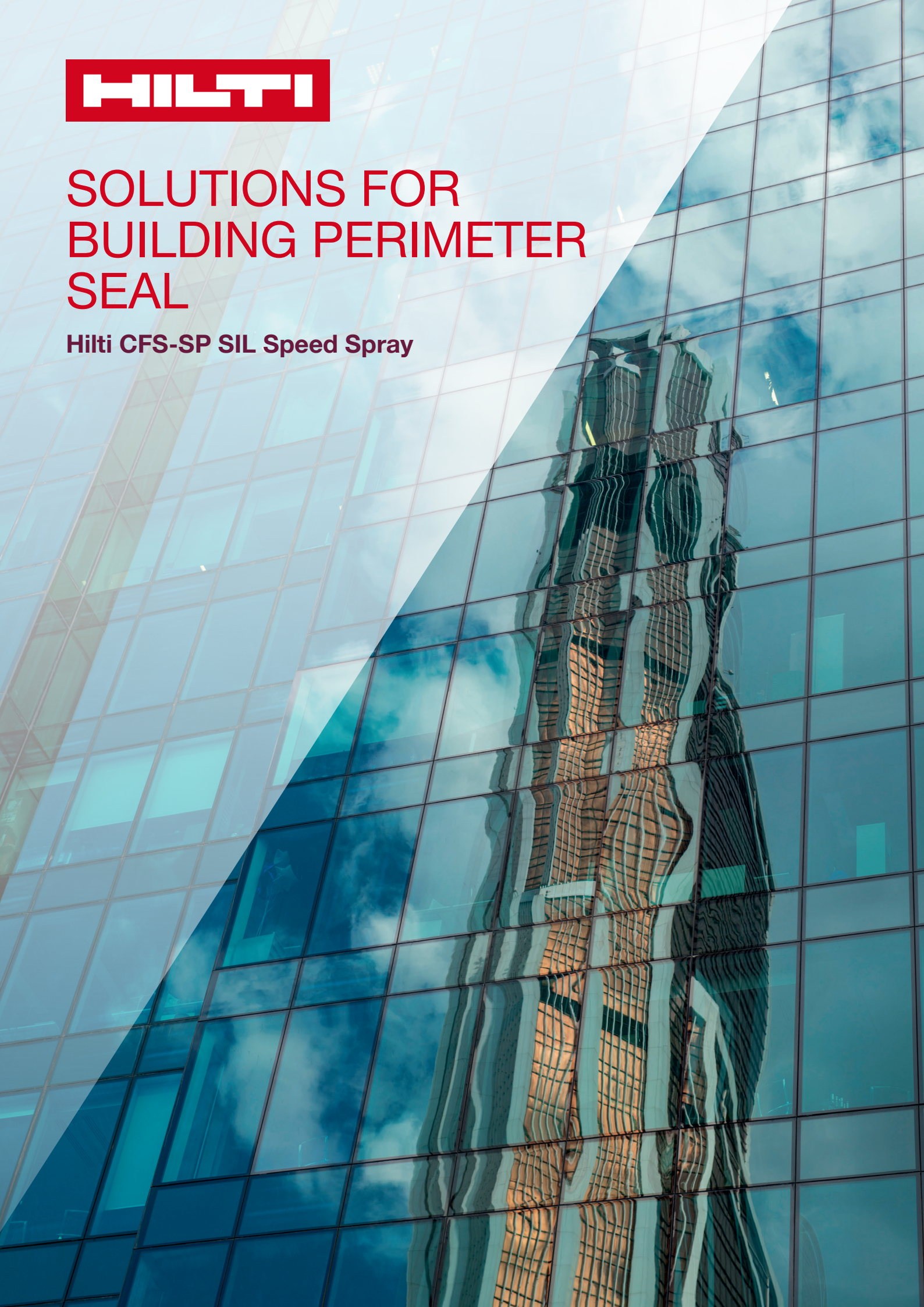
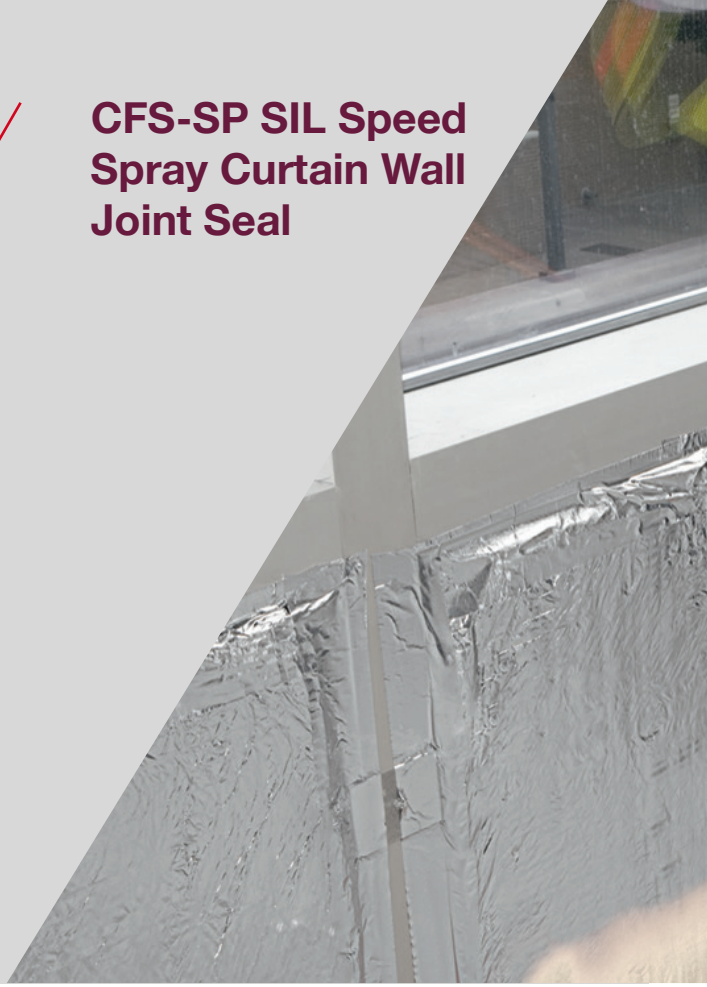


SOLUTIONS FOR BUILDING PERIMETER SEAL

Hilti CFS-SP SIL Speed Spray

SAFE & ENDURING CURTAIN WALL DESIGN

CFS-SP SIL Speed Spray Curtain Wall Joint Seal



The Hilti CFS-SP SIL speed spray is a silicon-based smoke and fire resistant sealant which is applied to various construction joints by an airless spray applicator or brush. The CFS-SP SIL system compensates for considerable movement laterally, vertically and horizontally while maintaining its ability to prevent the passage of smoke and flames.

It is most suitable for use on the perimeter seal of a building between the edge of the concrete slab and the inside face of the curtain wall. As the CFS-SP SIL creates a large flexible seal, it allows for relative movement of the curtain wall façade not possible from traditional methods, it offers greater safety and security for the curtain wall façade.

Hilti CFS-CP SIL Speed Spray

The system is an effective and efficient solution for the edge of slab perimeter seal. Spray application simplifies the installation of the fire perimeter barrier increasing productivity vs traditional methods of metal sheet, shot fired fastenings and additional corking.

CFS-SP SIL speed spray is applied on top of a compressed mineral wool backing, in the gap between the edge of slab and curtain walls, using an airless spray applicator. It adheres to the concrete slab and the curtain wall façade with a small overlap. The compressed mineral wool, and the elasticity of the CFS-SP SIL sealant allow for movement without compromising the seal.

With the sealant covering the entire gap between the edge of slab and curtain wall, there is no need for a metal, sheet, shot fired nails or additional corking to create a perimeter seal, along with the mineral wool.

The system required the following items:

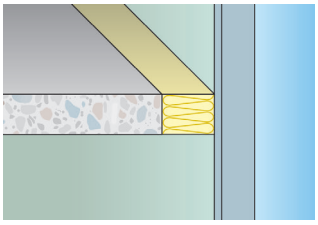
- Hilti CFS-CP SIL silicon-based speed spray
- An appropriate airless spray applicator and suitable nozzle
- Approved mineral wool as backing
- Checking Card

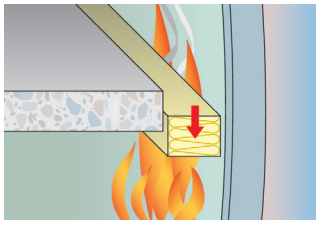
The silicon based speed spray, coupled with the mineral wool, provides a smoke and fire seal barrier between floors, after less than half a days cure time.

CFS-SP SIL Silicon Speed Spray

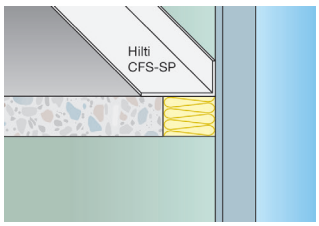
Airless Spray Applicator

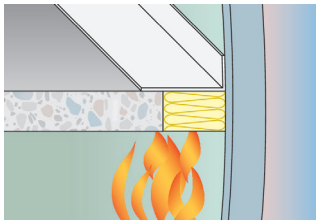
Mineral Wool





Failure of a Rigid Seal





Performance of a Flexible seal

Cover your Bases for Building Movement

Building movement occurs for any number of reasons. These can be specific to the area in which a building is constructed, and the methods used in construction. It is important that fire and smoke seals within a building are able to maintain their integrity throughout the life of the building to ensure the safety of its occupants.

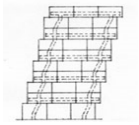
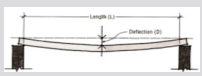
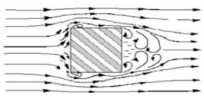
Type of Movement	Source of Movement	Amount of Movement	Figure
Horizontal Shear between façade and floor	Wind Drift Seismic Thermal	~3.175mm max	
Vertical movement between brackets at floor level	Dead load + Live Load	~9.5mm max for 9m slab	
In-and-out movement between brackets at floor level	Wind pressure and Rolling Vortexes	± L/175 Where L is distance between brackets	

Table of expected movement between edge of slab and curtain wall

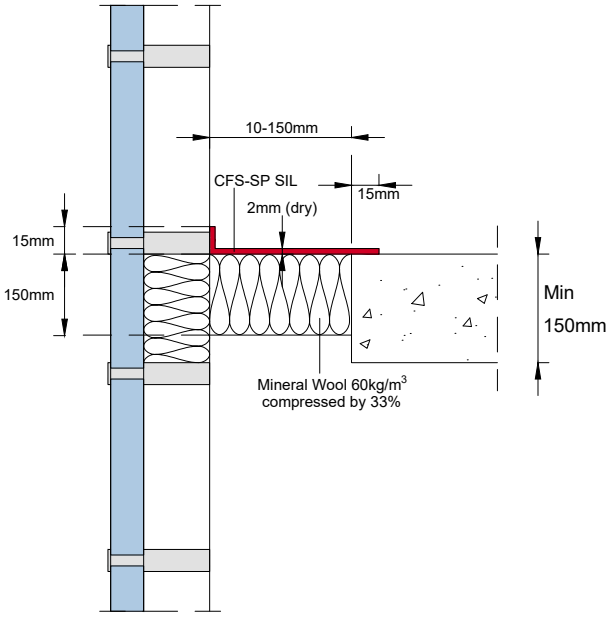
Above some of the expected movements are outlined for a curtain wall slab. Additionally, if the curtain wall bulges outwards in the event of a fire, a rigid building material will not stretch and will fail. The CFS-SP SIL system provides a flexible seal.

Design Using an Fully Qualified System

The Hilti CFS-SP SIL Speed Spray comes with ETA and UL approval for curtain wall to edge of slab applications. Additionally, it is supported by a AS 1530.4 Fire test for construction joints.

Because there are no are guidelines for qualifying an edge of slab to curtain wall construction joint under the locally cited fire standard AS1530.4. We need to look at what international standards exist to develop an alternative solution under the NZBC. BS EN 1364-4:2014 - Fire resistance tests for non-loadbearing elements, and ANSI/ ASTM E2307 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus, can be identified as best practices.

The CFS-SP SIL speed spray has approvals for both of these, as well as a complimentary mid-slab joint test to AS1530.4 to demonstrate its effectiveness when tested under the local standards.



Basic Dimension requirements based on ETA 17/0082

Hilti Service Package

Get your design right the first time. Hilti provides a full range of support for the CFS-SP SIL system from design to install. Our team of engineers will support by:

- Reviewing your edge of slab firestop detail
- Optimise the design, providing the options to omit non-compulsory components
- If required, Hilti can provide an Engineering Judgement for your specific arrangement (acoustic and fire).
- Advise the installer on required equipment
- Train the installer on the use of the applicator
- Review installed fire barriers

Contact a Hilti Engnieer at nzengineers@hilti.com for more information.

The Right Tools for the Job

Boost your productivity by using an airless spray machine to apply the CFS-SP SIL speed spray.

Airless Spray Machine

- Possible brands & types:
  - Wagner – PS3.31
  - Titan – Advantage 600 or 1100
  - Graco – Ultra Max II 695, 795
- Pump needs a min. delivery rate of ≥ 2,6l/min

Hose and Whip

- The length of the hose depends on the available pressure of the airless sprayer.
- Use an additional hose whip for a more convenient use when the hose diameter is ≥ 10mm.

Gun and Tip

- Spray guns with a built-in filter avoid tip blockages and should therefore be given preference for this reason.
- Reversible tips should be used due to their ease of replacement and ease of cleaning.
- Select the tip angle to suit the joint width. This will reduce overspray and thus reduce costs.
- Further advice available from Hilti for tip selection upon request.

Gun Extensions

- Use of a tip extension may be a helpful tool. These are available in various lengths from 25cm to 2m.

CFS-SP SIL Silicon Speed Spray

Airless Spray Applicator

Hose and Whip

Spray Gun

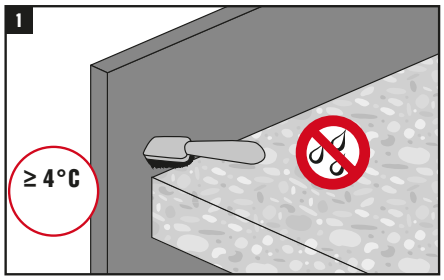
Spray Tip

Technical Data

Base materials	Concrete, Masonry, Steel, Aluminium
Chemical basis	Neutral cross-linking silicone
Approx. cureing time	2mm / 5h
Water Resistance	2 hours rain resistance after 160min. Of cure time (ASTM D6904)
Movement	±12.5% (ISO 11600)
Seismic Movement	±12.5% (EAD 350141-00-1106)
ETA Fire Approval	ETA 17/0082
Acoustics performance	Test report available
Mould & Mildew Test	1 (ASTM G21)
Shelf life	12 months
Application temperature range	4 - 40 °C
Temperature resistance range	-35 - 120 °C
Storage and transportion temperature range	4 - 25 °C
Colour	Off-white
Complimentary products	Mineral wool
LEED VOC	72 g/l

Step By Step Installation Guide

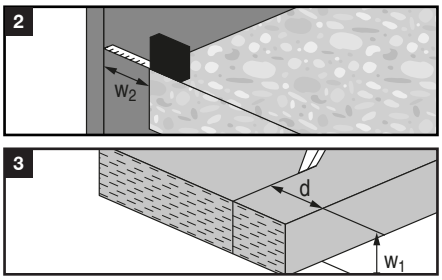
Gain Productivity with the spray based seal



Prepare the work surface

CFS-SP SIL should be applied only when the temperature is between 4°C & 40°C.

Surfaces to which CFS- SP SIL is to be applied should be cleaned to remove loose debris, dirt, oil, moisture, frost & wax.

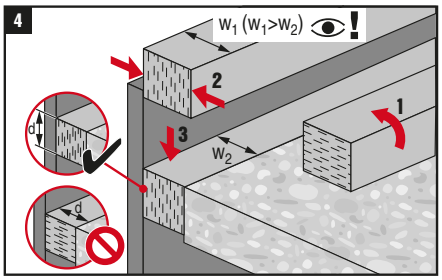


Cut the mineral wool to size

Measure joint width, consider that the joint width could vary from on the drawing.

Cut the mineral wool into strips according to the measurements necessary to achieve the required backfilling depth.

The type, depth and compression of the backfilling material may vary depending on the specific requirements.

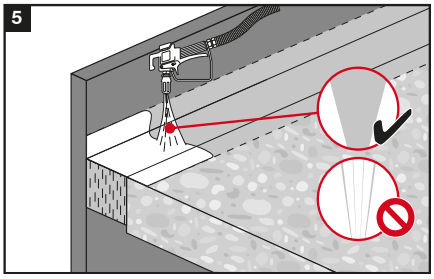


Compress the mineral wool into the gap

Compress the required number of layers of Mineral Wool (MW) together, with the fibers running parallel to the edge of the joint (the cut cress-section faces the installer)

Slide the MW down the edge of the slab, until it sits flush with the floor, or to the specified off-set. Release the compressed mineral, so that it expands against curtain wall. (A flat plate can be used to aid the compression of the mineral against the edge of slab).

To ensure a nice finished is achieved once the sealant is applied, take care to make sure the MW surface is even and level.

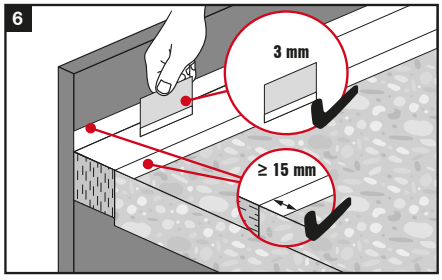


Apply the CFS-SP SIL to the top of the joint

Holding the spray gun at right angles to the surface, begin with a low pressure setting and increase the pressure gradually until the spray pattern and finish achieved by the tip is fine and even.

Excessively high pressure will cause the liquid to be forced into the mineral wool, resulting in higher consumption of the product.

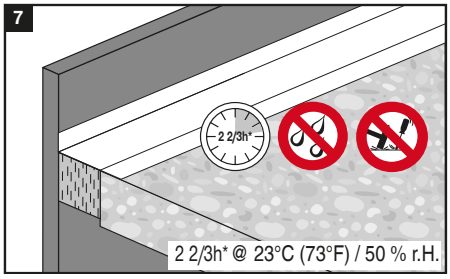
Testing the spray pattern and sealant consistency on paper is recommended, before applying to the construction joint.



Check wet film thickness

A film thickness gauge should be used to randomly check wet film thickness during application of the coating.

The wet film thickness should be no less than 3mm at any point in the seal.



Allow the product to cure

Drying time depends on temperature, air humidity and air movement (ventilation).

During this time the film must be protected from damage and from contact with water.

The CFS-SP SIL is water/weather resistant after 2 hours and 40 minutes of cure time. Full cure time is 2mm/5hours at 24 °C, 50% relative humidity.

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