

IGK – Info no. 17

IGK 130 Polyurethane Processing Guidelines

Status: July 2016

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IGK 130

PROCESSING GUIDELINES

General Information

The present processing guidelines shall give you instructions for the safe use of our sealants with the objective to achieve the required final properties and meet the quality standards for insulating glass production.

The checks listed below are tried and tested and are recognised by national and international test institutes.

The present processing guidelines will not replace any national standard. Furthermore, specific checks can deviate from each other due to varying circumstances in the production plants. Please consult your machine manufacturer for more information.

IGK 130 is a solvent-free two-component sealant and adhesive, which has been developed especially as a secondary sealant to seal and join multi-pane insulating glass.

IGK 130 is free of any mercury-containing catalysts.

The B component of IGK 130 is available as a liquid or a paste.

Transport and storage of the product

Transport of the product is unproblematic at extremely high or low temperatures.

Please note: Allow the sealant to reach the right temperature before processing. This might take a while, depending on the temperature difference, possibly up to one week.

In sealed original containers, the A and B components of IGK 130 can be stored for up to 6 months between +15°C and +25°C. The product should not be exposed to direct sunlight.

When stacking transport pallets with IGK 130 on top of each other, comply with the instructions concerning work safety.

Processing of IGK 130

IGK 130 can be processed on all commercial 2-component sealing machines and manual 2-component systems. The mixing ratio is 10 : 1 (by volume) or 100 : 7.1 (by weight).

All adhesive faces must be clean, dry, fat and oil free. IGK 130 adheres on any conventional surface used in the insulating glass industry. As required by EN 1279/GMI, the used materials in the production must be checked daily due to possible fluctuations in the spacer quality. Please contact our application technology department, if required.

Quality check on the IGK 130

According to EN 1279-6, annex A, incoming goods inspection (section 1), production controls (section 2) and final product controls (section 3) must be carried out in agreement with the recommended procedures with the respective requirements and the frequency described therein. The checks are described in short below.

Incoming goods inspection

Packaging and labelling

Before opening, check the containers for the A and B components for damage and leaks. Damaged, deformed or leaking containers should not be processed. Defects must be reported to the delivering driver and confirmed by him on the delivery note; in addition, it should be reported to IGK.

Each drum or hobcock or flat-top drum is labelled with product name, batch number and expiration date ("To be processed until...").

Shelf life

The expiration date is printed on the label and must be recorded as part of the quality control.

Check before processing

When opening A drums, make sure that no dirt can fall from the lid into the material.

When opening B drums liquid, solid crystal particles must not be present. For the pasty hardener, make sure that no hardened residues can enter the material from the follow-up plate.

Quality checks during processing

Checking the appearance of the mixture

The mixture of both components A and B should be homogeneous and free of streaks.

The most popular method is the check between two glass panes.

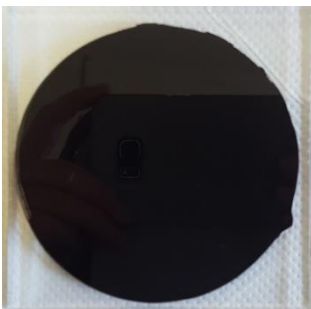
Take 2 glass panes, float 4 mm, approx. 100 x 100 mm and apply a small amount of mixed material between the panes. Press the glass panes together by hand.

Check visually that no light streaks are visible on the glass.

If streaks or marbling is visible, clean or exchange the mixer.

This check should be carried out at each begin of a shift after approx. 10 ISO units again.

homogeneous mixture
- good -



visible marbling
- bad -



General adhesion spacer / glass

The adhesion test of IGK 130 with spacers on glass can be done as follows:
Press a spacer with a length of approx. 10 cm into the fresh sealant so that a sealant layer of at least 4 mm remains between glass and spacer.
After 24 h curing time, pull the spacer upwards with pliers.
A visible cohesive break between spacer and sealant should occur.

Create a specimen



Evaluation after 24h:

100% cohesive break



Adhesion to glass and spacer – test with adhesion tester

The adhesion test for IGK 130 on glass and spacers can be carried out as described in EN 1279-6, annex F or IGK info no. 8 – Adhesion test. The specimen should not break within the first 10 min. after curing the sealant for 24h and loading it with 0.3 N/mm².

For this purpose, create a specimen:

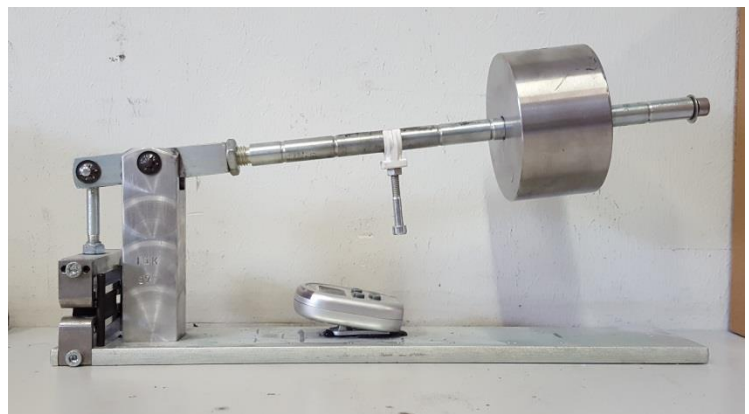
Cut 4 spacer profiles (2 x 2 pieces with 70 mm length each). We recommend to use always the same spacer width e.g. 16 mm.

Fix both profiles with the white Teflon spacers in the pressing template. Make sure to insert the profiles correctly (perforation in the profile outside the sealant application).

Press the profiles together slightly (hand-tight) by tightening the tensioning screw. Make sure that the profiles touch the bottom, press down on the Teflon bottom plate, if required.

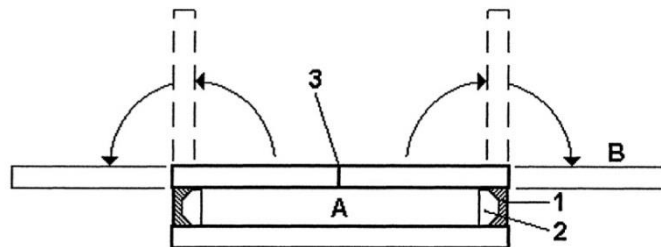
When filling the sealant into the provided slits and subsequent grouting, ensure good contact to the profiles and absence of bubbles.

After curing (check after 24 h at room temperature), the specimen can be removed from the template and can be used for tests in the device.



Butterfly test

The butterfly test, also described in EN 1279-6, annex F, is valid as an alternative adhesive check after curing the sealant for 24 hours.



Key

- 1 Sealant
 - 2 Spacer
 - 3 Cutting line
 - A Position A
 - B Position B
- Length and width of the specimen adapted to washer and press

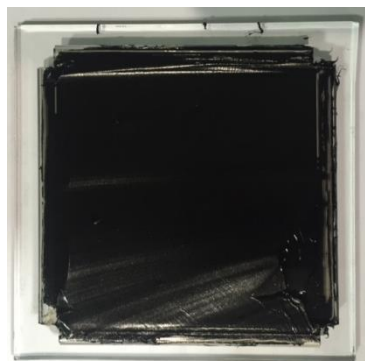
Wash two glass panes, approx. 300 x 300 mm and furnish with a spacer frame. Now, seal two opposite sides.

After 24 h, one glass pane will be cut, as shown in the drawing above. The opening of one side should happen slowly, within approx. 10 sec. A 100% cohesion break should be visible in the sealant.

Check of the Shore A hardness

For the check of the Shore A hardness, it is recommended to create a sealant layer of min. 6 mm thickness.

In order to create an even surface for the measurement afterwards, a spacer frame is recommended.



Measurement of the hardness will be done with a Shore A hardness measurement device. Apply a contact force of 50 N (5,0 kg) and read after 1 sec.

Measurement after 3h:
approx. 20



Measurement after 24h:
approx. 50



Mixing ratio

In order to determine the mixing ratio A : B, different methods are available depending on the machine type.

“Volumetric dosing” is the most simple method. It is described by the respective machine manufacturers in the operating manual of the machine. The following principle applies:

2 empty containers are weighed and their weight is recorded as tare weight. The A and B valves for the sampling of the processing system are opened at the same time so that the material can flow into the containers. In order to achieve the highest accuracy possible, at least 500 g A component must be extracted. After closing the valves, the A and B component is weighed with the containers, the applicable tare weight is deducted and the mixing ratio 100 : X is calculated according to the following formula:

$$X = 100 \times B \text{ weight} / A \text{ weight}$$

For example 1051.4 g A and 74.6 g B is a mixing ratio of 100 : 7.1 because
 $X = 100 \times 74.6 \text{ g} / 1051.4 \text{ g} = \mathbf{7.1}$

Please note:

The mixing ratio by volume for sealants of the manufacturer IGK is always 100 : 10.

The mixing ratio by weight is 100 : 7.1 for polyurethane.
Deviations in the mixing ratio may not exceed $\pm 10\%$.

Further information for processing

Change of drum:

After changing a drum, the A and B systems must be ventilated appropriately.

The drums are dimensioned in a way that only small amounts of material will remain. These residues should not be filled into the new drums. This would cause the risk of creating air bubbles which would lead to faulty production.

The follow-up plates of the machine should be adjusted in a way that no pieces of foil can be drawn into the pump.

For more information about acceptance of product residues for reuse, avoiding and disposal of waste, and handling empty packaging material, see IGK info no. 1 to 3 which are available on request.

Production of the IG units:

Make sure that the sealing nozzles are clean during processing. Heating systems must be switched off and all oil receptacles on the pumps must be filled with plasticiser IGK 918.

Choose a setting of the machine parameters for the best application of the polyurethane that ensures application of enough material, especially in the corners.

Material samples from the sealing nozzle should be taken 30 min. after starting the machine at the earliest, when the machine has warmed-up.

Please observe the pot time signal of the sealing machine! For longer standstill during production or in intervals, the mixer must be flushed with A component.

The filter insert for the B component should be cleaned according to the recommendations of the machine manufacturer. Use the flushing fluid IGK 911 as cleaning agent.

When adhering to these guidelines, the service life of the mixing equipment might reach up to one month.

Use the cleaner IGK 921 for a thorough cleaning of the mixing equipment. For this purpose, the individual parts of the mixer are "boiled out" in a commercial available household deep fry filled with cleaner 921.

This procedure will take approx. 3h at a temperature of approx. 190 C. Afterwards, the cleaned parts can be blown out with pressurised air. Please avoid the use of steel brushes. Otherwise the mixing equipment surfaces will be activated.

Furthermore, observe the processing guidelines of the manufacturers of the other used components and check the compatibility of all materials.

Sealing depth of the IG units:

For double glazing, we recommend to apply the dimensions indicated in DIN 18008 in its applicable version or dimensioned calculated by software programs (e.g. GlasGlobal, GLASTIK) for the back overlap depending on the glass thickness values. These recommendations are valid for triple glazing as well.

According to report G1109-3 "Beanspruchung Randverbund" (Strain on the edge seal) by Prof. Dr. Franz Feldmeier, the internal load is increased in triple glazing due to both internal spaces and thus the bending load of the glass panes and the tensile load of the insulating glass edge seal is increased as well, whereby the biggest tensile load of the edge seal at excess pressure in the gap between the panes will appear at the centre point of the long edge.

The strain on the edge seal in triple glazing increases with the width of the gap between the panes, compared to the standard structure 4/16/4. An increased strain will be the result even for thicker glass panes, especially when the gap between the panes is increased.

The strain on the edge seal has a maximum value for small edge lengths. It is strongest for square panes, but even small rectangular panes with a ratio of the long to the short side of 3 : 1 has high edge seal strains.

This is why we recommend to increase the value for the back overlap taken from DIN 18008 in its current version or calculated by software programs (e.g. GlasGlobal, GLASTIK) by at least 25% for triple glazing with short edge lengths, symmetric structure and big gaps, all triple glazing with small edge lengths, non-symmetric structure and big panes with big gaps and thick panes.