

## Additional technical terms and conditions

### Bill of quantities for wall systems with *Hoesch Thermowand TL®*.

**Manufacturer: Hoesch Bausysteme (certified according to ISO 9001)**

Construction project name: .....

#### 1. General remarks

The subject of the tender is the delivery and installation of sandwich wall elements with polyurethane core layer (PUR) of the *Hoesch Thermowand TL®* type forming a heat-insulated wall system, except for cooling cells and cooling houses, as well as all other services necessary for a proper and work-manlike execution.

The quotation is based on the documents attached in the exhibits, like tendering documents, drawings, detailed sketches etc.

.....  
.....

Deliveries and supplies that the bidder considers necessary, which, however, are not or not completely contained in the bill of quantities, have to be determined and submitted via an additional quotation.

Power, water and sanitary facilities will be provided free of charge by the owner. Sufficient storage place will be made available on the installation site for storage of the building materials. There will be sufficiently stable, horizontal and plane subsoil on the installation site.

Special features:

.....  
.....

The building site address is:

.....  
.....  
.....

Accessing the building site will be via .....

.....

Type and nature of the subsoil allow the drive-in of truck-trailers and articulated trains (40 tons) as well as truck-mounted trains. The building site will be accessible from ..... sides.

Special conditions and impediments:

.....

In case of questions about technical and constructional issues, please contact:

..... Phone:.....Fax:.....

## 2. General assessment basis for the construction project

It is about the walls of (e.g. a storage or production hall)

.....  
consisting of **Hoesch Thermowand TL®** wall panels, classified as a „limited contribution to behaviour of fire“, (C-s3,d0 acc. to EN 13501-1).

Direction of laying: vertical

Substructure:  steel,  
 hot-rolled sections, steel grade S ....., profile .....,  
 cold-rolled sections, steel grade S ....., sheet thickness... mm  
 wood, quality grade .....,  
 wood glue structure  
 steel-armoured concrete, type .....,  
 with embedded fixation rail, type; .....

Building dimensions length: .....m  
width: .....m  
eave height: .....m  
parapet height: .....m  
ridge height: .....m

- Wind loads according to DIN 1055, part 4:  
 closed building structure  
 open building structure
- Wind loads according to EN 1991-1-4 (EC 1)  
Gust speed pressure  $q_p = \dots\dots\dots \text{kN/m}^2$   
 closed building structure  
 open building structure

or according to the requirements of the customer (Attach wind load specification as exhibit).

Expected interior room temperature: summer .....°C  
winter .....°C

Relative humidity (max.) interior of the hall: .....%

The corrosion protection of the sandwich elements has to comply with DIN 55634 or EN 10169 as well as the approval regulations (e.g. Z30.11-30). Multi-layer coatings have to comply with EN 508-1.

The CE identification mark acc. to EN 14509 is for providing evidence that the chosen corrosion protection system complies with the requirements according to DIN 55634 or EN 10169, and that the properties defined for this corrosion protection systems are fulfilled.

Further details on dimensioning and product descriptions will be given under the respective individual items.

### 3. Technical requirements

The construction execution will be governed by the prescriptions of this bill of quantities, the general technical regulations of VOB, the relevant standards, as far as applicable to the works, directives imposed by the construction inspectorate, government regulations, directives imposed by the trade association and working guidelines specified by the components and/or material manufacturers in their current version. Particular reference is made to:

VOB part C	General technical contract conditions for construction work (ATV)
DIN 1055 - 3	Load assumptions for buildings, travelling loads
DIN 1055 - 4	Load assumptions for buildings, travelling loads, wind loads in building structures in-sensitive to vibrations
DIN 1055 - 5	Load assumptions for buildings, travelling loads, snow and ice loads
DIN EN 1991-1-4	Impact on supporting structure, wind loads
DIN 4102	Fire behaviour of building materials and components
DIN 4420 - 1	Work and safety scaffolds; General rules; safety requirements, tests
DIN 4420 - 2	Work and safety scaffolds; ladder scaffolds; safety requirements
DIN 4420 - 3	Work and safety scaffolds; scaffold construction types, except for ladder and system scaffolds; Safety requirements and standard designs
DIN 4420 - 4	Work and safety scaffolds made of pre-fabricated components (System scaffolds); Materials, scaffold components, dimensions, load assumptions and safety requirements
DIN 4422 - 1	Movable working platform (travelling scaffold) made of pre-fabricated components; Materials, scaffold components, dimensions, load assumptions and safety requirements
DIN EN 10169-1, 2, 3	Flat steel materials with continuous organic coating
DIN EN ISO 12944-1	Corrosion protection of steel structures by coating systems, General, definition of terms, exposure to corrosion
DIN EN ISO 12944-2	Corrosion protection of steel structures by coating systems, classification of environmental conditions
DIN EN ISO 12944-5	Corrosion protection of steel structures by coating systems and painting, coating substances and protection systems
DIN EN 13501 - 1,2	Classification of building products and construction types by their fire behaviour
DIN EN 14509	Self-supporting sandwich elements with double-sided metallic final coatings
DIN 18201	Tolerances in civil engineering, definition of terms, principles, application, tests
DIN 18202	Tolerances in building construction, building structures
DIN 18203 - 2	Tolerances in building construction, pre-fabricated parts of steel DIN EN ISO 12944
DIN 18230	Structural fire protection in industrial constructions
DIN 18299	General regulations for construction work of all types
DIN 18338	Roofing and roof sealing work
DIN 55634	Corrosion protection of steel structures by coating systems and painting, corrosion protection for load-bearing, thin-walled components
DIN 9001	Quality management systems

Public-law construction regulations:

Approval by the construction inspectorate for connection elements for the use in structures with „cold-rolled sections“ made of sheet metal, in particular with steel sheet sections, approval no. Z-14.1-4 and the respective European technical approval ETA 04/0101

Approval by the construction inspectorate for connection elements for the use in structures with sandwich panels, approval no. Z-14.4-407.

Accident prevention regulations - Building trade associations

General regulations VBG 1

Construction work VBG 37

Safety rules and health protection rules for the installation of sectional panels, trade associations ZH/1/166

Ladders and steps VBG 74

IFBS guideline for the installation of sectional steel plates for roof, wall and ceiling structures

Working guideline of the manufacturer for the planned steel PUR sandwich element.

Item	Qty.	Object/work item	Price per unit [€]	Amount [€]								
		<p><b>Wall panels</b></p> <p>The „additional technical contract conditions“ with the subitems 1 to 3 are an integral part of this tender. The legally required safety equipment for the installation of the steel PUR sandwich elements are separately listed in the bill of quantities „Safety Equipment“.</p> <p>The following items apply to the building part(s):</p> <p>.....</p>										
.....	.....	<p><b>m<sup>2</sup> Hoesch Thermowand TL®</b> sandwich element, consisting of an outer and an inner steel cover shell, which is connected with a heat-insulating, flame-resistant PUR insulation core layer shear-stiff and fixed in a concealed manner.</p> <p>The Hoesch Thermowand TL® complies with the following technical regulations: DIN EN 14509, Approval for use Z-10.49-533. The products are manufactured and inspected for quality in accordance with the EPAQ quality certificates 09-02-01-01-0024.</p> <p>The product was certified with the environmental product declaration EPD according to ISO 14025, ISO 21930 and EN 15804 standards; declaration number EPD-TKS-2011311-D of the IBU.</p> <p><input type="checkbox"/> delivery ex-works  <input type="checkbox"/> delivery free on building site  <input type="checkbox"/> including installation, as well as the necessary mounting parts to connect to the existing substructure</p> <p>.....          (according to section 2 of the technical introductory remarks)</p> <p>Material thicknesses of the steel cover shells (standard)</p> <table border="0"> <tr> <td><b>Outer layer:</b></td> <td><b>Inner layer:</b></td> </tr> <tr> <td><input type="checkbox"/> t = 0.50 mm</td> <td><input type="checkbox"/> t = 0.40 mm</td> </tr> <tr> <td></td> <td><input type="checkbox"/> t = 0.50 mm</td> </tr> <tr> <td><input type="checkbox"/> t = .....</td> <td><input type="checkbox"/> t = .....</td> </tr> </table> <p>For special material thicknesses, delivery periods and quantities on inquiry.</p> <p><b>Corrosion protection:</b></p> <ul style="list-style-type: none"> <li>- Exposed side of the outer cover shell: (acc. to DIN 55634 and DIN EN 10169)</li> <li>- Corrosion resistance category: RC ..... R<sub>UV</sub> .....</li> <li>- Exposed side of the inner cover shell: (acc. to DIN 55634 and DIN EN 10169)</li> <li>- Corrosion protection class: CPI .....</li> <li>- required protection period: <input type="checkbox"/> H, <input type="checkbox"/> M, <input type="checkbox"/> L</li> </ul> <p>Corrosion protection of the surfaces of the steel cover shells is provided by the high-quality metallic ZM Ecoprotect coating or equivalent types of protection systems according to DIN 10346 and/or SEWO22. In addition, an organic tape coating acc. to DIN 55 634.</p>	<b>Outer layer:</b>	<b>Inner layer:</b>	<input type="checkbox"/> t = 0.50 mm	<input type="checkbox"/> t = 0.40 mm		<input type="checkbox"/> t = 0.50 mm	<input type="checkbox"/> t = .....	<input type="checkbox"/> t = .....		.....
<b>Outer layer:</b>	<b>Inner layer:</b>											
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	<input type="checkbox"/> t = 0.50 mm											
<input type="checkbox"/> t = .....	<input type="checkbox"/> t = .....											

Item	Qty.	Object/work item	Price per unit [€]	Amount [€]
		<p>Chosen <b>Coating system</b> <b>Shade:</b></p> <p><b>Outer layer:</b></p> <p>Standard: <input type="checkbox"/> PLADUR®-SP .....  <input type="checkbox"/> PLADUR®-PVDF .....</p> <p>Special: <input type="checkbox"/> PLADUR®-Relief .....  <input type="checkbox"/> PLADUR®-Relief iceCrystal .....  <input type="checkbox"/> PLADUR®-Relief stone .....  <input type="checkbox"/> PLADUR®-Wrinkle .....  <input type="checkbox"/> PLADUR®-Pearleffect <sup>PLUS</sup> .....  <input type="checkbox"/> ReflectionsOne® .....  <input type="checkbox"/> ReflectionsZinc® .....  <input type="checkbox"/> PVDF-3-4 layer .....  <input type="checkbox"/> .....  <input type="checkbox"/> Pladur L (Anti-graffiti) .....  <input type="checkbox"/> SP thick layer (plastic insulation).....  <input type="checkbox"/> .....</p> <p><b>Inner layer:</b></p> <p>Standard: <input type="checkbox"/> PLADUR®-DU RAL 9002  <input type="checkbox"/> PLADUR®-SP .....</p> <p>Special: <input type="checkbox"/> PLADUR® Agro 3 .....  <input type="checkbox"/> .....</p> <p>For special coatings, delivery periods and quantities on inquiry.</p> <p><b>Surface profiling</b></p> <p><i>Cover shell outside (A side):</i> trapezoid profile (T)</p> <p><i>Cover shell inside (B side):</i> slightly profiled (L)</p> <p>Delivery of the elements will be in commercial-type Packets are alternately stacked.</p> <p>Sealing of the longitudinal joints is provided by sealing tapes installed in the factory.</p> <p><b>Element thickness:</b></p> <p><input type="checkbox"/> d = 66 mm      <input type="checkbox"/> d = 96 mm</p> <p>U value: ≤.....W/m<sup>2</sup>K</p>		

Item	Qty.	Object/work item	Price per unit [€]	Amount [€]
		<p>The sandwich element <b>Hoesch Thermowand TL®</b> (Manufacturer: <b>Hoesch Bausysteme</b>, certified acc. to ISO 9001) has the following properties:</p> <p>Fire behaviour:  <input type="checkbox"/> <b>C-s3,d0</b> (limited contribution to behaviour of fire, acc. to EN 13501-1)</p>		
		<p><b>Structural frame:</b></p> <p>The <b>laying</b> of the elements ready for installation will be:  <b>vertically</b> on the existing supports, spacing ..... m</p> <p><input type="checkbox"/> single-span girder    <input type="checkbox"/> 2-span girder    <input type="checkbox"/> 3-span girder  <input type="checkbox"/> 4-span girder    <input type="checkbox"/> .....multi-span girder</p> <p>cantilever,                    <input type="checkbox"/> upside: .....m     <input type="checkbox"/> downside: .....m</p> <p>or sketches (enclosed as attachment)</p> <p><i>End support width:</i>                    <i>Intermediate support width:</i>  <input type="checkbox"/> ≥ 40 mm                                    <input type="checkbox"/> ≥ 60 mm  <input type="checkbox"/> .....mm                                    <input type="checkbox"/> .....mm</p> <p>The elements are designed for wind- and temperature load in accordance with the technical introductory remarks, section 2. (General dimensioning bases for the construction projects, wind load).</p> <p>Connection of the elements to the building substructure will be effected by means of bolts approved as per Z-14.4-407.</p> <p>The previously described wall elements, including all required fastening materials have to be supplied free on building site and installed on the building site substructure according to the Hoesch Bausysteme installation recommendation (Info no. 4.6.2) as well as in compliance with the technical rules issued by IFBS.</p>		

Item	Qty.	Object/work item	Price per unit [€]	Amount [€]
	linear m	<p><b>Intersection joint</b> Intersection joint design acc. to the details provided by Hoesch Bausysteme, consisting of:</p> <ul style="list-style-type: none"> <li>• Drip flashing, Part no.: K40-08... coated in the same shade as the panels.</li> </ul> <p>Sealing tapes have to be installed on either side of the transversal joint between element and substructure, part no.: Z70-A02.</p> <p>including supply and installation of all required sundries, sealing and mounting materials.</p>		
	linear m	<p><b>Bottom</b> Bottom design acc. to the details provided by Hoesch Bausysteme, consisting of:</p> <ul style="list-style-type: none"> <li>• Drip flashing, Part no.: K40-08... coated in the same shade as the panels.</li> </ul> <p>including supply and installation of all required sealing and mounting materials.</p>		
	linear m	<p><b>Outer / inner corner</b> Corner design acc. to the details provided by Hoesch Bausysteme, consisting of:</p> <ul style="list-style-type: none"> <li>• Outer corner Part no.: K40-10... or Part no.: K40-11...</li> <li>• Inner corner Part no.: K40-09... coated each time in the same shade as the panels,</li> </ul> <p>including supply and installation of all required sealing and mounting materials.</p>		
	linear m	<p><b>Parapet</b> Parapet design acc. to the details provided by Hoesch Bausysteme, consisting of:</p> <ul style="list-style-type: none"> <li>• Parapet cap Part no.: K40-12...</li> <li>• Holding angle acc. to sketch or Part no.: K70-031 coated each time in the same shade as the panels,</li> </ul> <p>including supply and installation of all required sealing and mounting materials.</p> <p>Provide the rear side of the panels with sufficient insulation and provide water-proof sealing to enclose it to the roof structure.</p>		

Specimen text for tenders on **Hoesch Thermowand TL®** wall panels

Item	Qty.	Object/work item	Price per unit [€]	Amount [€]
	linear m	<p><b>Verge</b></p> <p>Verge design acc. to the details provided by Hoesch Bausysteme, consisting of:</p> <ul style="list-style-type: none"> <li>• Verge profile                      Part no.: K30-07... coated in the same shade as the panels.</li> </ul> <p>including supply and installation of all required sealing and mounting materials.</p>		