"GEMINIslimRED" CSST TUBING BY PSP FOR SOLAR PLANTS

PLIABLE CORRUGATED TUBES OF THE "GEMINIslimRED" CSST TUBING SYSTEM BY PSP

DESCRIPTION
Double separable pre-insulated with sensor clable CSST pliable corrugated tubes in stainless steel with thermal insulations for thermal solar plants (indoor and outdoor installations) suitable also for drinking water.

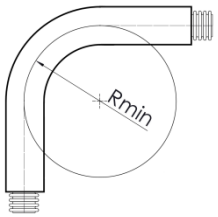
APPLICATION FIELDS
Thermal solar plants with water or water/glycol mixtures as heat carrier and also plants for the supply of hot and cold fluids [1] [2]:
- nominal pressure (20°C): PN 10;
- maximum working pressure at 150°C: 6 bar (0,6 MPa);
- maximum working temperature: 150°C (175°C for short time);
- minimum working temperature: -50°C.

The thermal solar plants must be installed in accordance with all the existing municipal, regional and national regulations and the instructions by PSP.

COMPONENTS
- **Tube**: CSST pliable corrugated tube type 3 annular with narrow pitch conform to EN ISO 10380 in stainless steel conform to EN 10028-7 type 1.4404 - X2CrNiMo17-12-2 (AISI 316L).
- **Thermal insulation**: expanded PU 8 mm thick, high temperature resistant with external tear-proof and UV resistant protective coating:
  - thermal conductivity at 40°C: $\lambda \leq 0{,}030$ W/m K,
  - fire reaction class: F
- **Sensor cable**: multi-polar flexible cable 4×0,25 mm^2 in silicone rubber.

CERTIFICAZIONI
The quality management system of PSP S.r.l. is certified as conform to EN ISO 9001 : 2015 (Bureau Veritas certificate nr. IT334096).

METHODS OF USE
- Keep the tubes in their original packaging, in a dry place and sheltered from corrosive substances.
- Before their use, verify the integrity of the tubes.
- Do not pull or twist the tubes.
- It is possible to bend by hand the tubes complying with the following minimum bending radii:

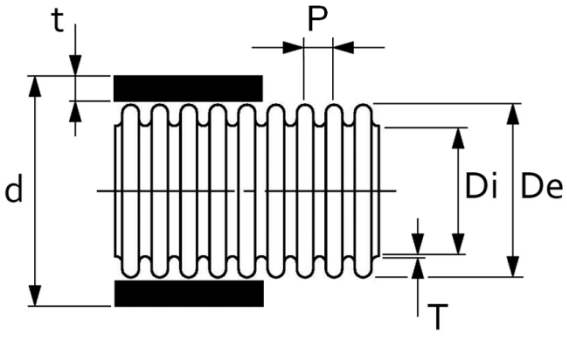


Nominal dimension	Minimum bending radius Rmin [mm]
DN 16	25
DN 20	30
DN 25	40

- Do not submit the tubes to repeated bending.
- For the fastening of the tubes, it is recommended to place a clamp every 2 / 3 meters.

FITTINGS (see Technical Data Sheet DT-PSP-016-ENG)
For the pliable corrugated tubes of the "GEMINIslimRED" CSST tubing system by PSP, two kinds of fittings are suitable:
- **"GeminiFAST" self-flanging fittings**: the tightness of the junction is obtained through the compression of the high temperature resistant plane gasket between the plane surface of the fitting and the flange of the corrugated tube;
- **"GeminiQUICK" metal to metal seal fittings**: the tightness of the junction is obtained through the plastic deformation of a brass bushing without the use of gaskets.

The use of fittings other than those specifically supplied by PSP for the "GEMINI" CSST tubing system could not guarantee durable tightness: contact PSP to verify the suitability of fittings from other manufacturers.

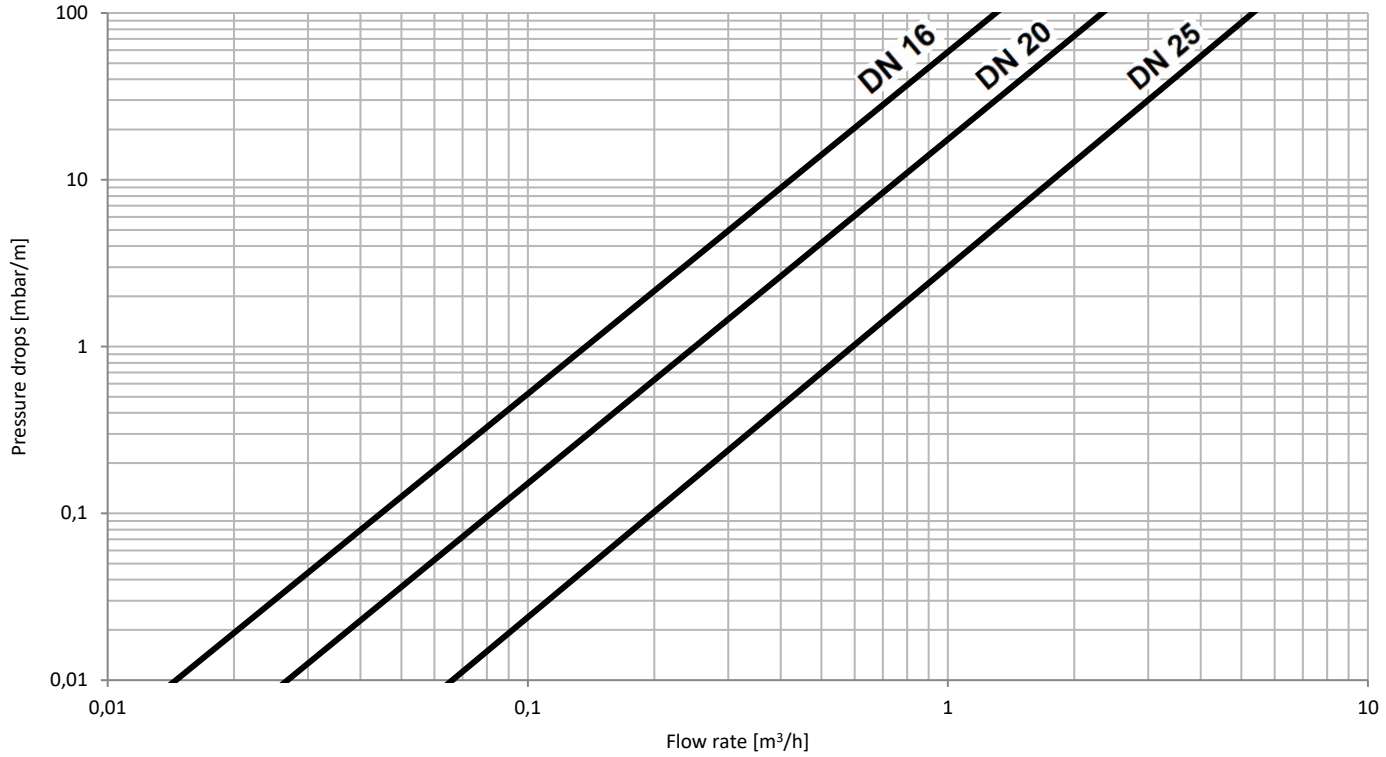
DIMENSIONS


Nominal dimension	DN 16	DN 20	DN 25
Connection thread	3/4"	1"	1 1/4"
Thickness T [mm]	0,18	0,18	0,2
Internal diameter Di [mm]	16,3	20,8	24,8
External diameter De [mm]	21,3	26,3	31,2
Pitch P [mm]	4,9	5,0	5,6
Lineic surface [m^2/m]	0,09	0,11	0,14
Lineic volume [l/m]	0,29	0,45	0,64
Insulation thickness t [mm]	13	13	13
Insulation external diameter d [mm]	39	44	49

1) The CSST pliable corrugated tubes are not suitable for the connection of moving appliances and/or parts in relative motion each other: for these purposes use only suitable flexible hoses.
2) For fluids different from water or water/glycol mixtures, verify the chemical compatibility of all the components of the tubing system (tubes, fittings, sealing elements and so on).

THERMAL SOLAR PLANTS WITH THE "GEMINI" CSST TUBING SYSTEM BY PSP

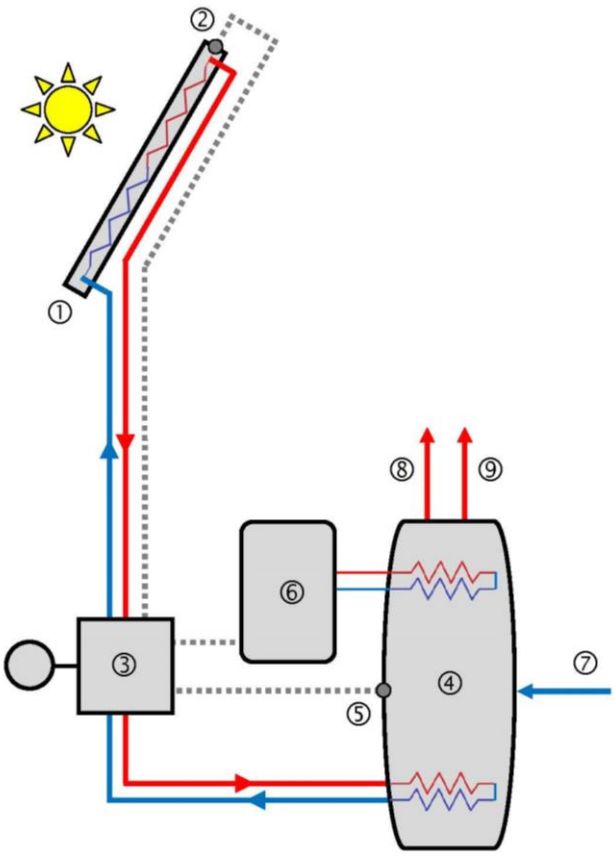
PRESSURE DROPS (water at 20°C)



SCHEME OF THERMAL SOLAR PLANT

A solar thermal plant converts the solar radiation into heat. Different types of solar thermal system are realizable including those with **natural circulation** (in which is the same sanitary water to be directly heated) and those **combined with forced circulation** (in which to be heated it is a heat transfer fluid, typically a mixture of water and glycol - see schematic illustration at the side) which in summer are able to provide the entire need of domestic hot water and in the winter period preheat the water in the storage tank where it is heated to the final temperature by an auxiliary source (usually a gas boiler) making it usable both for the domestic hot water and for the low temperature underfloor heating.

In the design and setup of the thermal solar plants with forced circulation, the phenomenon of "stagnation" shall be avoided with the overheating of the heat transfer fluid resulting in resistance / corrosion problems of the system components.



① solar collector / panel
② temperature probe of the solar collector / panel
③ solar controller integrated with recirculation pump and expansion vessel
④ storage tank (solar boiler)
⑤ temperature probe of the solar boiler
⑥ auxiliary boiler (for example gas boiler)
⑦ cold water feed
⑧ hot water sanitary plant feed
⑨ heating plant feed
hot fluids pipelines
cold fluids pipelines
sensor cable