Industry Standard
for

# Extruded Glazing Seals

# WG 45101.16-2023

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## Part 1 – Referring to the materials and manufacture of glazing seals for windows and doors.

window & glass association nz

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# INDUSTRY STANDARD for EXTRUDED GLAZING SEALS

## Contents

## 1.0 Introduction

The intent of this industry standard is to ensure the materials used in the manufacture of glazing and other seals for the window and door industry are appropriate for their intended use, thus claims of compliance with NZBC Clause B2 – Durability can be made with confidence.

Section 4.4 of NZS4223.1:2008 - Glazing in buildings: Glass selection and glazing, describes compatibility, application, and durability requirements for glazing materials. These requirements provide the underlying foundation of this Industry Standard.

**4.4.2 Compatibility of materials**

A glazing material shall be used only where compatible with contiguous materials, including the rebate surface finish, setting or location blocks, distance pieces and glass type.

**4.4.3 Application of materials**

The application of glazing materials shall be in accordance with the manufacturer's instructions.

**4.4.4 Life expectancy of materials**

A glazing material shall only be used where its life expectancy (durability) has been established.

NOTE –

1. The manufacturer's advice should be sought for information regarding life expectancy.
2. For durability requirements, refer to the New Zealand Building Code Clause B2.

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This, Part 1 of the Industry Standard guides the reader through the compatibility of materials and the correct selection of glazing seals. The use of appropriate seals contributes to the durability of the glazing system they form a part of.

*Comment*
*Whilst this Industry Standard includes plasticised polyvinyl chloride (PVC) glazing seals within its Tables, the industry is working to phase out their use, to simplify selection moving forward.*

Part 2 of the Standard will outline industry best practice glazing techniques.

## 2.0 Scope

This Industry Standard relates specifically to extruded glazing gaskets and other seals used in the manufacture of windows and doors including, but not limited to, aluminium, timber, uPVC, steel, composite, and pultruded materials.

## 3.0 Definitions

For the purposes of this Industry Standard the following definitions apply.

| | |
|---|---|
| **Building Importance** | As described in Clause A3 of the Building Code. The importance level of a building (levels 1-5) can have an impact on the durability requirements of a building component. |
| **Backing Seal** | The component which usually fits between the glass and the fixed portion of the frame it is being glazed into. Its size is usually common across the window system. |
| **Component** | In this Standard, *Component* refers to a complete seal, whether a backing seal or glazing wedge. |
| **Co-extruded Seal** | A seal where two or more materials are extruded together to form a single component, taking advantage of the properties of both materials.<br>The process can also be used to extrude a backing seal into a uPVC window or door frame. |
| **Durability** | The ability to resist wear and decay. In terms of NZBC Clause B2, the minimum period for which the component must perform its designed function. |
| **Dynamic Seal** | A seal that is in an active position, (e.g. sash seals, casement door seals). |
| **Glazing Wedge** | Usually the external seal between the glass and the frame it is being glazed into. The wedge is used to take up any tolerances in the thickness of the glazing and/or for differing overall thicknesses of the glass. |

| | |
|---|---|
| High Rise | In terms of this industry standard, high rise refers to an installation with a height above 25m. |
| Life Expectancy | The intended serviceable life of a building component. |
| Low Rise | In terms of this industry standard, low rise refers to an installation with a total height of up to 10m. |
| Materials | This refers to the raw materials, polymers etc used in the manufacture of a glazing seal. |
| Manufacturer | The business extruding the glazing seal from its raw materials. |
| Mid Rise | In terms of this standard, high rise refers to an installation with a total height of up to 25m. |
| Static Seal | A seal that is used in a fixed position, (e.g. wedges, backing seals, channel gaskets). |
| Supplier | The manufacture and/or distributer of glazing seals. |
| Warranty | A written statement, issued to the purchaser, by the manufacturer, or supplier, promising to repair or replace the component, if necessary, within a specified period. |

## 4.0 Design and Construction

Glazing seals are designed to perform the following functions:

i. to minimise the entry of air and water.
ii. to provide a cushion for the glazing media, which they encase.
iii. to take up the tolerance between rigid components.
iv. to allow movement of glazing media under wind load and/or temperature changes.

## 5.0 Performance

Glazing seals shall meet the following performance requirements,

i. They shall be designed to withstand prolonged exposure to Ultraviolet light under normal New Zealand conditions without an appreciable breakdown in performance.
Table 1 from NZBC Clause B2 requires that glazing seals remain functional for a minimum period of not less than 15 years, based on them being moderately difficult to access or replace.

**Table 1: Durability Requirements of Nominated Building Elements** (cont'd)

| Building Element | Component | Situation/Function | Not less than 50 years | Not less than 15 years | Not less than 5 years |
|---|---|---|---|---|---|
| **Windows** (Continued) | Gaskets, glazing and glazing beads | Moderately difficult to access or replace | | ✓ | |

ii. High temperatures can adversely affect the performance and durability of a glazing seal. Where seals are installed in combination with dark coloured frames and reflective glass, the use of plasticised PVC is not recommended.

iii. When using glazing seals with materials other than glass, i.e., polycarbonate or metal panels, consult with the manufacturer regarding the appropriate material.

iv. Thermoplastic Vulcanizate (TPV) and Thermoset Rubbers, as recommended by the manufacturer, should be used for mid and high rise applications (above 10m in height), or for other installations in extreme or exposed conditions or where the building importance level requires it.

v. The performance and/or compatibility of materials other than those listed in the following tables is the responsibility of the seal manufacturer or supplier.

vi. Glazing seals included as a part of a structurally glazed system must be checked for compatibility with the following, prior to the manufacture of the windows,
   a) the structural silicone sealant being used to attach the glass to the frame,
   b) Any weathering sealant it may come into contact with, and
   c) IGU edge sealing system.

vii. Glazing seals finished in colours other than black must be designed to accommodate movement within the limits specified below or provide their own performance specification to the client. Contact the manufacturer for further information, prior to specifying or ordering.

Table 5.1 Material End Use

| Glazing Seal Material | Low rise Static | Low rise Dynamic | High rise Static | High rise Dynamic |
|---|---|---|---|---|
| TPV – (Thermoplastic Vulcanizates) | ✓ | ✓ | ✓ | ✓ |
| EPDM – (Ethylene Propylene Diene Monomer) | ✓ | ✓ | ✓ | ✓ |
| Silicone | ✓ | ✓ | ✓ | ✓ |
| PVC – (Plasticised Polyvinyl Chloride) | ✓ | ✗ | ✗ | ✗ |

Table 5.1 provides a quick guide to the suitable end use of glazing seals manufactured from these common materials.

Table 5.2 Material Properties

| Glazing Seal End Use | Material Properties | | | |
|---|---|---|---|---|
| | Hardness Shore A | Tensile Strength | Elongation @ Break | Compression Set @ 70° |
| Low rise Static | 60-80 | 7.0MPa | 300% | max 75% |
| Low rise Dynamic | 55-75 | 7.0MPa | 300% | max 65% |
| Mid & High rise Static | 60-80 | 7.0MPa | 300% | max 35% |
| Mid & High rise Dynamic | 55-75 | 7.0MPa | 300% | max 35% |

Table 5.2 provides a guide to the required material properties of glazing seals manufactured for these specific end uses.

# 6.0 Test Procedures

## 6.1 Heat Reversion

A length of seal shall be cut (300mm-400mm) and the length recorded. The seal is then placed in a calibrated laboratory oven at the selected temperature for one hour.

The sample is removed and allowed to cool for one hour at ambient temperatures and measured again.

Shrinkage is calculated and must be less than the maximum allowable as per the tables below:

| Table 6.1a Single Hardness materials for Low Rise applications | |
|---|---|
| Test Temperature | 70°C |
| Allowable Shrinkage | 3.0% max. |

| Table 6.1b Single or dual hardness materials for High Rise applications | | |
|---|---|---|
| | Test 1 | Test 2 |
| Test Temperature | 70°C | 85°C |
| Allowable Shrinkage | 0.25% max. | 1.0% max. |

## 6.2 Raw Material Tests

The following Test Methods are used to demonstrate compliance with the requirements of this standard.

| Table 6.2 Test methods | | |
|---|---|---|
| | ASTM | ISO |
| Shore Hardness | D-2240 | 868 |
| Tensile / Elongation | D-412 | 37 |
| Compression | D-395 | 815 |

## 7.0 Scope

The following dimensional drawings for aluminium "T" slots have been formalised by the Associations Component Suppliers Group and Window Technical Committee to create standardisation within the window industry.
These standardised dimensions should be incorporated where possible in all future window system designs. However, manufacturers can specify custom dimensions.

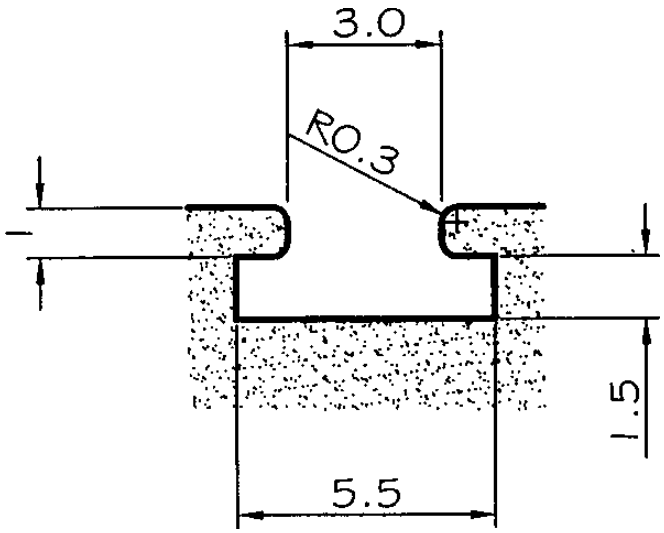


Figure 7.1 – Nominal foot width – 4.8mm

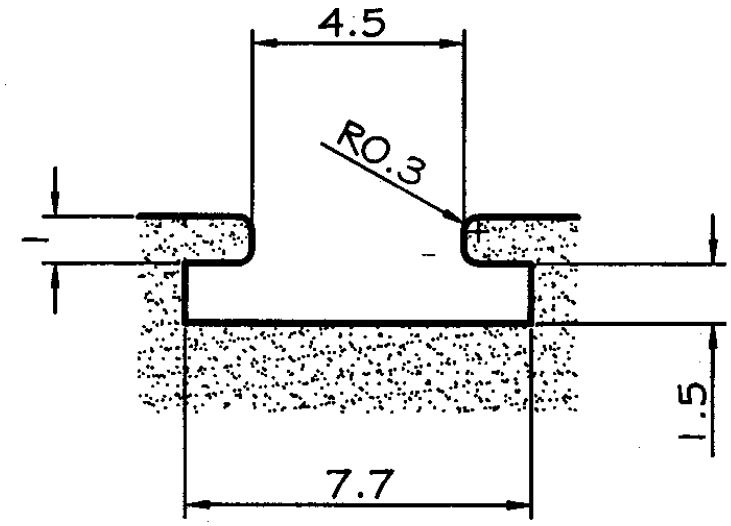


Figure 7.2 – Nominal foot width – 6.9mm

## 8.0 Quality Assurance

Suppliers claiming compliance with this part undertake that they will maintain a documented system of quality assurance that ensures:

i. That the product sold will perform the same as the tested sample.
ii. That the materials of manufacture will be the same as those tested.
iii. That comprehensive instructions for the use of, and the maintenance requirements of the product will be available to the purchaser.

## 9.0 Application

To satisfy both the Durability requirements set out above, and the warranty requirements of the manufacturer, it is crucial that glazing seals be used within the demands set out in this document. Use of seals outside of these performance requirements and industry best practices, may result in the transfer of liability, should failure occur.

If you are unsure of correct glazing seal selection, please contact the manufacturer for further information, prior to use and/or installation of the seal.

## 10.0 Product Information

The new building information requirement regulations place obligations on Aotearoa New Zealand-based manufacturers, importers, wholesalers, retailers, and distributors.

Given that Glazing Seals cannot be readily purchased by the consumer from a retail store, it is considered they do not need to meet the requirements of the 2023 legislation.