WANZ In-Factory Quality Assurance Procedure For Sealants

Overview

The purpose of this document is to describe how a WANZ Window Manufacturer can set up a basic in-factory quality assurance system for sealants they use in the manufacturing of aluminium joinery.

The peel test procedures in this document are based on ASTM C794 which is an internationally recognised test method for sealant adhesion. Each user of this document must satisfy themselves that the QA systems they use are adequate for the intended purpose as neither WANZ, nor its officers, accept any responsibility either expressed or implied.

WANZ Window Manufacturers are also reminded that actions and circumstances beyond their direct control may influence the performance of manufacturing sealants and it is, therefore, prudent to have suitable safeguards in place regarding such eventualities.

1. **Systems**

   All manufacturing sealant purchases must conform exactly to the sealant supplier's compliant product test reports.

   a. A copy of the above laboratory test reports must be in the factory QA file.
   b. A copy of the sealant supplier's recommended application procedures must be in the QA file.
   c. A register of trained applicators must be maintained in the QA file.
   d. The QA file will reside with the Factory Foreman/Production Supervisor.
   e. The QA file is a permanent production materials record and shall not be discarded.

2. **Periodic QA Testing**

Peel Adhesion Test

Preparation:

i. At least once per week two off-cuts of frame material that are representative of the actual materials used in the production process that same week will be cut and assembled as a fully finished corner joint in accordance with the normal factory processes. The corner should include all the normal corner componentry such as plastic parts. (Where componentry reduces the available surface area of joinery exposed to the testing – simply extend the length of sealant to cover more surface area).

   Of course, actual production can be used providing it is retained until the sealant is fully cured and testing is completed before despatch.

ii. The corner joint assembly will be further prepared for the peel test by immediately overlaying the freshly prepared joint with a very strong, open weave, non-coated cloth tape and then firmly embedding that tape between the freshly applied backing sealant and an additional layer of the same back-sealing sealant applied about 2mm thick. To aid adhesion, thoroughly "butter" the tape with adhesive, pushing it right through the fabric so that it is saturated with sealant. The result is a sandwich of tape between the two layers of sealant, with sufficient tape (at least 100mm) left exposed so that it may be held to rip the joint apart after the curing process is complete. The date and time of sample preparation is written onto the frame material for later reference. Only one leg of the corner joint need be prepared as a "sandwich".

    The cloth tape can be cut from linen – (genuine flax linen such as tea towel).

iii. The test sample is delivered to the factory foreman for peel testing after the cure period is completed.

Peel Adhesion Testing

After the standard curing time, the joint assembly is peel tested using the standard technique (based on Standard Test ASTM C794) as follows:

1. Secure the assembled joint in a vice with the test surface uppermost.
2. Firmly grip the exposed 100mm end of the cloth tape and pull it firmly and steadily (not jerking) backwards over the surface of test sample – as per the diagram. The tape should be changing direction very sharply causing the sealant to rip apart. For a more rigorous test, cut the sealant right through to the joinery surface, and then start pulling the tape. Doing this provides a starting point for sealant/joinery adhesion failure. If the adhesion is maintained you have achieved very good adhesion. (See the note on the diagram).

Observing and Recording the Peel Adhesion Test Results

1. When the sealant has ripped apart, it should be well stuck to both sides of the tape, and the other half of the sealant should be well stuck to the joinery.

2. If the sealant is partially stuck to the joinery and, also, partially ripped away, this indicates that the sealant joint has failed.

3. Make an assessment of the percentage of sealant material that remains well stuck to the joinery and record that result on your QA record sheet.

Working with your results

1. 100% of ripped sealant remaining stuck to the joinery is a “pass”. (This is the same “100% cohesive failure result” that should be on the Laboratory Test Report that your supplier issues for the sealant product you are purchasing. Your in-house testing is now verifying that the sealant is working on your joinery as per the laboratory test reports.

2. Any result that is less than 100% adhesion to the joinery indicates adhesion has not been fully achieved. This is the clue to start looking for the reason why you are not getting full value and performance out of your sealant. Possible reasons are:

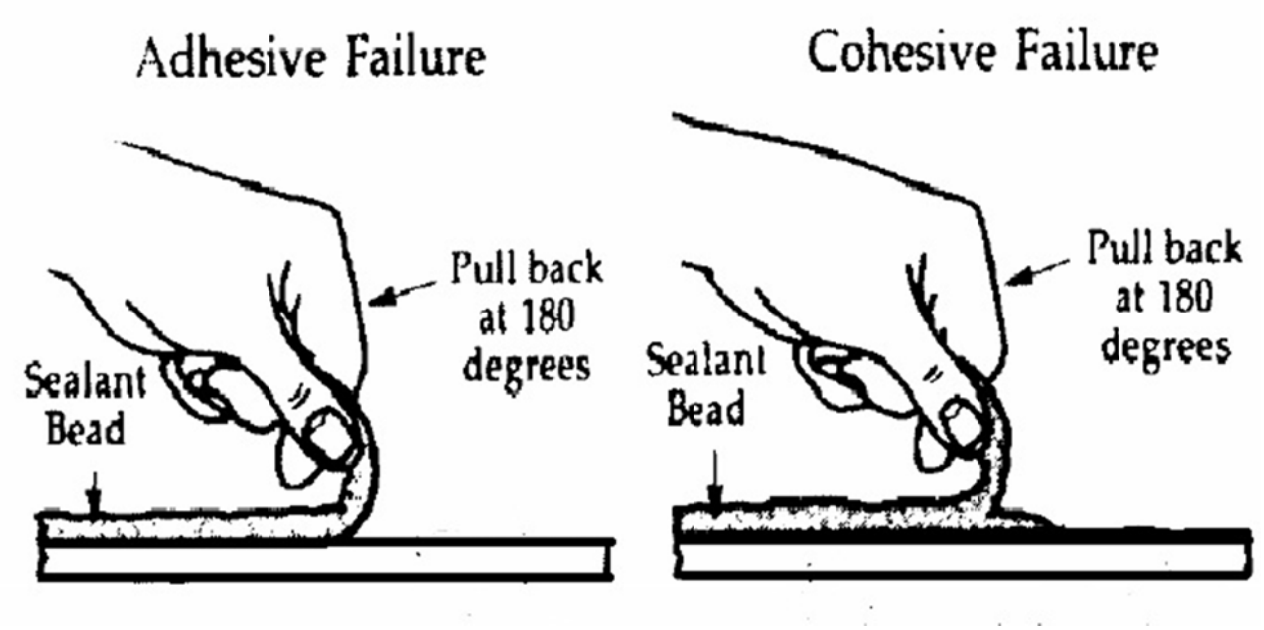
    a. The sealant:
        i. Has the worker actually used the right sealant?
        ii. Do you have test reports in your QA file and in your purchasing file for this (brand name and type) of sealant?
        iii. Is it fresh stock?
        iv. Has it been applied properly?
        v. Has the application temperature been within the recommended temperature range?

    b. The Substrate:
        i. Has the surface finishing changed?
        ii. Has the surface been thoroughly cleaned as per the “written instructions” that are in your QA file from the sealant supplier?
        iii. Has the correct cleaner been used?
        iv. Have clean wipes been used for each joint?
        v. Are you using the recommended cutting lubricants on your saws?

Applying the Solution

Remedy the identified problem/s, retest, and repeat procedure until 100% cohesive failure is achieved.

Resume scheduled testing.



Result = Failure:
The sealant has been removed from the joinery.

Result = Pass: ↑
The sealant has ripped through the middle at the cloth tape interface, and the sealant is still firmly attached to the joinery.
Note: (from page 2)
The arrow indicates where you would cut through the sealant down into the joinery (under the tape) to introduce a failure starting point).

Additional Support:

WANZ Window Manufacturer Audit
The WANZ Executive Committee has authorized an additional check as part of the WANZ Audit of Window Manufacturers.

The audit now covers four things:

1. That <u>each and every</u> window and door you manufacture is labeled with an NZS4211 compliance label, or a Specific Engineering Design Label, as appropriate.
2. The production complies with the brand manufacturing manual, or to the Specific Design calculation job sheet, as appropriate.
3. Documentary evidence of an active OSH system. E.g. System Documents, Hazard Register, Accident Register, OSH meeting records.
4. QA records for regular sealant checks and rectification, as appropriate.

A WANZ Window Manufacturer Audit Certificate is issued to each member.

WANZ In-Factory Quality Assurance Procedure For Sealants
Record of Testing

(use one page per test)

Business Name:

About the Test Sample:

Date and time the sample was prepared:

Sample prepared by (name) :

Brand name of sealant used: Supplier:

Date of the Sealant Supplier laboratory test report for this product:
(the report must be no older than 12 months from date of this test)

Brand name of cleaner used: Supplier:

Name of surface finish:

About the Test:

Date and time peel test was performed:

Name of tester:

Result of peel test:

Cohesive Failure = Pass / Fail (delete one)
(must rip apart at cloth tape interface)
If less than 100% = investigation is required

Adhesive Failure = Pass / Fail (delete one)
The sealant must remain firmly stuck to the joinery after ripping the tape apart.
Any sealant that has come off the joinery is a failure = investigation is required.

Follow Up Actions:
Record here (and on the reverse side of this page) the plan to address any failure noted above.

File this record of test in your Sealant Quality Control manual ❒
Your Sealant Quality Control manual should also contain copies of the product literature for the sealants you use, their respective supplier laboratory test reports and their Material Data Sheets for Safe Handling and OSH.
It is this manual that will be subject to WANZ Audit.

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