



## The hygienic condenser

### Compabloc

In the pharmaceutical industry there is a requirement for high quality condensers. The hygienic Compabloc is used as main or overhead condenser on reactors as well as vent condensers.

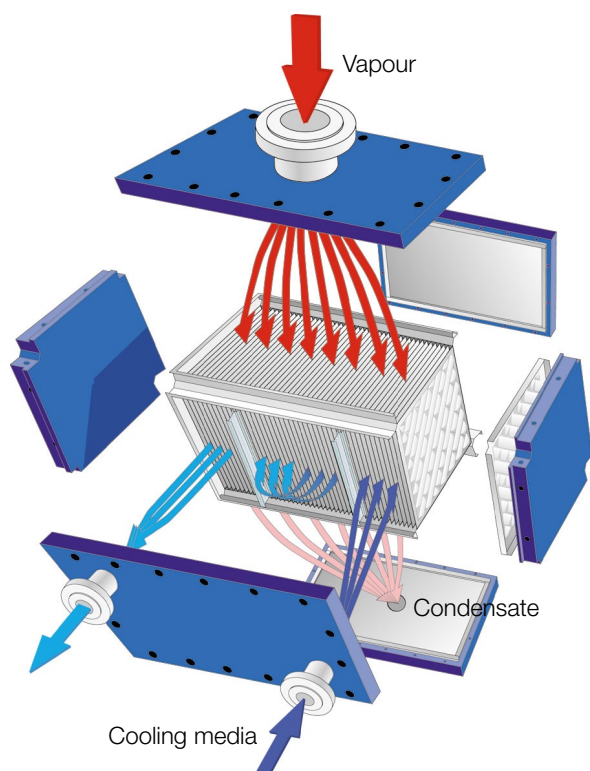
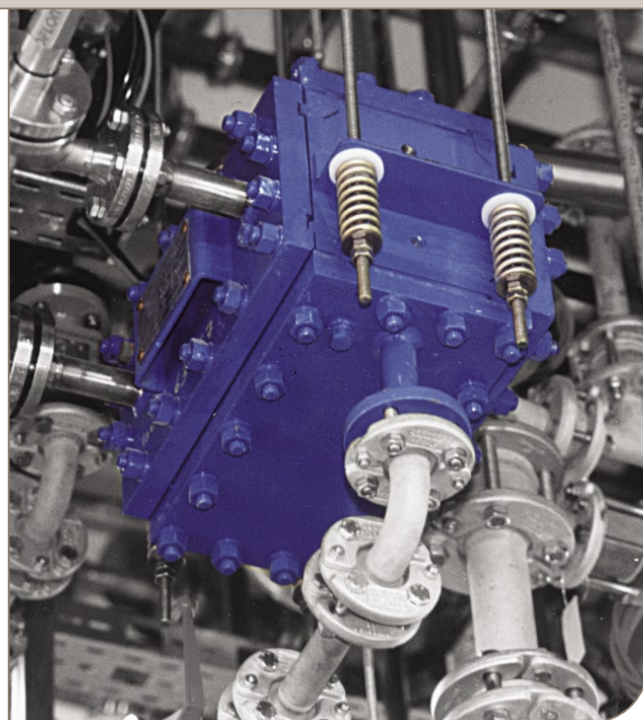
The Compabloc is a welded construction only with cover gaskets to the exterior. The design of the fully drainable, hygienic Compabloc, compared to the conventional Compabloc, involves a new concept of baffles and lateral end plates without any retention of condensate. The surface roughness is kept at a minimum by acid pickling and passivation. Also electropolishing can be offered on request.

#### Applications

Pharmaceutical industry, fine chemicals and speciality chemicals.

#### Duty

Condensing duties with or without non-condensable gases.

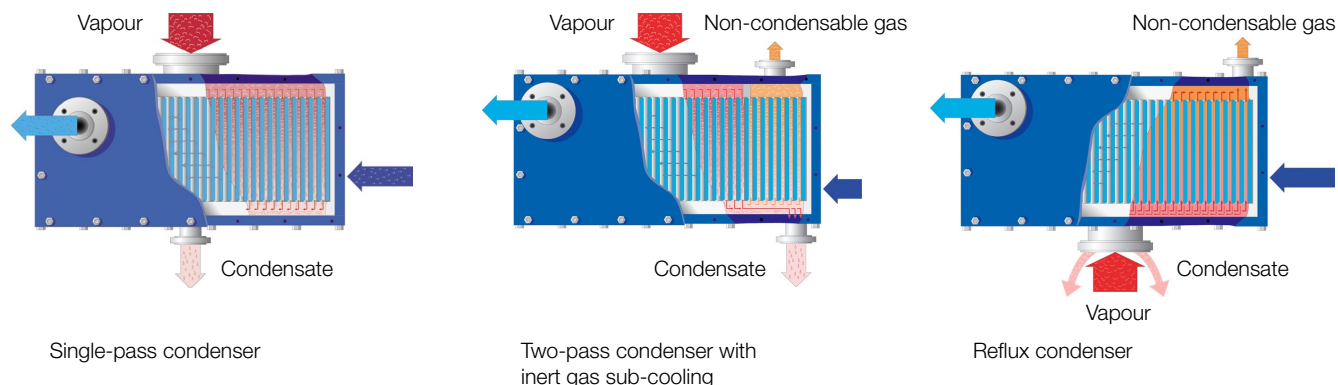


#### Unique design

The Compabloc is based on an innovative concept completely different from traditional shell-and-tube condensers. It really represents a quantum leap both technically and in terms of cost benefits.

The Compabloc is built around a pack of corrugated heat transfer plates. These plates are welded alternately to form channels. The complete plate pack slides inside a four-column carbon steel frame bolted to pressure-retaining heads. Four removable panels contain the fluid inlet and inlet connections, and baffles direct the fluid media back and forth through the channels.

The corrugated pattern in the Compabloc condenser creates a maximum of turbulence, which in turn results in outstanding heat transfer efficiency. The overall heat transfer coefficient is two to four times greater than in a corresponding shell-and-tube unit. In other words, a Compabloc condenser requires only 25-50% of the heat transfer area of an equivalent tubular unit. That, in essence, is the advantage of the Compabloc.



### Working principles

In operation the vapour enters the Compabloc and condenses on the cold plate while passing through the plate pack. The condensate is extracted from the bottom of the unit. The cooling media is forced through several passes with a series of baffles. This, together with the plate corrugations, maximises heat transfer efficiency and minimizes fouling.

The Compabloc can be fitted to any condensation duty. If the vapour contains non-condensable gases, a two-pass arrangement on the condensing side can be used. This enables sub-cooling of the non-condensable gases, thus condensing as much as possible. The two-pass arrangement permits gas/liquid separation inside the Compabloc, eliminating any need for a special separator unit to do this. The main condensation takes place in the first pass. The sub-cooling of the non-condensable gases is achieved in the second pass, and this also serves as a mist eliminator. The two-pass Compabloc works like two condensers in series. The Compabloc can be mounted directly on top of, for example, a reactor as a reflux condenser. In the reflux design the vapour enters from the bottom and condenses on the cold plates, with non-condensable gases being removed at the top, and the condensate flowing back to the reactor.

### Hygienic standard design on process circuit

- No liquid retention inside the unit.
- Full drainability.
- Surface roughness,  $R_a < 0.8 \mu\text{m}$ .
- Plate pack acid pickled and passivated.
- Complete process circuit acid pickled and passivated by recirculation.
- Helium leak test.

### Options

- Electropolished plates (SS 316L).
- Electropolished plate pack after welding (SS 316L).
- Fully welded design for hazardous or dangerous duty.

### Materials

Standard: SS 316L, Hastelloy C22, C2000 and Tantalum.  
On request: Hastelloy C276.  
Cover gaskets in PTFE.

### Design codes

AD-2000 AD merkblatt design for CE-marking (PED).  
ASME VIII Div. 1 design (with U-stamp option).

### Technical specifications

Heat transfer area	0.7 to 32.8 m <sup>2</sup>
Design pressure	FV to 16 barg (232 psig)
Design temperature	-40°C (-40°F) / 200°C (392°F) for PED -45°C (-49°F) / 200°C (392°F) for ASME -100°C (-148°F) on request
Surface finish	< 0.8 $\mu\text{m}$ on process circuit (SS 316L)

### Models

HCP15, HCP20, HCP30 and HCP40.

PPM00044EN 0305

Alfa Laval reserves the right to change specifications without prior notification.

### How to contact Alfa Laval

Contact details for all countries are continually updated on our website. Please visit [www.alfalaval.com](http://www.alfalaval.com) to access the information direct.