specific gravity of the product (in particular for the final product).



RB

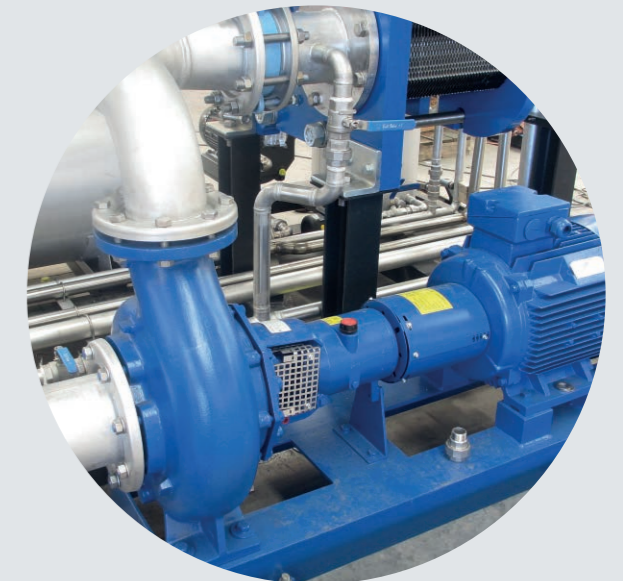
FORCED CIRCULATION VACUUM EVAPORATOR

Single stage evaporators with forced circulation by means of mechanical vapour compression.

Its high efficiency enables treatment of effluents that are otherwise difficult to treat, such as brines, oily water, RO rejects, washing waters, etc.

Our RB pumps in duplex SAF 2507 are one of the key points of the plant as they must ensure the movement of the product in heavy conditions, in terms of vacuum, viscosity and specific gravity of the product.

Pumps are equipped with mechanical seal designed to work in high vacuum condition.



RD

MULTIPLE EFFECT VACUUM EVAPORATOR

Multiple effect vacuum evaporator, for the effective concentration of water-based solutions. After a process of evaporation, very high percentages of distilled water are achieved (95% at least) and a very low amount of rejection (no more than 5%) to be managed.

Our RD pumps in duplex SAF 2507 are one of the key points of the plant they must ensure the movement of the product in heavy conditions, in terms of vacuum, viscosity and specific gravity of the product

Pumps are equipped with mechanical seal designed to work in high vacuum condition.



Wet scrubbers are used to remove water-soluble gases and vapors, as well as particulates and aerosols. Gases are scrubbed by the process of diffusion constrained by vapor-liquid equilibrium. Particulate or gases are collected in the scrubbing liquid. Wet scrubbers are generally the most appropriate air pollution control devices for collecting both particulate and gas in a single system.

RB

BLAST FURNACE SCRUBBER

After primary separation in a cyclone, the blast furnace top gas is scrubbed with water in the annular gap scrubber to obtain the desired residual clean gas particulate concentration. The quantity of water required for scrubbing is relatively low and thus the gas cooling requirements normally determine the total water flow rate. Our RB pumps are used for water circulation in wet scrubbing system of a blast furnace. The pump is able to guarantee, thanks to the use of the channel impellers, high efficiencies even with dirty liquids.



RDV

WET SCRUBBER

The scrubbing process takes place in a packed column where the packing provides the necessary surface area and turbulence to achieve the desired removal. The scrubbing liquid is distributed at the top of the packed bed and it "rains" down flowing through the bed where it comes in intimate contact with the gas. This contact allows the scrubbing liquid to remove a contaminant from the dirty gas. Our RDV vertical immersible sump pumps are installed above metallic tank where scrubber water is collected: pumps are used for water circulation in wet scrubbing system. Pumps in AISI with bottom bearing bush can easily work even with aggressive chemicals coming from gas or air cleaning.



Pits are used typically for collection and equalization of waste water flow from trenches or sewer lines before treatment or storage. They are usually quiescent and open to the atmosphere. In industry, individual drains may be dedicated to a single source or piece of equipment. Area drains will serve several sources and are located centrally among the sources or pieces of equipment that they serve. Lift stations are usually the last collection unit before the treatment system: their main function is to lift the collected waste water to a treatment and/or storage system, usually by pumping or by use of a hydraulic lift.

RB

OPEN PIT DEWATERING

Open pit dewatering is a process where dirty water is pumped out from the pit using high-head drainage pumps, preferably suspended from underneath. The water can contain suspended solids and traces of sand. Our RB channel impeller pump is installed in a pontoon for dewatering pits. The pump is able to guarantee, thanks to the use of the channel impellers, high efficiencies even with dirty liquids.



RCV

SUMP VERTICAL PUMP

Vertical sump pumps are usually installed above pit that are used to collect liquid overflows or chemical wastes from industrial processes. Our RCV vertical sump pump, up to 6 meters length, has all the intermediate bearing bushes lubricated by an external source: bushes are always in contact with clean liquid. This execution is used when the pumped liquid is dirty, sticky or with suspended solids.



La nostra storia ha inizio nel 1935 in una piccola officina nel centro di Parma dove Salvatore Robuschi, il fondatore dell'azienda, costruiva e riparava piccole pompe.

Nel corso degli anni l'assistenza si è trasformata in produzione e oggi, quasi 90 anni dopo, la Salvatore Robuschi è uno dei principali produttori di pompe di processo in Italia e ricopre un ruolo strategico anche a livello mondiale.

La gamma odierna comprende pompe centrifughe orizzontali e verticali con girante chiusa, aperta, a canali ed arretrata utilizzate in settori quali trattamento acque, chimico, alimentare e molto altro.

Ciò che contraddistingue la Salvatore Robuschi dalla concorrenza è il supporto tecnico: grazie alla continua crescita degli ultimi decenni è stato possibile creare uno staff tecnico-commerciale altamente qualificato che, con competenza e rapidità, è in grado di sviluppare soluzioni personalizzate per ogni esigenza del cliente.

L'ampia gamma, l'affidabilità, la totale modularità dei prodotti, i brevi tempi di consegna ed il supporto puntuale sono i motivi principali per cui la Salvatore Robuschi continua ad accrescere la propria quota di mercato anno dopo anno, senza però tralasciare l'attenzione per l'ambiente ed il benessere dei dipendenti.

#### La struttura organizzativa

L'ufficio tecnico commerciale è in grado di affiancare il cliente nella scelta del prodotto, intesa come vera e propria guida nell'identificazione della corretta macchina da destinare all'uso specifico.

#### Direttiva ATEX

L'azienda è anche in grado di fornire pompe certificate secondo le norme ATEX, categorie 2 e 3, per l'utilizzo in atmosfera esplosiva.

#### Attenzione per l'ambiente

L'attenzione che la Salvatore Robuschi riserva all'ambiente ha portato l'azienda a sviluppare una politica ecosostenibile investendo nella posa di un impianto fotovoltaico composto da 1.000 m<sup>2</sup> di pannelli di ultima generazione con capacità produttiva media annuale di 1 MW.

Our history starts back in 1935 in a small workshop in Parma where Salvatore Robuschi, the company founder, built and repaired small pumps.

Over the years service has turned into production and today, almost 90 years later, Salvatore Robuschi is one of the largest manufacturers of process pumps in Italy and plays a strategic role worldwide too.

Today's range includes horizontal and vertical centrifugal pumps with closed, open, channel and vortex impeller used in applications such as water treatment, chemicals, food and much more.

The main difference between Salvatore Robuschi and other competitors is the technical support: thanks to the continuous growth in the last decades it has been possible to create a highly qualified technical-sales staff that, with competence and rapidity, is able to develop tailor-made solutions for every customer need.

The wide range, the reliability, the total modularity of its products, the short delivery times and the punctual support are the main features that allow Salvatore Robuschi to keep on increasing its market year after year, always keeping in mind the attention to the environment and the employees' welfare.

#### Organisational structure

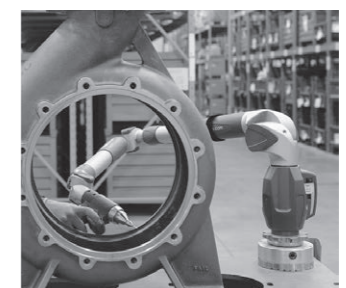
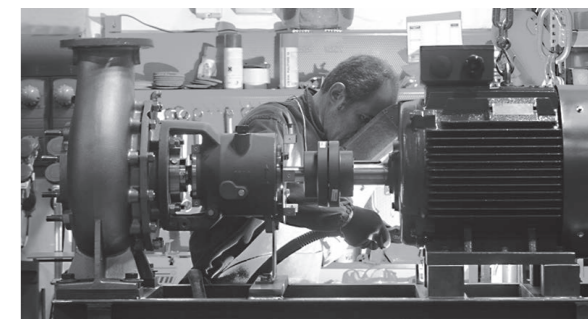
The sales-technical department is well-qualified to assist the customer in choosing the most suitable machine and meet customers specific needs.

#### Atex directive

Salvatore Robuschi is able to supply pumps according to the ATEX rule, category 2 & 3, suitable to be installed in hazardous area.

#### Environment

Salvatore Robuschi concern with the environment led to an eco-friendly policy investing in a photovoltaic system that has an average capacity per year of 1 MW thanks to its 1,000 m<sup>2</sup> panels.



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ACCADUEO IMPIANTI

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