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CE

Application diagram
for max. sash weight 130 kg

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Infill weight

Prerequisites for using the application diagram:

■ Verifications regarding the attachment of load-bearing components to the window or by the window fabricator according with the following forces:
- 3525 N at the stay bearing
- 3760 N at the stay bearing
■ Glass re

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>2.6m²

WINDOW TECHNOLOGY

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EN **Application diagrams**
Intended use

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1.   Product description

1.1   Function

The application diagram can be used for a specific filling weight to find the maximum sash dimensions that may be manufactured when using the hardware concerned. They apply exclusively for the **long-term performance** characteristic.

1.2   Basics

The ift guideline „Creation of application diagrams for Turn-Only and Tilt&Turn hardware" forms the basis for the creation of application diagrams.
You can find more information on using the application diagrams in the Internet at www.anwendungsdiagramme.de.

1.3   Definition

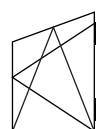**Abbreviations**

GR   Glass reduction [mm]

SW   Sash width [mm]

SH   Sash height [mm]

SRW   Sash rebate width [mm]

SRH   Sash rebate height [mm]

FFHR   Sash rebate height up to round arch [mm]

SRH HS   Sash rebate height on side of hinges [mm]

IW   Specific infill weight IW [kg/m²]

PW   Profile weight PW [kg/m]

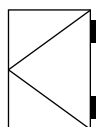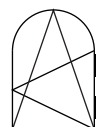### 1.4   Pictographs
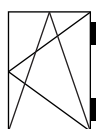
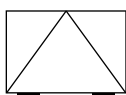|			
	Tilt&Turn window Tilt-First window		Pitched window
	Turn-Only window		Arched window
	Tilt-Only window		Timber profiles
	PVC profiles		Aluminium profiles
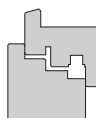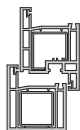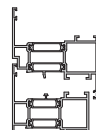
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## 2. Use of application diagrams

2.1 Intended use

Strictly observe the points listed below when using the application diagrams:

■ Unless expressly stated otherwise on the application diagrams, the hardware is intended exclusively for installation in inwards-opening windows.

■ Unless expressly stated otherwise on the application diagrams, the hardware is intended exclusively for installation in windows that are vertically installed in vertical walls of solid building.

■ Observe the **glass reduction GR** and the **profile weight PW** on the application diagrams.

■ If different hardware components are combined, the application diagram for the hardware component with the lowest load-bearing capacity must be used.

■ For the application range of the hardware, refer to the installation drawing or catalogue and the corresponding application diagram. If the information does not correspond, the information on the installation drawing is binding.

■ Observe the specifications and limitations of the profile manufacturer, the window system owner (timber/PVC/aluminium) and/or DIN 68121 „Timber profiles for windows and balcony-doors", especially in relation to sash weight and dimensions.

■ Observe the information and application diagrams of the window infill (e.g. glass) manufacturer.

■ Observe the VHBH directive „Specifications/information on product and liability" of the German Quality Assurance Association for Locks and Hardware, Velbert. Also observe the pre-valid documents listed in this directive, and further applicable directives.
You can find the VHBH directive in the Internet under the following address:
http://www.beschlagindustrie.de/ggsb/richtlinien.asp

■ Compliance with these guidelines, especially the guidelines in the application diagram, forms part of the intended use. The manufacturer shall assume no liability in the event of material damage or personal injury caused by failure to comply with these guidelines!

2.2 Glass reduction GR

The glass reduction GR depends on the window material used (timber/PVC/aluminium or a combination of these). The glass reduction GR [mm] for the different materials can be determined by means of the following depiction.

Glass reduction GR

Timber — PVC — Aluminium
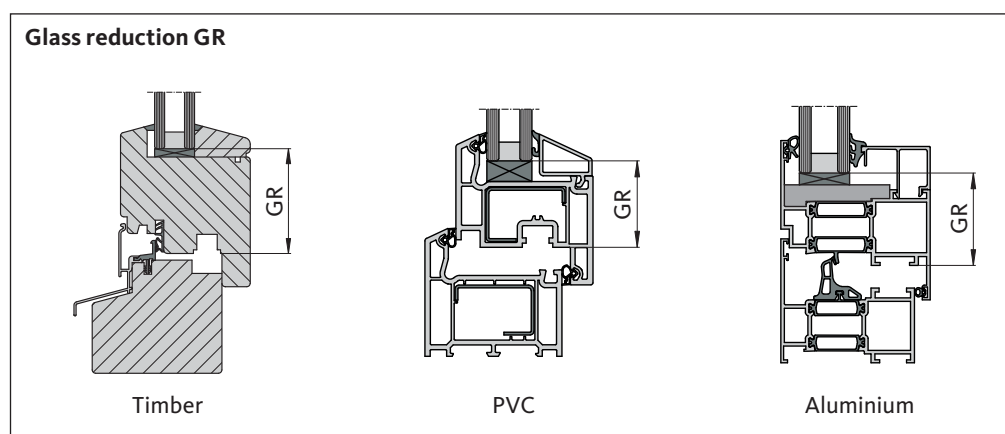
2.3 Profile weight PW

The profile weight PW is the specific weight of the sash profile in kilograms per running metre. This is comprised of the sash profile, glazing bead, gaskets, stiffening elements, etc.

2.4 Infill weight IW

The infill weight IW in kilogrammes per square metre refers to the specific weight of the window infill. The window infill can be made of glass or other materials used in window construction.

The application diagrams show curves for various specific infill weights IW and the sash dimensions can easily be determined from these.

NOTE

The infill weight curve in the application diagram with the highest specific infill weight corresponds to the maximum specific infill weight which can be used with this hardware!

A larger specific infill weight IW is not permitted for the corresponding hardware!

Calculation of the specific infill weight IW for glass infill
You can calculate approximately the specific infill weight IW for glass infill as follows:

Specific infill weight IW = $2.5 \dfrac{kg}{m^2 \times mm}$ x total glass thickness (all glass panes) [mm]

Example
A double glazing system consisting of 2 glass panes with 6 mm thick glass produces a total glass thickness of 2 x 6 mm = 12 mm.

The specific infill weight IW is determined as follows:

Specific infill weight IW = $2.5 \dfrac{kg}{m^2 \times mm}$ x 12 mm

Specific infill weight IW = $30 \dfrac{kg}{m^2}$

Specific infill weights IW for various total glass thicknesses

Total glass thickness * [mm]	Spec. infill weight IW [kg/m²]
1	2,5
8	20
12	30
16	40
20	50
24	60
28	70
32	80
* glass thicknesses of all panes added together	

NOTE

The infill weight curve for the next higher specific infill weight must be used in each case for specific infill weights IW that lie between the infill weights specified on the application diagrams!

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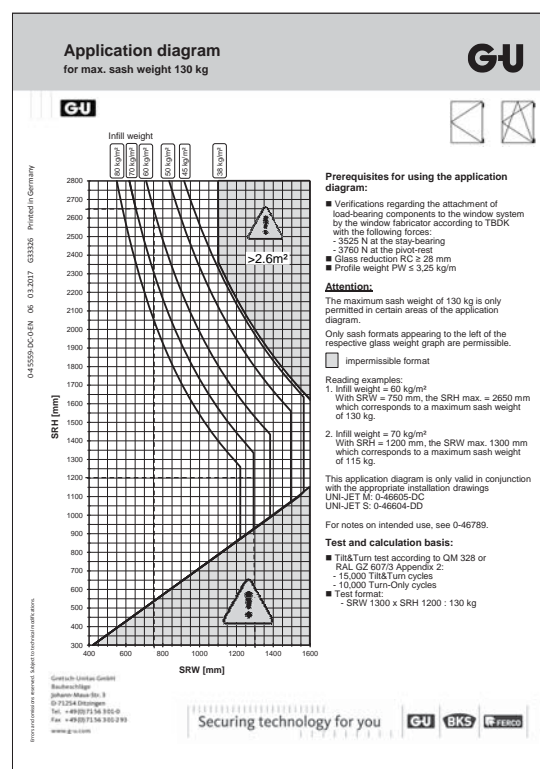## Application diagrams

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2.5   Using the application diagrams

Prerequisites for application examples:

- Verification regarding the attachment of load-bearing components to the window system according to TBDK must be provided by the window fabricator by using the values in the application diagram.

- The glass reduction GR and profile weight PW of the window system correspond to the specifications in the application diagram.

- The specific application of the hardware is covered by testing and calculation principles in the application diagram.

Determining the possible range of application based on the specific infill weight IW

- Determine the specific infill weight IW

- Use the infill weight curve for the specific infill weight determined.
  The infill weight curve for the next higher specific infill weight must be used in each case for specific infill weights IW that lie between the infill weights specified on the application diagrams!

- Only sash formats in the white area to the left of the corresponding infill weight curve are permitted.

- Sash formats to the right of the corresponding infill weight curve are not permitted.

- The grey areas denote impermissible sash formats.

Example of an application diagram

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2.6   Examples of using the application diagrams

The reference variables SRW and SRH are used in the examples.
A similar procedure is followed for application diagrams with the reference variables SW and SH.

2.6.1 Example 1 – Determining possible sash rebate widths and heights

Determining the possible sash rebate width **SRW** and sash rebate height **SRH** for a specific infill weight of **IW = 50 kg/m²**:

- Sash formats in the area **to the left** of the infill weight curve for IW = 50 kg/m² **are permissible**.

- Sash formats in the area **to the right** of the infill weight curve IW = 50 kg/m² **are impermissible**.

Infill weight

80 kg/m²   70 kg/m²   60 kg/m²   50 kg/m²   45 kg/m²   38 kg/m²

>2.6m²

SRH [mm]

SRW [mm]
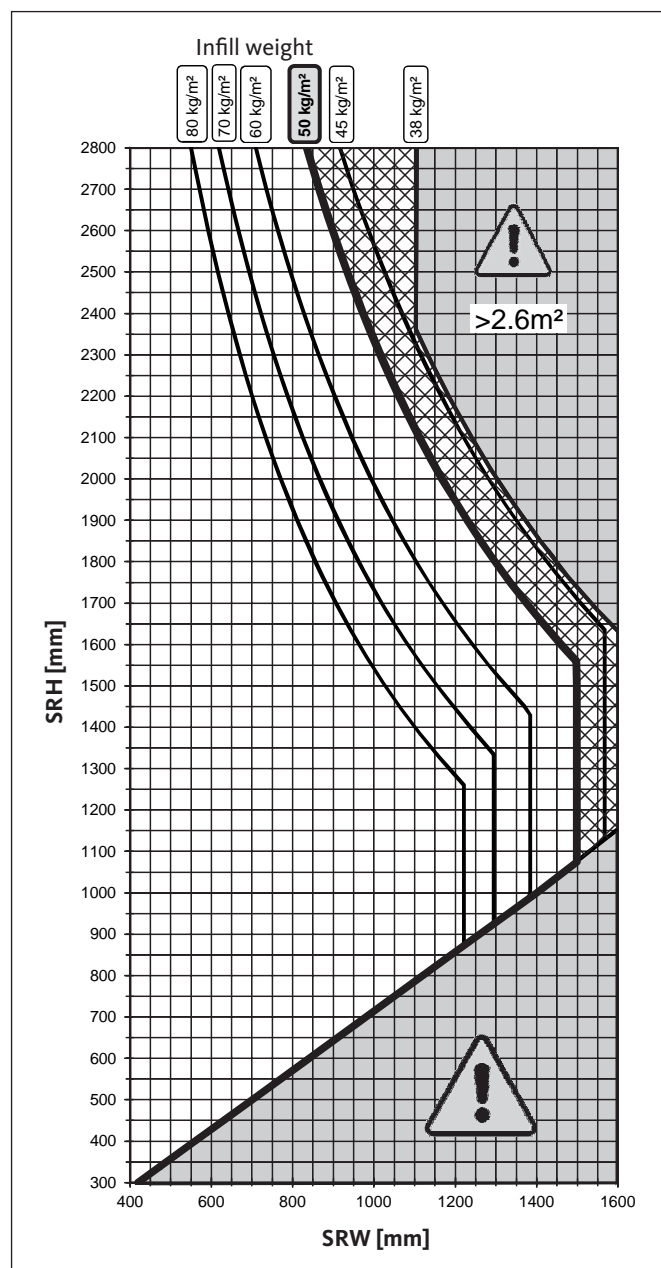
2.6.2 Example 2 – Maximum specific infill weight IW

In the application diagram used in the above example, the infill weight curve with the highest specific infill weight has a value of **IW = 80 kg/m²**. This value corresponds to the **maximum specific infill weight** that can be used for this hardware.
A larger specific infill weight IW is not permitted for this hardware!

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2.6.3 Example 3 – Permissible area to the left of the infill weight curve

A sash has the following data:

Sash rebate width
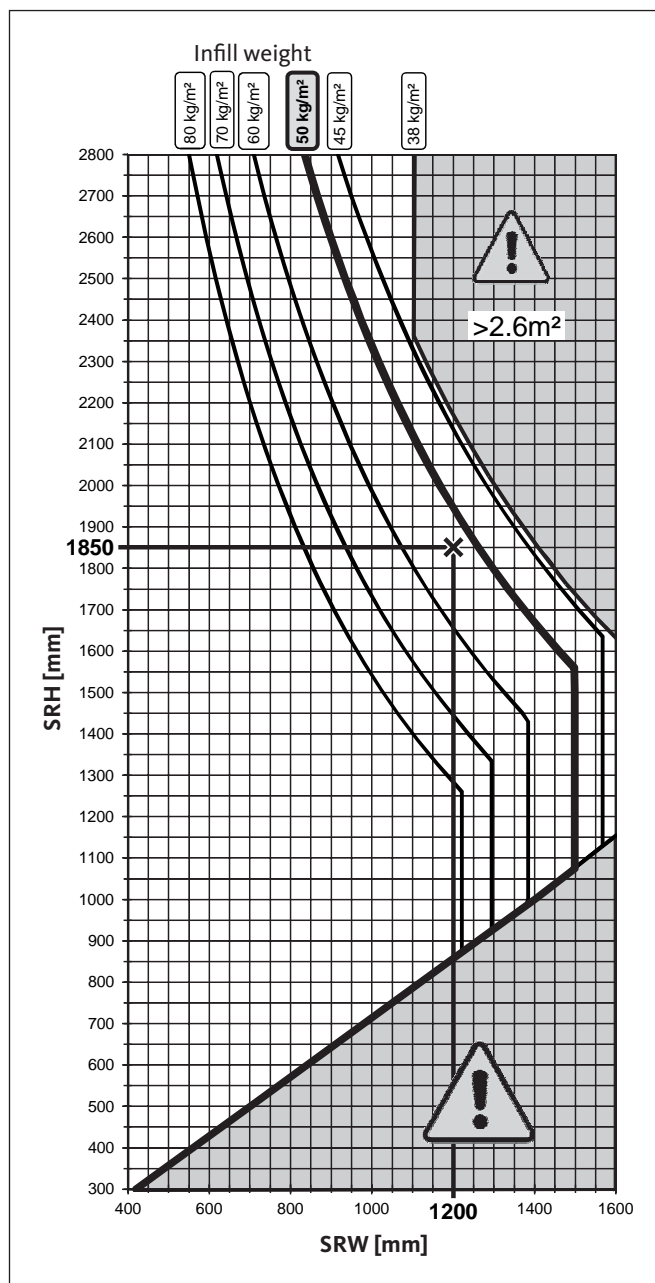**SRW = 1200 mm**
Sash rebate height
SRH = 1850 mm
Infill: 2 x 10 mm toughened safety glass
–> Specific infill weight
IW = 50 kg/m²:

■ The two lines
SRW = 1200 mm and
SRH = 1850 mm cross one another to the **left** of the infill weight curve
IW = 50 kg/m².

■ The hardware **can be used** with the sash.

Infill weight

80 kg/m² 70 kg/m² 60 kg/m² 50 kg/m² 45 kg/m² 38 kg/m²

>2.6m²

SRH [mm]

SRW [mm]

2.6.4 Example 4 – Impermissible area to the right of the infill weight curve

A sash has the following data:
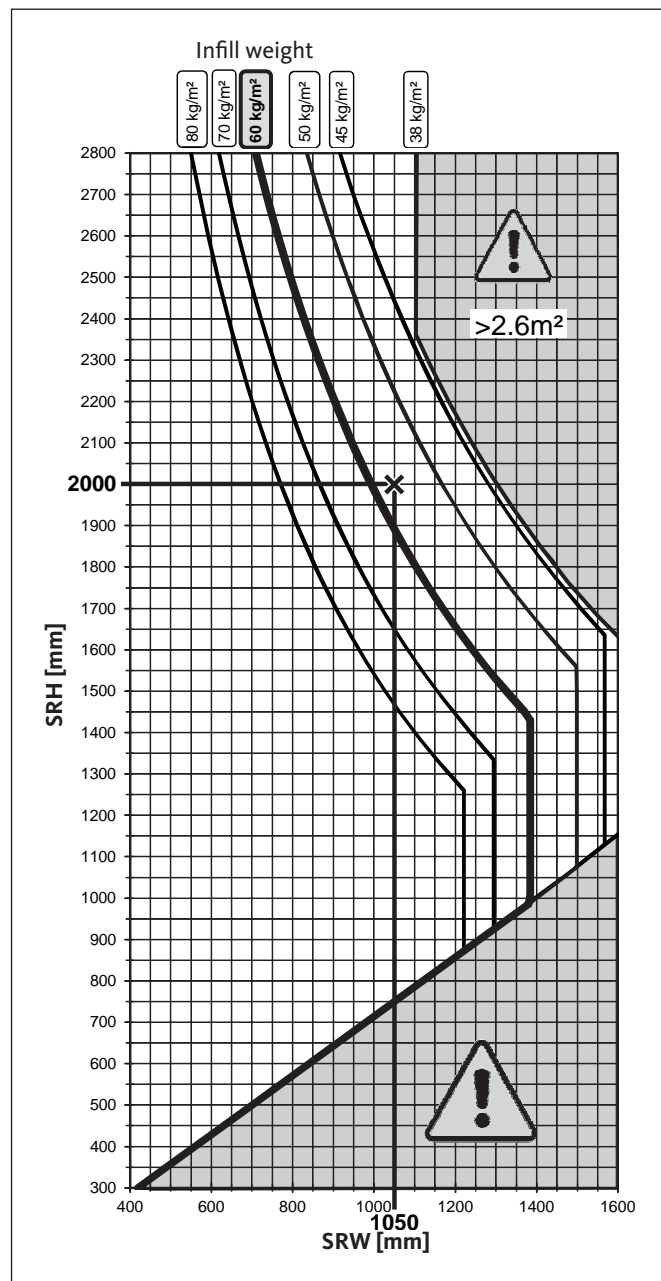
Sash rebate width
SRW = 1050 mm
Sash rebate height
SRH = 2000 mm
Specific infill weight
IW = 60 kg/m²:

- The two lines
  SRW = 1050 mm and
  SRH = 2000 mm cross one
  another to the **right** of the
  infill weight curve
  IW = 60 kg/m².

- Use of the hardware with
  the sash is **not permitted.**

Infill weight

80 kg/m² 70 kg/m² **60 kg/m²** 50 kg/m² 45 kg/m² 38 kg/m²

>2.6m²

SRH [mm]

2000

SRW [mm]
1050

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2.6.5 Example 5 – Impermissible grey areas

Upper grey area
A sash has the following data:

Sash rebate width
SRW = 1300 mm
Sash rebate height
SRH = 2200 mm:

- The two lines
  SRW = 1300 mm and
  SRH = 2200 mm cross
  over in the upper grey
  impermissible area (area of
  sash > 2.6 m²).

- Use of the hardware with
  the sash is **not permitted**
  (independently of the
  specific infill weight IW).

Lower grey area
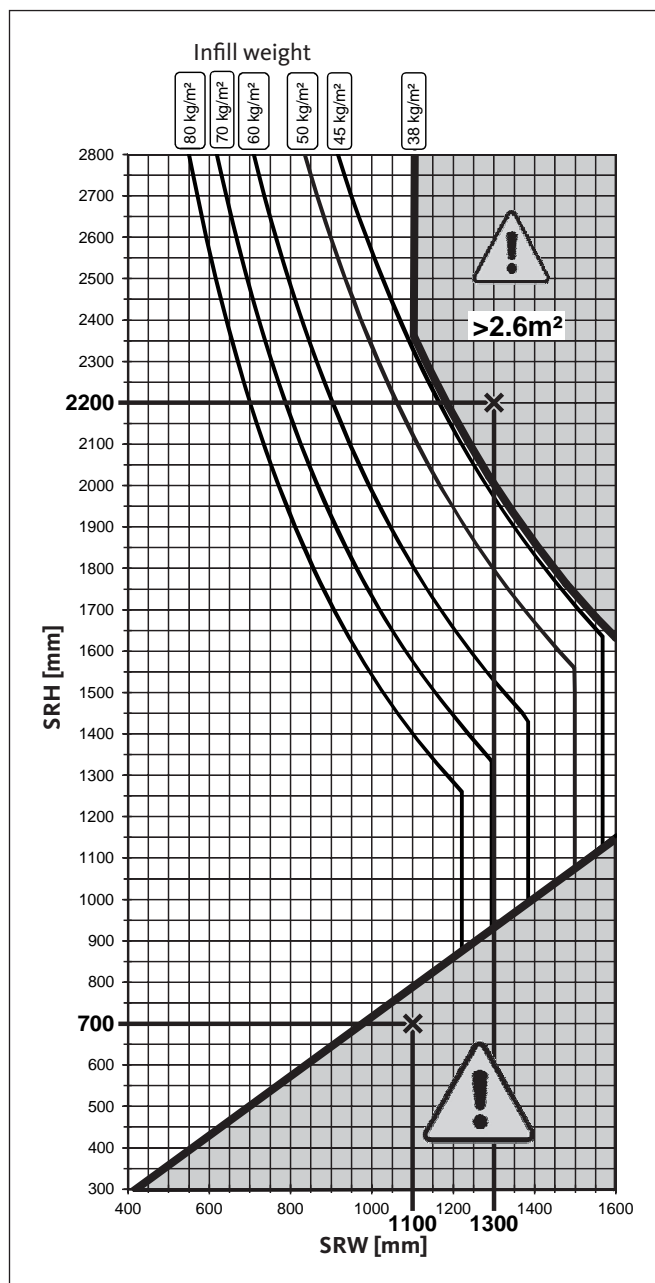A sash has the following data:

Sash rebate width
SRW = 1100 mm
Sash rebate height
SRH = 700 mm:

- The two lines
  SRW = 1100 mm and
  SRH = 700 mm cross
  over in the lower grey
  impermissible area (SRW/
  SRH $\geq$ 1.4).

- Use of the hardware with
  the sash is **not permitted**
  (independently of the
  specific infill weight IW).

Infill weight

80 kg/m² · 70 kg/m² · 60 kg/m² · 50 kg/m² · 45 kg/m² · 38 kg/m²

>2.6m²

SRH [mm]

SRW [mm]

2.6.6 Example 6 – Specific infill weight IW without own infill weight curve

The spec. infill weight lies between the infill weight curves shown
A sash has the following data:

Sash rebate width
SRW = 1200 mm
Sash rebate height
SRH = 2000 mm
Specific infill weight
IW = 47 kg/m²:

- There is no separate infill weight curve on the application diagram for the specific infill weight **IW = 47 kg/m²**.
  The next higher infill weight curve **IW = 50 kg/m²** must therefore be used!

- The two lines SRW = 1200 mm and SRH = 2000 mm cross one another to the **right** of the infill weight curve IW = 50 kg/m².

- Use of the hardware with the sash is **not permitted.**

The specific infill weight is less than the weight of the smallest infill weight curve shown.
A sash has the following data:

Sash rebate width
SRW = 1400 mm
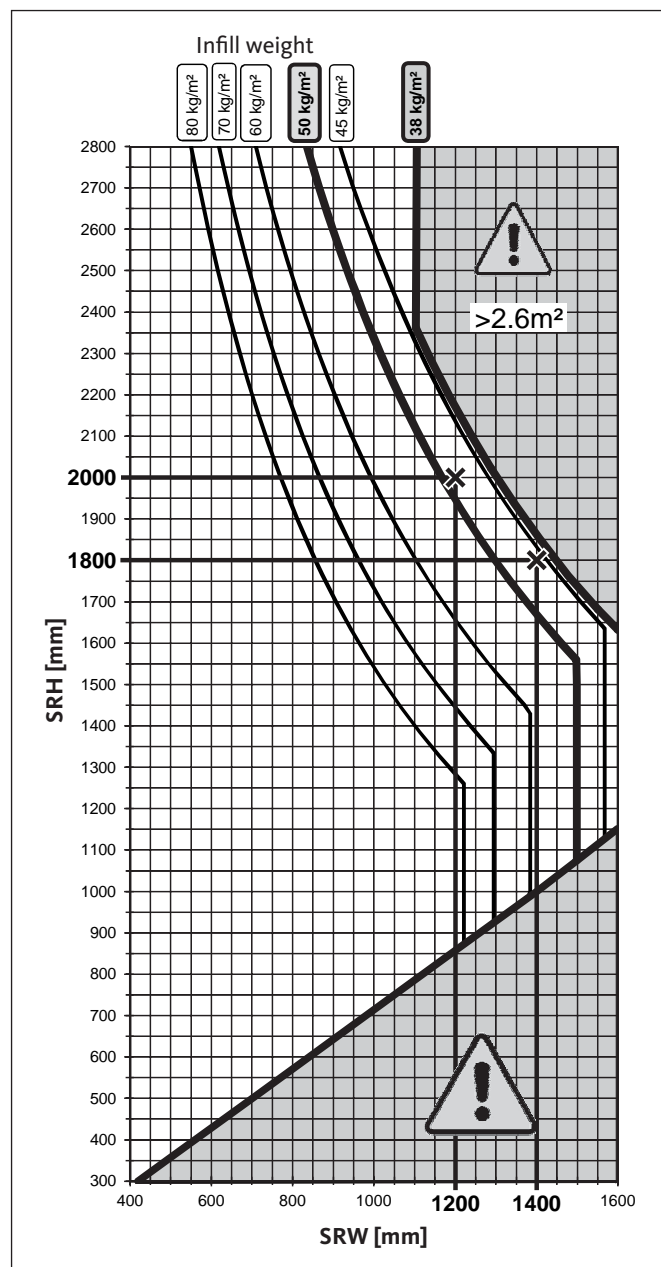Sash rebate height
SRH = 1800 mm
Specific infill weight
IW = 20 kg/m²:

- There is no separate infill weight curve on the application diagram for the specific infill weight **IW = 20 kg/m²**.
  The next higher infill weight curve **IW = 38 kg/m²** must therefore be used!

- The two lines SRW = 1400 mm and SRH = 1800 mm cross one another to the **left** of the infill weight curve IW = 38 kg/m².

- The hardware **can be used** with the sash.

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