ASSEMBLY SPECIFICATION

THERMAL BREAK ALUMINIUM PROFILES

For Windows, Doors and Façade Systems

Polyamide Insulating Strips · Knurling · Assembly · Anodising · Powder Coating

Document Ref.	ASS-TB-001	Rev. 1.0 – 2024
Application	Aluminium profiles with polyamide thermal break strips	
Reference Standards	EN 14024 · EN 12020-2 · EN ISO 11357-3 · EN ISO 527 · EN ISO 179-1 · DIN 51900	
Scope	Assembly, surface finishing (anodising & powder coating), storage and QC	

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1. INTRODUCTION AND SCOPE

This document establishes the technical requirements and quality standards for the assembly of aluminium profiles incorporating polyamide-based thermal break insulating strips. It covers the complete production chain from incoming goods inspection through to the finished surface-treated profile, ready for use in the fabrication of windows, doors and curtain wall / façade systems.

The specification may be used as:

- a contractual reference in supply agreements for assembly services;
- an internal work-instruction and quality-control reference for assembly operations;
- a technical guide for subsequent surface-treatment operations (anodising and powder coating) applied to assembled thermal break profiles.

All personnel involved in the assembly, surface treatment and quality control of thermal break profiles must be familiar with the requirements set out in this document.

2. POLYAMIDE INSULATING STRIP – MATERIAL PROPERTIES

Polyamide 66 (PA 66) reinforced with 25 % glass fibre (GF25) is the standard material for thermal break insulating strips. The glass fibre reinforcement ensures the dimensional stability and mechanical strength required throughout the assembly process and during subsequent surface-treatment operations. A thorough understanding of the physical and chemical behaviour of PA 66 GF25 is essential for obtaining a high-quality assembled profile.

2.1 Standard Material Grades

The following grades are commercially available and may be specified according to project requirements:

Grade	Description	Density (g/cm³)
PA 66 GF25	Standard, dry impact resistant	1.30 ± 0.05
Low Lambda PA 66 GF25	Enhanced thermal performance	1.00 ± 0.10
RE30 PA 66 GF25	30 % pre-consumer recycled content	1.30 ± 0.05
Recycled PA 66 GF25	100 % post-industrial recycled PA66	1.30 ± 0.05
PA 66 GF40	High stiffness (40 % GF)	1.45 ± 0.05
PBT GF30	High precision, low moisture absorption	1.53 ± 0.05

2.2 Key Mechanical Properties – PA 66 GF25 (Reference Grade)

The values below are minimum requirements for extruded insulating strips, measured on samples taken directly from production profiles. Two conditioning states are distinguished:

- Dry state (D): sample water content < 0.2 % by weight
- Equilibrium moisture content (EMC): fast-conditioned per EN ISO 1110 at 23 °C / 50 % RH

Property	Standard	Unit	Dry State	EMC State
Melting temperature	EN ISO 11357-3	°C	min. 250	min. 250
Density	EN ISO 1183-1/-3	g/cm³	1.30 ± 0.05	1.30 ± 0.05
Glass fibre content	EN ISO 1172	%	25 ± 2.5	25 ± 2.5
Shore hardness D	EN ISO 868	–	82 ± 4	78 ± 4
Impact strength	EN ISO 179-1	kJ/m²	≥ 30 or no break	≥ 40 or no break
Tensile strength	EN ISO 527-2/-4	N/mm²	≥ 80	≥ 50
Young's modulus	EN ISO 527-2/-4	N/mm²	≥ 4500	≥ 2000
Elongation at break	EN ISO 527-2/-4	%	≥ 3.0	≥ 7.0

⚠ **NOTE:** *The moisture state of the strip at the time of assembly significantly influences dimensional behaviour and shear strength of the assembled profile. Always assemble at equilibrium moisture content (room temperature, standard conditions).*

2.3 Hygroscopic Behaviour and Dimensional Stability

Polyamide 66 is a hygroscopic thermoplastic material. Insulating strips leave the manufacturing facility in a dry state and progressively absorb ambient moisture. The following effects must be understood and managed throughout the entire production process:

- Moisture absorption increases with ambient temperature and relative humidity.
- Mechanical properties change with moisture content: tensile strength and Young's modulus decrease, while elongation at break and impact resistance increase.
- Dimensional changes occur upon moisture absorption: the strips expand slightly, particularly in width. This must be accounted for during knurling and assembly.
- Equilibrium moisture content (EMC) under standard indoor conditions (23 °C / 50 % RH) is approximately 2 % by weight.
- Strips stored in hot and humid summer conditions may absorb more moisture than under standard conditions, even over short storage periods.

⛔ **WARNING:** *Strips that have absorbed excess moisture due to improper storage (rain water, condensation) must not be used for assembly without prior drying. Excess moisture will cause blistering and foaming during subsequent powder-coating oven cycles.*

2.4 Thermal Properties and Fire Classification

- Melting point: 250–265 °C (PA 66 grades); approx. 220 °C (PBT grades)
- Calorific value (PA 66 GF25): Hi = 23 MJ/kg (ref. DIN 51900)
- Reaction to fire classification: Class E per EN 13501-1 (tested per EN ISO 11925-2 on 1.6 mm and 2.1 mm wall thickness)
- Maximum permissible object temperature during surface finishing: 200 °C (see Section 6)
- Hazardous decomposition products above 270 °C: ammonia, CO, CO_2, nitrogen oxides (PA 66); above 290 °C: CO, tetrahydrofuran (PBT)

2.5 Chemical Safety and REACH Compliance

All manufacturers of PA 66 and PBT-based insulating strips comply with EU REACH Regulation 1907/2006. The products do not intentionally contain substances of very high concern (SVHC) as listed on the ECHA candidate list. The materials also comply with REACH Annex XVII restrictions on the use of dangerous substances.

The following hazardous substances are confirmed absent (Living Building Challenge Red List, U.S. EPA Chemicals of Concern, Google Materials of Concern, State of the Environment Norway Priority Substances):

- No asbestos, cadmium, lead, mercury, chromium, PVC, PFCs, BPA, phthalates
- No halogenated flame retardants, CFCs, HCFCs, PCBs, PAHs, dioxins
- No formaldehyde additives, nanomaterials, anti-microbial chemicals

⚠ **NOTE:** *Safety Data Sheet equivalent information is provided voluntarily in accordance with CLP Regulation 1272/2008. No formal SDS obligation applies to solid articles. Store away from food, strong acids, and direct sunlight. PPE: safety glasses, work gloves, protective clothing and footwear.*

3. INCOMING GOODS INSPECTION

3.1 Insulating Strips

Upon receipt, each delivery of insulating strips shall be verified against the purchase order. The following checks are mandatory:

1. Verify article code and batch number against order documentation. Labels on packaging must be legible and intact.
2. Measure principal dimensions on at least one sample per delivery (strip width, head width, leg thickness, overall height). Use calibrated measuring instruments appropriate to the tolerances involved.
3. Visually inspect strips for surface defects, cracks, blistering or signs of moisture damage.
4. Check that strips have not been exposed to rain, condensation or direct sunlight during transport. Wet or visibly damp strips must be dried before use.
5. As an alternative to in-house dimensional checks, a Certificate of Conformity to the approved drawing and material specification may be requested from the supplier.

All incoming inspection records must be retained and traceable to the batch number used in each production order.

3.2 Aluminium Profiles

Aluminium profiles must comply with the applicable project specification and relevant standards. Inspection shall include:

- Verification of alloy designation, temper, and surface condition (anodised or unpainted pre-treatment state).
- Dimensional check of the thermal break groove (width and depth) to ensure correct fit of the polyamide strip.
- Absence of burrs, sharp edges, or contamination within the groove that could prevent proper strip insertion or damage the strip during assembly.
- Verification per EN 12020-2 for extruded precision profiles where applicable.

4. STORAGE OF MATERIALS

4.1 Insulating Strips – Storage Requirements

Correct storage of polyamide insulating strips is critical to product quality. The following rules apply from receipt through to the moment of assembly:

Parameter	Requirement
Location	Covered, dry, well-ventilated indoor warehouse
Temperature	Ideal range: 15–20 °C. Avoid extremes below 5 °C or above 35 °C.
Humidity	Avoid prolonged exposure to RH > 70 %. Keep strips in original packaging.
Direct sunlight	Prohibited. UV radiation degrades polyamide surfaces.
Contact with water	Prohibited. Rain water and condensation cause excess moisture absorption.
Stacking	Support pallet must be ≥ strip length. Strips must not overhang pallet ends.
FIFO rotation	Mandatory. Use oldest batches first to minimise moisture uptake.
Maximum duration	As short as possible. Extended storage increases moisture content and risk of permanent deformation.

⛔ **WARNING:** *Strips stored on pallets shorter than the strip length will sag at the unsupported ends. If this sag becomes permanent, the strips cannot be used. Similarly, individual bundles removed from a pallet must be kept straight – any torsional deformation that is not corrected immediately may become permanent.*

4.2 Assembled Profiles – Storage and Handling

Assembled profiles (prior to surface treatment) must also be protected from moisture:

- Store assembled profiles indoors, protected from rain, dew and condensation.
- Do not stack assembled profiles in a way that causes permanent bending or twisting.
- Mark each bundle or pack with the batch reference of the insulating strips used, to ensure full traceability.

5. ASSEMBLY PROCESS

The assembly of thermal break aluminium profiles consists of three sequential operations: knurling, strip insertion, and roll-in (lock-in). Each step is described in detail below.

5.1 Pre-Assembly Conditions

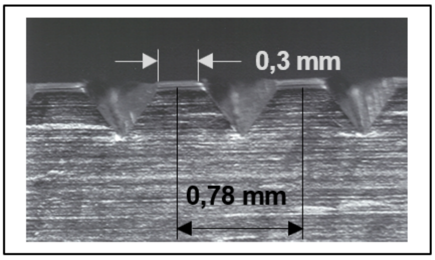
- Assembly shall be carried out in a production hall under standard indoor climatic conditions (approx. 20 °C, 50 % RH).
- Insulating strips must have attained room temperature before assembly. Strips coming from cold storage or subjected to low temperatures must be allowed to equilibrate thermally before use.
- Verify that the correct strip type and dimensions are selected for the aluminium profile groove geometry.
- Verify strip orientation: the geometry of the strip head determines which face locks against the aluminium knurling. Incorrect orientation results in sub-standard shear strength.

5.2 Step 1 – Knurling

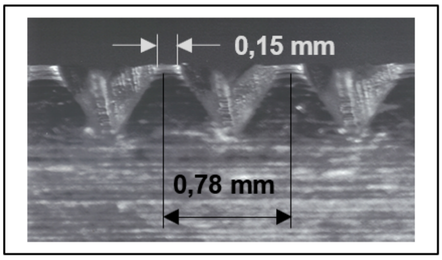
Knurling creates a series of teeth on the inner walls of the aluminium groove. These teeth interlock with the polyamide strip head during the roll-in operation and are the primary means of mechanical connection between the aluminium and the polyamide. The quality of the knurling is directly proportional to the shear strength of the assembled profile.

5.2.1 Knurling Geometry Requirements

Parameter	Sufficient Knurling (A)	Optimal Knurling (B)
Tooth crest height	≤ 0.30 mm	0.15–0.25 mm
Tooth pitch (spacing)	≤ 0.78 mm	0.60–0.70 mm
Edge sharpness	Pronounced	Sharp and well-defined
Both groove walls	Required on both	Required on both



A - Adequate knurling



B - Optimal knurling

5.2.2 Knurling Rules

- Knurling wheels must be sharp and in good condition. Worn wheels produce shallow, rounded teeth that do not adequately interlock.
- Following knurling, verify that the insulating strip can still be inserted into the groove without excessive friction. The groove opening must not be reduced below the minimum insertion width.
- For painted (powder-coated or anodised) aluminium profiles used as pre-painted extrusions, account for the paint layer thickness when setting the knurling depth: the paint layer reduces the effective groove opening.
- Asymmetric knurling is acceptable: a deeper knurl on the hammer (roll-in) side and a shallower knurl on the reaction side is a common optimised setting, provided both sides are knurled.

⛔ **WARNING:** *Absent or insufficient knurling on either groove wall will result in failure to meet the minimum shear strength requirements of EN 14024 and must be treated as a production non-conformity.*

5.3 Step 2 – Strip Insertion (Threading)

- Before insertion, confirm the correct strip type, dimensions and orientation.
- The strip must be fully inserted into both groove channels along the entire profile length.
- Insertion shall be performed smoothly and continuously. Do not force the strip or cause lateral bending.
- Check for full seating: the strip head must be fully engaged in both grooves with no gaps or partial insertions.

⚠ **NOTE:** *If resistance is encountered during insertion, stop and investigate. Common causes: incorrect strip-to-groove size match, insufficient groove opening after knurling, burrs in the groove. Do not force the strip as this may cause deformation or cracking of the strip head.*

5.4 Step 3 – Roll-In (Lock-In / Fissaggio)

The roll-in operation deforms the aluminium groove walls inward, causing the knurling teeth to bite into the polyamide strip head. This creates the mechanical interlock that provides the longitudinal shear strength of the assembled profile.

- The roll-in machine must be correctly set for the specific profile geometry being processed.
- Parallel guidance of the aluminium profiles through the machine must be maintained. Supporting rollers shall be used as necessary.
- The hammer (roll-in disc) must penetrate as deep as possible into the strip head – full penetration is mandatory.
- Roll-in discs must not contact the polyamide strip body, only the aluminium hammer zone.
- Roll-in discs must not interfere with the aluminium extrusion walls outside the hammer zone.

- After roll-in, verify that both groove walls are uniformly closed and that the strip is positively locked along the full profile length.

⛔ **WARNING:** *Partial or uneven roll-in causes non-uniform shear strength along the profile length and is a potential source of field failure. Reject any profile where the roll-in appears incomplete.*

5.5 Assembly Quality Verification and Shear Strength Testing

5.5.1 Purpose

Shear strength testing verifies that the assembly process achieves the mechanical performance required by EN 14024 for the intended end-use classification of the assembled profile.

5.5.2 Reference Standard

Mechanical testing shall follow the methodology of EN 14024 (Aluminium and aluminium alloys – Architectural profiles – Technical conditions for inspection and delivery of profiles with thermal barriers). The shear strength value T (N/mm) is determined in accordance with clause 5.4 of the standard.

⚠ **NOTE:** *For profiles to be used in France, additional compliance with NF 252 is required.*

5.5.3 Sampling Plan

- A test specimen consists of a 100 mm length cut from an assembled profile, taken at least 100 mm from either end.
- Two specimens taken from consecutive profiles (bar X and bar X+1) constitute one test set.
- Test sets shall be taken from: the first two profiles assembled; the last two profiles assembled; the first two profiles assembled after any batch change of either polyamide strips or aluminium profiles; and two profiles selected every 100 profiles for deliveries exceeding 100 pieces.
- The first-batch test also verifies the correct machine setup.

5.5.4 Test Procedure

6. Test one specimen from each set immediately after assembly, without any ageing or thermal treatment (as-assembled condition).
7. Condition the second specimen of each set in a forced-air oven at 200 °C for 20 minutes, then cool to ambient temperature in still air, and test.

5.5.5 Acceptance Criteria

Option	Criterion	Notes
F-1	Statistical characteristic value ≥ 24 N/mm	Statistical analysis per EN 14024 clause 5.6.2. All individual values used in calculation.
F-2	All individual T values ≥ 45 N/mm	Applicable as alternative to F-1. All specimens (as-assembled and aged) must pass.

5.5.6 Quality Record

A production log must be maintained for each customer order, recording:

- Order and customer references
- Batch numbers of polyamide strips and aluminium profiles used
- Individual shear strength values for each test set (as-assembled and aged)
- Pass/fail assessment for each set
- Overall production acceptance statement

⚠ **NOTE:** *It must be agreed contractually whether a copy of the production log is to be supplied with each delivery.*

6. SURFACE FINISHING OF ASSEMBLED PROFILES

Assembled thermal break profiles may undergo powder coating (electrostatic spray of thermosetting powder) or anodising. Both processes involve chemical pre-treatment baths and elevated-temperature oven cycles. The presence of polyamide insulating strips inside the assembled profile places strict requirements on process temperatures, drying procedures, and strip moisture content.

6.1 Pre-Treatment and Drying

Chemical pre-treatment (cleaning, etching, conversion coating) leaves liquid residues in the assembled profile. Incomplete drying before the oven cycle is the primary cause of strip blistering and foaming. The following rules are mandatory:

8. After each pre-treatment bath, thoroughly drain and blow off all residual liquid from the assembled profile. Pay particular attention to the cavities between the aluminium extrusions and the polyamide strip, and to any hollow sections within the aluminium extrusions.
9. Use compressed air to purge all enclosed cavities. The direction of the air jet should expel liquid from the assembly rather than driving it further in.
10. Where blowing is insufficient, allow profiles to drain vertically before loading into the oven.
11. Profiles must be completely surface-dry before entering the oven. Even small amounts of residual bath liquid significantly raise the effective moisture content of the strip during baking.

⛔ **WARNING:** *Residual bath liquid in the profile cavities is converted to steam at oven temperatures. This steam pressure is responsible for blistering or rupture of the insulating strips. Prevention relies entirely on thorough pre-oven drying.*

6.2 Profile Hanging / Racking for Coating

Correct racking avoids thermally induced deformation of the assembled profile during the oven cycle:

6.2.1 Horizontal Coating Process

- Support the assembled profile at mid-span in addition to the two ends if: (a) the self-weight deflection of the profile is significant, or (b) the thermal expansion of the two aluminium extrusions differs significantly (e.g. because their cross-sectional areas differ).
- When strips with an adhesive bonding wire are used, avoid any pre-bow before the oven cycle, as the adhesive will fix any deformation permanently once cured.

6.2.2 Vertical Coating Process

- Hang the assembled profile from the heavier aluminium extrusion (or from both extrusions equally if they are of similar weight) so that the profile hangs as close to vertical as possible.
- Asymmetric hanging introduces a twisting moment that, under oven temperature, can cause permanent misalignment of the two aluminium extrusions.

6.3 Powder Coating – Oven Temperature and Dwell Time

The critical constraint for powder coating of assembled thermal break profiles is the maximum permissible object temperature of the polyamide strip:

Parameter	Requirement	Notes
Maximum object temperature	200 °C (strip surface)	Do not exceed under any circumstances
Maximum dwell time at 180–200 °C	20 minutes	Cumulative: all oven passes
Temperature uniformity	±5 °C within load	Verify with data logger across different profile positions
Temperature sensor location	Critical	Air temperature ≠ object temperature. Use thermocouples on profiles to calibrate.

⛔ **WARNING:** *Exceeding 200 °C or 20 minutes dwell time will soften the polyamide, causing misalignment of the two aluminium extrusions (loss of parallelism) and a significant reduction in longitudinal shear strength. Profiles exposed to excessive oven temperatures must be rejected.*

⚠ **NOTE:** *The injected air temperature in a powder-coating oven can substantially exceed the set-point temperature, particularly near the air inlets. It is the object temperature (measured on the profile surface) that matters, not the oven air set-point. Always validate with profiling data loggers.*

6.4 Anodising

Anodising involves immersion of assembled profiles in a series of chemical baths (alkaline cleaning, acid etching, anodising bath, sealing). The process temperatures are generally below 40 °C and do not pose a risk to the polyamide strip. However:

- Chemical bath liquids (particularly alkaline solutions) must be completely drained and purged before the sealing bath (hot water or steam sealing) to avoid contaminating the seal and causing strip blistering.
- Hot-water sealing baths operate at approximately 95–100 °C and dwell times of 30–60 minutes. At these temperatures and durations, and with strips pre-dried to EMC moisture levels, no blistering should occur. However, excess moisture from inadequate pre-treatment drainage greatly increases the risk.

- Electrolytic colouring and organic top-coat processes involve additional thermal steps; apply the same object temperature limit of 200 °C and verify process compatibility with the strip supplier if in doubt.

6.5 Blistering and Foaming – Root Cause Analysis

Blistering or foaming on the polyamide strip surface or beneath the paint film is caused by the vaporisation of absorbed moisture at oven temperatures. The phenomenon depends on the combined effect of moisture content and temperature:

- Strips in normal EMC condition (approx. 2 %) will withstand 180–200 °C for 20 minutes without blistering.
- Strips with elevated moisture content (from rain exposure, condensation in cavities, or poor storage) will blister at temperatures and dwell times that would otherwise be safe.
- Prevention strategy: dry storage + thorough drainage after pre-treatment + controlled oven temperature = no blistering.

Root Cause	Prevention	Detection
Rain / condensation on strips	Dry indoor storage, FIFO, original packaging	Visual inspection on receipt
Residual bath liquid in cavities	Compressed-air blow-off after each bath	Pre-oven inspection
Excess oven temperature / dwell	Calibrated oven + profiling data logger	Thermocouple monitoring
Non-uniform oven temperature	Regular oven survey	Cross-load thermocouple mapping

7. DIMENSIONAL TOLERANCES OF ASSEMBLED PROFILES

In the absence of specific customer–supplier agreements, dimensional tolerances shall comply with EN 12020-2 (Aluminium and aluminium alloys – Extruded precision profiles in alloys EN AW-6060 and EN AW-6063). The following tolerance tables apply:

7.1 Length Tolerances

Circumscribed circle diameter CD	L ≤ 2000 mm	2000 < L ≤ 5000 mm	5000 < L ≤ 10000 mm	L > 10000 mm
CD ≤ 100 mm	+5 / 0	+7 / 0	+10 / 0	By agreement
100 < CD ≤ 200 mm	+7 / 0	+9 / 0	+12 / 0	By agreement
200 < CD ≤ 300 mm	+8 / 0	+11 / 0	+14 / 0	By agreement

The length difference between the two assembled aluminium profiles must be within the tolerance value shown above. End-squareness tolerance = half the length tolerance.

7.2 Straightness Tolerance

- Local straightness: maximum bow ≤ 0.3 mm per 300 mm measured length, at any position along the profile.
- Overall straightness (ht): varies with total profile length as follows:

Total length L	Maximum bow ht (mm)
L ≤ 1000 mm	0.7
1000 < L ≤ 2000 mm	1.3
2000 < L ≤ 3000 mm	1.8
3000 < L ≤ 4000 mm	2.2
4000 < L ≤ 5000 mm	2.6
5000 < L ≤ 6000 mm	3.0
L > 6000 mm	3.5

Straightness verification: lay the profile on a rigid, flat horizontal surface; measure the bow first on one face and then on the adjacent face.

7.3 Bow (Concavity–Convexity) Tolerances

Total profile width W	Tolerance F (mm)
W ≤ 30 mm	0.10
30 < W ≤ 60 mm	0.15
60 < W ≤ 100 mm	0.20
100 < W ≤ 150 mm	0.25
150 < W ≤ 200 mm	0.35
200 < W ≤ 250 mm	0.43
W > 250 mm	0.50

⚠ **NOTE:** *For widths exceeding 200 mm, an additional local bow tolerance of 0.5 mm per 100 mm of width also applies.*

7.4 Twist Tolerance

Width W	L ≤ 1000	1000–2000	2000–3000	3000–4000	4000–5000	5000–6000	L > 6000
W ≤ 25	1.0	1.5	1.5	2.0	2.0	2.0	By agr.
25 < W ≤ 50	1.0	1.2	1.5	1.8	2.0	2.0	
50 < W ≤ 75	1.0	1.2	1.2	1.5	2.0	2.0	
75 < W ≤ 100	1.0	1.2	1.5	2.0	2.2	2.5	
W > 100	1.0–1.8	1.5–2.5	1.8–3.0	2.2–3.5	2.5–4.0	3.0–4.5	

Twist tolerance values in mm. All dimensions in mm. See EN 12020-2 for the full table and measurement method.

7.5 Angularity Tolerance

Width W (mm)	Angularity Z (mm)
W ≤ 30	0.3
30 < W ≤ 50	0.4
50 < W ≤ 80	0.5
80 < W ≤ 100	0.6
100 < W ≤ 140	0.7–0.8
140 < W ≤ 200	0.9–1.2
W > 200	1.5

8. PACKAGING, LABELLING AND TRACEABILITY

8.1 Labelling Requirements

Each bundle or pack of assembled profiles must carry a durable, legible label showing at minimum:

- Customer order number
- Article code (aluminium profile reference)
- Batch number of the polyamide insulating strips used
- Date of assembly
- Quantity (number of profiles / total length)
- Assembler identification (operator or line reference)

8.2 Packaging

The specific packaging form must be agreed between assembler and customer. In all cases, assembled profiles containing polyamide insulating strips must be protected against:

- Direct contact with water (rain, condensation) during transport and storage.
- Mechanical damage to the aluminium surface and the polyamide strips.
- UV exposure (protective wrapping or opaque packaging).

8.3 Transport

Transport conditions shall be agreed between assembler and customer. The assembler is responsible for ensuring that the product reaches its destination without moisture damage or mechanical deformation. Profiles must be adequately supported along their full length during transit.

9. NON-CONFORMITIES AND CORRECTIVE ACTIONS

Non-conformity	Probable Cause	Corrective Action
Shear strength below minimum (F-1 or F-2)	Insufficient knurling, wrong assembly machine settings, strip fully or partially missed during roll-in	Re-inspect knurling depth; re-calibrate machine; scrap affected batch
Profile misalignment / loss of parallelism after oven	Excessive oven temperature or dwell; asymmetric hanging; racking-induced thermal gradient	Verify and reduce oven temperature; improve racking; scrap affected profiles
Blistering / foaming on strip surface	Excess moisture in strip or in profile cavities; insufficient pre-oven drainage; excessive oven temperature	Enforce dry storage; improve drainage; reduce oven temperature
Strip permanent deformation (bow / twist)	Excessive storage period; poor storage conditions; unsupported overhang on pallets	Improve storage (FIFO, temperature, support); do not use permanently deformed strips
Strip not fully inserted	Incorrect strip selection; burrs in groove; friction from moisture swelling	Verify strip–groove fit; deburr groove; assemble at correct ambient temperature
Dimensional tolerance exceedance	Assembly machine out of calibration; thermal distortion during surface finishing	Re-calibrate machine; optimise oven racking and temperature profile

10. DECLARATION OF CONFORMITY

By signing or issuing this document with each delivery, the assembler declares conformity with all requirements set out in this specification, and in particular confirms the correct execution of:

- Incoming goods inspection (Section 3)
- Storage and handling of insulating strips (Section 4)
- Knurling operation – geometry and quality (Section 5.2)
- Strip insertion – correct type, orientation and full seating (Section 5.3)
- Roll-in / lock-in – complete and uniform along full profile length (Section 5.4)
- Assembly quality verification – shear strength testing per EN 14024 (Section 5.5)
- Surface finishing – compliance with temperature and dwell-time limits (Section 6)
- Dimensional conformity – compliance with EN 12020-2 tolerances (Section 7)
- Packaging, labelling and traceability requirements (Section 8)

Company / Assembler	Responsible person	Date
Signature	**Title**	**Order reference**

ANNEX A – REFERENCE STANDARDS

Standard	Title
EN 14024:2004	Aluminium and aluminium alloys – Architectural profiles – Technical conditions for inspection and delivery of profiles with thermal barriers
EN 12020-2:2008	Aluminium and aluminium alloys – Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 – Part 2: Tolerances on dimensions and form
EN ISO 11357-3	Plastics – DSC – Part 3: Determination of temperature and enthalpy of melting and crystallisation
EN ISO 1183-1/-3	Plastics – Methods for determining the density of non-cellular plastics
EN ISO 1172	Textile-glass-reinforced plastics – Prepregs, moulding compounds and laminates – Determination of the textile-glass and mineral-filler content
EN ISO 868	Plastics and ebonite – Determination of indentation hardness by means of a durometer (Shore hardness)
EN ISO 179-1	Plastics – Determination of Charpy impact properties
EN ISO 527-2/-4	Plastics – Determination of tensile properties

Standard	Title
EN ISO 1110	Plastics – Polyamides – Accelerated conditioning of test specimens
EN ISO 11925-2	Reaction to fire tests – Ignitability of products subjected to direct impingement of flame
EN 13501-1	Fire classification of construction products and building elements
DIN 51900	Determining the gross calorific value of solid and liquid fuels
ISO 14021	Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)
EU REACH 1907/2006	Registration, Evaluation, Authorisation and Restriction of Chemicals