



English version



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Technology of components used in heating.

Chapter 33

Threads sealants



Threads sealants

The selection of a thread sealant depends on the application and installation conditions, temperature and pressure. In particular, sanitary rules must be observed for pipe where is circulating drinking water, and special safety rules for those where hot water or gas circulate. The user must take into account all these regulations and constraints before making his choice.

Description of the main products and the different existing technologies

Type	Advantages	Disadvantages	Packing
Sealing tape PTFE	<ul style="list-style-type: none"> - Sealing of metal and plastic threaded connections. - Recommended for drinking water pipes. - The pressurization can be immediate. - Non-curing - Non-hardening - Easy disassembly 	<ul style="list-style-type: none"> - Cannot be adjusted by unscrewing the elements. - Any disassembly requires to remake a Teflon application after having carefully removed the remains of the previous seal. 	Roll, standard width 6.3 and 12.7 mm, thickness 0.075 mm to 0.1 mm
Multi-filament nylon thread impregnated with a silicone-based solution	<ul style="list-style-type: none"> - Sealing of metal and plastic threaded connections. - Pipe immediate pressurizing is possible - Adjustment is possible (up to 1/2 turn), - Reusing the connections after possible disassembly. - Resist to water hammers and vibrations - Non-curing and non-hardening - Easy Disassembly 	<ul style="list-style-type: none"> - Cannot be used in piping carrying pure oxygen or oxygen-rich mixtures. - Do not use in contact with chlorine, hydrocarbons or other strongly oxidizing products 	Dispenser roll
Polyamide impregnated yarn (Loctite 55)	<ul style="list-style-type: none"> - Pipe immediate pressurizing is possible - Easy disassembly - Sealing connections up to 1 1/2 " (40 x 49) - Mixed metal / plastic unions - Maximum pressure / maximum temperature 15 bar and 120°C on the water - Acts quickly and cleanly - Colmate immediately. - Repositionable on 90°. - Compatible with: <ul style="list-style-type: none"> - potable water - hot and cold water - heating water - glycol and its additives - hydrocarbons - common gases (air, steam, butane, propane, city gas) 	<ul style="list-style-type: none"> - Roughen the threads with a saw blade or a file so that the fiber remains in its place. 	Dispenser roll
Hemp twine with plumber's putty This is the oldest pipe sealant.	<ul style="list-style-type: none"> - Improves the resistance of the connections to pressure (especially in case of large clearance). - Hold up to 140°C - Possible setting: unscrewing a quarter of a turn without the need to remake the joint otherwise, the seal may be imperfect. (must be made quickly before drying) 	<ul style="list-style-type: none"> - Strike the thread perpendicularly with a hacksaw blade - These scratches will prevent the tow from "sliding" on the fitting - If too much hemp twine is used, the pressure that will exert the male connection will be too important and it is possible that the female fitting breaks at the time of the screwing - Near zero elasticity - Low lubricity to prevent galling - Need a torch to get the parts disassembled - No more allowed in many countries 	Comes in the form of a ball, called a doll, or a reel. It is a natural fiber made from hemp or flax. It must be applied with a specific paste, originally made with limestone powder in linseed oil)

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Type	Advantages	Disadvantages	Packing
Teflon-based sealant pastes	<ul style="list-style-type: none"> - Resists water hammer and vibration - Non-curing - non-hardening - Easy disassembly 	<ul style="list-style-type: none"> - Check that these pastes are compatible with plastics - Check that these pastas are compatible with drinking water uses, because the additives used can be toxic 	Pot
Sealing resins based on silicone resin or acetic single component	<ul style="list-style-type: none"> - Threaded connections (conical or cylindrical) made of plastic such as PVC, CPVC, PP, ABS, PE - Joints between metal and plastic. - Water for human consumption - Contact with foodstuffs (aqueous and fatty) - Good chemical resistance to common liquids - Hot and cold water - Pool water - Heating water - Pressurized air - Diluted acids and bases - Glycol cooling fluids - Allowable gap 0.8 mm in diameter - Repositioning possible up to 1 hour - Easy disassembly without damaging the threads (loosening torque = 10 N.m for a 1 " conical connection) 	<ul style="list-style-type: none"> - Curing time at slow ambient temperature: 2 mm in 5 hours, and 4.5 mm in 24 hours - Low pressure resistance: Up to 15 bar at 20°C and up to 2 bar at 80°C. Pressure resistance decreases rapidly in temperature - Do not use on gas installations 	Tube, syringe
PTFE-based anaerobic resins	<ul style="list-style-type: none"> - Excellent resistance to mechanical shock (water hammer) - Versatile product: water, hydrocarbon gases, air. - Do not dry - Temperature resistance: minus 30°C to 110°C, (120°C peak) - Repositioning time varies according to the material, generally of the order of 15 minutes (shorter on steel and brass than on stainless steel) 	<ul style="list-style-type: none"> - Hardens only if there is presence of metal (catalyst curing). - The joint must be imperatively metallic (steel, copper, brass, stainless steel) - Strength on stainless steel is lower than on other metals - All plastic materials must be avoided - Disassembly very difficult or impossible after hardening. - Brushing and degreasing with a solvent (acetone, ethyl acetate) are mandatory on the two parts to be assembled. - Requires at least 4 threads in contact - Curing time before repressurization vary from 15 minutes to 4 hours - Maximum possible gap between threads is about 0.25 mm - Max joint diameter 2 " - Once cured, the product can only be removed by mechanical action (sand blasting). 	Bottle
Fast curing thixotropic anaerobic resins	<ul style="list-style-type: none"> - Recommended for all raw metal threads - Ideal for fast applications at low temperatures. - Open time: 20 to 30 minutes - Curing time: 12 hours - Max thread size: 80mm - Extended temperature range: up to 150°C 	<ul style="list-style-type: none"> - Check approval for use with drinking water or gas 	Bottle
PTFE Pre-treated fittings	<p>The thread is originally coated with a layer of PTFE powder held by an acrylic binder. This replaces all other products, just mount the fitting as it is. Thus treated, the connection can be reused at least 5 times.</p>	<ul style="list-style-type: none"> - Check approval for use with potable water or gas 	Pre-coated by the manufacturer

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The above information is given in good faith and is the result of information received from suppliers of these products. Given the number of materials, the differences in quality and the variety of working methods, we recommend that users carry out pre-tests under the actual conditions of use.

Main Standards Applicable to Sealants

EN 751-1: 1996 Sealing materials for threaded connections in contact with gases of the 1st, 2nd and 3rd families and hot water Part 1: Anaerobic sealing composition

EN 751-2: 1996 Sealing materials for threaded connections in contact with gases of the 1st, 2nd and 3rd families and hot water Part 2: Non-hardenable sealant composition.

EN 751-3: 1996 Sealing materials for threaded connections in contact with gases of the 1st, 2nd and 3rd family and hot water Part 3: Unsintered PTFE strips

DIN 30660: Non-hardening jointing compounds and polytetrafluoroethylene (PTFE) tapes for metallic threaded joints in domestic installations

BS 6920: Suitability of non-metallic products for use in contact with water.

Certification for use in drinking water: In Europe the names of the most common testing laboratories that carry out verification in accordance with the above standards are: KTW, SSGI, DVGW, WRAS.

US drinking water standards: ANSI / NSF Standard 61 (commercial and residential drinking water systems)

Food contact: USFDA-CFR 21, chap 177.2600