

DESIGN MANUAL

CLADDING LAMELLAS

FACADE CLADDINGS



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

- **Basics**

Before ordering lamellas project-specific plans should be made, considering the background structures, lamella frame structures, lamella installation direction, 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.

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

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

- **Dimensioning**

The lamella width is always expressed as the manufacturing width excluding joints, the height as the effective height and the depth as the distance from the support stud surface to the exterior surface of the lamella. The exception to the rule is Lamella vertical 70, where the width is expressed using the manufacturing height and the height using the effective width (the lamella is for vertical installation only).

- **Lamella joints**

The vertical lamella joints are usually left open and covered with vertical joint flashings. Depending on the lamella type, flashings can be installed either on top of the lamellas or under the lamellas. Vertical joints can also be done using lamella shaped joint pieces, which are installed under the lamella ends (not in Lamellas groove 10, 20 and 30).

Note. There must be a gap of 4–5 mm between the lamella ends. Lamella vertical 70 is an exception as it already has a standard vertical joint (5 mm).

The horizontal joints are distinct for each lamella type, excluding Lamella vertical 70, where sill flashing is used in horizontal joint.

- **Fastening holes**

The fastening holes are punched during lamella manufacturing for Lamellas sharp 40 and 45, lap 60, vertical 70 and straight 100. The holes are oval, 5 x 10 mm in size. Standard fastening holes are made at the corners of the lamella, 15 mm from the lamella 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 width of the lamella. The positions of the holes are expressed in the following format:

Lamella width / 2; lamella width / 3, etc. where the divisor is a number indicating the number of equal-size parts the width should be divided into.

Standard fastening holes:










- Lamella width ≤ 750 mm;
fastening at the lamella corners.
- Lamella width 751 – 1 500 mm / 2;
fastening at the lamella corners and in the middle.
- Lamella width 1 501 – 2 250 mm / 3;
fastening at the lamella corners and in the middle with two equally spaced fastener.
- Lamella width 2 251 – 3 000 mm / 4;
fastening at the lamella corners and in the middle with three equally spaced fastener.

● Support studs

The lamellas are mostly fastened in steel sheet metal support studs by self-drilling screws. When the lamellas are over 750 mm wide, additional center support studs are required. Levelness of the substructure for the entire width of a lamella is extremely important, so that fastening causes no deformation of the lamella surface.

All support studs used in lamella systems can be galvanized as they do not remain visible.

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 $< l/150$, $t_{min.} = 1.2 \text{ mm}$

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 Lamellas groove 10 and 20, sharp 45, lap 60, and straight 100 a separate starting fillet is needed. Length (width) of the starting fillet is same than the width of the lamella.

The starting fillet is visible in Lamellas groove 10 and 20. In Lamellas sharp 45, lap 60 and straight 100 the starting fillet is only visible from directly below.

● Special lamellas

Corner lamellas

Two separate lamellas slanted at a 45 degree angle can be combined to make a corner lamella, which can be used for the external and internal corners of the building. These external and internal turns can be done with Lamellas groove 10, 20 and 30, sharp 40 and 45, lap 60 and straight 100.

The maximum width for the corner lamellas is 3 000 mm. The corners are measured from the outermost point on the lamella. Corner lamellas are used with flashings designed for that purpose.

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

● Ventilation

There must be an adequate ventilation space (min. 20 mm) between the lamella 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 lamellas has ventilation holes (not in Lamellas groove 10, 20 and 30 and vertical 70), 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, 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 lamella ends.

- **Facade flashings**

The number of the flashings in a lamella facade can be decreased significantly through good planning. Typical applications include the corners of the building, window frames, etc. Flashings are typically designed to be covered by the lamellas to improve the esthetic quality of the facade. When planning the flashings the mounting method and shape of the basic lamella 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 lamellas to avoid variance in colour appearance.

- **Fasteners**

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

The lamellas 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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