

DESIGN MANUAL

LIBERTA RAINSCREEN PANELS

FACADE CLADDINGS



Energy-efficient steel solutions for better **LIVING. WORKING. MOVING.**

- **Basics**

Before ordering panels project-specific plans should be made, considering the background structures, panel frame structures, panel installation direction, joint width, ventilation, thermal expansion and gaps as well as flashings and fastenings. The plans should be made by a structural design company familiar with facade planning or the structure planner of the building project.

Panel installation drawings are made based on the facade drawings. The panels are identified with unique ID numbers. Panel dimensions must match the architect's plan, which is complemented by detailed dimensions of the horizontal and vertical panel joints as well as details of any corner, window and door connections. Based on these plans the installer can report the panel dimensions as the work progresses.

At the same time the location, number and fastening method of the panel substructure should be specified. These are determined based on wind loads and panel dimensions.

- **Dimensioning**

The width and height of the panels (A- and B-dimensions) are measured from the center of the joint to the center of the joint. The depth (C) is measured from the top of the support stud to the outer surface of the panel and the joint widths (Dh and Dv) as the widths of the visible joints.

The minimum and recommended maximum panel sizes are specified in separate panel size charts.

- **Panel joints**

The outward turned flanges form the base of the vertical joint between the panels in panels Liberta original 102 and original 102Grande. In panels Liberta elegant 500 and elegant 500Grande, the support stud is used as the joint base. In all panels the base of the horizontal joint between the panels consists of the turned panel flanges.

- **Fastening holes**

The fastening holes are punched during panel manufacturing. The holes are round, with diameter 7 mm in panel Liberta original 102, or oval, 5 x 10 mm in size in panels Liberta original 102Grande, elegant 500 and elegant 500Grande. Standard fastening holes are made at the corners of the panel, 15 mm from the panel end. Additional holes are made automatically or according to customer specifications. If the customer does not specify the positions of the additional holes, the holes are always made automatically as described below.

The positions of the required additional holes depend on the dimensions of the panel. The positions of the holes are expressed in the following format:

A-dimension (B-dimension) / 2; A-dimension (B-dimension) / 3, etc. where A and B are dimensions of the panel sides and the divisor is a number indicating the number of equal-size parts the side should be divided into. The fastening holes are punched in B direction only in panels Liberta original 102 and original 102Grande.

Standard fastening holes:










- A-dimension (B-dimension) ≤ 700 mm;
fastening at the panel corners.
- A-dimension (B-dimension) $701 - 1\,400$ mm / 2;
fastening at the panel corners and in the middle.
- A-dimension (B-dimension) $1\,401 - 2\,100$ mm / 3;
fastening at the panel corners and in the middle with two equally spaced fastener.
- A-dimension (B-dimension) $2\,101 - 2\,800$ mm / 4;
fastening at the panel corners and in the middle with three equally spaced fastener.
- A-dimension (B-dimension) $2\,801 - 3\,000$ mm / 5;
fastening at the panel corners and in the middle with four equally spaced fastener
(these dimensions apply to panels Liberta original 102Grande and elegant 500Grande only).

- **Support studs**

The panels are mostly fastened in steel sheet metal support studs by self-drilling screws. When the panels are over 700 mm wide, additional center support studs are required. Levelness of the substructure for the entire width of a panel is extremely important, so that fastening causes no deformation of the panel surface.

In panels Liberta original 102 and original 102Grande, all the studs can be galvanized. In panels Liberta elegant 500 and elegant 500Grande, the studs at the vertical joints are visible and should be the colour of the panel (the additional center studs by the panels can be galvanized).

Dimensioning table for support stud (Support stud CA1SS1):

L mm B m	q = 0.6 kN/m ²			q = 0.8 kN/m ²			q = 1.0 kN/m ²		
									
0.5	1240	1540	1565	1130	1400	1420	1050	1300	1320
0.7	1100	1380	1400	1010	1270	1270	935	1165	1165
0.9	1025	1270	1285	925	1150	1170	860	1070	1090

Bending limit $< l/150$, $t_{min.} = 1.2$ mm

The allowed spans at different loads,

L = fastener distance, B = support stud distance, q = wind load

The loads are not multiplied by a safety factor.

- **Starting fillets**

In panels Liberta elegant 500 and elegant 500Grande separate starting fillet is needed (Starting fillet CA1SF2). Length of the starting fillet is determined as follows: panel A-dimension – width of one vertical joint between the panels (Dv) – 5 mm. The starting fillet is only visible from directly below.

- **Special panels**

Panels can be used for manufacturing various kinds of special panels for a wide range of uses. When using special panels, also note the general size recommendations of the panels. More detailed dimension regulations and the minimum and maximum dimensions that apply for special panels can be found on the dimensional drawings for the Liberta Rainscreen panels.

Corner panels

Corner panels can be made to extend around the external corner of the building. In addition to normal fastening holes in the panel is automatically included additional fastening holes on both sides at a 100 mm distance from the corner unless the customer requires otherwise.

A single panel for the internal corner of a building cannot be manufactured – two separate panels and a flashing must be used.

Pitched panels

Panels with a pitched upper edge can be manufactured for the eaves of a building, for example. The lower edge of the panel or a vertical edge can also be pitched. Any holes are not made on the pitched edge. It is generally recommended for only one edge of the panel to be pitched.

U-panels

So-called "U-panels" (with two external corners) can be manufactured for lining pillars, for example, in building. In addition to normal fastening holes in the panel is automatically included additional fastening holes on both sides at a 100 mm distance from the corners unless the customer requires otherwise.

The possibility to produce other special panels than those mentioned here must be determined case-specifically.

- **Ventilation**

There must be an adequate ventilation space (min. 20 mm) between the panel and the windshield, enabling an unobstructed air change. It must also be ensured that there are gaps in the upper and lower edge of the wall structure to ensure free air change.

The lower edge of the panels has ventilation holes, through which the water that has entered the structure through the joints or is caused by condensation can be removed. The ventilation holes are oval, of 5 x 15 mm in size. The holes are prepared as described in the fastening hole instruction above, independent of the customer-specified fastening hole positions. The outermost holes are placed 60 mm from the panel ends.

- **Facade flashings**

The number of the flashings in a panel facade can be decreased significantly through good planning, as the panels can be ordered to the exact shape and dimensions. Typical applications include the corners of the building, such as corner panels, window frames, etc. Flashings are typically designed to be covered by the panels to improve the esthetic quality of the facade. When planning the flashings the mounting method and shape of the basic panel must be considered.

Note. When the flashings are powder coated, notice that the flashings must be designed and bent before coating. Flashings shall be coated at the same time with the panels to avoid variance in colour appearance.

- **Fasteners**

The fastenings related to the panels can be generally divided into three categories: fastening the support studs to the frame, fastening the panels to the support studs and fastening the flashings.

The panels are usually fastened using self-drilling screws, which are manufactured of stainless steel. Also gasket screws are recommended to use.

Sizing of the screws according to the instructions by SFS intec, for example. The final type and number of fasteners for each purpose is always defined by the structural designer in charge.

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