Structures for all your projects

Technical Guide
Highly efficient load-bearing structures for all your projects

MULTIBEAM and PSB are manufactured in France by ARVAL Profil du Futur, Europe’s number one. These profiles are specially designed for use as roofing purlins, cladding rails and floor joists in accordance with current European standards.
Arval Profil du Futur has been present in Europe for 30 years now, carrying out close to 10,000 projects per year thus becoming the European leader in steel roofing, cladding and flooring supports thanks to its purlin, rail and joist systems.

Our MULTIBEAM and PSB ranges provide ARVAL Profil du Futur with the ability to offer you the best possible building solutions for a given site, whatever the size.

With our purlin, rail and joist systems you will receive the "complete ARVAL Profil du Futur service", which is as follows:

- A direct sales organization with a local network and inside technical sales representatives, an engineering and design department with engineers, technicians, designers and draughtsmen, a "customer service" with logistics people, who will schedule your production and dispatch your order according to your delivery time.

All our purlin, rail and joist systems are delivered on-site, whatever the quantity, and are design justified on the basis of testing and Eurocodes. They are also covered by technical approvals and TAC, validated by auditors in France and in many other countries.

In-company quality controls are performed under the supervision of the official German organization "Versuchsanstalt für Stahl, Holz und Steine".

Sales department

Our local area representatives will set up and maintain good business relationships with you as well as good business cooperation. They represent and fully commit ARVAL Profil du Futur.

In our offices, technical sales representatives are in charge of defining systems with high-level optimization, and they also perform quantity surveys according to your specifications (the building’s properties, weather loading, working loads …) and they will give you a written agreement to the price and lead time.

Order servicing:

- Logistics people - Engineering & design department - Technical department

Our logistics people are in charge of processing orders, from the time they acknowledge receipt of the order to its delivery on-site. They make sure that plans, a drawing of the general layout and design calculations have been made and then they schedule release for manufacture. They are in permanent contact with our shipper thus guaranteeing delivery on the agreed date.

Our engineering & design department has software adapted to our product range and based on Auto CAD and Tekla structures, which serves to establish all the plans concerning details, location, manufacturing and assembly according to your framework drawing.

Our technical department makes out design calculation documents for the inspection bodies. It ensures compliance with current standards and due renewal of all appropriate technical approvals.

Manufacturing

In our Horbourg-Wihr plant, near Colmar (France), we have facilities specially designed to obtain efficient and cost effective manufacturing of the whole ARVAL Profil du Futur range as well as all our flashings, thus guaranteeing observance of the lead time.

Our raw materials are subject to very stringent specifications and undergo a systematic quality check.

Our finished products are checked daily by our quality control department, and very regularly by an outside independent inspection body.

Delivery

The scope of our business is such that we can guarantee on-site delivery in keeping with the contractual deadline whatever the size of the affair.

Our shipper has a shipping office in our plant, which enables him to be even more reactive, supervise the progress of the order and enjoy the advantage of customer proximity.
Multibeam

Rapid installation
Symmetrical profile (no right–hand and left–hand)
Stable profile
Wide flanges (easy roof laying)
Simple fixing onto stanchions and rafters
Simple and efficient positioning of ties
Cost effective
Lightweight
Galvanized finish
A wide range of applications

Multibeam is the result of intensive testing and is compatible with the latest design and construction techniques.

Multibeam has been present in Europe for over 30 years, continually optimizing its performance, and now offers an unbeatable mixture of simplicity and efficiency.

Multibeam is manufactured from Sendzimir processed galvanized steel (275 gr/m² double-sided for standard applications and up to 600 gr/m² double-sided for special applications, coastal, aggressive environments...). The guarantee of a 350 N/mm² and 390 N/mm² yield stress contributes to the performance and quality of the profiles.

A simple but modern purlin system suited to all types of buildings as well as to all kinds of frames and bays.
The Multibeam rail system is one of the simplest today. The rails and ties are perfectly suited to all kinds of structures and make the system rigid and easy to install.

Multibeam joisting is resistant, cost-effective and the solution you need for your new floors, refurbishments, extensions and mezzanines because the elements can be hand-carried most of the time.
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Multibeam Cleats

Different ways of fixing

- Steel substrate
- Concrete substrate
- Wood substrate

Bolt-on cleats are hot dip galvanized. Weld-on cleats are black and without a base.

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* For rail systems only

Bolt-on cleats are hot dip galvanized. Weld-on cleats are black and without a base.

Corner detail

- Gable rail
- Special cleat
- Max length = 500mm
- Corner piece
- Cleat
- Long section of rail
The sleeves are designed to fit the contours of the profiles they assemble, thus ensuring continuity on bearing points and transforming the statically determinate purlin system into a continuous system of purlins over one or more bays.

They can vary in length and in thickness, allowing them to adapt to all types of bays and loadings.

**Sleeve Ø 14 punch holes**

**SD-SR Rail Ø 14 Drill**

**SD-SR Rail Ø 18 Drill**

**Note**: standard drilling, consult us for any other drilling.
Tubular ties are designed and developed to ensure the stability of purlins, rails and joists in a simple and efficient manner. They can be screwed together without the use of tools.

Ties placed over the ridge ensure the conjoining of ridge purlins, and even provide a “hard spot” in some instances.
The linking system is composed of sag rods and/or adjustable tie rods. The latter are the “hard spots” of purlins, rails and joists. They ensure independent stability of the secondary structure. They have adjusting possibilities which allow for quick and easy assembly.

**Multibeam Adjustable Tie**

- **Fixed overhang with cleader rail**
  - Positioning adjustable tie rods
  - Fixing adjustable tie rods

- **Removable purlin overhang with cleader rail**

- **Removable corner bar overhang with cleader rail**

**Multibeam Overhangs and Cleader Rails**

- **Temporary** (future extension)
  - 250 mini
  - 250 maxi
  - 80 mini
  - Rafter
  - Cleader rail
  - Purin overhang

- **Definitive**
  - L45x45x3 Ø14
  - 28
Multibeam Rafter Stays

Rafter stability brace

Stability bracing on one side. The user is responsible for checking the brace and the rigidity of the stabilisation system.

- Ø14 Punch holes
- Ø18 Punch holes

For profiles between B120 and C300

- L 45 x 45 x 3 - Ø14 Punch holes

28 profiles between B120 and C300

For profiles between C320 and D450

- L 70 x 70 x 3 - Ø18 Punch holes

40 profiles between C320 and D450

Multibeam Standard Punch Holes

- Multibeam profile 120 to 300
- Section = T-16 mm
- Ø18 punch holes (profiles 120 to 300)

- Multibeam profile 320 to 350
- Section = T-16 mm
- Ø18 punch holes (profiles 320 to 350)

- Multibeam profile 400 to 500
- Section = T-16 mm
- Ø18 punch holes (profiles 400 to 450)
This range of compounded beams can favourably replace hot rolled sections in a great many applications: joists, lintels, frame members, sprinkler supports, etc...

These compounded beams are much lighter than their equivalent in hot rolled sections.

They are easy to handle and are delivered complete with a galvanized finish and ready to install (bolts not provided).
Cleats are provided by Profil du Futur on request. (Consult us for the price and delivery time)

Type 1 cleat to sustain compressive loads

For discrepancy between different roof covering elements

Type 2 cleat to sustain compressive loads.

Cleat for different heights of profiles.

Multibeam Assembly Principles

Special cleats

Multibeam Assembly Principles

Multibeam rail, purlin and joist systems

1 row of ties

2 rows of ties

3 rows of ties

Ø18 - 320 to 450 high
Ø14 - 120 to 300 high

Ø14 - 120 to 300 high

Y: 58 to 100mm

Y: 58 to 100mm
**Multibeam Assembly Principles**

**Principles for fastening elements under the purlins**

Specify loading when work is sized

**Fastening at a point load less than or equal to 20 DaN**

**Fastening at a point load greater than 20 DaN**

**Support for false ceilings and for flooring without bracing**

**Floor with bracing**

A simple, rapid and efficient solution for our floor system screwed onto joists

---

**Multibeam rail and joist systems**
Example 1

CROSS SECTION A-A

Example 2

CROSS SECTION A-A

Example 3

CROSS SECTION A-A

Fasteners provided by Profil du Futur on request: consult us
Multibeam Trimmer Details

Sliding trimmer beam with 2, 3 or 4 branches

Trimmer beams for light domes

Trimmer beams with reinforced fasteners

Downspout trimmer beam

Note: please specify the loading the trimmer will need to sustain, as this determines the fasteners to be used.

Fastener A2
Fastener A5X
Fastener A5
Trimmer beam bar
Purlin

Fastener A4X
Fastener A4
Trimmer beam bar
Purlin

Fastener A5-A5X
Ø14
Thickness 3 mm
Bending line

Fastener A2
Fastener A4A
Ø14
PSB

The PSB solution requires no flashings for screw-fixed steel roofing, cladding and flooring.

PSB is optimized with dimensions and calculations in compliance with Eurocode standards.

PSB is manufactured from Sedzimir processed galvanized steel (275 gr/m² double sided for standard applications and up to 600 gr/m² double sided for special applications, coastal, aggressive environments...).

The guarantee of a 350 N/mm² yield stress contributes to the performance and quality of the profiles.

Cost saving

Simple

High performance

No cleats

No sag rods

No tie rods

The solution for bays up to 7m in length

Stable and symmetrical

PSB Purlin System

The PSB purlin system is specially suited to small bays (up to 7 metres long) and is the ideal solution for all kinds of buildings including those used for farming and industry.

No flashings are required to assemble the system providing the roofing is screw-fixed and compositely acting.

Profile overlapping guarantees the continuity of the system since the profiles are fitted and secured on-site with self-tapping screws, supplied by Arval – Profil du Futur.
The PSB profile is symmetrical and stable with no need for flashings. It allows for easy installation and is a rigid building system. The PSB profile can be erected both ways round thus adapting to all types of structures.

Properties regarding the strength of the PSB profile as well its simplicity and cost effectiveness are in the limelight when used to joist your new flooring, refurbishments, extensions and mezzanines.
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#### PSB Range

- **PSB 120**: 75 x 248 x 135°
- **PSB 140**: 81 x 188 x 135°
- **PSB 160**: 109 x 256 x 135°
- **PSB 180**: 126 x 288 x 135°

#### Cleader Rails and Punch Holes

**Cleader rails**

- L45x45x3 Ø8

**Standard punch holes**

- **In the pan**: Ø5 x 6.5
- **In the web**: Ø4
- **In the flange**: Ø3
In order to enhance the simplicity of the system and its installation, Arval - Profil du Futur and SFS intec have developed and perfected a self-tapping screw, to improve on the standard bolt. It has as much strength and is five to seven times as fast to install. This screw has the following properties:

- **Screw**: TDBL-T-8.6 x 16 mm
- **Head**: 13 mm hex head on flat side
- **Diameter of rod**: d = 8.6 mm
- **Length under head**: L = 16 mm

**Pre-drilling**:
- Ø 8 mm in rafters and stanchions
- Ø 6.5 x 10.5 mm in PSB purlins

**Properties**:
- **Stability brace on one side.** The user is responsible for checking the brace and the rigidity of the stabilisation system.

---

**Rafter stability brace**

**Pre-drilling**:
- Ø 8 mm in rafters and stanchions
- Ø 6.5 x 10.5 mm in PSB purlins
**PSB Installation Principles**

- Overlapping isostatic PSB assembly
- Continuous PSB assembly

**Principle for fastening elements without purlins. Specify loading when work is sized.**

**PSB Trimmer Beam Details**

- Sliding trimmer beams with 2, 3 or 4 branches
- Trimmer beams for light domes

**Roofing**

- FASTENER A2 Ø14
- A6/A6X Fastener

**Façade**

- Façade trimmer beam fasteners

<table>
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<tr>
<th>Profiles</th>
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<th>B</th>
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*Note: For all enquiries, specify the loading sustained by the trimmer beam as this determines the fasteners to be used.*
Additional Profiles

All additional profiles are manufactured from Sedzimir processed galvanized steel coils (275 g/m² double sided for standard use) with a minimum yield stress guaranteed at 350 N/mm².

### U Profile

- A available mm: 120, 140, 170, 200
- B mm: 40 to 70
- C mm: 3 mm
- t maxi: 3 mm

### CE Profile

- A available mm: 120, 140, 170, 200
- B mm: 70
- C mm: 14 to 28
- t maxi: 3 mm

### CE+ Profile

- A available mm: 120, 140, 170, 200
- B mm: 70
- C mm: 28
- t maxi: 3 mm

* Other heights on request

### Cleader angle

Maximum lengthwise bend 8 m

### Top hat

Consult us

### Eaves purlin

Example

* Cleader angle with unequal legs, maximum length 8m.
Post-Painting

Description of post-painting operations

System: powder coating onto galvanised steel

SURFACE PREPARATION
APPLIED AUTOMATICALLY (PARKER tri-metal treatment):
- Pickling
- Phosphate/degrease
- Chrome passivation
- Demineralised water rinse,
- Stoving.

APPLIED MANUALLY
- Phosphate/degrease
- Water rinse,
- 1 layer of wash primer, PASSIREX primer or water-soluble primer, 1 0/1 5 µ thick,
- Stoving or ambient-drying.

COATING
APPLIED AUTOMATICALLY OR MANUALLY
- 1 layer of polyester powder with a QUALICOAT label, or industrial polyester, 60 µ thick.

Examples of Applications

Solar Systems Steel Structures

Acoustic and thermal complex

Acoustic complex and structure

Hairaqua and structure

Arsolar and structure

Vegetated roofing and structure
**Company:**  
Tel:  
Date:  

**Address:**  
Fax:  
Contact:  
E-mail:  

**Building reference:**  
Location:  
Construction date:  

**Diagram:**  
- Building: type ________ slope(s)  
- Pitch: ________ %  
- Long: ________ m in ________ bay(s) ________ m  
- ________ bay(s) ________ m  
- Wide: ________ m in ________ half(s) de ________ m  
- Height: Eaves purlin ________ m  
- Ridge purlin ________ m  

**Weather loading:**  
- Snow: ________  
- Accumulation: yes - no type ________  
- Wind: ________  
- Permeability of long sections: ________ %  
- Permeability of gables: ________ %  

**Purlin system:**  
- Type of roofing: ________ daN/m²  
- Type of insulation – on roof: ________ daN/m²  
- Extra loads: ________ daN/m²  
- Spacing between purlins: ________ mm  
- Overhangs: ________ mm  
- Compression sustained by the purlins: ________ (daN non weighted)  
- Purlins between -on portal frames  

**Rail system:**  
- Type of cladding: ________ daN/m²  
- Long side: number: ________ length: ________ m in ________ bays of ________ m  
- Space between rails: ________ mm  
- Rails between – on stanchions  
- Gables: number: ________ length: ________ m in ________ bays of ________ m  
- Space between rails: ________ mm  
- Rails between – on stanchions  

**Joist system:**  
- Type of flooring: ________ daN/m²  
- Extra Loads: ________ daN/m²  
- Space between joists: ________ mm  
- Joists between – on bars  

**Miscellaneous:**  
- Cleader rails: ________ ml  
- Sliding trimmer beams: ________ u  
- Others:  
- Braces + plates: ________ u  
- Downspout trimmer beams: ________ u  

Price to be quoted on:  

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Due to a policy of continuous improvement, Arval–Profil du Futur reserves the right to change any of the product specifications described in this guide, without prior notice.  
*The photos and illustrations are not contractually binding*.