

# HC Application



Environmental concerns about the potential direct emissions from refrigeration systems based on synthetic fluid and EU legislation are driving the market towards higher efficiency and lower greenhouse gas emissions. Castel is actively involved on this process to study and develop the right components and solution to support these trends.

As a green alternative, one possible solution to this demand could be covered by HC, flammable natural refrigerant, due to its good performance.

Propane (R290) which has long been used for its good thermodynamic characteristics, It has zero ozone depletion potential, negligible global warming potential, as well as excellent thermodynamic properties.

Other key benefit of HC system requires in average half the charge of hydrofluorocarbons (HFCs) with equal capacity.

The refrigerant properties of HC not require technical changes in the design of the cycle but due the flammable characteristics and property dedicated components and dedicated safety rules applied.

Castel proposes a complete range of products opportunely developed, tested and produced to be suitable with the characteristic of HC systems.

The technology and type of refrigerant applied depends on the application and location area of the installation.

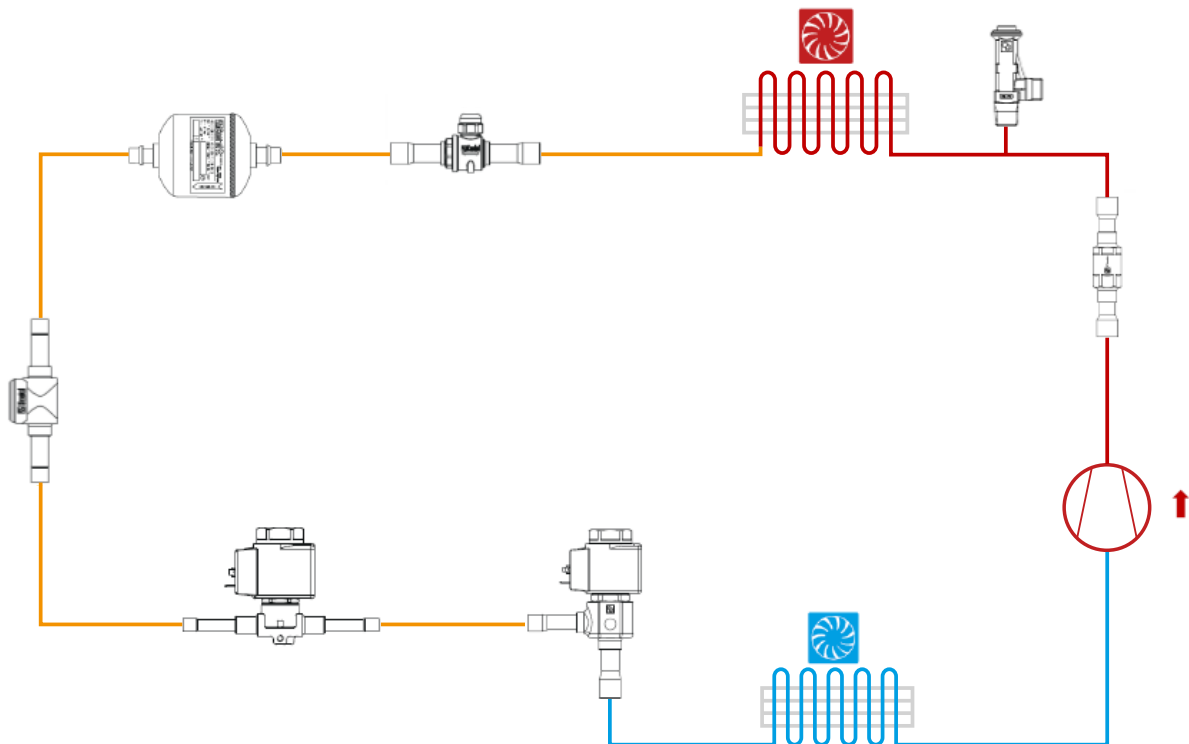
HC uses is attractive and already largely used today in:

- R290: Refrigeration plant
- R600a: Domestic refrigerators, freezers and ice makers
- R290: Residential air conditioner
- R290: Heat pump

Castel to comply the more strictly requirements developed an ATEX product range with the conformity for use in EX Zone 2.

The Pulse solenoid valve with interchangeable orifice series and Normal Closed Solenoid Valve series connected with dedicated coils complain the requirements to be in conformity with ATEX for use in EX Zone 2.

Castel can offer also a complete range of Solid Core Filter Driers 100% molecular sieve ATEX for use in EX Zone 2.



## Castel Product family for HC (R290, R600, R600a) application

Product type	Product family	Max Operation Pressure PS (bar)	TS (°C)
Pulse Solenoid Expansion Valve	2028N	45	-40/+100
Pulse Solenoid Expansion Valve with coil ATEX (1)	2028EX	45	-40/+100
Normal Closed Solenoid Valve	1028N, 1068N, 1078N, 1079N, 1098N, 1099N	45	-40/+120
Normal Closed Solenoid Valve with coil ATEX (1)	1028EX, 1068EX, 1078EX, 1079EX, 1098EX, 1099EX	45	-40/+120
Safety Valve	3061, 3065	60	-40/+120
Straight check valve	3132N, 3133N, 3144N, 3145N	45	-40/+150
Right Angle. Check valve	3184N, 3185N	45	-40/+120
Moisture Indicator	3940	45	-40/+120
Filter Driers ATEX (1)	4303EX, 4305EX, 4308EX, 4316EX, 4330EX	45	-40/+80
Receiver valve	6110N	45	-40/+150
Ball Valve	6570N	45	-40/+150
Valve cores	8395/A3	80/140	-25/130
Threaded brass fitting	Various	120	-
Access fitting	Various	120	-l

(1) Atex conformity for use in EX Zone 2



### PRODUCTS SUITABLE FOR HYDROCARBONS REFRIGERANTS

The products for hydrocarbons refrigerants shown in the table can be used with the following refrigerant fluids: R290 (propane), R600 (butane) and R600a (isobutene). These refrigerants are classified as flammable fluids proper to Safety Group A3 according to EN 378-1: 2008 + A1 Standard.

The products must be used solely on refrigerating systems that are in compliance with regulations about flammable refrigerant fluids 8EN 60335). Only authorized persons, qualified to work on refrigerating systems containing flammable hydrocarbons, may do installation, maintenance and repair.



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Castel has always been aware of environmental sustainability issues and gives its contribution to a cleaner environment, supplying the refrigeration and air conditioning industry with state-of-the-art and environment-friendly technology. With its commitment and steady research in its laboratories, Castel has developed a whole range of products using natural refrigerants, which reduce emissions to the minimum. The large range of products belonging to the Castel "GoGreen" line has been developed to be used in CO<sub>2</sub> (R744)- and HC hydrocarbon-filled systems.



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