



operating side of the operator panel

compressed air 1/2", 6 bar

connections for electric heating in the side wall

electrical power supply 3x400V, 50Hz, 175 kW (from below)

ventilating outlet for cooling down operation  $\phi 400$ , approx 3700 mm in height Temp. max. 300°C

switch cabinet 1200x500, 2000 height

intake air flap for cooling down operation

confirmed:.....

		zul. Abw. DIN ISO 2768		Fertigmasse	Maßstab 1:50	Position -	Menge -						
		<table border="1"> <tr> <td>Datum</td> <td>Name</td> </tr> <tr> <td>Bearb. 26.07.13</td> <td>MangC</td> </tr> <tr> <td>Gepr.</td> <td></td> </tr> <tr> <td>Norm</td> <td></td> </tr> </table>		Datum	Name	Bearb. 26.07.13	MangC	Gepr.		Norm		Layout HST-Ofen engl - Standard maximum glasssize 4200/4000x2500	
Datum	Name												
Bearb. 26.07.13	MangC												
Gepr.													
Norm													
Auftr.-Nr.: 45 240-50 86 00 000.dwg		Version - Blatt - - Bl											
Zust.	Änderung	Datum	Name	(Ers.f.)-		(Ers.d.)-							

- Flachglas – Maschinen und Anlagen
- Photovoltaik – Maschinen und Anlagen
- Logistik für Flachglas und Photovoltaik
- Entwicklung, Fertigung und Service



Torgauer Maschinenbau GmbH Solarstraße 29 04860 Torgau

**Quotation No. 18008500**

**Ravensby Glass Co. Ltd.**

West Pitkerro Industrial Estate  
 Mr. Hamish Ogilvie  
 8 Tom Johnston Road  
**DD4 8XD DUNDEE**  
 GROSSBRITANNIEN

Customer No. : 008174.005  
 Your reference : Mr. Hamish Ogilvie  
 Your phone No. : 0044 1382 4808 42  
 Your fax No. :  
 Our reference : Reinhardt Thomas/RE  
 Telephone : +49 (0) 34 21/72 05-28  
 E-mail : reinhardt@tmb-torgauer.de  
  
 Date : 2018-02-22  
 Title : HST-Ofen 4200x2500 engl.

**Your written inquiry dated 20.02.2018**

**Dear Hamish,**

many thanks for your inquiry dated 20.02.2018. We are pleased in submitting the following quotation to you:

Item	Quantity	Unit	Specification	Unit price	Net price
1	1.00	piece	<b>HST-Oven EK 4200 x 2500 mm incl. Digital recorder</b>		

consisting of:

1.1	1.00	piece	<b>HST-Oven EK 4200 x 2500 mm incl. Digital recorder</b>		
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Features:

- assembly space needed approx.: height: 4400 mm  
length: 5700 mm  
width: 2700 mm
- chamber volume: approx. 21 m<sup>3</sup>
- max. glass capacity: approx. 5,0 t
- inside dimensions of chamber approx.: height: 3100 mm  
length: 4400 mm  
width: 1600 mm
- clear door height: 3000 mm
- clear door width: 1600 mm
- max. glass size: 4200 mm x 2500 mm (perpendicularly)
- The oven consists of a single chamber electrically heated
- The glass sheets to be tested are put on a special stillage (Item 2) in vertical mode separated by spacers; the stillages are transported by means of pallet trucks into the test chamber and out respectively.
- residence time at 290 °C: adjustable
- The oven features a steel skeleton construction with optimum heat insulation incl. bottom insulation.
- The outside covering consists of steel sheet.
- The inside lining and air conducting devices are made of zinc galvanized steel sheet.
- The hot air is circulated by high-performance fans in order to achieve a homogeneous distribution of temperature.
- A forced air-flow guarantees an optimal heating of the glass.
- A fan is used for a rapid removal of the resting hot air after finishing the test.
- separate waste air outlet (duct to open air upon request)

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 BIC/Swift-Code: COBADEFFXXX  
 Sparkasse Leipzig  
 IBAN: DE80 8605 5592 2210 0171 84  
 BIC/Swift-Code: WELADE8LXXX

Geschäftsführer:  
 Eckhard Knöchelmann  
 Amtsgericht Leipzig, HRB 3887  
 USt.-IdNr. DE 141 737 497  
 Steuer-Nr. 239/121/00138



- Flachglas – Maschinen und Anlagen
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			<ul style="list-style-type: none"> <li>- The oven is equipped with a swivel door on front side which is locked mechanically and electrically (standard right hinged).</li> <li>- For the floorground a concrete plate is required with a capacity of 1500 kg/m<sup>2</sup>.</li> <li>- Bottom cavity (approx. 70 mm in depth) within the area of the oven place is to be provided in accordance with our instructions. Thus the oven flushes with the floorground.</li> <li>- Evenness of the floorground and the cavity respectively: <math>\pm 4</math> mm, but not more than 3 mm/m</li> <li>- Instead of a bottom cavity an access ramp can be provided as an alternative (option).</li> </ul> <p><u>Oven control:</u></p> <ul style="list-style-type: none"> <li>- PLC-control for the technological regimen and for monitoring</li> <li>- operating the oven via touch panel display</li> <li>- digital input of test temperature and holding time</li> <li>- standard test temperature 290 °C <math>\pm 10</math> °C (adjustable)</li> <li>- holding time: 1 - 10 h (adjustable)</li> <li>- digital preselection of heating-up and cooling-down time e.g. for different glass thickness and charging of the oven</li> <li>- automatical temperature guiding during heating-up and cooling down time</li> <li>- automatic loop control of the test temperature</li> <li>- a value limited thermostate observes the maximum oven temperature of 320 °C (adjustable)</li> <li>- digital preselection of starting time</li> <li>- The heat-soak test is exactly recorded for certification of the tested glass by a digital recorder.</li> <li>- After finishing the test the operating mode is automatically set to cooling.</li> <li>- release signal for unloading the glass</li> <li>- switch cabinet with main switch, fuse elements, control unit and recorder</li> </ul> <p><u>Digital recording:</u></p> <ul style="list-style-type: none"> <li>- Screen recorder for recording the test curves</li> <li>- graphical display for indicate the curves</li> <li>- Industrial USB-stick (2 GB) for saving the test data</li> <li>- original recordings protected against manipulations</li> <li>- at least one reserve channel for additional recordings</li> <li>- Interface RS232 is existing for exporting of the test data to a separate PC or host computer</li> </ul> <p><u>Supply features:</u></p> <ul style="list-style-type: none"> <li>- electrical power supply: 3 x 400 V <math>\pm 10</math> %, 60 Hz, TNC-s, PEN (other supplies upon request)</li> <li>- internal control voltage: 24 V DC</li> <li>- total power rating: approx. 175 kW</li> <li>- compressed air: 6 bar, dry, without oil</li> <li>- weight: approx. 7000 kg</li> <li>- permanent sound level: 78 dB(A)</li> <li>- max. ambient temperature: 35 °C</li> <li>- max. air humidity: 85 %</li> <li>- color: silver grey</li> </ul>		

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*The heat-soak-test oven is in accordance with the process-technical requirements of the European standard EN 14179-1 (E):09/2005, the German "Bauregelliste 2014/2" as a rule for manufacturing of tempered glass (ESG-H) as well as DIN 18 516, part 4 and is designed and manufactured according to the valid European standards (CE). Our warranties comprising a glass surface temperature of 290 °C ± 10 °C.*

1.2 1.00 piece **Interface RJ45-Ethernet**

- prepared for connection between digital recorder of the HST-oven and customer side computer network

**STILLAGE VERSION FOR SPECIAL COATED GLASS**

2 1.00 piece **HST-A-Bar-Stillage 4000 mm length for coated glass (special design)**

consisting of:

2.1 1.00 piece **HST-A-Bar-Stillage 4000 mm length for coated glass (special design)**

Technical parameters:

- Capacity: 5,0 t
- Length: approx. 4000 mm
- Width: 1300 mm
- Total height: approx. 3000 mm
- Loading height approx. 2600 mm
- Back bearer height: approx. 2600 mm
- Base bearer length: approx. 475 mm each side
- Number of back bearers: 10 pcs each side
- Number of base bearers: 10 pcs each side
- Distance between bearers: approx. 440 mm
- back bearer angle: approx. 3°
- Angle between back and base bearers: 93°
- back bearers: spacer bars (see Item 3)
- Supporting material of the base bearers: Teflon strips
- 9 pcs double-row perforated strip above and below per side
- Hole pitch: approx. 30/15 mm, staggered
- no craning possible in loaded condition
- excluding spacer bars
- Surface treatment: untreated
- delivered with unassembled A-frames

**including:**

- forklift pockets at the long side

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2.2	1.00	set	<b>fixed wheels on one side and ball reception on the other side for floor transport of the stillages</b>  - floor transport alternatively with: • lever roller (see separate item) • forklift adapter (see separate item) • special tractor - incl. wheel position shifted to the end of the trolley		
3	150.00	piece	<b>Spacer bars</b>  - Ø 20 mm - length: approx. 2600 mm - core material: steel tube - tubes covered with heat-resistant material		
<b>Option:</b>					
4	1.00	piece	<b>Lever roller for easy floor manipulation of the stillage with wheels</b>  (only empty stillages or for light load)		
5	1.00	piece	<b>Packing and Transport DAP Dundee/Scotland</b>  with 1 Special flat bed truck		
6	1.00	piece	<b>Installation, commissioning and training with 1 supervisor form TMB in Dundee/Scotland</b>  - qualified fitters and electricians from customer side free of charge - incl. training and acceptance - incl. traveling expenses, flight, accommodation - excl. transportation in customers country only		
<b>Option:</b>					
7	1.00	piece	<b>Calibration of the HST-Oven according to EN standards</b>  - necessary for glass export to the European Union - execution under production conditions on site at the customer - procedure in accordance with European Standard EN14179-1 (E) 09/2005, Annex A, page 24-34 - 20 measuring points per load - procedure for 100 % and 10 % load - helpers from customer side free of charge for the whole time of calibration - calibration report in English language - execution of the calibration directly after Installation, so that no additional travel expenses occur		

**Net Value (without options, Item 4 and Item 7):**

**All prices in brackets [ ] are option prices and must be added to the total price if the respective option is selected.**

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Not included in this quotation:

- provision of free space for construction
- possibly necessary construction works (roof and wall openings and their sealing)
- media supply to interface oven
- supply of hoisting machinery, crane, forklift etc.
- pavement work
- helpers free of charge
- costs for certification

*For possible tests the glass is to provide by customer.*

- Documentation: 1 set in English (on paper, or usual data storage medium)

**Training and Acceptance test**

The Customer has to provide the necessary and suitable material and personnel for Training and Acceptance test. Training and Acceptance test take place without interruption directly after installation and commissioning.

- Delivery Period: Approx. 5 - 6 months ex factory Torgau, after receiving your written purchase order and down payment and after complete clarification of all technical specifications.
- Pricing Conditions: DAP Dundee/Scotland  
incl. packing, transport, installation, commissioning and training  
excl. value added tax
- Payment Terms: 30 % down payment  
60 % before delivery against documents  
10 % after acceptance, but latest 6 weeks after delivery
- Grace Period: 30 days after rendering account, down payment immediately
- Warranty: 12 months (excluding wear parts)  
Precondition for warranty are properly executed care and maintenance procedure.
- Validity: without engagement

If not otherwise agreed the "General terms and conditions of the TMB" are to apply. You can find this at our website [www.tmb-TorgauerMaschinenbau.de](http://www.tmb-TorgauerMaschinenbau.de) or request it by phone under +49 (0) 3421 72 05 25.

We trust this quotation is in accordance with your requirements and we would be pleased to be of service to you. However, should you have any queries, kindly do not hesitate to contact the writer.

Yours faithfully

Eckhard Knöchelmann  
General Manager

Thomas Reinhardt  
Sales Dept.

This offer is valid without signature if sent by e-mail.