

Installation detailing

STEICO^{zell} and STEICO^{floc}

Environmentally friendly construction products
made from **renewable** raw materials



Technology & details

CONTENTS

General instructions	p. 02
Compression density	p. 05
Air injection options	p. 07
Construction site report	p. 12



**STEICO**
engineered by nature

Processing instructions

| GENERAL INFORMATION

STEICO air-injected insulations may be processed exclusively by installers trained and certified by **STEICO**.

- Important requirements such as damp protection, fire protection, thermal protection and airtightness must be observed.
- The air-injected insulation is not intended to replace wind- and airtightness membranes.
- To make use of the economic benefits of air-injected insulation, good preparation of the construction site is a fundamental prerequisite for ensuring smooth, safe and successful order processing.

| CONSTRUCTION SITE PREPARATION

- Detailed scheduling
- Complete planning documents as well as detailed drawings for calculating the volume and material requirement as well as for detailed solutions/special partitioning etc. must be available prior to the submission of a bid.
- Clarification of interfaces:
 - Who is responsible for the substrate and who for the remaining structure (e.g. plastering work or roof cladding)?
 - Who is responsible for creating and sealing the air-injection openings?
- It is recommended that the required information be submitted to the relevant building authority along with the tender before any work is undertaken.
- From a practical perspective, scaffolding must be provided for working heights greater than 3.5 meters. Country-specific occupational safety guidelines must be observed.

- Clarify space requirements on the construction site; manoeuvring or parking space for vans in the construction site area.
- The construction site must be swept clean. The components must be freely accessible.
- It must be ensured that no screws and nails protrude into the air-injection voids as these could cause damage to the air-injection hose and prevent smooth air-injection procedures.
- Recessed light fixtures/recessed spots must be covered with a fire-protection enclosure in accordance with the manufacturer's specifications. Connections to chimneys must be designed in accordance with the respective fire protection regulations.
- From a work hygiene perspective, it is recommended that installers wear at least a fine dust mask (P2) when processing air-injected insulation. Suitable protective clothing should also be worn.

Power supply

(national directives must be observed.)

- For three-phase current machinery 400 V, 16 A, Euro CEE plugs, 5-pin with neutral conductor, (C16 fused).
- Fusing of 220 V and at least 16 A (C16) for light flux machinery.
- The connection cables to the machine and to the amplifier station should have a large cross-section (min. 2.5 mm²).
- Cable lengths greater than 30 m must be avoided. Cable reels must be fully unwound.
- The machine should be connected to a separate power circuit. Insufficient power output can lead to malfunctions in the machine and a loss of performance.

ADDITIONAL CONSTRUCTION SITE PREPARATION

- The air-injection voids must be individually sealed. In this case, the following prerequisites must be observed: partitioning, no double lamination and no cross battening. In a gable roof, a blocking panel must be installed in the ridge.
- Remaining joints or gaps must not be wider than 1 cm. Larger joints can be sealed with STEICOflex.
- If STEICOfloc is used, walls > 3.0 m must be separated by bulkheads. With STEICOzell, the maximum is 3.5 m. Alternatively, joists (e.g. 40/60 mm) can also be attached to the panelling on the left and right approx. every 1 m in the panels to provide slide protection.
- All installation components such as alternating, transverse or diagonal struts must be identified. The same applies for cable harnesses and ventilation pipes that are installed in the panels.
- Panels < 0.25 m² should be insulated with STEICOflex before the structure is sealed.
- Panels < 10 cm wide and or < 10 cm insulation thickness should likewise be insulated beforehand with STEICOflex.
- Continuous, homogeneous filling guarantees lasting slump resistance.

Use of membranes



- Only membranes that are approved by the manufacturer for air-injected insulation, such as STEICOmulti membranes should be used.
- If the membrane is laid laterally, we recommend providing additional reinforcement to the lap joint in the middle of the panel with STEICOmulti tape pieces arranged at right angles. Alternatively, an additional lath can also be fitted here along the adhesive connection for mechanical protection.
- The distance between the lath and the supporting structure should not exceed max. 42 cm

- The distance between the staples to be used for fixing the vapour barrier in place on the supporting structure is max. 10 cm.
- The use of STEICO fibreboard strips or an additional lath along the rafter is recommended as an alternative.

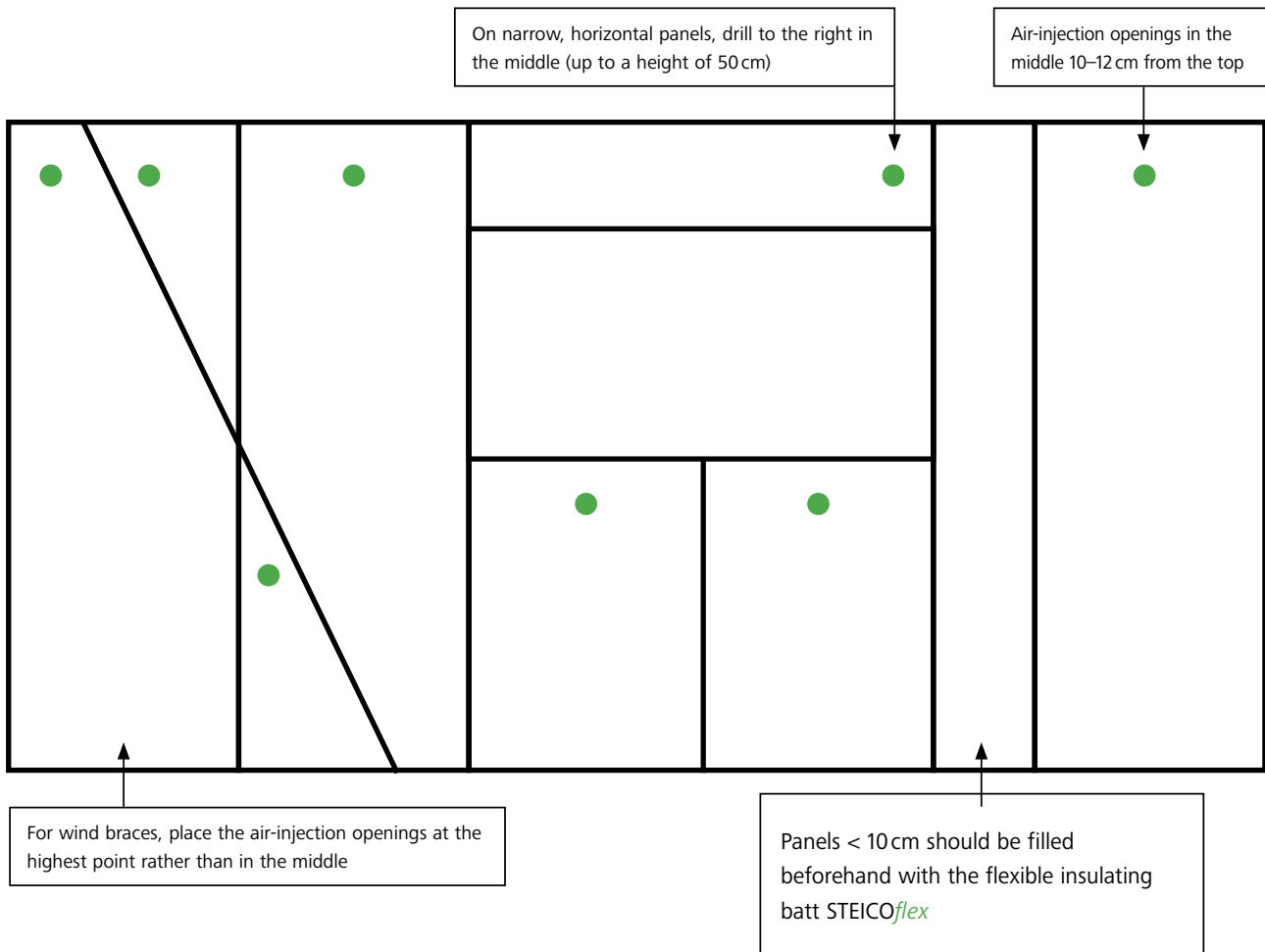
Use of plaster baseboards

- Plaster baseboards must not be plastered or sealed prior to the air injection. This can cause the plaster to crack or flake off!
- Similarly, gypsum or cement fibre panelling should not be installed prior to the air-injection work. In this case, the manufacturer's specifications must be heeded
- Fill airtight cavities with venting nozzles or lances.

Attention: In the case of STEICOzell, the maximum height for filling with the rotary nozzle is 1.50 m.

- For each new application, STEICO recommends using selected test panels to check and document the machine setting and the required bulk densities on the construction site.
- Create a construction site report (see page 12) on completion of the insulation work. Enclose the original invoice and a copy for your records.

AIR-INJECTION OPENINGS FOR APPLICATION BY HOSE



- The air-injection openings should have a diameter of 104 mm or 120 mm, see STEICO blanking plugs.
- For air injections into the ceiling, the air-injection openings should be approx. 30 cm from the wall.

COMPRESSION DENSITY

- Check the air-injection bulk density using the test box: Set the machine to 0.1m³ and then check the correct function of the air-injection insulation machine (manometer check).
- Calculate and check the necessary density of the panels (cavities). Determine the volume for 2–3 panels and compare with the air-injected quantity (kg). This procedure should be carried out on each storey, as the difference in height can also result in changes in the pressure conditions of the air-injection machine.
- The requisite compaction values are summarised in the tables below.



Images of X-FLOC®

COMPRESSION DENSITY TABLE FOR STEICOzell Z-23.11-1120, ETA-12/0011

Tip for the preliminary computation of the material quantity:
40 kg/m³

Minimum raw density STEICOzell [kg/m³]

Component insulation thickness	Up to 16 cm	17–22 cm	23–28 cm	29–34 cm	35–40 cm
Blown freely onto ceiling	32	32	32	32	32
Blown into intermediate floor	35	35	35	35	35
Blown into suspended ceiling					
Blown into top floor ceiling					
Blown into roof up to 20° pitch					
Blown into roof with 20° to 60° pitch					
Blown into roof over 60° pitch					
Blown into walls					

- The prerequisite for slump resistance is the quantity blown in in accordance with the compression density table plus uniform distribution of STEICOzell in the cavity.
- For prefabricated components and subsequent transport, a material quantity of **7 kg/m³** must be added. It is essential that the air-injected panels be inspected on the construction site in order to meet the high quality standards.
- If the product is blown freely onto a ceiling, **no** insulation covering is required!!!



allows Moisture Control Design compliant with
 ✓ EN 15026
 ✓ ASHRAE 160
 ✓ DIN 4108

COMPRESSION DENSITY TABLE FOR STEICOfloc Z-23.11-2070, ETA-16/0141

Minimum raw density STEICOfloc [kg/m³]

Component insulation thickness	Up to 16 cm	17–22 cm	23–28 cm	29–34 cm	35–40 cm
Blown freely onto ceiling	30	32	34	34	34
Blown into intermediate floor	38	40	43	44	48
Blown into suspended ceiling					
Blown into top floor ceiling					
Blown into roof up to 20° pitch	43	45	47	49	51
Blown into roof with 20° to 60° pitch					
Blown into roof over 60° pitch	47	50	52	55	57
Blown into walls					

- The prerequisite for slump resistance is the quantity blown in in accordance with the compression density table plus uniform distribution of STEICOfloc in the cavity.
- For prefabricated components and subsequent transport, a material quantity of **5 kg/m³** must be added. It is essential that the air-injected panels be inspected on the construction site in order to meet the high quality standards.
- If the product is blown freely onto a ceiling, **15%** of the insulation covering must be taken into account.

ROOF/CEILING/WALL BLOWN IN COMPACTION

- As a general principle, the walls to be filled should be accessible at a distance of at least 1 m to ensure problem-free filling.
- The designs (panelling) must have sufficient (pressure) stability and be designed for air injection:
 - For panels with wood fibre board cladding, we recommend a board thickness of min. 35 mm. In addition, the offset in the board joints should be a minimum of 250 mm, as well as there should be no two panel joints in a row in one cavity. Otherwise, additional measures may be required.
 - Ensure that panelling and vapour barriers are secured in accordance with the manufacturer's specifications.
 - Maximum width: The width of the panels must not exceed 85 cm, otherwise air injection must be carried out using »2-hose technology«. As an alternative, the air-injection needle can be used (see page 9).
 - Boards (e.g. a gypsum panel) that are attached without a supporting structure directly to the rafters/studs must be temporarily secured by a battening aid during the air injection in order to avoid deformation or breakage. Even flexurally rigid panelling requires additional reinforcement in weakened areas, e.g. in apertures.
 - Do not blow in any material lying on the floor as otherwise dirt (nails, stones, etc.) can enter the machine and cause damage to the sealing lips and the rotary valve.



| VENTING ROTARY NOZZLES

We recommend using a rotary nozzle for extremely airtight designs.

The rotary nozzle procedure enables rapid and dust-free filling of the cavity. The components do not have to cope with the volume of air as the excess air can escape via the holes in the rotary nozzle through the dust bag or can be actively suctioned.

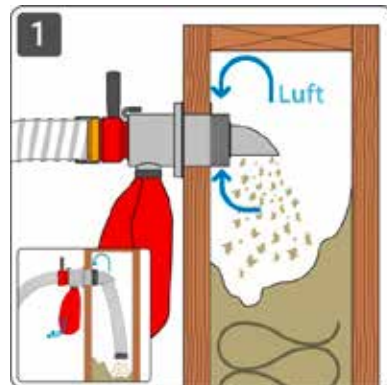
Venting rotary nozzles can be used to fill stud-wall designs with STEICOzell (max. cavity height 150 cm) or STEICOfloc.

The use of a rotary nozzle to process cellulose requires an installer with a high level of experience. (Machine setting)

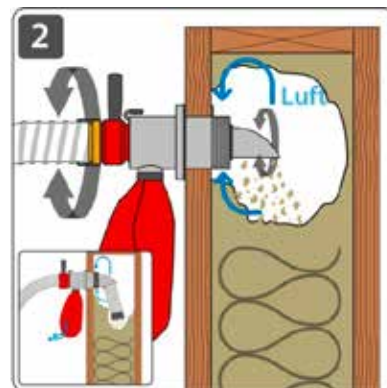
Homogeneous filling of the cavity often depends on the surface quality of the panelling. Special designs should be tested in advance on a sample wall.

It is essential that any obstacles in the cavity are clearly marked for the installer.

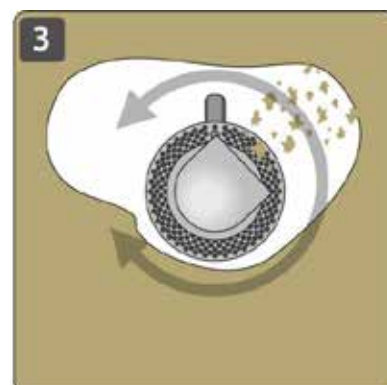
FILLING PRINCIPLE



The vented rotary nozzle is inserted into a precisely fitting air-injection opening, which is created using a keyhole saw. The element is filled ...



... until the area of the nozzle outlet is reached. This can be recognised by the increasing pressure sound.



The nozzle outlet is now turned alternately towards the two element corners. Optimum compaction is achieved in the upper area in this way.

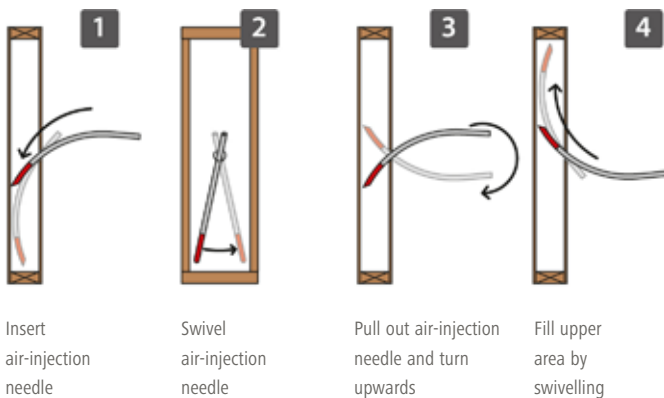
AIR-INJECTION NEEDLE

An air-injection needle is a bent tube with a pointed tip for easy insertion and compaction in the cavity.

ADVANTAGES

- A quick and simple alternative to the 2-hose technology, cavities > 85 cm can be insulated.
- A higher bulk density can be introduced (prefabrication!).
- Re-compacting possible if the required bulk density was not reached.
- Extremely suitable for guaranteeing filling of the upper area with high insulation thicknesses in the ceiling area.

The diagram below shows the correct insertion technique using the example of a wall:



This method requires experience and assumes familiarity in working with air-injection insulation.

The recommended air-injection opening for the needle during filling of walls, ceilings and roofs with stable panelling is the "oval air-injection opening" (see page 11). The hole diameter depends on the diameter of the needle used. The drill bit diameter should be at least 15–20 mm bigger.

AIR-INJECTION AID

A sealing sponge is recommended if you are filling using a hose or the air-injection needle.



Air-injection hose in use with sealing sponge

If filling using the air-injection needle behind membranes, you can generally dispense with a sealing sponge as the membrane performs the function of a seal.

In this case, the membranes are penetrated with the tip at a suitable point. Pay attention while filling that the membranes are not torn any further.

AIR-INJECTION LANCES AND TELESCOPIC AIR-INJECTION LANCES



The vented air-injection lance is intended for the prefabrication of horizontal elements.

ADVANTAGES

- Time-saving and simple handling
- Uniform distribution and compaction in the component
- Higher compaction is possible with STEICOzell as the lance permits even better re-compacting (min. 42 kg/m³).
- Easy to operate and control
- Smooth lance surface minimises adhesion of insulating material
- Low load on the panelling by ventilation (passive/active)
- The air-injection openings can be drilled with a drill bit of approx. 85 mm in the sole plate or head runner.

To guarantee good handling, suitable space should be provided to allow easy insertion/withdrawal of the lance.

BLOWING FREELY IN OPEN SPACE



- The surface to be blown must be cleaned and bulky items removed.
- Openings between rafters and masonry are to be sealed with adhesive tapes, membranes or eaves joists so that the air-injection insulating material cannot escape to the outside.
- Walkways to rooftop escape hatches, chimneys, ventilation pipes and antenna distributors etc. must be implemented as a separate service on site.
- If necessary, attic hatches can be insulated with STEICOflex to the same thickness.
- Ventilation shafts must be protected to prevent the ingress of the air-injection insulating material.
- Recessed light fixtures/recessed spots must be covered with a fire-protection enclosure in accordance with the manufacturer's specifications.
- Protect the insulating material from excessive exposure to wind in the roof space.
- For STEICOflor, the surface should be sprayed with water. After drying, it forms a cardboard-like surface, which prevents the flakes from swirling up.

Surface treatment is not required for STEICOzell!

CREATING AN OVAL AIR-INJECTION OPENING IF AN AIR-INJECTION NEEDLE IS USED



Circular bore



Inclined bore



Oblong hole

SEALING THE AIR-INJECTION HOLES USING STEICO SYSTEM ACCESSORIES

To seal the air-injection holes, we recommend the system accessory STEICO*multi tape P* stickers for the internal insulation or the STEICO wood fibre blanking plugs for air-injection openings in wood fibre insulation boards. The STEICO system accessories are perfectly matched with the STEICO insulating and construction materials to ensure a long-lasting construction.



The STEICO processing guidelines correspond to the state of the art and are adapted as and when required. By means of intensive training provided at the construction site (construction site support), the work instructions and information can be implemented in practice.

In the event of inconsistencies that can be attributed to the air-injection insulating material, the work must be stopped and the local retail partner or contact partner at STEICO SE must be informed. STEICO SE accepts no liability for processing errors.

Please sign the building certification and return/fax as a copy.

Building certification for STEICO air-injection insulation

STEICOzell
DIN EN 13501-1, Class E
as per building authority approval
No. Z-23.11-1120
 λ_B 0.040 W(m*K)
as per ETA-12/0011
 λ_D 0.038 W(m*K)

STEICOfloc
DIN EN 13501-1, Class E
as per building authority approval
No. Z-23.11-2070
 λ_B 0.039 W(m*K)
as per ETA-16/0141
 λ_D 0.038 W(m*K)

Executing company/STEICO specialist company

Construction project

Name/company

Street/house number

Telephone/fax

Postal code/town or city

E-mail

Name/property

Street/house number

Postal code/town or city

Telephone

E-mail

Confirmation by the STEICO specialist company that the following compaction values were achieved in the components:

Component Roof, ceiling, wall, free blowing, etc.	Measured component thickness [cm]	Insulation area minus wood content [m ²]	Processed quantity [kg]	Bulk density calculated [kg/m ³]	Bulk density target [kg/m ³]

The construction site is implemented in accordance with the general building authority approval as well as the STEICO processing guidelines for thermal insulation with air-injection insulation.

Place, date

Signature/stamp of STEICO specialist company

Place, date

Signature of building owner / client

