

EGOLF RECOMMENDATION 055-2019

Subject of Recommendation	Testing linear products in the SBI
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Problem

At the meeting of TC1 in October 2017, the solution given to helpdesk item 2017-06 (N666) referred to a specific product, that of plastic pipes. In order to provide a better basis for discussion in the EGOLF meeting in April 2018, Giombattista Traina of Istituto Giordano supplied a summary of different solutions for different products and circulated them via the helpdesk forum before the meeting for members to respond. The following text includes the comments received prior to 31st December 2018 plus additional information from TUM and Istituto Giordano, as agreed in TC1 meeting April 2019.

Recommendation

The main criterion to be used in order to find the correct mounting and fixing for the SBI test of a linear product is to simulate its end use application, as specified in EN 13823, clause 5.2.1 (test according to the intended use), not clause 5.2.2 (standard mounting and fixing).

Warning concerning products which are not linear insulation products: The classified end use must be representative for the tested setup. Wording example: “The classification is only valid for a product length of 5,5 m per every 2,25 m² and a distance \geq 100 mm between the individual linear products”.

Many linear products can be tested according to a specific EN standard or EGOLF Agreement; therefore similar products with the same end use application should be tested following the same rules. This document gives a detailed indication on how to test a large number of various linear products. For colour variation, EGOLF Recommendations should be used for any kind of product. The choice of substrate for any product is based on EN 13238.

If not defined otherwise in the paragraph specified, when testing a family of products, minimum and maximum parameters shall be tested as indicative and two more tests shall be added for the worst-case scenario.

For linear insulation products, if not covered by harmonized product standards, EN 15715 shall be applied and the classification as linear pipe insulation product shall be used as per clause 10 of EN 13501-1. Any other linear product (also insulated pipe/tubes) shall be classified according to clause 8 of EN 13501-1.

See Figure 1 for a decision flow chart.

Normative references

In order to test a linear product according to EN 13823, the following standards and documents should be applied:

- EN 16000 - Plastics piping systems - Systems within the building structure - Mounting and fixing of components in the test apparatus to thermal attack by a single burning item
- EN 15651-2 - Sealants for non-structural use in joints in buildings and pedestrian walkways
- EN 15266 - Stainless steel pliable corrugated tubing kits in buildings for gas with an operating pressure up to 0,5 bar

- EN 14800 - Corrugated safety metal hose assemblies for the connection domestic appliances using gaseous fuels
- EN 15715:2009 - Thermal insulation products - Instructions for mounting and fixing for reaction to fire testing
- EN 15012 - Plastics piping systems - Soil and waste discharge systems within the building structure - Performance characteristics for pipes, fittings and their joints
- EN 15015 - Plastics piping systems for hot and cold water not intended for human consumption Performance characteristics for pipes, fittings and their joints
- EN 13963 - Jointing materials for gypsum boards
- ETAG 026 - Fire Stopping and Fire Sealing Products
- EGR 010-2017 - SBI test for non-flat products
- EGA 004-2016 - Joints for pipe insulation in the SBI
- EGA 003-2016 - Wall thickness of pipe insulation made out of FEF (flexible elastomeric foam)
- EGA 014-2016 - Pipe insulation products with inner diameters > 22 mm
- EGA 018-2016 - System chimneys with plastic flue liners
- EGA 019-2016 - Flexible air ducts & PVC/PP plastic ducts to protect electrical wires
- EGA 029-2016 - Product orientation in the SBI
- EN 15725 - Extended application reports on the fire performance of construction products and building elements
- EN 13823 - Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item
- EN 15447 - Mounting and fixing in reaction to fire tests under the Construction Products Directive
- EN ISO 6927 - Buildings and civil engineering works, Sealants - Vocabulary

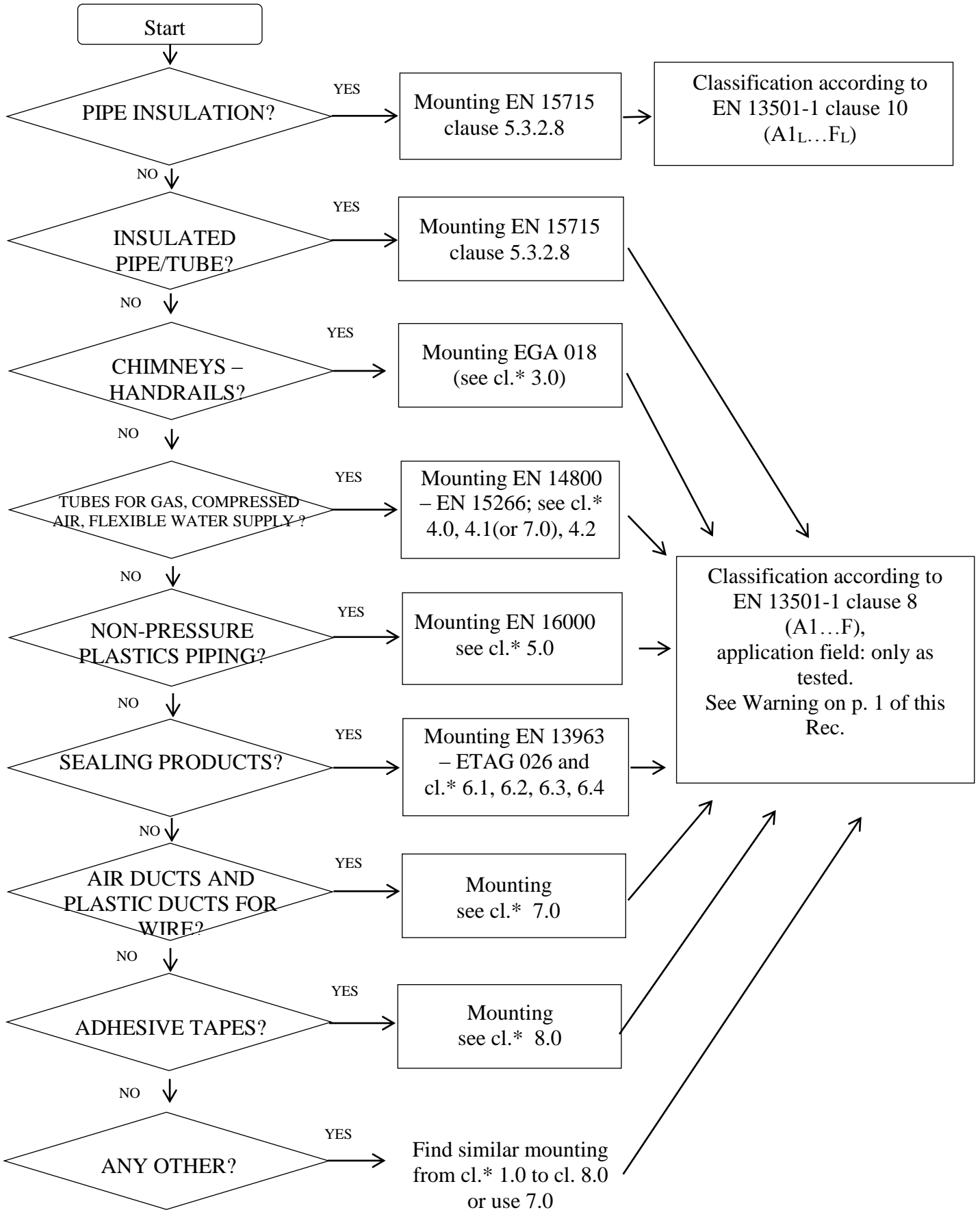
Terms and definitions

seal (verb): place the appropriate products in the joint in order to prevent the penetration of water, moisture and/or air between the elements, components and assemblies made of the same or dissimilar materials

sealant: material applied in an unformed state which, once cured or dried has the adhesive and cohesive properties to seal a joint

gasket: material applied in a well-defined shape and form to seal a joint

Short decision flowchart for Linear Products testing



- (1.0) **LINEAR INSULATION PRODUCTS**, if not covered by harmonized product standard, shall be tested according to EN 15715 (fig. 2). EGOLF agreements EGA 004 and EGA 014 shall be used, taking into account that the steel pipes used to mount the insulation products shall have the outer diameter equal to the inside diameter of the insulation product. The distance between products and from products to the backing board is always 25 mm, as described in EN 15715. If different inside diameters are produced, 22 mm is valid for any other diameter, otherwise min. and max. inside diameter (single test) shall be tested, repeating twice the most critical case. With diameter variation, the range of thickness shall be tested following par. 5.3.2.8.2 of EN 15715 (25mm, 50 mm, and 75 mm). Be aware, insulation products with a thickness of facing or coating less than 3 mm are normally covered by the relevant harmonized product standards. Steel pipes are used to simulate any other metal pipe. If the internal tubes are made of a different material than metal, the test shall be carried out replacing the metal pipes with that material.
- (2.0) **INSULATED TUBES** (Fig. 3) shall be tested according to EN 15715 as insulation products (Fig. 2); an additional metal tube or metal brackets can be used to support plastic pipes during the test, preventing them from collapsing. Be aware, the classification according to clause 10 of EN 13501-1 refers only to insulation products. If an insulated tube is the subject of the classification, even if the rules for testing are the same, clause 8 of the EN 13501-1 shall be applied for the final reaction to fire class.

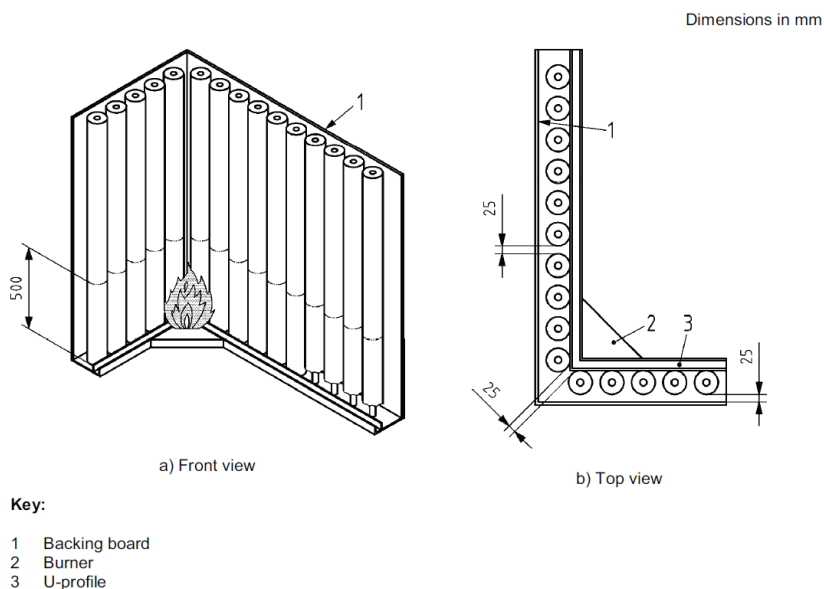


Fig 2. Mounting and Fixing EN 15715



Fig 3. Insulated pipe

- (3.0) **CHIMNEYS** and other products with a vertical orientation, as well **HANDRAILS** where the ventilation is almost parallel to the product in the end use condition and that are normally installed as a unique product (no similar to any other product), shall be tested according to EGA 018. Diameter and linear density (kg/m) and wall thickness are considered “Influencing parameters”.

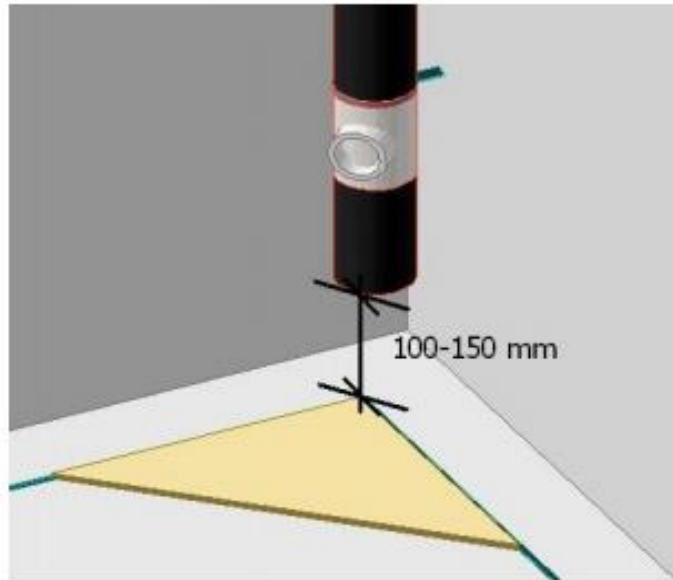


Fig 4. Mounting and Fixing EGA 018

(4.0) **TUBES FOR GAS** can be tested according to EN 14800 or EN 15266. Even if the products are quite similar, the mounting and fixing is really different therefore it is not simple to take a decision on what kind of mounting shall be used for other similar products not covered by EN 14800 or EN 15266.

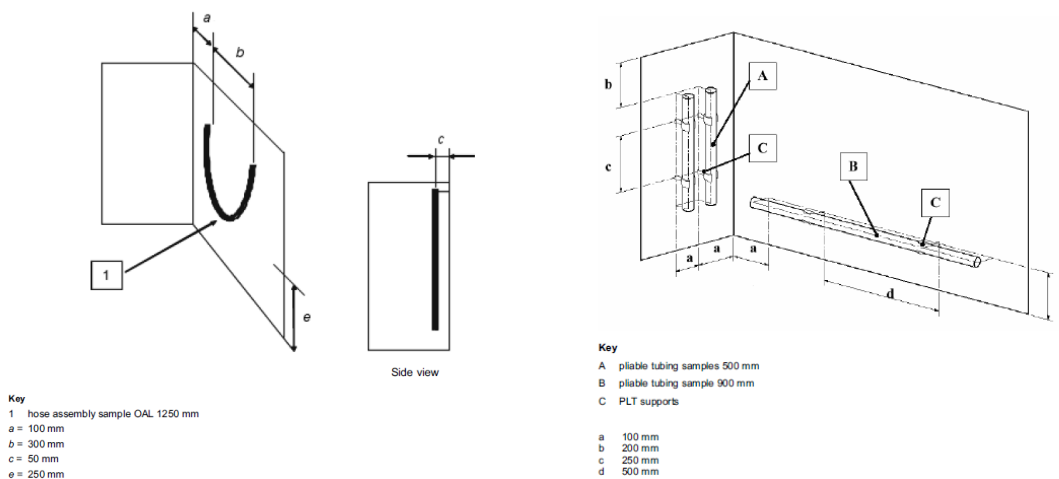


Fig 5. Mounting and Fixing EN 14800 and EN 15266

(4.1) **PAINTED METALLIC TUBES FOR COMPRESSED AIR** should be tested according to EN 15266. If in end use condition, two or more tubes are installed near each other, the mounting at par. 7.0 should be used (as AIR DUCTS).

(4.2) **FLEXIBLE WATER SUPPLY TUBES** should be tested according to EN 14800.



Fig. 6 flexible water supply tube

(5.0) **NON-PRESSURE PLASTICS PIPING SYSTEMS** (not insulated pipes, described in the scope of EN 16000) shall be tested according to mounting and fixing of EN 16000, EN 15012, EN 15015, and all diameters can be classified testing the pipes with “100 mm” and “40 mm” diameters as described in the standard. Thickness is considered an “influencing parameter”. In case the given dimensions do not exist, a single diameter for both tubes creating the “T-specimen” can be used and the minimum and maximum diameter shall be tested as indicative test, concluding the test with the worst case.

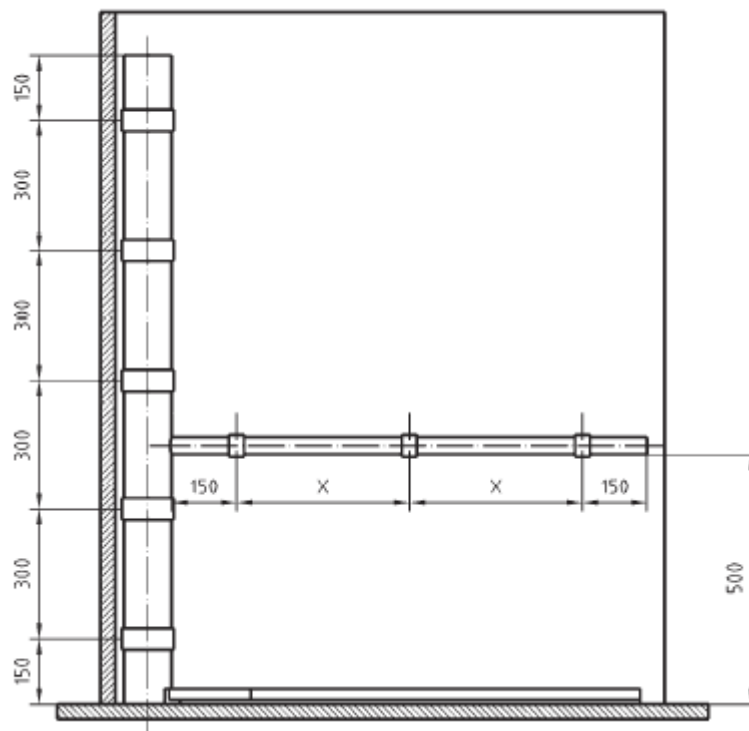


Fig. 7 Mounting and Fixing EN 16000

(6.0) SEALING PRODUCTS

(6.1) GASKETS shall be tested applying the products on a substrate (EN 13238) using a metallic wire or any other system provided by the sponsor, fixing the test specimen at each end and every 300 mm from the floor corner. The gaskets shall be mounted on the long wing creating a “T-specimen” with two vertical products, starting with the first gasket at “X” mm from the edge, where “X” is the thickness of the substrate; the second is then fixed at 100 mm from the first gasket. One horizontal specimen at 500 mm from the floor of the SBI creates the “T-specimen”. Another gasket shall be mounted in the short wing, at 100 mm from the edge. Fig 8 shows the mounting of the gaskets on the long and short wings. Shape, linear density (kg/m) are considered “Influencing parameters. If the distance between two parallel gaskets in end use is less than 100 mm, another gasket shall be mounted in the long wing and one in the short wing at 50 mm from the gasket mounted in the corner. This mounting is also representative of linear/pipe application under end use condition.

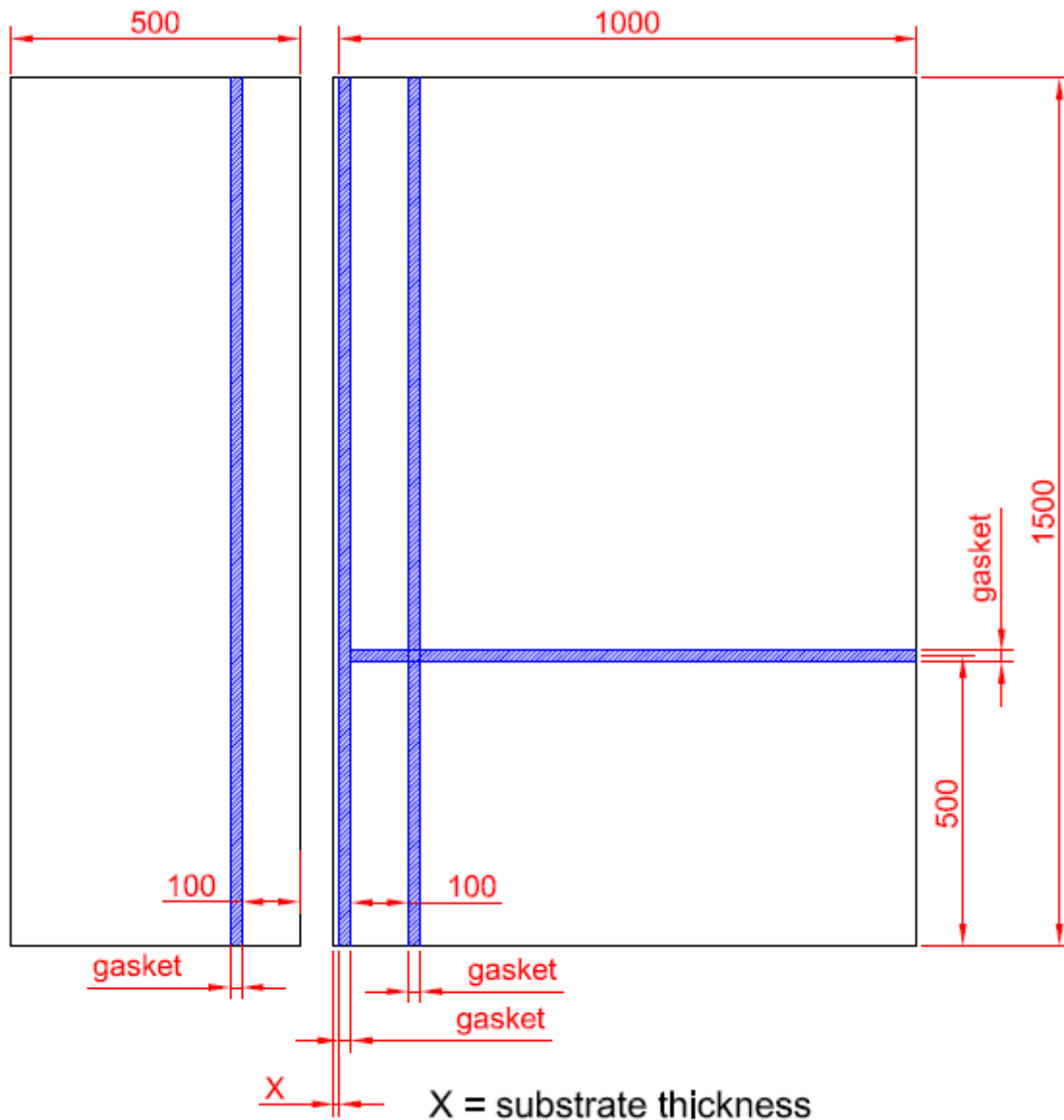


Fig. 8 gaskets on the long and short wing (quote in mm)

(6.2) **SEALANTS** shall be mounted in the long wing as showed in fig. 9 and shall be fixed creating three joints, two with the following measures: 20 mm x 10 mm x 1500 mm and one: 20 mm x 10 mm x 1000 mm (width x depth x length) as described in the standard EN 15651-2, this is the minimum width x depth, if the product is applied with a greater amount in the end use conditions, that specific width x depth shall be used. Another seal of the same width x depth x length shall be mounted in the short wing, at 100 mm from the edge. Calcium silicate with a thickness of 20 mm and a density of $870 \pm 50 \text{ kg/m}^3$ or any other substrate as described in the EN 13238 should be used as substrate. Linear density (kg/m) is considered “Influencing parameter”. If in end use the distance between two parallel sealants is less than 100 mm, another sealant shall be applied in the long wing and one in the short wing at 50 mm from the sealant mounted in the corner. This mounting is also representative of linear/pipe application under end use condition.

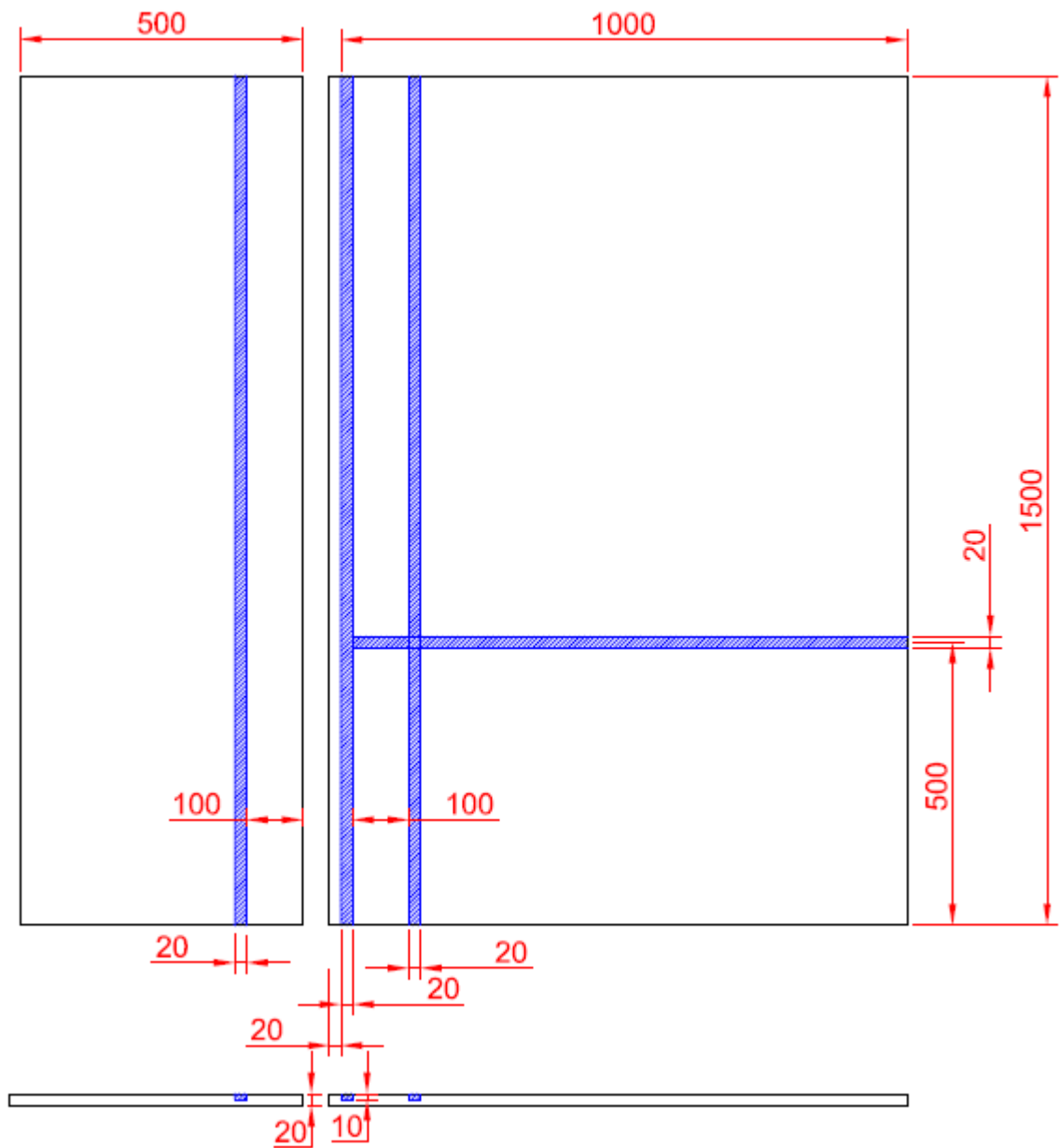


Fig. 9 Sealants on the long and short wing (quote in mm)

- (6.3) **FIRE STOPPING AND FIRE SEALING PRODUCTS** shall be tested covering the entire area of the substrates as described in the ETAG 026.
- (6.4) **JOINTING MATERIALS** for gypsum boards (EN 13963) shall be tested filling only the vertical (200 mm) and horizontal joint (500 mm). Where the jointing system requires the compound to be applied to the whole surface of the board, the test shall be carried out with the surface coated with the highest recommended thickness.
- (7.0) **AIR DUCTS AND PLASTIC DUCTS FOR WIRE (This document supersedes EGA 019-2016)** shall be tested only with vertical orientation. Ducts have to be tested with the minimum and maximum diameter and shall be tightly placed next to each other and hung from a calcium-silicate substrate board. Ducts shall fully cover short and long wings of the SBI test specimen. In order to test products with an outer diameter > 200mm, the ducts shall be reshaped and products flattened until the external outer diameter reached is 200 mm and the internal minor diameter will be ≥ 40 mm; if it is not possible to modify the product further, then a flat version comprising a vertical (200 mm) and horizontal (500 mm) joint shall be tested. In order to fix the product, a metal frame shall be used and the specimens shall be fixed by means of screws and washers, one on each corner. Be aware, these products show a completely different fire behaviour if tested as flat specimens or ducts. **PLASTIC DUCTS FOR WIRE** shall be tested following the rules of air ducts. Shape, thickness of the wall and diameter/overall thickness are considered “Influencing parameters”; for rectangular forms with a variation of width, only the minimum width shall be tested. In order to fix the plastic ducts on the substrates, means provided by the sponsor or metallic wires can be used, fixing the specimen every 300 mm from the floor of SBI trolley
- (8.0) **ADHESIVES TAPES** shall be attached to the required substrates with vertical and horizontal orientation, tightly placing all the strips next to each other. The substrates on each wing shall be fully covered by the tapes. Check the worst orientation with an indicative test and if the worst parameter for classification differs more than 20%, add two more tests in the worst case, otherwise add only one more test, since the orientation is not relevant. Only the minimum width shall be tested and results are valid for all other larger tapes.