



VENTILATED FAÇADES AND SUNSCREENS.

IS IT:

Product

Technology

Equipment

APPLICABLE FOR:

Restoration

Rehabilitation

New Construction

APPLICABLE ON:

1. Foundations and underground structures

2. Vertical structures

3. Horizontal structures and vertical connections

4. Roof and terraces

5. Façade and building envelope

6. Finishes and completion elements

7. Integrated services

8. General strategies for building recovery

Related companies: DENVELOPS

DESCRIPTION

To create double skin surfaces for façades, pergolas, walls, and ceilings.

WHY TO USE

- Architects will be able to make innovative designs with no risk to the budget.
- Customers will enjoy the safest, most efficient, and customized result.
- Installers will be able to adapt the project to the real work dimension and to organize the modulation according to their requirements.
- The wires and the pieces for the system can be made of unlimited shapes, forms, colours and materials.
- With lightweight solutions and 100% adaptable modulation the system is perfect for new buildings or fast renovations.
- Dry and fast speed installation system, available in small formats or in large folded frames of 50 square meters.
- Small interchangeable component composed system. Perfect for creating combined designs, both for maintenance and subsequent refurbishment.
- Lean construction philosophy. Denvelops is produced off-site with minimum waste. All its projects or components can be easily recycled or reused.
- Explore the functional options of the system, including kinetics, domotics, photovoltaics, isolation, acoustic or waterproofing properties.
- The system's innovation consists of a new way to assemble surfaces without screws but using thin vertical plates (horizontal steel wires) for all parts. This makes it simple, clean, and quick to assemble.

HOW TO USE AND APPLY

Install more than 500 m2 with one team and crane:

To install a Denvelops project only a few steps and tools are required. An open production system ensures that installers can easily modify the production plans in order to optimize their resources and real project dimensions in every project.

In the best conditions project, one crane can install more than two 20 m2 sequences per hour, which means doing marks of 640 m2 per day.

Free modulation adjustment:

Up to the last moment, and before starting production, all dimensions can be freely modified to optimize the operations in the construction area.

Installation mode:

The system can be installed in two ways, top hung or direct to a back wall.

Top hung:

Perfect for big projects. Denvelops can produce installation formats about 30 m large and 3 m wide.

1. Pull up the sequences with the crane.
2. Fix the sequences over the load lines and the wind line anchors in every slab.
3. End the work by adding the wind connector rivets and fixing all sequences together with screws.

Direct system:

For small areas where big formats do not work, Denvelops can produce exploded elevation with all the required dimension frames. To install them it is only necessary to use M10 screws.

1. Preview, install and position the anchors.
2. Fix the panel to the brackets..

TECHNICAL CHARACTERISTICS

- It is a fusion between steel meshes and curtain walls facades.
- It is based on Lean Construction 100 % off-site manufactured.
- Power to design: It is 100% produced by CNC parametric machines.
- Unlimited materials, pieces, patterns, and functions can be used.
- 100% cheap and customizable.

Smart components

Denvelops system is designed with three customizable components; Lines, Connectors and -optional- Pieces, created with the following objectives:

- Customizable components to create efficient and ecological projects.
- Maximum freedom to create projects.
- Work with massive and economical industrialized small components.
- Produced off-site: easy and simple (to install, maintain and recover).

With this basis, *Denvelops* is ready to assume all big new objectives that project designers are demanding today.

A. **Denvelops® System Name Parts:** The system is composed of a short list of components.

1. Lines: Vertical flat-bar profile as connectors support.
2. Connectors: Wire elements that connect Lines and optionally support the cladding pieces.
3. Pieces: Panel, tile, brick, or specific design piece to be fixed to the Connector.

B. **Types of Pieces, Connectors & Lines.** Pieces, Connectors and Lines are the one that makes the finished of the system:

- For a metal fabric image project, there will be only with Lines and a lot of Connectors.
- For a ventilated facade or sunscreen project, there will be Pieces attached to the Lines or Connectors.

Pieces

- **Shape:** Modifying the shape of the connectors, all type of tiles or brick can be used in the system.
- **Material:** Stainless, aluminum, steel, HPL, polycarbonate, composite, etc...
- **Dimensions:** Normally every piece (up to 350 x 350 mm) is attached to one connector. But big pieces can also be attached to the system with more than one connector.

Lines

- **Shape:** Free. It can be straight or curved, in many turns or curved forms.
- **Material:** Stainless, aluminum, steel, HPL, polycarbonate, composite, etc. up to 50.3 mm.
- **Dimensions:** Normally with rectangular sections from 30.3 mm up to 50.3 mm.
- **Hinged connections:** In order to make larger Lines or in order to insert graft appendices to the system.

Connectors

- **Shape:** It can be straight or curved, in many turns or curved forms.
- **Material:** Stainless ASI316 wire of 2'5 mm section. Also can be painted or sheathed with some kind of small and thin pipe, just to increase its volume vision.
- **Dimensions:** Connectors should not be larger than 350 mm (Lines modulation).

C. **Denvelops Surfaces.** Because *Denvelops* is an open System constructed with parametric technology, flat surfaces with single or double curve can be manufactured.

- **Plane surface:** Optimize.
- **Single curvature surface:** Optimized. With curved connectors or curved Lines.
- **Double curvature surface:** Optimized for small project areas.

D. **Pattern Options.** With *Denvelops* it's possible to design your project piece by piece as everything can be mounted in series or separately. The choice and combination of Lines, Connectors and Pieces, will depend on the desired finish of each project:

- The position of the Connectors and Pieces with respect to the Lines is free and the direction, rotation and depth can be adjusted.
- Different Lines, Connectors or Pieces can be freely mixed in the same project.
- Designs can be made with regular or random width and depth of columns and lines.



E. **Denvelops Functions.** Many functional surfaces can be created with Denvelops with just a little knowledge of how the pieces can be attached or how some pieces can be developed specifically for certain systems. Any of our simple methods can be used in the same project according to the needs of each facade orientation.

Available functions:

- **Static Attach mode:** Piece attached with no movement. Choose for every case its orientation, rotation, or depth position against the facade surface.
- **Kinetic Attach mode:** Piece attached with wind. Choose for every case its orientation, rotation, or depth position against the facade surface.
- **Ventilated facade:** Static attached pieces designed with overlapped or open joins. Additional insulation is also available.
- **Sunscreen:** Static attached pieces with free election of the tile's density and free election of the tiles position and orientation to get the best shade in relation to the sun's heat.
- **Retail furniture:** Explore the system to create furniture and product displays.

<https://www.denvelops.com/projects-news-technical-posts/>

<https://www.denvelops.com/nuevas-ventajas-en-los-sistemas-modulares-denvelops/>

WEBSITE OF THE COMPANY

<https://www.denvelops.com/>

RECOMMENDATIONS AND OTHER INFORMATION

DENVELOPS is part of the Plural Project, which receives funding from the European Union's Horizon 2020 Research and Innovation Programme under agreement No. 958218.

<https://www.denvelops.com/plural-innovating-facades/>

EXAMPLES

<https://www.youtube.com/watch?v=TIqt1rtCqAI&t=9s>

REFERENCES / SOURCES AND LITERATURE

<https://www.denvelops.com/catalog/>

<https://www.denvelops.com/new-construction-system/>

<https://www.denvelops.com/new-installation-system/>



IMAGES AND CAPTIONS



Fig.1: Top hung installation process. In this case, the parts are placed at an angle, which is a project requirement that the Denvelops system adapts to. ©DENVELOPS.COM



Fig.2: Example of the system's short list of components: (1) *Lines* = Vertical flat-bar profile as connectors support; (2) *Connectors* = Wire elements that connect *Lines* and optionally support the cladding pieces; (3) *Pieces* = Panel, tile, brick, or specific design piece to be fixed to the *Connector*. ©DENVELOPS.COM



Can Fatjó:



Fig.3: Fast renovation with double skin modular cladding (2020) Corporate façade made with double skin with platelets in 4 colors, generating an irregular pattern. ©DENVELOPS.COM



Fig.4: The construction system of a dividing wall with pluvial partition wall conditioned the fixing of the load and the wind line, increasing the section of the tubes (100X100X10 and 100X10) and increasing the number of wind lines to reduce the loads to be supported on each screw and anchor.

Very lightweight solution representing about 15 kg/m².

The dimensions of the pieces were 2.10 m wide, achieving an output of 20 m² in 15 minutes, significantly reducing the costs of auxiliary means, such as the crane.