

13) Control tests and checks :

The **GS S.r.l.** products are subjected to functional, targeted tests according to exact procedures and internal instructions as well as well as tightness tests under pressure. The rate of pressure loss to the exterior and detectable during these tests, remains in accordance with those levels set out in Paragraph 9.4 of EN 12284:2003.

In order to ensure and guarantee compliance with the parameters of recognized performance criteria, rather than to accept the declarations of the manufacturer/supplier of individual components.

Specifically, the following verification tests are carried out:

Copper tube

- Dimensional control
- Surface hardness control
- Internal cleanliness control

Molecular sieve

- Granular control
- Density control
- Maximum adsorption control
- Dynamic resistance control
- Dust control
- Friction resistance control
- Weight loss control (L.O.I.)

Dimensional and functional control at key points of the process

- Programmed dimensional control
- Programmed control of the weight of the molecular sieve
- Final packaging and quantity control

GS S.r.l. certifies that their measuring and testing instruments are governed by exact control and calibration instructions which ensure, where available, compliance with national standards.

Monitoring activities are registered, full raw material traceability is guaranteed at all stages of the production cycle

14) Packaging:

GS S.r.l. uses various types of packaging including triple-ply cartons of various sizes with or without internal polythene bag, hermetically sealed plastic drums and one-way wooden pallets with or without HT fumigation.

Other types of packaging maybe agreed with the customer when the order is placed.



Technical Specification Filters, Accumulators, Fittings

1) General Information

This specification is effectively an integral part of the supply contract for filters, accumulators and fittings as laid down by **GS S.r.l.**

It defines all the key technical and qualitative characteristics of the products and services which our company guarantees as well as the checks, verifications and tests which are systematically applied throughout the production process and which are systematically recorded.

2) Description of the products

Filter dryer: copper tube with spun ends containing the molecular sieve.

It serves to eliminate any possible water particles present within the refrigeration system.

Mechanical filter: copper tube with spun ends containing a metal fine filter to remove any micro impurities within the refrigeration system.

Accumulator: copper tube with spun ends used to increase the volume of the refrigerant system.

Fitting: particularly in copper and used as a soldered connection to further tubes within the refrigerant circuit.

Charge valves: with or without connecting tube : made for use in refrigeration and air-conditioning installations, they allow the rapid and cost effective creation of a charging or bleeding point. Once the charging or bleeding operation has been completed, the cap and seal prevent any possible loss of refrigerant.

GS S.r.l. produces the various models of filters, accumulators, charge valves and fittings based on a standard or against specific customer requests and specifications.

3) Dimensions :

GS S.r.l. guarantees to respect all the dimensions stated on the definitive drawings supplied or approved by the customer. Possible difficulties and or impossibilities in realizing the stated requirements will be reported in writing from time to time.

4) Dimensional tolerances :

For all the drawing tolerances without indications to the contrary, **GS.rl.** adopts, as an internal procedure, its own standard tolerances as follows:

Total length	± 4mm
Sockets for incoming and outgoing	-0 /+0.2mm
Cup depth and strainer	± 2mm
Counterbo re inclination	± 5°
Weight sieve	± 4%

5) Finishing:

Filters, accumulators and fittings are absolutely free of visible dents, sharp edges and burrs. Particular attention is given to all manufacturing operations which could in any possible way, affect the internal cleanliness of the tube: they exclusively use polyester based lubricants which are compatible with Freon R-134-A and all other refrigerant gases in common use.

6) Materials used:

Filters, accumulators and fittings manufactured by **GS S.r.l.** are all produced using copper tube for refrigeration applications in accordance with EN12735-2

Chemical composition of copper tubing: CW024A CU-DHP

Copper (Cu)	Min. 99,900%
Bismuth (Bi)	Max 0.001%
Lead (PB)	Max. 0.010%
Phosphorous (P)	Min. 0.015% Max. 0.040%

(taken from the specification declared by the producer)

Mechanical properties of the copper tubing

Physical state	Hard
Breaking strength Rm	Min. 290 N/mm2
Elongation	Min. 3%
Surface hardness Vickers	Min. 100 HV

(taken from the specification declared by the producer)

7) Perforated caps:

Produced by stamping Fe DC04 LC, raw material produced in accordance with EN10139 / EN 10140 and all with copper electrolytic plating of 1μ, produced with holes of 1 or 1.2 mm D, serving to retain the molecular sieve and facilitate the flow of refrigerant gas.

8) Ringed mesh filters:

Produced by molding Fe DC04LC, raw material produced in accordance with EN10139 / 10140 and all with copper electrolytic plating of 1μ, serving to withhold any micro impurities and facilitate the flow of refrigerant gas.

9) Filter nets:

Brass woven, 150 mesh, wire diameter 0.06 / 0.07 mm, light mesh ≤ 0.134 mm. Before using other possible requested materials, GS S.r.l. must first of all check the suitability of such materials.

10) Molecular sieve:

Synthetic zeolite sodium-potassium with crystalline structure of type A and pore diameter of 3 Ångström (Å), specific for each type of refrigerant or various mixtures. Its capacity is that of adsorbing any water molecules present within the cooling circuit:

Nominal sphere dimension	ø mm	2
Granular distribution	1.6/2.5mm	95%
Settled bulk density	Kg/m3	>900
Resistance to crushing	N	>80
Free water residual	Wt.%	<0.7
Dry abrasion	Dry-wt.%	<0.5
Abrasion with liquid	Wet-wt.%	<1.5
Adsorption capacity water	Wt.%	>17

Values refer to universal sieve

11) Caps:

The caps in polyethylene low density (LDPE) are used to hermetically seal the filters in order to ensure the physical and mechanical properties of the molecular sieve.

Melting point	°C	107
Embrittlement point	°C	<-20
Softening	Vicat	84
Yield strength	Mpa	11
Bending modulus	Mpa	130
Hardness	ShoreD	4

(taken from the specifications stated by the producer)

12) Maximum working pressure:

All **GS S.r.l.** products are suitable for use with fluid refrigerants belonging to Group 2 as defined in paragraph 9 of Directive 97/23/EC (PED). This regulation applies to the design, manufacture and conformity assessment of pressure equipment (vessels, piping, safety and pressure accessories) and combinations of these products (various pressure equipment assembled by a manufacturer to establish a fully integrated and functioning system) with a maximum allowable pressure ‘PS’ of more than 0.5 bar with the exclusion of the cases listed in Article 1, paragraph 3 of the above regulation.

GS S.r.l. products, if subject to hydrostatic tests, guarantee to resist a pressure equal to 1.43 x PS as set out in the PED. If they are subjected to burst tests, they guarantee to resist pressure equal to at least 3.5 x PS which is more than that set out in EN378-2-2008.

How to determine the maximum operating pressure:

$$PS = \frac{20 * Rm * S}{(De - S) * F}$$

Rm = Tensile strength : (200 N/mm2 is used for annealed tube or that which is subjected to braze welding or high temperature heat treatments).

F = Safety factor : (for the maximum allowable pressure of 3.5)

S = Thickness : (using the nominal thickness less the maximum permitted tolerance)

De = Outside diameter in millimeters