



**S&M.**  
refrigerazione

# S&M

## REFRIGERATION

### **S&M Customizable cool**

Climate control for people. Preservation for food. Technology for the pharmaceutical industry. Customized products to meet the needs and demands of all of our customers. We offer expertise in both traditional and innovative technologies thanks to continuous training and everyday sensibility to apply the norm and satisfy the customer, exploiting all the tools that research and the market make available to us.

For over thirty years S&M Refrigeration has designed, installed and maintained refrigeration and climate control systems: we offer a vertical competency that oversees the idea, design, production and operational life of the system. We imagine and produce refrigerating systems using innovation in the service of sustainability and performance over time, according to the technical rulebook and in compliance with the most stringent norms and most sophisticated good practices.

S&M is the ideal partner, thanks its across-the-board expertise applied in extremely sophisticated industrial fields and in wide array of climactic contexts with installations throughout the world, and the independence that allows us to offer you tailor-made solutions. Not what we've always used, not what a supplier of ours is proposing. Yours. Because we design it and build it for you.



## OUR SECTORS

CHEMICALS - PETROCHEMICALS -  
OIL & GAS

PHARMACEUTICAL INDUSTRY

FOOD INDUSTRY

RESEARCH LABORATORIES

MEAT - FISH - FRUIT AND VEGETABLES

CONFECTIONERY AND ICE CREAM  
INDUSTRY

TECHNICAL GASES

ENERGY

COSMETICS

REFRIGERATION PLANTS

HVAC SYSTEMS

LOW-CHARGE AMMONIA BRINE CHILLERS

SUBCRITICAL, TRANSCRITICAL AND  
PUMPED CARBON CO<sub>2</sub> REFRIGERATION  
SYSTEMS

GAS AND SOLVENT CONDENSATION  
SYSTEMS

INDUSTRIAL AND COMMERICAL CLIMATE  
CONTROL SYSTEMS

INDUSTRIAL AND COMMERICAL  
WAREHOUSES AND COLD ROOMS

LIQUEFACTION PROCESS

## SYSTEM TYPOLOGIES



### Design, Upgrade, Maintain

The effectiveness of an S&M-made system is the fruit of the total safeguarding of our work. We're by our clients' side in the design phase of the whole system, with consultations rich in experience and technologically up-to-date. We take the idea and transform it into a system, optimizing the guidelines to maximize performance.

Our planning is dynamic and continuous. Prior to installation it's open to any element of innovation or optimization that we propose or that is submitted for our evaluation. Once the system is in place, its goal becomes effectiveness and functionality over time – no ifs, ands, or buts.

And to give continuity to this effectiveness, we provide maintenance services capable of reacting immediately to problems, utilizing modern digital support tools and helping the customer choose between upkeep or upgrade, with the greatest possible attention to cost and the life cycle of the system. Because our goal is always one and the same: the system's continued performance over time.



### Technology and Know-how in the Service of Excellence

We're ready to bring our expertise to bear on any challenge: our accumulated experience in the field, our contacts with suppliers, and our intensive training is offered in an applied and appropriate fashion for every single project or intervention, generating results that are always specific to the customer's demands.

Before beginning work, we acquire the necessary data to establish which processes and technical and technological tools will allow us to achieve the desired results, always making our choices pertinently and with the greatest possible attention to budget. Our analysis is always systemic and independent, helping us provide well-documented and objective proposals.

Traditional as well as innovative refrigerants, latest-generation redundant compressors, integrated solutions of optimization and remote control: these are only a few of the pieces we bring to the table to compose the customized mosaic of a top-quality refrigeration system.



### All-around Applied Expertise

Cold may be a single concept, but it has many applications: the management of a wide variety of industrial problems is one of our most distinctive characteristics, because we analyze them every time with all the tools that our thirty years of experience can give to our clients.

Pharmaceuticals, food, oil & gas, paper mills, foundries. High temperatures, extreme climactic conditions, fire risk, integrated systems. With the support of reliable partners both on the number side and in installation, we're able to resolve the most complex and heterogeneous issues, whether they're determined by external factors like dislocation or climate or internal ones like the need to meet certain operational requirements.

Our approach is as versatile as our execution: nothing is impossible, if it's handled with the proper tools and the right method of planning and realization.

## AMMONIA



## EFFICIENCY and SAFETY, the results of research, innovation and expertise

**Ammonia Brine Chiller for cooling**  
**water** and Ethylene glycol down to -20 °C,  
with a potential of 800 kW at -25 °C (TEV)  
+40 °C (TC).

### Technology

**Gravity-flooded evaporator** feed with  
level controller.

### Competitive Advantage

A system that's typically **10-15% more efficient** than the corresponding direct expansion ammonia refrigeration system, and **20-25% more efficient** than the equivalent HFC system.

### Technical Features

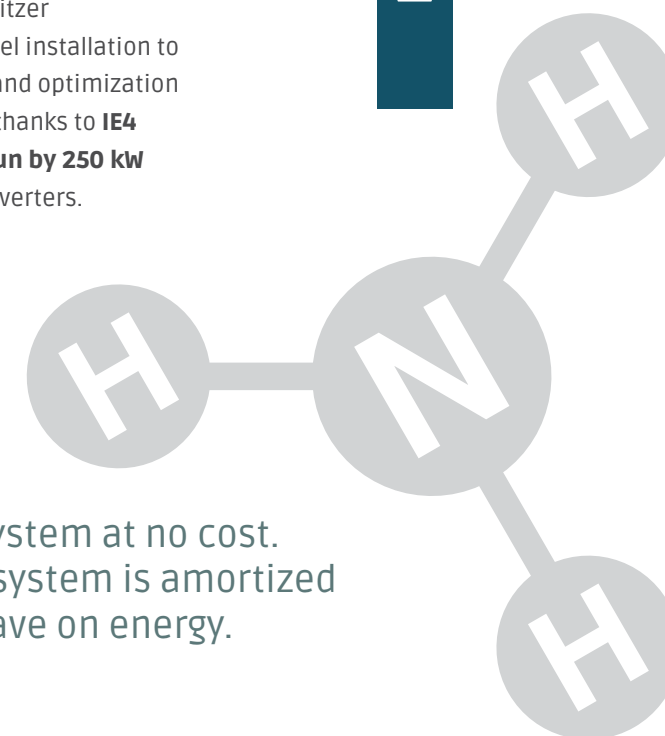
New OSKA95103-series Bitzer  
Compressors with parallel installation to  
guarantee redundancy and optimization  
of energy consumption thanks to **IE4  
synchronous motors run by 250 kW  
Danfoss Fc103-series inverters.**



Upgrade your system at no cost.  
The cost of the system is amortized  
by what you'll save on energy.

↑  
EFFICIENCY

↓  
ENERGY CONSUMPTION





## AMMONIA



## EFFICIENCY DOUBLES, one structure subjected to two temperature control systems

**Dual-temperature Ammonia Brine Chiller**, capable of serving an HVAC system at +7 °C and a process system at -20 °C.

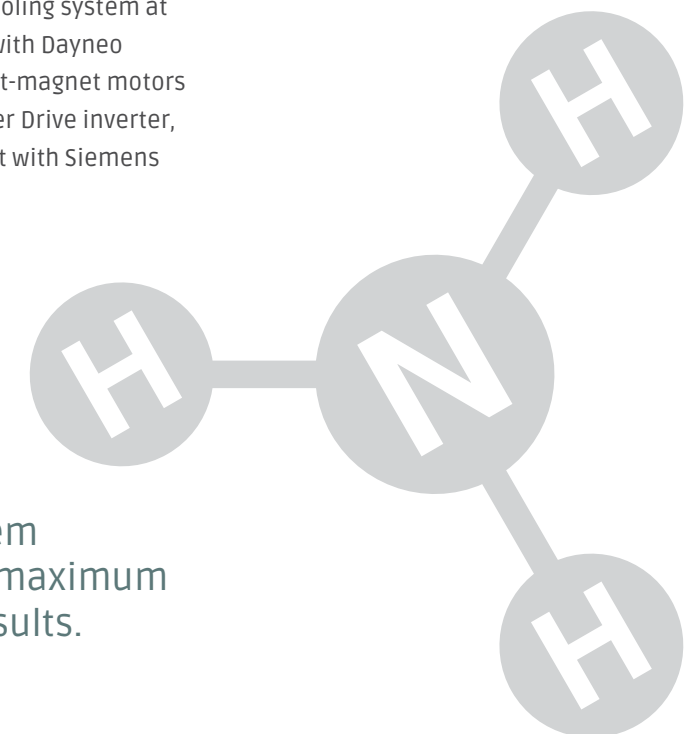
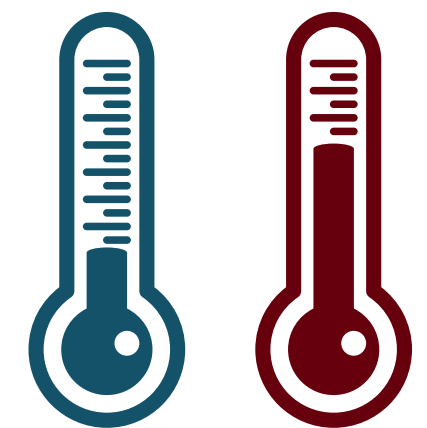
**Technology**  
Unfreezable-solution cooling system.

**Goal Achieved**  
On a single skid, a system capable of simultaneously regulating functions of climate control and service to the manufacturing process.

**Technical Features**  
Unfreezable-solution cooling system at -20 / +7 °C, 350/400 kW with Dayneo synchronous permanent-magnet motors run by a dedicated Power Drive inverter, integrated management with Siemens PLC.



Maximum system integration for maximum efficiency of results.





HFC



## OPTIMIZATION EVEN ON FLUORINATED GAS

Our expertise goes beyond  
the conventional limits

**Diathermic-oil cooling system with two  
levels** of functioning:

- -30 °C
- -50 °C

### Technology

Use of an HFC refrigerant ideal for providing maximum performance at the requested operating conditions. Use of a dedicated exchanger with low-temperature operation and automation per optimal management.

### Competitive Advantage

Energy efficiency obtained and increased despite detrimental operating conditions of the COP, leading to a notable increase in the COP and a return on investment.

### Technical Features

Therminol D12 cooling system at -30/-50 °C, power 300/150 kW with Dayneo synchronous permanent-magnet motors run by a dedicated Power Drive inverter, integrated management with PLC Siemens Step 7 with a 15" graphic terminal.

-30

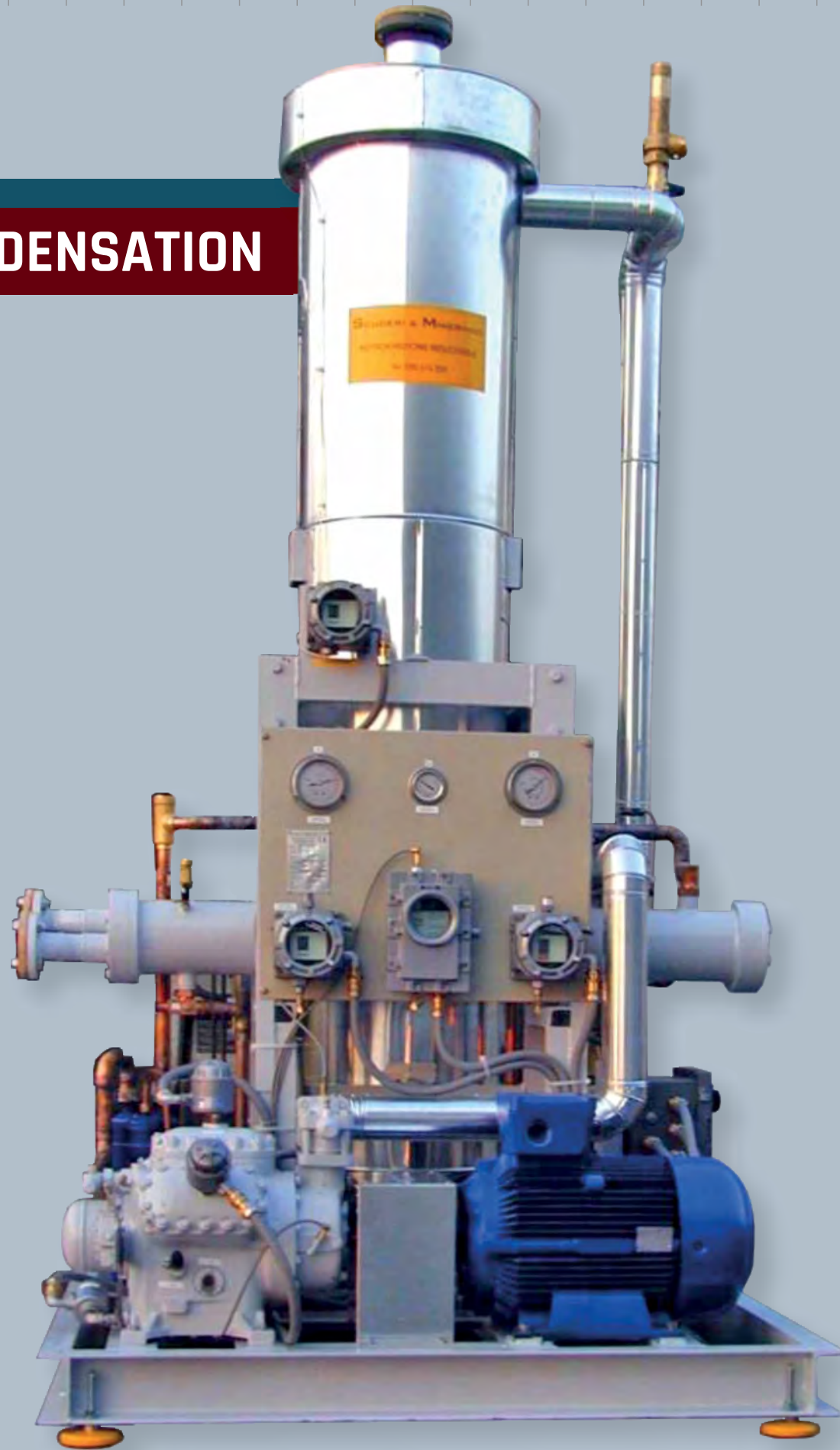
-50

HFC



Fluorinated, natural: the solution  
isn't one refrigerant or another.  
The solution is our know-how.

## CONDENSATION



## CUSTOMIZING CONDENSATION SAVING with MAXIMUM SAFETY

System of condensation of organic products from an inert gas source for the reclamation of pure nitrogen.

### Project Logic

Specific definition of system of condensation and separation beginning with the properties of the product, separation, and retrieval of substance.

Characterization of system with respect to conditions of a potentially explosive atmosphere (ATEX).

### Goal Achieved

Regeneration of pure nitrogen **in an environment of potentially explosive atmosphere** and removal of dichloromethane (DCM) with dimethylformamide (DMF) from nitrogen.

### Technical Features

Copeland piston compressors, dedicated, custom-built vertical evaporator.



S&M project design combines efficiency of process and maximum safety.





## NITROGEN – PROCESS



## NITROGEN LIQUEFACTION

### Efficient refrigeration in the service of the process

**Optimization of Nitrogen-based liquid.**

#### Technology

System of Nitrogen pre-cooling in liquefaction unit, operating temperature from -25 °C to -30 °C.

#### Competitive Advantage

Increase in performance and efficiency of liquefaction system achieved by low-temperature compression.

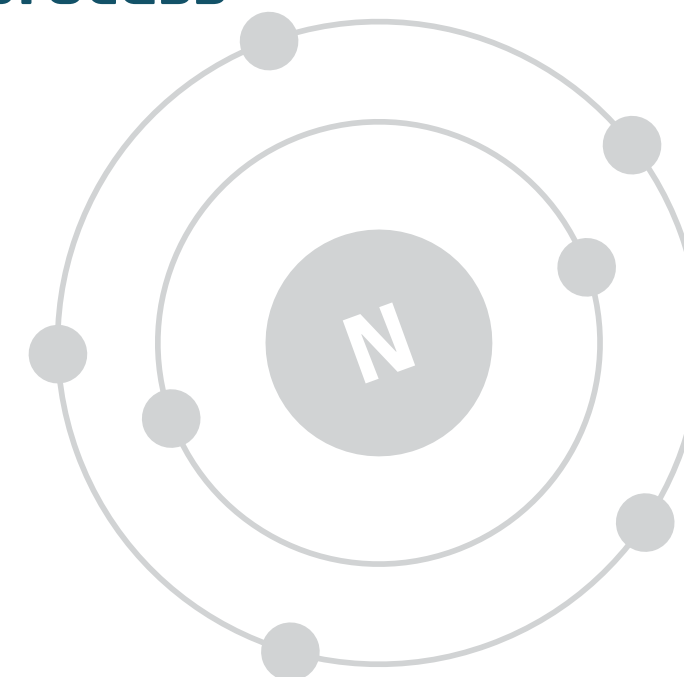
#### Technical Features

Nitrogen cooling system at -30 °C with use of open screw compressor coupled with high-efficiency motor equipped with inverter. Cooling system with flooded HFC evaporator customized by one of our partners.

**Manufacture possible even for ATEX-classified areas**

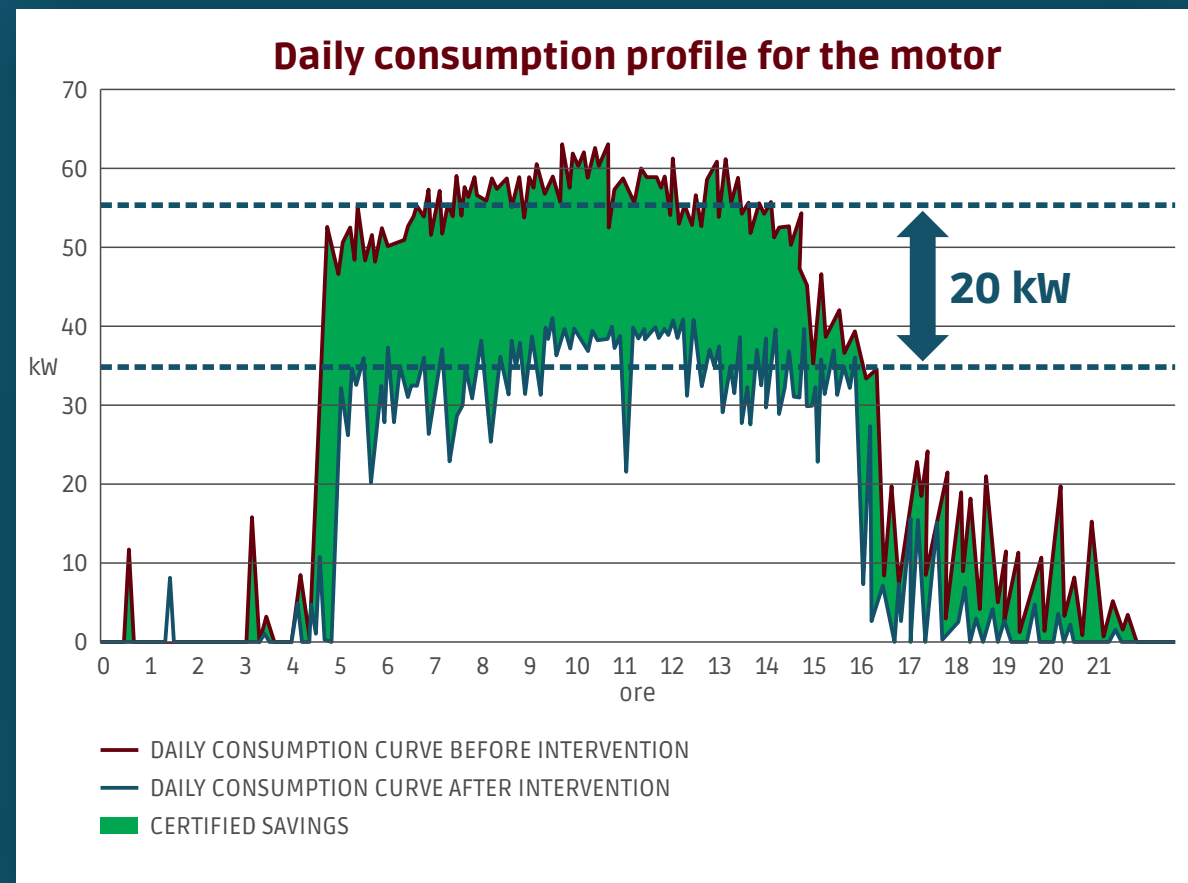


We design and implement processing refrigeration in environments with the most stringent safety requirements.





## ENERGY EFFICIENCY



**REAL SAVINGS. VERIFIED IN ACTUAL CASES AND ON SYSTEMS FUNCTIONING ACCORDING TO NORMAL STANDARDS OF USE**



Annual energy savings: 110.000 kWh

Energy rate paid: 0,16 €/kWh

Annual energy savings: € 18.000,00

## Innovative applications for **MAXIMUM ENERGY EFFICIENCY**

Reluctance motor system for maximum optimization in electrical energy consumption.

### Technology

In a structure of 7 compressors, modification of one with motor replacement and insertion of IE4 synchronous motor with inverters that functions as masters.

### Competitive Advantage

Savings in energy consumption compared to old motor **equivalent to 35%**, with **time for return on investment of less than two years**.

### Technical Features

Structure modified with insertion of IE4 synchronous motor with inverters and equipped with instrumentation for continuous monitoring for a real-time analysis of consumption patterns at any given moment and over time.

**Lower energy costs without sacrificing performance**



Applied and integrated innovation and technology in intelligent solutions that make the difference.

## HEAT RECOVERY

## THE HEAT PRODUCED BY THE INDUSTRIAL PROCESS BECOMES AN ENERGY RESOURCE

Integrated system for welding fumes recovery and their "intelligent use" in heating.

### Technology

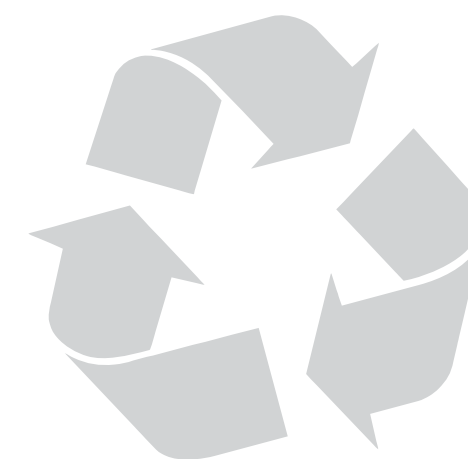
Refrigeration cycle constituted by an inverter compressor working to recover heat given off by welding fumes and expediently channeled toward the evaporator.

### Goal Achieved

Recovery of heat from the process, for an optimization of energy consumption in the production of required temperature conditions, with a reduction of power consumption estimated in 100 kW to 35 kW with 40 CV for the same amount of air treated.

### Technical Features

Fume-fed evaporator for production of heat from compression and condensation, in low external-temperature conditions. Supporting inverter for further increase in optimal heat management.



The use of the heat recovered from the process generates a new system model, more efficient and sustainable.





## TECHNICAL ASSISTANCE

## TECHNICAL ASSISTANCE FOR EVERY SYSTEM

Whether they are made  
by us or by third parties

- Maintenance contracts
  - normal
  - emergency.
- Retrofits for compliance with new fluorinated gas norms.
- Inspection of compressors.
- Technical and manual training of in-house personnel.
- Technical consultations.
- Legal expert reports.
- Metric surveys.
- ATS procedure for obtaining authorization to use toxic gases.



# CERTIFICATIONS



## certified systems built by certified technicians

- UNI EN 13.313: the most important professional qualification in the refrigeration industry.
- D.P.R. 74: energy efficiency qualification for our systems.
- The norm UNI EN 378: our primer in all we do.
- F-GAS treatment: technical expertise and environmental safety.
- ATEX: design of systems at risk of explosion and training of relevant personnel.







il freddo  
Su Misura

**S&M Refrigerazione s.r.l.**

Sede legale: Via Masone 2 – 24124 BERGAMO BG

Sede operativa: Via del Chioso 12/A – 24030 MOZZO BG

Telefono: +39 035 615 350 – Fax: +39 035 437 6671

[info@smrefrigerazione.it](mailto:info@smrefrigerazione.it)

[www.smrefrigerazione.it](http://www.smrefrigerazione.it)

ENG