

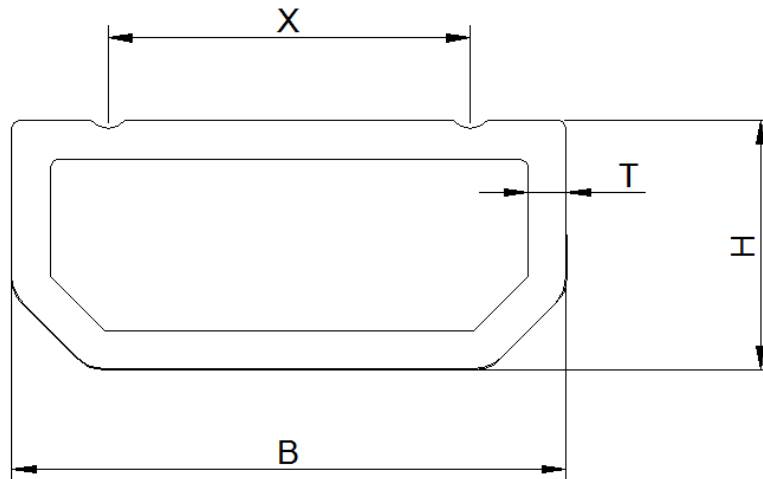
MULTITECH

MULTITECH is a new and innovative rigid spacer profile made of reinforced plastic copolymer and a special metallized multilayer barrier film, impermeable to gases and with exceptional thermal performance.

Thanks to the high barrier properties of the multilayer foil, which is extremely thin, MULTITECH is positioned as one of the warm edge spacer bars with the best linear thermal transmittance performance (Psi) available on the market.

MULTITECH can be bent using bending machines with the Heating option, welded with special equipment, or cut and assembled with appropriate corner keys.

The spacers, tied in bundles of 16 bars, are packed both in cardboard boxes and in stillages.



1. Spacer properties

1.1 Cross section and tolerances

| Spacer | B +/- 0.1 [mm] | H +/- 0.1 [mm] | X +/- 0.1 [mm] | T +0.15 / -0.05 [mm] |
|--------------|----------------------|----------------------|----------------------|----------------------------|
| MULTITECH 8 | 7.50 | 6.50 | 2.45 | 0.95 |
| MULTITECH 10 | 9.50 | 6.50 | 4.45 | 0.95 |
| MULTITECH 12 | 11.50 | 6.50 | 6.45 | 0.95 |
| MULTITECH 14 | 13.50 | 6.50 | 8.45 | 0.95 |
| MULTITECH 15 | 14.50 | 6.50 | 9.45 | 0.95 |
| MULTITECH 16 | 15.50 | 6.50 | 10.45 | 0.95 |
| MULTITECH 18 | 17.50 | 6.50 | 12.45 | 0.95 |
| MULTITECH 20 | 19.50 | 6.50 | 14.45 | 0.95 |
| MULTITECH 22 | 21.50 | 6.50 | 16.45 | 0.95 |
| MULTITECH 24 | 23.50 | 6.50 | 18.45 | 0.95 |
| MULTITECH 27 | 26.50 | 6.50 | 21.45 | 0.95 |

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EN 1279-6 reference to table A.2 & A.5

| Ref. No. | EN Ref. | Description / Specification | Internal test method |
|----------------------------------|--------------------|---|-------------------------------------|
| Further Spacer properties | | | |
| 1.2 | 2.3 2.4 | Geometry / Shape The spacer geometry is shown in the cross section picture page 1. On enquiry a specific drawing can be delivered. | Slide gauge and inspection drift |
| 1.3 | 2.2 | Length and straightness Stillages: Standard length is 6,000 mm +/- 10 mm. Boxes: Standard length is 5,000 mm +/- 10 mm. Straightness deviation 15 mm/m at room temperature. | Steel ruler. Visual. |
| 1.4 | 2.7 | Undesired openings The spacer is tight as the backside is covered with a gastight foil. Plastic and foil are glued together with a PU hot-melt. | Process validation. |
| 1.5 | 2.6 | Perforation. Se comments below ** Calibrated perforation holes measured for optimal performance. | Air flow meter. |
| 2.0 Spacer material | | | |
| 2.1 | a | Thermal properties / Material for calculations Value according to the 2 box model is 0.13 W/mK for the second box. Basic material is Styrene-Acrylonitrile SAN. | Documented by IFT Rosenheim |
| | b | Coefficient Thermal Expansion = 2.01×10^{-5} 1/K | |
| 2.2 | 2.5 | Surface The surface is clean and do not undergo any treatment with chemicals. Colours: Light Grey (similar to RAL 7035), Titanium Grey (similar to RAL 9023), Black (similar to RAL 9004), White (similar to RAL 9016), Light Brown (similar to RAL 8003) and Dark Brown (similar to RAL 8016). Black, light grey, dark grey, light brown, dark brown and white. | Visual test & Adhesion test. |
| 2.3 | | Tolerances of the plastic material The wall thickness of the spacer is according to data sheet. | Micrometre. |
| 2.4 | | Lubrication Not relevant. | Adhesion test. |
| 2.5 | 2.8 | Volatile elements Volatile elements are tested according to EN 1279-6 annex G. $M_v \leq 0.3\%$. | Weight loss test. M_v measured |

** 1.5.1 Level of perforation

The ALU-PRO standard perforation will reduce the absorption of aqueous vapour to be app. 1.0 weight % over a period of 24 hours (16 mm cavity tested by Grace Davidson Europe) - relative to the spacer size. The perforation is targeted EN 1279-6 annex A – specified maximum preload $H_2O \leq 3\%$.

** 1.5.2 Function of the perforation

The perforation holes are until a certain particle size able to detain dust from the desiccant. This point is particular related to the performance of the bending machine and to the desiccant quality. An incorrect adjustment of the bending tool can cause damage to the perforation.

3.0 Quality aspects

3.1 Quality management

ALU-PRO S.r.l. is certified according to UNI EN ISO 9001.

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3.2 Tests of the product

Processes and routines are established to secure the quality of the delivered material. During production the spacers are continuously monitored through systematic and random checks. Data will be available for a period of 5 years.

3.3 Quality agreement

ALU-PRO S.r.l. fulfil the requirements of EN 1279-6 annex A. Specific quality agreement can be made to reduce inspection and test of the incoming material according to EN1279-6 part 5.

4.0 Customer focus and warranty

On all spacers ALU-PRO offers a 5 year product warranty. The warranty covers free exchange of spacers in case of a defect. The spacers must have been stored, installed and used according to present Technical Data Sheet and technical standards. Special solutions and **usage that are not standardized** will need prior approval in writing from ALU-PRO in order to be covered. Related to temperature standardized condition for IG is -30° to 70°C.

4.1 Storage and use

To secure the performance of the spacers, the stock conditions must be acceptable. Broken packaging, humidity and variation in temperature will have an effect on the spacer in general. Make sure the spacer is conditioned at room temperature before use.

Preferred conditions will be a room temperature 15 - 25°C and humidity RH of minimum 45%

Avoid having an environment with a high concentration of dust.

General handling and attention according to safety data sheet for the spacer. Use gloves when handling the spacer/frames and make sure there is exhausting when cutting the spacer.

It is recommended to check out and control all the specific points above.

4.2 Adhesion check

When preparing samples for adhesion test according to EN1279-6 F3.2.2 make sure the spacer backside is covered and in full contact with the sealant (no air bubbles).

During the traction process the spacers, to avoid any deformation, must be supported inside the cavity.

Alternatively, as required by the Norm the ends must rest directly on the jaws of the dynamometer.

If the spacer deforms the adhesion test will be affected. Written procedure can be delivered up on request. Curing time according to instruction from sealant manufacturer.

4.3 Pressure

Deformation by pressure such as wind load and weight load by horizontal installation.

Indicative values for a 16 mm and given for a test length ≥ 3 cm is up to 100 N/cm. If the load is higher the spacer can collapse.

4.4 System performance

The user (here the IG producer) must secure the whole system consisting of spacer, connector/corner key, bending machine, desiccant, butyl and sealant works well together in the chosen setup. Focus on compatibility, adhesion, dust and corner quality.

From ALU-PRO it's recommended to fill all four sides of the frame with desiccant.

After handling and transport of the frames, it's important to check if the connector/corner keys are still in the correct position, if not there is a significant risk for desiccant dust inside the IG unit. Foam behind the connector/corner can be used to avoid such problems.

4.5. Cleaning the plastic surface

If for some reason the plastic surface is defiled by dust from other materials it can be cleaned again by the use of water or air. Dust can easily be removed with antistatic loaded compressed air or a moist cloth. Do not use any chemicals before a compatibility check.

4.6 UV stability

The plastic used is an organic material with UV stabilizer in order to minimize the ageing effect caused by sun light. The material is tested for 3.000 hours according to EN ISO 4892-1 & EN 4892-2 method A, cycle 1. Evaluation is done according to grey scale index.