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STEEL STRUCTURE  Single-Storey Buildings

The structure consists of columns and rafters made of welded or hot-rolled profiles, purlins and rails of cold-formed galvanized profiles.

PRIMARY FRAMING:
Primary framing consists of all the structural elements which transfer loads to the foundations.

Main frames consist of built-up welded primary framing members, including flange bracings, connection bolts and anchor bolts.

The bases of the intermediate frames are generally pinned, however, certain circumstances may dictate the use of fixed constructions.

Protection:
• All profiles are shot blasted to SA 2.5
• To afford protection during transportation and erection, all profiles receive a primer coat of 80 microns thickness, in either blue or grey.
• Optionally, corrosion protection paint can be provided, with a thickness of 100 microns.

SECONDARY FRAMING:
Secondary framing consists of the elements which support the roof and wall sheeting and which transfer loads to the primary framing:
• Roof purlins
• Wall girts
• Framings of openings

Purlins and girts are galvanized Z profiles, produced by cold roll forming.
• Connections are made using galvanized bolts
• Framing of openings essentially consist of Cold-formed L, C, U or Z galvanized profiles.

ADVANTAGES:
• Aesthetic profile
• Optimum clear space
• Easy adaptation of the building in case of modification or change of building use
• Fast and easy erection
• Purlins are cable trays
• Secondary framing galvanized as standard
Fast-build, sheltered, short construction period – Pre-engineered solutions

Large free span for optimum utilisation of the available floor - Flexibility of use: to extend-, or to change the use of the building or to incorporate new installation

Aesthetically pleasing
A building that reflects the customer’s ambition
STEEL STRUCTURE Multi-Storey Buildings

The structure consists of columns, beams and stabilization elements. Beams and columns are made of hot-rolled or welded profiles, purlins and rails of cold-formed, galvanized profiles.

STEEL STRUCTURE:
Columns are fixed to the foundations by anchor bolts embedded in the concrete.
Construction elements are connected to each other with galvanized, high-tensile steel bolts. All welded and hot-rolled construction elements are shot-blasted according to SA 2.5 and have an 80 micron primer coating in either blue or grey. Optionally, elements can be supplied hot-dip galvanized.

The design based on a 3 dimensional approach allows various structure options using narrow columns to meet customer requirements and optimize costs.

INODEK FLOOR BEAMS:
The floor elements are laid on INODEK beams connected to the columns by butt plates.

STABILIZING ELEMENTS:
The diaphragm effect of the floor elements, as well as the wind bracing in the roof ensure the horizontal stability of the building.

Depending largely on the arrangement of the façade, but also on the building use, vertical stability is provided by additional elements, combined under specific conditions; these may be:

• Cross bracing (the basic option, low cost and highly effective)
• A stabilization frame, which allows greater flexibility in the installation of doors and windows
• Concrete walls or concrete cores such as lift wells or staircases

ADVANTAGES:

• Few and narrow columns, therefore wide, empty floor spaces
• Low building height due to integrated beams
• 3D design for an optimised conception
• Quick and simple erection thanks to bolted connections
**Integrated** floor system (no protruding beams). **Easy and low-cost** installation of heating and ventilation systems

**Slim** structure - **Fast and easy erection** - Reduced floor depths and overall height of the building

**Wide free space** - **Flexibility** in design, both during construction and in use
LMR600
Standing seam roof mechanically fixed using unique sliding clips.

TECHNICAL SPECIFICATIONS:
• Consists of 600mm wide roll formed panels with a 70mm high corrugation
• The panel is fixed with a clip allowing linear and lateral expansion and contraction
• The flat side of the panel contains cross flutes improving the panel rigidity under foot traffic
• The panels are produced in 0.66mm nominal thickness Aluzinc coated high tensile strength steel
• Standing seam

COLOURS AND COATINGS:
• Aluzinc AZA (metallic coating)

ACCESSORIES:
In order to maintain the watertightness integrity and aesthetic appearance, a full range of accessories adapted to LMR600 roof systems have been developed:
• Skylights
• Smoke vents
• Ventilators
• Polycarbonate vaults
• Roof curbs
• Monovent

ADVANTAGES:
• The clip allows free expansion and contraction, thus avoiding any stress in the roof system
• Long-lasting, ultimate moisture tightness
• Side lap formed on site with a special seaming machine, crimping a 360° double-lock seam
• The panel is connected to the secondary structure with a special clip and roll formed on its top into the seam
• Once seamed the entire roof forms a monolithic metal membrane
• Thermal bridges reduced to spacing clips
Three effective systems

SINGLE SKIN ROOF WITH OR WITHOUT ISOBLOC:
- This system is the most cost-effective
- The insulation is made of soft faced glass fiber providing good acoustical comfort
- It is available with Isobloc and increased insulation thickness to improve overall thermal performance and reduction of thermal bridges

<table>
<thead>
<tr>
<th>Insulation (mm)</th>
<th>40</th>
<th>60+</th>
<th>80+</th>
<th>100+</th>
<th>120+</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-value W/(m²·K)</td>
<td>0,96</td>
<td>0,67</td>
<td>0,57</td>
<td>0,51</td>
<td>0,50</td>
</tr>
</tbody>
</table>

+= with Isobloc

SINGLE SKIN ROOF WITH BRIDGE:
- This system offers superior thermal efficiency and advanced condensation control by reducing the thermal bridge to a minimum. It also prevents the insulation being compressed at the location of the secondary framing elements
- It increases insulation thickness through spacer bridge

<table>
<thead>
<tr>
<th>Insulation (mm)</th>
<th>140</th>
<th>160</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-value W/(m²·K)</td>
<td>0,29</td>
<td>0,27</td>
<td>0,25</td>
</tr>
</tbody>
</table>

DOUBLE SKIN ROOF:
- It offers the best possible insulation up to 260mm
- It includes all the advantages of the bridge solution
- It has a solid and aesthetic appearance thanks to the internal panel that acts as vapour barrier, best fire rating
- Optional acoustic panel for increased noise absorption

<table>
<thead>
<tr>
<th>Insulation (mm)</th>
<th>120</th>
<th>140</th>
<th>160</th>
<th>200</th>
<th>260</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-value W/(m²·K)</td>
<td>0,33</td>
<td>0,29</td>
<td>0,25</td>
<td>0,20</td>
<td>0,17</td>
</tr>
</tbody>
</table>
LPR1000
Long span ribbed panel

TECHNICAL SPECIFICATIONS:
• Long span ribbed panel: coverage width 1000mm
• 0.50mm core thickness, high tensile strength steel – S550
• Fixed to the structure with self drilling stainless steel screws

COLOURS AND COATINGS:
• Aluzinc (metallic coating)  AZA
• Superpolyester 35 micron, colour 01 38 35

ACCESSORIES:
In order to maintain the watertightness integrity and aesthetic appearance, a full range of accessories adapted to LPR1000 roof systems have been developed:
• Skylights
• Translucent panels
• Smoke vents
• Ventilators
• Polycarbonate vaults
• Roof curbs
• Monovent

The side lap incorporates 2 key features:
• Full return under lapping corrugation to provide increased stability during fixing installation
• Tape sealer

ADVANTAGES:
• An economical and practical solution
• An increase of safety and watertightness thanks to the strength of its fixation
• Attractive and economical
• Easy to install
• Cost-effective energy efficiency
• Long-term performance

NB: please refer to the official colour chart for the exact colour
Three effective systems

SINGLE SKIN ROOF WITH OR WITHOUT ISOBLOC:
• This system is the most economical
• The insulation is made of soft faced glass fiber providing a good acoustical comfort
• It is available with Isobloc and increased insulation thickness to improve overall thermal performance and reduction of thermal bridges

<table>
<thead>
<tr>
<th>Insulation (mm)</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>80+</th>
<th>100+</th>
<th>120+</th>
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<tbody>
<tr>
<td>U-value W/(m²-K)</td>
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<td>0,94</td>
<td>0,81</td>
<td>0,60</td>
<td>0,49</td>
<td>0,42</td>
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</table>

+= with Isobloc

SINGLE SKIN ROOF WITH BRIDGE:
• This system offers superior thermal efficiency and advanced condensation control by reducing the thermal bridge to a minimum. It also prevents the insulation being compressed at the location of the secondary framing elements
• It increases insulation thickness through spacer bridge

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<td>0,31</td>
<td>0,29</td>
<td>0,26</td>
</tr>
</tbody>
</table>

DOUBLE SKIN ROOF:
• It offers the best possible insulation up to 260mm
• It includes all the advantages of the bridge solution
• It has a solid and aesthetic appearance thanks to the internal panel that acts as vapour barrier, best fire rating
• Optional acoustic panel for increased noise absorption

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</tr>
</thead>
<tbody>
<tr>
<td>U-value W/(m²-K)</td>
<td>0,33</td>
<td>0,29</td>
<td>0,25</td>
<td>0,21</td>
<td>0,17</td>
</tr>
</tbody>
</table>
POLAR roof system

The Polar roof is a complete roof system based on sandwich panels. It includes all necessary framed openings, fasteners and finishing flashings.

Polar panels consist of two profiled ribbed coated steel panels, produced by cold roll forming, between which a CFC-free polyurethane foam is factory injected.

Different insulation thicknesses and panel profiles are available within the Polar roof system. The U-values of the different products are those published by the panel manufacturers.

TECHNICAL SPECIFICATIONS:
Standard thicknesses: 40 to 130mm

COLOURS AND COATINGS:
Exterior finishes:
coating: Superpolyester 25 micron / HDS 35 micron
colours: 39 38 35

ACCESSORIES:
A full range of accessories adapted to Polar, Spacetec and Multitec roof systems have been developed to ensure an optimum watertightness and pleasing aesthetics:
- Skylights
- Translucent panels
- Smoke vents
- Polycarbonate vaults
- Roof curbs

N.B.: For the exact colour, please refer to the official colour chart.

ADVANTAGES:
- High degree of thermal insulation
- Aesthetical interior finish
- Quick erection
- Easy maintenance
- Large range of integrated accessories
- Fixed with stainless steel and self drilling screws
Spacetec/Multitec built-up roof systems

Both low pitch roof systems consist of ribbed steel panels and allow the application of a built-up roof system. The Spacetec roof system is purlin-free, the panels are directly fixed to the upper flange of the primary framing. The Multitec roof system is fixed onto purlins.

**Spacetec**

Spacetec does not require secondary framing. Slim, discrete compression tubes are installed on the lower flanges of the rafters to transmit the forces from the wind bracing tie rods. Framed openings are concealed within the depth of the roof panel. The thermal insulation depends on the type of the built-up roof.

**Colours and Coatings:**
Interior finishes: superpolyester in grey white

**Advantages:**
- Aesthetically pleasing interior aspect of the building roof: ideal for sports halls, airport buildings, supermarkets, showrooms, etc.
- Low pitch roof creates simple and economical parapets
- Reduced peak height
- Quick and easy erection
- Fully integrated accessories: skylights, smoke vents, polycarbonate vaults, roof curbs

**Multitec**

Multitec panel is fixed to the secondary framing by self-drilling screws. The panel overlaps are fastened with stitching screws. The secondary framing is normally Z purlins fixed with a 1.5m purlin spacing to the primary framing. The thermal insulation varies depending on the type of the built-up roof adopted.

**Colours and Coatings:**
Interior finishes: superpolyester in grey white

**Advantages:**
- Simple and economical parapets
- Can be used for complex roof shapes
- Economical rain water drainage
- High degree of thermal insulation (depending on the specification of the built-up roof system)
- Reduced peak height
- Fully integrated accessories: skylights, smoke vents, polycarbonate vaults, roof curbs
LPA900 - LPD1000 wall systems

The LPA900 - LPD1000 consist of ribbed steel panels, externally fixed to the secondary framing with self-drilling screws with composite nylon heads, coloured to match the sheeting.

Two external panels are available, LPA900 - LPD1000 offering distinct architectural aspects:

LPA900

<table>
<thead>
<tr>
<th>300</th>
<th>300</th>
<th>300</th>
<th>28.6</th>
</tr>
</thead>
</table>

COLOURS AND COATINGS:
Several exterior coatings are available (superpolyester 25 micron, HDS 35 micron)

Most used colours: 01 32 15
35 45 50

LPD1000

<table>
<thead>
<tr>
<th>333.3</th>
<th>333.3</th>
<th>333.3</th>
<th>38.1</th>
</tr>
</thead>
</table>

COLOURS AND COATINGS:
Several exterior coatings are available (superpolyester HDS 35 micron)

Most used colours: 01 38 35

INSIDE SHEETING
Two inside sheeting options are available, LPI1200, and the perforated LPG1000 for a pleasing interior finish and excellent sound absorption. Both panels hide the secondary framing.

| 200 1200 | 18.5 |

NB: for more colours please refer to the official colour chart.

ADVANTAGES:

- Economical, functional and durable construction
- Aesthetically pleasing panel with discreet ribbed profile
- Easy replacement of damaged panels
- Simple and quick erection
- High performance coatings
- Large range of integrated accessories
- All flashings and connecting parts

ACCESSORIES:
- single or double personnel doors,
- translucent panels,
- wall louvres,
- framed openings,
- flashings and trims…
Three effective systems

SINGLE SKIN WALL WITH OR WITHOUT ISOBLOC:
• This system is the most economical
• The insulation is made of soft faced glass fiber providing good acoustical comfort
• It is available with Isobloc and increased insulation thickness to improve overall thermal performance and reduction of thermal bridges
• Optional inside sheeting (plane LPI1200 or perforated LPG1000) can be fixed internally to conceal the secondary wall framing

<table>
<thead>
<tr>
<th>Insulation (mm)</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>80+</th>
<th>100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-value W/(m²·K)</td>
<td>0,91</td>
<td>0,79</td>
<td>0,61</td>
<td>0,54</td>
<td>0,45</td>
</tr>
</tbody>
</table>

+: with Isobloc

SINGLE SKIN WALL WITH BRIDGE:
• This system offers superior thermal efficiency and advanced condensation control by reducing the thermal bridge to a minimum. It also prevents the insulation being compressed at the location of the secondary framing elements
• It increases insulation thickness through spacer bridge
• Optional inside sheeting (plain or perforated) can be fixed internally to conceal the secondary wall framing

<table>
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<th>160</th>
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<td>0,30</td>
<td>0,29</td>
</tr>
</tbody>
</table>

DOUBLE SKIN WALL:
• This system offers the best possible insulation values up to a thickness of 160mm
• It includes all the advantages of the bridge solution
• The white faced internal liner panel provides a solid aesthetic appearance, acts as a vapour barrier and provides an improved fire rating over the faced insulation options
• Optional acoustic panels are available for increased noise absorption

<table>
<thead>
<tr>
<th>Insulation (mm)</th>
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<th>140</th>
<th>160</th>
</tr>
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<tr>
<td>U-value W/(m²·K)</td>
<td>0,32</td>
<td>0,28</td>
<td>0,24</td>
</tr>
</tbody>
</table>
Sinutec wall system

Sinutec wall consists of sinusoidal, colour-coated steel panels, produced by cold roll forming, fixed horizontally to the secondary framing with self-drilling screws.

TECHNICAL SPECIFICATIONS:
- Nominal thickness: variable
- Cover width: 988mm (13 modules of 76mm)
- Installation: Horizontal
  > Steel core: protected by a zinc coat (275 g/m²).
  > Exterior coating: superpolyester on top of a primer coat.

ASTROTHERM INSULATION:
Sinutec walls facilitate Astrotherm insulation placed between the panel and the secondary framing. The insulation values are:

<table>
<thead>
<tr>
<th>Insulation (mm)</th>
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<th>80</th>
<th>80+</th>
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<td>0.79</td>
<td>0.61</td>
<td>0.54</td>
<td>0.45</td>
</tr>
</tbody>
</table>

+= with Isobloc

INSIDE SHEETING:
Plain or perforated (acoustical) inside sheetings are available giving the wall a better appearance by encapsulating the secondary framing.

COLOURS AND COATINGS:
- Coating: Superpolyester 25 micron, HDS 35 micron
- Colours: 45  44  50

ACCESSORIES:
- Single or double personnel doors
- Truck doors
- Window frames
- Framed openings
- Wall louvers
- Flashings and trims

NB: For the exact colour, refer to the official colour chart.

ADVANTAGES:
- Aesthetically pleasing, horizontally installed panel
- Discreet external fixings
- High performance and ecological fibre glass insulation
- Inside sheeting to encapsulate secondary framing
- Perforated inside sheeting for noise absorption
- All flashings and connecting parts
Cassette wall system

The horizontal liner Cassette wall consists of cold-formed, colour-coated, ribbed steel panels fixed directly with special fasteners to the exterior flange of the building portal frames. The outside cladding can be erected vertically or horizontally.

TECHNICAL SPECIFICATIONS:
• Nominal thickness: variable
• Cover width: 600mm
• Depth of ribs: 120mm

SECONDARY FRAMING:
The Cassette liner wall system spans the full bay spacing without the need for any secondary framing. For small and medium-sized framed openings, the structure of the framed openings is concealed within the depth of the wall.

THERMAL INSULATION:
High density glass-fibre blankets have been specially developed for the cassette walls. The insulation also covers the panel overlaps. An additional Isobloc is installed at the overlaps for improved thermal performance.

COLOURS AND COATINGS:
Interior side: grey white superpolyester

ACCESSORIES:
A range of fully compatible accessories is available. They ensure complete watertightness and pleasing aesthetics:
• Single or double personnel doors
• Truck doors
• Window frames
• Framed openings
• Wall louvers
• Flashings and trims

ADVANTAGES:
• Attractive interior finish
• Simple and economical parapets, mainly in combination with low pitch roofs
• Framed openings concealed within the Cassette wall
• Allows horizontal or vertical cladding
• High performance thermal and acoustical insulation
• Quick erection
Polar wall system

The Polar wall is a complete wall system based on sandwich panels. It includes all necessary framed openings, fasteners and finishing flashings.

Different insulation thicknesses and panel profiles are available within the Polar wall system. They consist of two profiled ribbed coated steel panels, produced by cold roll forming, between which a CFC free polyurethane foam is factory injected. Tongue and groove jointing arrangement ensure watertightness.

TECHNICAL SPECIFICATIONS:
Panel thickness: up to 120mm
Cover width: 1,000mm
The U-values of the different products are those published by the panel manufacturers.

FIXING:
Polar panels are fixed vertically to the secondary framing by special screws, complete with colour matching composite nylon heads or, as an option, with hidden fasteners.

COLOURS AND COATINGS:
The Polar wall systems offer different coatings satisfying the various climatic requirements.
Exterior coatings and colours are those published by the panel manufacturer.
Interior coatings: Superpolyester in grey white

ACCESSORIES:
A range of fully compatible accessories is available for each of the Polar wall systems. They ensure complete watertightness and pleasing aesthetics:
• Single or double personnel doors
• Truck doors
• Window frames
• Framed openings
• Wall louvres
• Flashings and trims

ADVANTAGES:
• High degree of thermal insulation
• Aesthetical exterior and interior finishes
• Easy maintenance
• Quick erection
• Large range of integrated accessories
Sinutherm wall system

The Sinutherm wall is a complete wall system based on sandwich panels with sinusoidal corrugation on the exterior panel and a slightly ribbed interior surface.

Consisting of two coated steel panels, produced by cold roll forming, between which a CFC-free polyurethane foam is factory injected. Sinutherm panels are produced from steel, which is protected by a GALFAN coat on both sides and have a superpolyester or PVDF exterior coating.

TECHNICAL SPECIFICATIONS:
The vertical panel-to-panel joints are coated aluminium transition channels.
- Total panel thickness: 84mm
- Cover width: 1,000mm (8 modules of 125mm)
- Fire rating: B-s3, d0 according to EN 13501-1
- U-value: 0.34W/(m²*K)

FIXING:
The panels are fixed horizontally to sub-girts by means of self-drilling screws, which are hidden in the longitudinal overlaps. These overlaps have a factory applied watertight tape sealant.

COLOURS AND COATINGS:
The Sinutherm wall system offers different coatings satisfying the various climatic requirements
Exterior coatings: 25 micron:
- superpolyester in colour 50
- PVDF in colour 45 or 44
Interior coatings: light grey superpolyester

ACCESSORIES:
A range of fully compatible accessories is available for the Sinutherm wall system. They ensure complete watertightness and pleasing aesthetics:
- Single or double personnel doors
- Truck doors
- Window frames
- Framed openings
- Wall louvres
- Flashings and trims

ADVANTAGES:
- Architecturally pleasing, horizontally installed sandwich panel
- Hidden fixations
- High performance insulation
- Quick erection
- All flashings and connecting parts
Astrotherm insulation

Astrotherm insulation consists of a fibre glass blanket with a laminated vapour barrier. Isoblocs significantly reduce thermal bridges and Alustrip improves the overall appearance of the insulation joints.

FIBRE GLASS BLANKET:
Consists of a flexible blanket of high quality fibre glass, based on a thermo-setting synthetic resin with a homogeneous fibre fleece and long fibres, without residual or reused materials.
- Density: 16kg/m³
- Thermal conductivity: 0.037W/(m•K)
- Nominal thicknesses: 40, 60, 80 and 100mm
- Lengths: Factory cut-to-length rolls to suit each project
- Packaging: in perforated polybags and labelled for correct identification on jobsite

VAPOUR BARRIERS:
Consist of a glass-scrim reinforced film bonded to the fibre glass blanket. The vapour barrier is wider than the actual insulation width, creating overlaps strengthened by a double glass-scrim reinforcement (60mm) for stapling together.

ERECTION:
Astrotherm insulation is unrolled and stretched over purlins or girts (except in double skin roofs). The longitudinal assembly of layers is achieved by double stapling the two adjacent overlaps thus ensuring the continuation of the vapour barrier.

ADHESIVE:
The vapour barrier is bonded to the fibre glass blanket with an adhesive, which contains a fire retardant.

ISOBLOC:
Isoblocs are insulating strips made of extruded polystyrene boards. Isoblocs are located over purlins and girts and significantly reduce thermal bridges.

ALUSTRIP:
Alustrip is a colour coated strip stretched over purlins and located under the sidelaps of the layers, in order to ease erection and to improve interior aesthetics.

N.B.: delivery of Alustrip is optional

ADVANTAGES:
- Thermal and acoustic insulation
- High insulation values
- Tailor-made supply, minimal waste
- High density fibre glass for long-lasting quality
- Large range of vapour barriers
- Excellent fire classification
- Fast erection
### Definitions:

- **V1:** low flammability
- **V3:** high flammability
- **NG:** non-combustible
- **G1:** low combustibility
- **G3:** normal combustibility
- **D1:** low smoke formation
- **D2:** medium smoke formation
- **D3:** high smoke formation

### Vapour barrier specifications and EU fire ratings

<table>
<thead>
<tr>
<th>Type</th>
<th>Fire rating according to EN 13501-1</th>
<th>Definition</th>
<th>Specification highlights</th>
</tr>
</thead>
</table>
| ASA  | A1                                  | • painted alufoil
      |                                     | • glass scrim reinforcement
      |                                     | • aluminium film
      |                                     | • non-combustible
      |                                     | • light grey colour                |
| AVS  | A2-s1, d0                           | • painted alufoil
      |                                     | • glass scrim reinforcement
      |                                     | • PVC film
      |                                     | • excellent fire rating
      |                                     | • good appearance
      |                                     | • light grey colour
      |                                     | • good vapour permeability
      |                                     | • very good quality/price ratio    |
| MPS  | E                                   | • vinyl film
      |                                     | • glass scrim reinforcement
      |                                     | • metalized polyester film
      |                                     | • excellent appearance
      |                                     | • white colour
      |                                     | • light-reflecting
      |                                     | • easy to erect                    |
| KAS  | D-s1,d0                             | • alufoil
      |                                     | • glass scrim reinforcement
      |                                     | • kraft paper
      |                                     | • good fire rating
      |                                     | • good vapour permeability
      |                                     | • aluminium colour
      |                                     | • economical                       |

### Astrotherm U-values:

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-value W/(m²·K)</td>
<td>0,82</td>
<td>0,57</td>
<td>0,43</td>
<td>0,35</td>
</tr>
</tbody>
</table>

### Russian certification of fire safety

<table>
<thead>
<tr>
<th>Type</th>
<th>Inflammability</th>
<th>Combustibility</th>
<th>Smoke formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astrotherm without facing</td>
<td>NG</td>
<td></td>
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</tr>
<tr>
<td>Astrotherm with facing ASA</td>
<td>V1</td>
<td>G1</td>
<td>D1</td>
</tr>
<tr>
<td>Astrotherm with facing AVS + KAS</td>
<td>V3</td>
<td>G1</td>
<td>D2</td>
</tr>
<tr>
<td>Astrotherm with facing MPS</td>
<td>V3</td>
<td>G3</td>
<td>D3</td>
</tr>
</tbody>
</table>

**Definitions:**
- V1: low flammability
- V3: high flammability
- NG: non-combustible
- G1: low combustibility
- G3: normal combustibility
- D1: low smoke formation
- D2: medium smoke formation
- D3: high smoke formation
Hollow-core concrete solutions:

INODEK SYSTEM:
A floor beam system based on a steel frame which provides the full advantage of slim floor construction, yet avoids the disadvantages of downstanding beams:
• Pre-engineered and prefabricated elements
• Faster construction
• Spans up to 7.5m
• Anti-fire protection easy to achieve, only the lower flange has to be protected
• No downstand beams/no service obstruction

MONODEK SYSTEM:
Beams are designed to accept precast concrete slabs (hollow-core concrete elements).
• Spans between 5 and 9m
• Fast and easy erection
• Economical construction

In-situ concrete solution:

MULTIDEK SYSTEM:
Generally the concrete is cast on metal decking, which can be laid continuously, allowing design optimisation of sections to reduce weight and cost.
• Maximum flexibility for positioning and size of openings, even after completion of the mezzanine design and construction
• Multidek beam spans up to 9m
• Floor beam spacing are usually 3m

ADVANTAGES:
• Single source supply for mezzanine and building
• Integrated design of the mezzanine in the building
• Maximised use of building space
• Reduced construction time: simultaneous erection of mezzanine and the building
• Guaranteed quality by use of precast elements, in steel or in concrete
Crane rail beams

Perfectly adapted crane rail beams can be integrated in the Lindab Building structure.

STANDARD SUPPLY:
- Beams with rails 50 x 30mm fixed by intermittent welding
- All fixing components, cleats and fasteners
- Standard finish: shot blast SA 2.5 and shop primer 80 microns
- Static calculations and erection drawings

Options:
- Heavy-duty rails
- Laminated rails for easy replacement of the crane rail
- Continuous welding of crane rail to crane beam
- End stop, excluding rubber buffers
- Final paint

CRANE RAIL BEAMS DESIGNED FOR:
- Standard crane capacity: < 15 tons
- Standard crane span: < 25m
- Classification:
  - H2, B3 (according to DIN)
  - French group II (following CTICM)
- Span of beam: from 6 to 9m bay spacing, with a limit of 8m for crane capacity above 12.5 tons
- One crane per crane beam, or in case of several cranes, by adding spacers to preserve the design integrity of the beam.
- Crane types: I (single girder) and II (double girder)
- Hoisting tool: hook

NB: Higher classifications or loads on special request.

ADVANTAGES:
- Perfect integration in Lindab building
- Optimisation between bay spacing and crane beams span
- Single source supply for crane beams and building
- Integrated design of the crane rail beams in the building
<table>
<thead>
<tr>
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<th>Address</th>
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