



4.0^{INDUSTRY}
compliant

IoT ready



 **enoberg**

Filling technology since 1984

Electronic and level ultra-compact filling systems, for filling PET and glass bottles with flat and carbonated products.



COMPANY PROFILE

Enoberg S.r.l. is a member company of the SMI Group and is one of the leading manufacturers of filling systems worldwide.

The company is based in the north of Italy in the province of Bergamo in a 3,500 sqm facility, in which the design, as well as the production of the filling machines take place.

The production range is very wide and it goes from electronic volumetric fillers to level fillers, from systems for PET, rPET, PP and HDPE containers to systems for glass and aluminum bottles. Characterized by production speeds from 1,000 to 50,000 bph and by an excellent price-performance ratio, these solutions are suitable for an extremely heterogeneous target group, both in terms of industry sector and company size.

The starting point of the development of all Enobergs' filling solutions is the careful analysis of the customers' needs. This element, together with the flexibility and reliability that these systems embed, allows to achieve the company mission: full customers' satisfaction.

Aware of the continuous market evolution, Enoberg also pays great attention to R&D investments, in order to supply cutting-edge solutions, capable of meeting the new consumers' and manufacturers' requirements, as well as the new challenges of this industry.

It is precisely the inclination towards innovation, together with the consolidated experience, the added value of Enoberg's solutions and the leading factor of the company success.

High-quality products go hand in hand with efficient services, both online and on-site, aimed at guaranteeing customers all over the world quick assistance and ensuring the maintenance of the machine over time.



HYPER CLEAN SERIES FEATURES

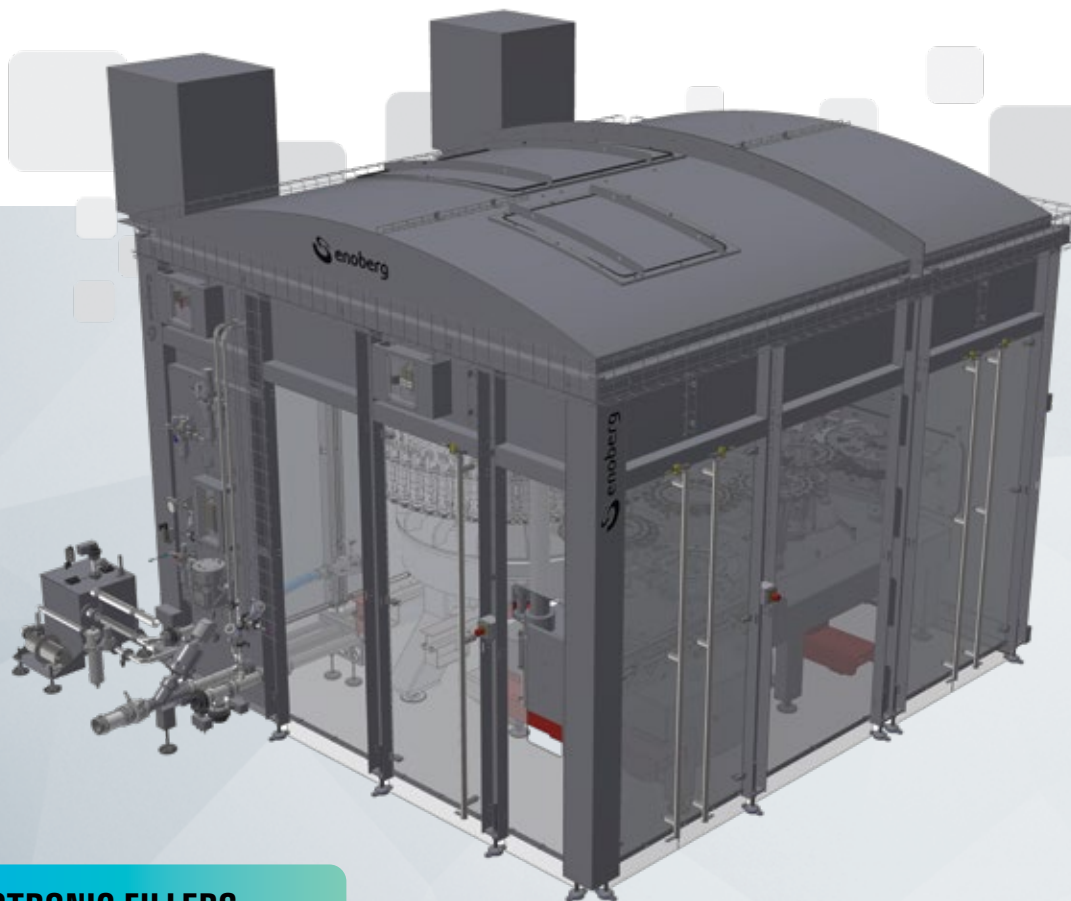
The new HYPER CLEAN series have been designed to meet hygiene, safety and cleanliness requirements and to minimize the possibility of contamination of the product to be filled.

The main features of standard models are:

- welded frame made of AISI 304 stainless steel, with no iron parts, ensuring a solid and rust-free structure;
- glass safety doors and sealing gaskets that hermetically seal the filling environment from the external environment;
- carousel movement executed by robust gears placed in the machine base;
- filling section completely isolated from the transmissions, that do not come into contact with the liquid to be bottled;
- base plate inclined towards the drainage points, to ensure the drainage of liquids from the internal part of the filling section towards the external part;
- filling valves made of AISI 316 stainless steel;
- ceramic-coated steel manifold for high durability, complete with a double seal.



HYPER CLEAN
VIDEO
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ELECTRONIC FILLERS

Enoberg electronic fillers can be supplied as stand alone machines or combined with SMI blow moulders for creating compact solutions for stretch-blow moulding, filling and capping rPET/PET and PP containers.

The electronic filling system is based on the use of a flow meter for each filling valve. The flow meter detects the flow of the product that fills each bottle; once the correct volume is reached, the flow meter controls the closing of the filling valve.

Characterized by a high operational flexibility and capable of meeting the market requirements in terms of hygiene, reliability, ease of use and maintenance, electronic fillers can be divided as follows:



- **HEVF series** suitable for filling flat products:
 - still and carbonated water
 - iced tea
 - clear juice (such as pineapple)
 - fresh milk (7 day shelf life)
 - wine and balsamic vinegar
 - apple vinegar
 - thick juice (such as pear)
 - syrups
 - soy sauce
 - detergents and sanitizers
- **HEMF series** suitable for filling oil
- **HEVS series** suitable for filling carbonated products



	0.5 L Containers			5 L Containers	
	HEVF	HEMF	HEVS	HEVF	HEMF
Filling	electronic	electronic	electronic	electronic	electronic
N° of valves	max. 96	max. 60	max. 96	max. 20	max. 20
Max output speed*					
FLAT WATER	55.000 bph	-	36.000 bph	8.100 bph	-
VINEGAR	40.000 bph	-	-	-	-
SYRUP	36.800 bph	-	-	-	-
DETERGENTS	35.000 bph	-	-	-	-
JUICES	31.600 bph	-	-	-	-
FRESH MILK	30.400 bph	-	-	-	-
EDIBLE OIL	-	36.000 bph	-	-	5.400 bph
SPARKLING WATER	-	-	36.000 bph	-	-
SOFT DRINKS (CSD)	-	-	32.000 bph	-	-



- High-precision flow meters installed next to the filling valves
- Dummy bottles to ensure complete cleaning and sanitization of the parts in contact with the product
- Product pump that allows to keep the pressure constant during the filling operation (HEVF - HEMF series)
- Quick format changeover of the bottle guide equipment
- Parameters of each format directly controlled through HMI
- 7" HMI touch screen (15" available as an option)



*Maximum output rate of the stand-alone filler, that might be limited in the Ecobloc® configuration

The stated values are not binding, as they have to be confirmed by SMI according to production conditions and preform/container technical specifications.



Operation

1 Bottles inlet

The bottles are moved to the monobloc inlet by means of a conveyor. Inside the monobloc a transfer star-wheel conveys the bottles to the rinsing carousel.

2 Rinser

In the rinser (if present) the bottles are turned upside-down at 180° in order to position the mouth over the rinsing nozzles. Then, the bottles are rinsed with water or air is blown inside them. At the rinsing carousel outlet the bottles are turned again upside-down, to bring them back to the starting position, and are moved to the filler by means of the transfer star-wheel.

3 Empty bottles transfer

Inside the filling module, empty bottles are conveyed to the filler by means of a neck handling direct transfer with a star-wheel system. A sensor detects the presence of the bottle; only if the bottle is present, the filling process starts.

4 HEVF Filling

Once the filling station is reached, a gripper grabs the bottle by the neck and places it under the filling valve. The product to be filled is positioned in an external manifold, from which it is conveyed to the filling valve through a specific pump. The electronic volumetric filling process is carried out

through electronic flow meters, placed upstream of each filling valve. During the filling process, the flow meter detects the amount of product that goes through the valve. The measurement is based on pulses, that are compared to the ones set for the format in use. When the set value is reached, the closure sign is sent to the filling valve. At this stage the filled bottle is transferred to the capper.

4 HEMF Filling

Once the filling station is reached, a gripper grabs the bottle by the neck and places it under the filling valve. The product to be filled is positioned in an external manifold, from which, through a specific pump, it is conveyed to the filling valve. The filling is electronic with mass flow meters based on Coriolis principle and placed upstream of each filling valve. During the filling process, the flow meter detects the amount of product that goes through the valve. The measurement is based on pulses, that are compared to the ones set for the format in use. When the set value is reached, the closure sign is sent to the filling valve. At this stage the filled bottle is transferred to the capper.

4 HEVS Filling

Once the filling station is reached, a gripper, directly connected with the filling valve, grabs the bottle by the neck and brings it into contact with the filling valve, in order to allow



the filling operation. The product to be filled is positioned in a manifold resistant to high pressure, placed inside the filling carousel. In the bottle, in contact with the filling valve, CO₂ is injected in order to take it to the right pressure and have a filling with no froth. The electronic volumetric filling process is carried out through flow meters, placed upstream of each filling valve. During the filling process, the flow meter detects the amount of product that goes through the valve. The measurement is based on pulses, that are compared to the ones set for the format in use. While the product enters the bottle, the CO₂ goes out through the dedicated channel. When the set value is reached, the closure sign is sent to the filling valve. At this point the decompression/sniff phase starts: a specific channel conveys the pressure left in the bottle to a dedicated manifold that discharges outside the filling section. At this stage the bottle is transferred to the capper.

5 Capping

A shaped star wheel allows to center the bottle under its capping station. The cap coming from the feeding system is picked by a transfer star wheel called "pick and place". The capping head picks the cap from the star wheels and applies it to the bottle. According to the cap to be applied (plastic screw cap or pressure cap), the capping system can operate by rotation or pressure. The filled and capped bottle is transferred to the outfeed conveyor.

6 Outfeed conveyor

The filled and capped bottles are transferred to a chain conveyor that conveys the bottles outside the machine. This conveyor is equipped with an automatic height adjusting system, that allows to adjust the bottle base according to the bottle height.



HEVF fillers advantages

Maximum filling precision

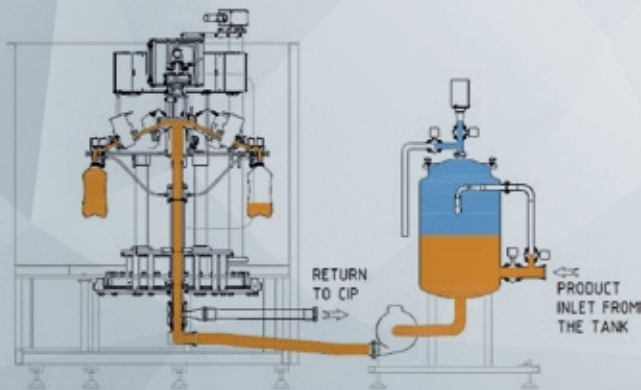
The filling process is extremely precise, thanks to the use of the flow meter, an electronic device installed near each valve that detects the flow of the product that fills each bottle by counting the pulses and sends the filling valve the closure sign, once the value of the format in use is reached.

Compact solution and reduction in transportation costs

The fully welded frame gives the whole machine a solid and resistant structure. This allows a considerable space saving for the machine positioning in the plant. Furthermore, it is possible to transport the filler inside a 40' high cube container (available for most models).

Workability of a wide range of products

A wide range of products can be filled thanks to the valve terminal that is changed according to the type of product.



HEVF 48-18 N S
VIDEO
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High level of hygiene

The machine base plate is inclined towards the drainage points. This allows the drainage of liquids that are on the machine base and a higher level of hygiene.

Protection of electronic components

The electric manifold and the drives of the filling valves are isolated from the filling environment through airlocks. This allows to protect electronic components from the contact with liquids and to perform COP washing operations on the whole filling carousel.

Separation between wet and dry manifolds

The entry of the filling product and the return of the washing product take place in the lower part of the machine through a ceramic manifold equipped with two gaskets (one for sealing and one for safety) and equipped with an inspection light. This leads to the neat separation between "wet" manifolds (product and CIP return) and "dry" manifolds (electric and pneumatic), in addition to a high durability.

Fully washable filling valve

Fully sanitized filling valve thanks to dummy bottles with manual or automatic (optional) positioning.

Efficient control of two filling speeds

The valve allows to control two filling speeds in order to fill homogeneously and efficiently, with no product leakage from the container. The duration of the filling cycles (slow or fast) can be controlled easily and intuitively through the recipes inside the man-machine interface (HMI Posyc®).





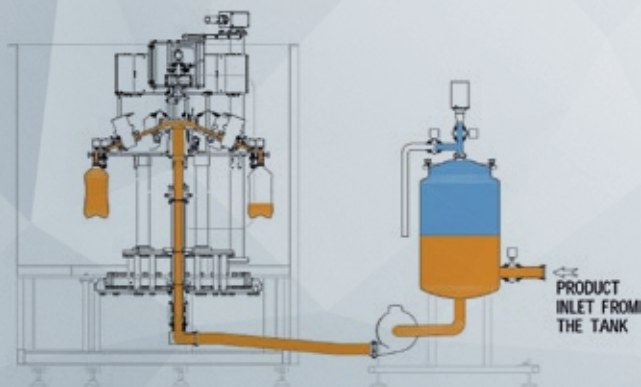
HEMF fillers advantages

Maximum filling precision

The filling process is extremely precise, thanks to the use of the flow meter, an electronic device installed near each valve that detects the flow of the product that fills each bottle by counting the pulses and sends the filling valve the closure sign, once the value of the format in use is reached.

High-precision mass flow meter

The high-precision mass flow meter (flow meter that uses the Coriolis effect in order to determine the exact amount of product at each passage), installed next to the filling valves, allows to get a quick measure with a greater repeatability. The flow meters are characterized by a high stability, with less need for calibration. During the measurement, the impact of the environmental conditions (mechanical vibrations, shaking, sprays, etc) is minimal. Moreover, there is no volume limit (the container size is not limited by the range of load cells). The control of the filling valve and the automatic compensation is performed through PLC.



Simplified filling valve with reduced maintenance costs

Simplified filling valve with a reduced number of gaskets with a significant reduction in costs and times for maintenance operations.

No drop filling valve

HEMF series is equipped with a special no drop filling valve for filling oil in rPET/PET containers, with specific anti-drip function at the end of the filling process.

Efficient control of two filling speeds

The valves allows to control two filling speeds in order to fill homogeneously and efficiently, with no product leakage from the container. The duration of the filling cycles (slow or fast) can be controlled easily and intuitively through the recipes inside the man-machine interface (HMI Posyc®).



HYPER CLEAN
VIDEO
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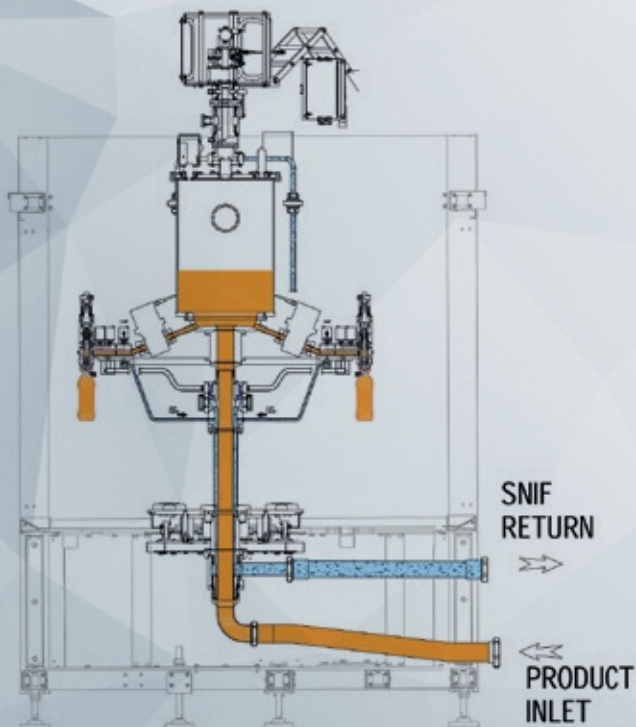




HEVS fillers advantages

Maximum filling precision

The filling process is extremely precise, thanks to the use of the flow meter, an electronic device installed near each valve that detects the flow of the product that fills each bottle by counting the pulses and sends the filling valve the closure sign, once the value of the format in use is reached.



Compact filling module

The compact filling module allows to minimize the number of transfer star wheels, ensuring at the same time practical access to the machine for maintenance and washing operations.

Cutting-edge filling valve

Filling valve with a high technological content with an independent channel for the passage of CO₂ inside the bottle. Furthermore, the valve terminal allows to divert the product flow to the bottle walls and therefore to reduce the liquid turbulence.

Fully washable filling valve

Fully sanitized filling valve thanks to dummy bottles with automatic positioning.

High precision product tank

The device is equipped with: fully washable and sanitized CO₂ charging/discharging valve; capacitive level probe, that communicates with the modulating valve in product infeed in order to keep the product level in the manifold constant

High level of hygiene and reduction in maintenance times

Filling piston integrated in the valve body ensures less bottle movement, a higher level of hygiene and a reduction in maintenance times.



HEVS 50-10 N S
VIDEO
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LEVEL FILLERS

In addition to electronic fillers, Enoberg produces level filling systems.

This category includes the HELC and HRLF series, which incorporate features and advantages of HYPER CLEAN series and are able to fill glass, PET and HDPE containers.

In these solutions, characterized by high reliability and easy maintenance, the filling valve ends the operation when it reaches the mechanically set level, to allow all the bottles to have the same product level inside.

Level fillers are suitable for filling the following products:



• **HELC series** suitable for carbonated products, such as:

- sparkling water
- CSD
- beer

• **HRLF series** suitable for filling:

- spirits
- foamy liquors
- oil
- juices
- sauces
- syrups
- vinegar
- products in HOT FILL



	0.5 L Containers	
	HELC	HRLF
Filling	level filling	level filling
N° of valves	Max 88	Max 88
Max output speed*		
FLAT WATER	35.000 bph	35.000 bph
SPARKLING WATER	27.000 bph	-
SOFT DRINKS (CSD) 11°C	77.000 bph	-
BEER	16.000 bph	-
EDIBLE OIL	-	30.000 bph
FOAMY JUICE	-	17.600 bph
SPIRITS	-	30.000 bph



To meet the most varied needs of the customer, the filler can be equipped with different accessories. This allows to optimize the configuration and the price of the supplied machine according to what is actually required. For beer filling, the machine is equipped with the appropriate accessory to carry out the double pre-evacuation before the filling operation; in this way it is possible to avoid the contact between the filled beer and the oxygen present in the bottle. Thus, the beer can have a longer shelf life and taste can be preserved over time.



*Maximum output rate of the stand-alone filler.

The stated values are not binding, as they have to be confirmed by ENOBERG according to production conditions and product/container technical specifications.



HELC fillers advantages

Maximum filling accuracy

Thanks to the electro-pneumatic filling valve (pneumatic valves activated by solenoid valves) the filling operation is precise and fast. All filling phases (pre-evacuation, bottle pressurization, filling and auto-leveling) are managed directly from the automation of the machine and can be easily modified and adapted through the HMI panel.

Compact frame

Smaller models (up to 30 filling valves) are equipped with a special compact frame, which integrates the rinsing carousel, the filling turret and the capper.

This allows a reduction of the machine footprint when the machine is positioned in the line and the possibility to transport it in a 40' high cube container (to be verified depending on the available configurations).



Versatility

Specifically designed for filling carbonated product in glass bottles, the machine can be easily adapted to also process flat products. Thanks to the bottom handling movement of the bottles (through the body, by means of star-wheels and counter star-wheels) the machine can work both glass and PET bottles.

Certified tank

The product tank, placed inside the filling environment, is certified according to Ped regulation to reach working pressures of up to 6 Bar.

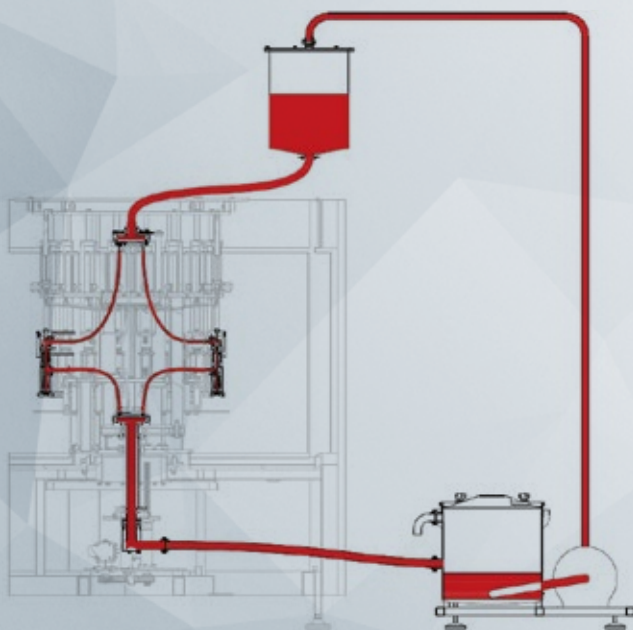




HRLF fillers advantages

Maximum filling accuracy

The filling valve is fully mechanical and with product recirculation. The bottle opens the valve and the gravity filling begins. During the filling process the air present in the bottle is evacuated from the recirculation channel of the product. This allows a faster filling. When the product reaches the desired level in the bottle, a small part of product is recycled.



In this way the level in the bottle is always optimal and any foam formed during the filling process is expelled and collected in a side tank. In the side tank the excess product is collected ready to be filled again.

Hot fill

The HRLF series machine can be adapted to process hot product in hot fill. In this configuration the filler is equipped with temperature sensors and bypass circuit for continuous recirculation of the product even when the machine is not running.

Versatility

Thanks to the advanced mechanical level valve complete with a dedicated vent channel for the air present in the bottle and for product recirculation at the end of the filling operation, the machine is suitable for processing a wide range of flat products. Water, vinegar, sauces, spirits and foamy products can be filled into glass and/or PET bottle, guaranteeing a high level of precision of the product in the bottle.

Modularity

Thanks to many available configurations, the filling bloc can be equipped with a number of valves between 15 and 50. The filler is available in the compact version (rinsing/filler/capper in a single frame), in the version with independent rinsing block and in the filler/capper version.

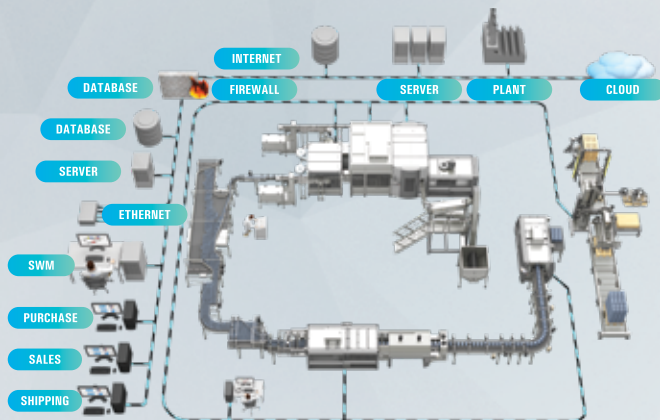


SOLUTIONS 4.0 AND IOT READY

In Enoberg fillers, designed according to INDUSTRY 4.0 principles, complete process automation, electronic handling management and wiring are synonymous with maximum reliability, remarkable operational flexibility and high operating efficiency. The hardware and software components used are IoT (Internet of Things) ready, they are "open" and modular and comply with the main international certifications.

The configuration of Enoberg fillers guarantees easy integration with other machines in the line, easy learning by the operator and the preservation of the investment value over time.

The POSYC is the HMI terminal device (graphic touch screen with IP65 front), based on industrial PC with solid state disks.



Enoberg fillers are very easy to use, as the technology they are equipped with allows to:

- store and manage the recipes of each single bottle operating in the filler
- control and program the machine production speed, depending on the type of the bottle.
- carry out format changeover easily and quickly
- solve or prevent any problems, thanks to remote assistance service, graphical alarms present in the POSYC and notifications of maintenance operations to be performed.
- guarantee high production rates, excellent quality and very low plant noise levels
- monitor performances and analyze machine downtimes.

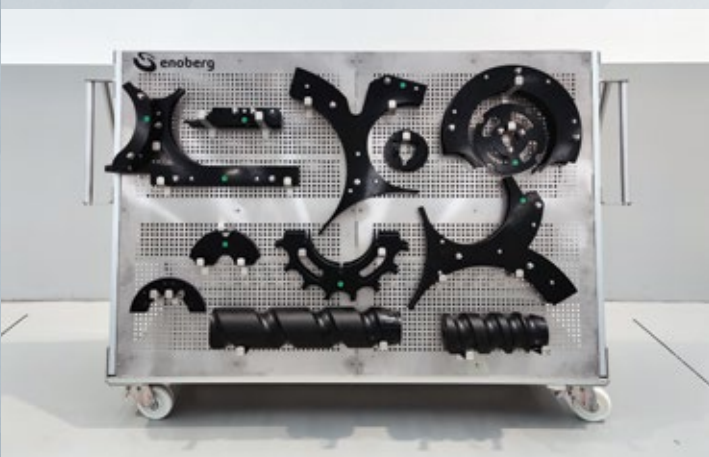
ENVIRONMENTAL SUSTAINABILITY

Enoberg has always been aware of global environmental issues and therefore paid attention to new eco-friendly solutions required by the market.

Thanks to our compact and highly efficient fillers, and to the low number of motors, consumption is minimized.

Moreover, Enoberg fillers can work without problems all new sustainable technical solutions, including recycled PET bottles (rPET), aluminium bottles, returnable bottles and tethered caps.





AFTER-SALES ASSISTANCE

Customer care is not shown only during the development and sales phase, but also continues in the following stages, thanks to a wide range of services aimed at carefully planning, solving, maintaining and enhancing the machine performance during its life cycle.

In order to provide clients with efficient and fast support, assistance is available both on-site thanks to skilled technicians boosting extensive experience, and online, which allows to receive support via call, chat, request form, remote internet connection and AR smart glasses.

Moreover, a wide range of spare parts and upgrades are available, to permit customers to maintain the machine efficiency and performance over the years.

Quick and efficient customer assistance is also ensured thanks to a widespread network of branches and representative offices, providing clients with fast technical and sales support: a way to shorten distance and to be close to customers all over the world.





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