ARCHITECTURE WITH STEEL
Façade profiles for ambitious architectural projects
ABOUT US
WHO WE ARE

The metallurgy business is Calvi Group’s core business: over the years, Calvi Network Special Steel Profiles has achieved the position of undisputed market leader in the field of technology and in the design and manufacturing of special steel profiles based on customers’ specifications.

CALVI NETWORK
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BU EXTRUSION
The three companies of the Calvi Network Hot Extrusion Business Unit are all highly specialized in the use of hot extrusion forming technology to produce special steel profiles or tubes. They work in synergy to produce a wide range of steel and alloy products and they are able to supply both standard profiles and custom solutions of all types and shapes.
OUR COMPANIES

HOT EXTRUDED SPECIAL STEEL PROFILES

Hoesch Schwerter Extruded Profiles GmbH
since 1957

Cefival SA
since 1905

Siderval SpA
since 1972

223 years of EXPERIENCE
BU HOT ETRUSION
SALES REPRESENTATIONS

Sales representative in USA
Laura Zak
laurazak@sidervalusa.com
www.sidervalusa.com
Facts & Figures

- Turnover: ≈ 100ML $n.
- Employees: 307
- Profiles designed: More than 30,000
- Customers: 600
- Export share: More than 50%
- Years of experience: More than 200
TECHNOLOGY
TECHNOLOGY

THE FORMING TECHNOLOGY KNOWN AS HOT EXTRUSION CAN BE USED TO PRODUCE PROFILED BARS AND TUBES WITH COMPLEX GEOMETRIES.

DURING HOT EXTRUSION, A PRE-HEATED BILLET IS PLACED IN A CHAMBER AND PUSHED THROUGH A SPECIAL DIE OPENING THAT GIVES THE DESIRED CROSS SECTION TO THE FINISHED BAR.
ADDED MANUFACTURING PROCESSES

To round off the production program, also the following additional processing steps can be offered by:

- Straightening machines
- Descaling equipment and pickling line
- Machining Centre (for e.g. milling, sawing, drilling)
- Special areas for heat and surface treatment
- Specific bending and flash-butt welding installations
- Use of complementary technologies like laser welding
KEY FEATURES
MATERIALS

- CARBON STEEL
- STAINLESS STEEL AND DUPLEX STEEL
- TITANIUM

TECHNICAL PARAMETERS

<table>
<thead>
<tr>
<th>DIMENSIONS</th>
<th>Fit in a circle of max Ø 255</th>
<th>Inside diameter for hollow profiles: from 20 mm to 160 mm</th>
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<tbody>
<tr>
<td></td>
<td>Minimum thickness: 4 mm</td>
<td></td>
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<tr>
<td>LENGTHS</td>
<td>Up to c. 16 800 mm</td>
<td></td>
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<tr>
<td>WEIGHT PER METER</td>
<td>Up to max. c. 110 kg/m</td>
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<tr>
<td>TOLERANCES</td>
<td>Depending on profile cross section and material</td>
<td></td>
</tr>
<tr>
<td>MATERIALS</td>
<td>Nearly all quality - all required heat treatments are available</td>
<td></td>
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</table>
KEY VALUES

CREATIVITY
TAILOR MADE PROFILES IN ORDER TO SATISFY THE INDIVIDUAL DESIRE OF STYLE

CREATIVITY IS AN ATTITUDE. IT IS A MINDSET. IT IS THIS ATTITUDE THAT DRIVES THE DESIRE IN ONE TO PRODUCE SOMETHING NEW RATHER THAN REPRODUCE EXISTING TRIED AND TESTED IDEAS.

DIVERSITY
INNOVATIVE SOLUTIONS FOR AMBITIOUS ARCHITECTS

FOR PLANNERS AND ARCHITECTS THE WIDE-RANGING SPECTRUM OF HIGHLY DIFFERENTIATED PROFILE GEOMETRIES OPENS UP AN ALMOST INFINITE NUMBER OF POSSIBLE FORMS.
KEY ADVANTAGES

• HEAT RESISTANCE
• DURABILITY
• SUSTAINABILITY
• APPEARANCE
• FINISHES
**BENEFITS**

**MANUFACTURING PROCESS BENEFITS**

- Huge raw material savings due to the near-net cross-section of the profile
- Costly processes and machining (welding, straightening, grinding, milling or turning) can be reduced or eliminated
- Low MOQ
- Prototyping possible
- Expansion of the product range using complementary technologies like laser welding
BENEFITS

PRODUCT BENEFITS

- Tailor made profiles
- Seamless and complex profile shapes
- Solid and hollow sections
- Different material thicknesses within one profile cross-section
- High design flexibility
- Integration of grooves
- Hollow profiles for lighter structures and water heated curtain walls
APPLICATION FIELDS
APPLICATION FIELD
ARCHITECTURE

AESTHETICS AND VARIETY OF FORM
Special profiles made of steel allow the use of so called “skeleton steel constructions”. Large heights and widths can be spanned.
Extruded special steel profiles can fulfill almost all the requirements for freedom of design, construction physics and architecture as part of an overall ecological concept. Behind this steel has in direct compare especially with aluminum the advantage of a much lower coefficient of expansion and higher modulus of elasticity. Also the fire protection level of steel is twice as big as aluminum.
DESIGN RULES

Design of profiles according to the E Modul

<table>
<thead>
<tr>
<th>Material grade</th>
<th>E Modul [MPa]</th>
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<tbody>
<tr>
<td>STEEL</td>
<td>210.000</td>
</tr>
<tr>
<td>TITANIUM</td>
<td>110.000</td>
</tr>
<tr>
<td>ALUMINIUM</td>
<td>70.000</td>
</tr>
<tr>
<td>CONCRETE</td>
<td>30.000</td>
</tr>
<tr>
<td>WOOD</td>
<td>10.000</td>
</tr>
</tbody>
</table>

Design

- SMALL SECTION
- BIG SECTION

HOT EXTRUDED SPECIAL STEEL PROFILES
DESIGN RULES

The narrower the shape, the more transparency and brightness will be possible.

1. Aluminium

2. Steel
   (same wall, same bending stiffnesses)

3. Steel
   (same wall, same bending stiffnesses, same $I_x$ than 2)
CASE STUDIES
REICHSTAG DOME – BERLIN, GERMANY

MULLION SECTIONS
Architect: Norman Foster
Material: S355
Length: 5200 mm

Characteristics:
The profiles are bended and welded to have a tubular section and butt-welded to obtain a circular ring. This building is a perfect example of matching the past with the future.
HANGAR 8 – SALZBURG, AUSTRIA

Transom profile
Dimension: 240 x 82.5 x 15 mm
Material: S355J2G3
Architect: Atelier Volkmar Burgstaller
Facade: Bollinger + Grohmann
PROFILE DESIGN

HOT EXTRUDED SPECIAL STEEL PROFILES
HOT EXTRUDED SPECIAL STEEL PROFILES

KONGRESSHAUS – SALZBURG, AUSTRIA

Hollow mullion section (heated)

Material: S235JRG2
Architect: Prof. Brandstätter/ Maurer
Engin.: Latzer
Facade: ARGE Saller/Asen/Grundtner
UNIQUA TOWER – VIENNA, AUSTRIA

Architect: Heinz Neumann
Material: Fe360C
Features:
T-shaped section with an oval cavity, in order to obtain the tubular profile in carbon steel.
HAUS DER ARCHITEKTUR – MUNICH GERMANY

Mullion and transom sections

Dimension:  
180 x 60 x 15 mm
115 x 60 x 15 mm

Material: S235JRG2

Architect: Drescher & Kubina

Engineering: Fuchs

Facade: Metallbau Schmitt
268 ORCHARD ROAD – SINGAPORE

Mullion Sections
Building: Trade Center
Architect: Raymond Woo
Quality: AISI 316LN
HOT EXTRUDED SPECIAL STEEL PROFILES
FREEDOM TOWER – NYC, USA

Architect:  David Childs - SOM
Material:  316L
Profiles length: 610mm
HOT EXTRUDED SPECIAL STEEL PROFILES

Kloster Andechs – Germany

Framework Section, Inner Court Roofing
Dimensions: 110 x 60 x 10 mm
Quality: S235JRG2
Architect: Prof. Ackermann
L’Arche de la Défense Lift Rail – Paris, France
Telekom Repräsentanz, Berlin (Germany)

Mullion and transom sections (heated)

Dimension: 60 x 60 mm with flange
Material: S235JRG2
Architect: Henze & Vahjen
Facade: Gartner, Timm
Shopping Mall Hertie, Munich, (D)

Triangular Hollow Steel Section
Dimensions: 130 x 60mm
Quality: S235JRG2
Architect: Heine & Prof. Breuer
Glass support: Musée de l’Orangerie – France

Material E 24-2
Commerzbank, Frankfurt - Germany

Hohlprofil

Dimension: 180 x 80mm
Material: S235JRG2
Architect: Sir Norman Forster
Facade: Gartner
Krankenhaus, Agatharied

Mullion and transom sections
Dimension: 35 x 65 mm - 50 x 65 mm
Material: S235JRG2
Architect: Irlen, Natterer
Engineering: Nickl & Partner
Facade: R & M
Lentille de la gare St LAZARE – France
RESEARCH AND DEVELOPMENT

- New project: Steel unitized system
- Complementary Technology
- Near-net shape Improvements
- New Materials
- Sustainability
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