

**INVITATION TO BID NO. 15002553 AO/MP
PROJECT MP/ROM/06/005**

TECHNICAL SPECIFICATIONS

**FOR THE PURCHASE AND SUPPLY OF GLASS-LINED
EQUIPMENT TO PHASE OUT THE CTC IN THE
PRODUCTION OF
DI(2-ETHYLHEXYL) PEROXYDICARBONATE (DEHPC) AT
OLTCHIM S.A., ROMANIA.**

1. AIM OF THE PROJECT

The project has been designed to phase out CTC at the DEHPC production of Oltchim S.A. Romania. DEHPC is used in CTC solution as a catalyst. The project will phase out the use of 120.45 ODP MT of Carbon tetrachloride (CTC) at Oltchim S.A. Ramnicu Valcea, Romania.

2. ENTERPRISE BACKGROUND

Oltchim S.A. is one of the largest basic material manufacturer and petrochemical companies in Romania. Owned 95% by the state Oltchim manufactures chlorinated products from chlorine and petrochemicals.

3. CONSTRUCTION MATERIALS FOR THE EQUIPMENT

Considering the corrosive nature of the phosgene and hydrochloric gas used/produced in the manufacturing processes, and also the explosive nature of the Hydrogen peroxide and DEHPC used/manufactured, the construction materials used for producing reactors and containers shall be selected and manufactured very carefully. Any heavy metal content in the products may result not only loss in the quality of the product, but also a decomposition that may result in a explosion.

4. SPECIFICATION OF SCOPE OF EQUIPMENT AND SERVICE

The Technical Specifications shall be used for the purchase and supply of equipment to produce DEHPC at Oltchim S.A. Romania in order to phase out the CTC. This document specifies the scope of supply of goods.

The Contractor shall inform UNIDO in its BID on the origin of equipment.

Pressure equipment shall be certified according to Romanian and EU legislation (DIN 28063:1999).

Also the Contractor shall transfer clear proofs together with its BID that it can comply with the requirements of the certificates and documents in the list as follows:

- CE Certification, Marking and Declaration of Conformity to the EEC directives as follows: Pressure equipment directive: 97/23/EC, Dangerous substances and explosive atmospheres regulations;
- Machinery (98/37/EC);
ATEX Directive (94/9/EC: ATEX II 3G);
- Code Mechanical design calculations.

The Contractor shall also comply with the following specifications:

- Any glass-lined autoclave and their parts and accessories shall be pores-free and free from any defects on their glass-lining;
- Glass lining shall resist to Hydrochloric acid vapor better than 0.04 mm/year according to DIN 51157, ISO 2743;
- Only screws with galvanic defending layers shall be used for connections;
- Any electric motors shall pass ATEX II 3G requirements
- Any autoclave shall have sight glass meeting DIN 7080 with illumination lamp meeting ATEX II 3G manufactured by Max Müller;
- Any autoclave shall have double acting cartridge mechanical seal Acc. to DIN 28136/ DIN 28137/ DIN 28.

The Contractor shall transfer together with its BID:

- Spare part list for commissioning and 1 year together with the prices.
- Drawings of equipment needed for erection: main dimensions/weights, nozzle details/dimensions, allowable loads and weight.

The Contractor shall transfer - within maximum 4 weeks from the contract awarding - the detailed drawings of the equipment, to be used for civil works and mechanical detailed design engineering

The Contractor shall attach documents together with the equipment when transported to Oltchim

- Inspection and testing plan to be used after the equipment installed and operating
- Weld procedure specs and qualifications for manufacturing the equipment
- Weld map details
- Installation, maintenance and operation manual for the equipment
- Packing and preservation procedure for the equipment
- Surface cleaning and preparation procedure for the equipment
- If the equipment is under PED requirements, to be included are also the general assembly drawing with the main design parameters (temperature, pressure, working fluid), and also the detailed design of the equipment manufacturing, and the drawing for the name plate
- Conformity statement of the manufacturer and CE stamp on the nameplate

Further details of the equipment are given in Annex 1.

5. SERVICE

The Contractor shall provide clear evidence with the bid of its ability to ensure the completeness of its service ability.

Price given in the bid shall cover:

- cost of equipment including cost of documentations
- service manuals and operating manuals
- packing and transportation cost, included also the transport insurance, according to INCOTERM 2000, DDU Ramnicu Valcea, Romania
- cost of spare parts and detailed spare parts list with price break down.

6. ELECTRICITY SUPPLY

220/380 V, 50 Hz

Any electric part of the EQUIPMENT shall meet ATEX II 3D.

7. TIME SCHEDULE

Equipment shall be delivered up to maximum 4 months after the placement of the Purchase Order.

8. SCOPE OF SUPPLY

The contractor must endeavor to submit complete offer for the whole equipment as described above as in the Annex 1. However, due to the shortage of the project funds partial offers will be also considered as well as the selection of the cheapest equipment items among all the bids received.

As required in the Purchase Order, the supplier shall provide complete lists of spare parts for the equipment together with their prices and delivery periods, including those provided by sub-suppliers. The price of these spare parts shall include labeling and packaging for preservation for a period of one (1) year in the destination country based on the agreed Incoterm DDU Ramnicu Valcea Republic of Romania.

9. SERVICES FOR INSTALLATION, COMMISSIONING, TRIAL RUNS AND START-UP

Installation will be performed by local companies, which will be involved in commissioning, trial runs and start-up. Electrical design will be also provided by a local company, which will also specify the control and monitoring equipment needed for technological line operation. However, the supplier shall provide control and monitoring devices specified in the Annex 1 together with the equipment because these devices should be assembled on the equipment.

Installation and commissioning costs should not be included in the supplier's offer. The Supplier can offer site technical assistance for the installation/start-up of the delivered equipment, if considered necessary, with the specification if it is free of charge or the daily man day tariff.

10. CERTIFICATES

The Contractor shall provide certificates, which shall clearly state how they refer to the identified part of equipment.

11. WARRANTY

EXTENT OF THE WARRANTY

The Contractor warrants that the equipment is in accordance with all the requirements of the Technical Specifications, new, of first quality, of tested design, safe and fit for purpose and use for which it is intended under the Technical Specifications.

WARRANTY PERIOD

The equipment or any part of it is warranted for a minimum period of 24 months from the date of receipt at Oltchim's stores of the equipment or 18 months from the date of commissioning, whichever ever is later.

Table of Scope of Supply

UNIDO ITB No. 15002553 AO/MP MP/ROM/06/005						
UNIDO REQUIREMENTS		TO BE COMPLETED BY THE INVITEE				
Item	Name and required parameters	Qty.	Unit price	Total item price	Compliance	Remarks**)
			US\$	US\$	yes/no	
	I. Equipment, parts, supplies					
1.	Glass-lined Phosgenation Reactor BE 16001 –Item R-102	1				
2.	Glass-lined Phosgenation Reactor BE 16001–Item R-103	1				
3.	Product storage jacketed tank – Item L-108	1				
4.	Product tank for feeding – Item L-210	1				
5.	Phosgene degassing column packing Item C-106	1				
6.	Balance for agitated reactors Items R-226/1, R-226/2, R-226/3	3				
	Sub-total:					
	II. Transportation costs DDU Ramnicu Valcea					
	Total price DDU Valcea Ramnicu					

Annex 1. DETAILED REQUIREMENTS FOR THE EQUIPMENT TO BE SUPPLIED

Position: R-102

Function: Phosgenation reactor

Type: BE-1600 or CE 1600 according to DIN 28136

Construction material: glass-lined steel

Nominal volume: 1600 l

Working regime continuous

Density of the inside fluid: 1000 kg/m³

Type cylindrical, vertical

Supporting: Steel legs

Heat exchanger surface: min. 7,1 m²

Working pressure: in the vessel: -1 / +6 bar

in the jacket: -1 / +6 bar

Working temperature: in the vessel: -20 C° / + 200 C°

in the jacket: -20 C° / + 200 C°

Agitation system: rpm: 120 as a minimum

baffle with installed Pt-100 thermometer

shaft seal: double mechanical seal

gearbox with motor

Special requirement: minimal volume of agitation is 100 Liter.

dip pipe for phosgene gas inlet: glass-lined inside-outside, inner diameter 40mm, reaching a volume in the reactor as low as 300 Liter

Discharge bottom valve

NOTE: The reactor needs temperature and pressure measurements devices as well as any safety devices required by the law.

Position: R-103

Function: Maturation reactor

Type: BE-1600 or CE 1600 according to DIN 28136

Construction material: glass-lined steel

Nominal volume: 1600 l

Working regime continuous

Density of the inside fluid: 1000 kg/m³

Type cylindrical, vertical

Fixing and Supporting: Side supports Steel legs

Heat exchanger surface: min. 7,1 m²

Working pressure: in the vessel: -1 / +6 bar

in the jacket: -1 / +6 bar
Working temperature: in the vessel: -20 C° / + 200 C°
in the jacket: -20 C° / + 200 C°
Agitation system: rpm: 120 as a minimum
baffle with installed Pt-100 thermometer
shaft seal: double mechanical seal
gearbox with motor
Special requirement: minimal volume of agitation is 100 Liter.
dip pipe for phosgene gas inlet: glass-lined inside-outside, inner
diameter 40mm, reaching a volume in the reactor as low as 300 Liter
Discharge bottom valve

NOTE: The reactor needs temperature and pressure measurements devices as well as any safety devices required by the law.

Position: L-108 (please, see also below TECHNICAL SPECIFICATIONS)

Function: Product storage jacketed tank

Flanges: according to DIN 3*N25 and 1*N50 on the cover as a minimum
Construction material: glass-lined steel
Nominal volume: 800 Liter
Type cylindrical, vertical
Density of the inside fluid: 1000 kg/m³
Supporting: Side support, Steel legs
Working pressure inside: hydrostatic
Working temperature inside: 5 C° / + 25 °C
Working pressure in the jacket: -1 – 6 bar
Working temperature in the jacket: -20 – 40 °C
Discharge bottom ball valve N40
Level measurement: Construction material: PTFE-lined
Type: swimmer

NOTE: The tank needs temperature and pressure measurements devices as well as any safety devices required by the law.

TECHNICAL SPECIFICATIONS

Equipment: storage tank
Item: L108
No. of pieces : 1
Function: storage 2-ethylhexyl chloroformate

PROCESS DATA

Fluid name	2-ethylhexyl chloroformate
Temperature (°C)	5-25
Density at 25 °C (kg/m ³)	980
Pressure (bar a)	hydrostatic

TANK DATA

Working regime	continuous
Type	cylindrical, vertical, with jacket
Nominal volume (l)	800
Process connection	flange acc. DIN, sealing surface, acc. DIN 2526 Form C
Accessories	inspection hole, bottom valve
Material	glass lined steel
Fixing and supporting data	steel legs
Placement	inside

The offer should also specify:

- catalogues and technical drawings for erection
- the weight of the tank

Position: L-210

Function: Product tank for feeding

Flanges: according to DIN 2*N25 and 1*N50 on the cover as a minimum

Construction material: glass-lined steel

Nominal volume: 1500 Liter

Type : cylindrical, vertical

Density of the inside fluid: 1000 kg/m³

Supporting: Side support, Steel legs

Working pressure: hydrostatic

Working temperature: 5 C° / + 25 C°

Discharge bottom ball valve N25

Level measurement: Construction material: PTFE-lined

Type: swimmer

NOTE: The tank needs temperature and pressure measurements devices as well as any safety devices required by the law.

Position №: C-106

Function: Phosgene degassing column packing

Diameter: 300 mm

Packing type: ordered packing, Mellacarbon 350.Y

Plates (theoretic) needed as a minimum: 13

Maximum height: equiv. to Type LA, as on the drawing No. 20-2561 from Lampart catalogue

http://www.lampart.hu/gyartmanyok/Lampart_katalogus.pdf

Packing should be fit into the column available

Special requirement: Liquid distributor for the packing

Position №: R-226/1, /2, /3

Function: Balances for the agitated reactors for finished product preparation, for measuring the mass of isododecane and crude DEHPC during the dilution operation. Three pieces.

The balances are for the three reactors of 100L each, equiv. to Type AE/M1, drawing No. 20-2563 from Lampart catalogue

http://www.lampart.hu/gyartmanyok/Lampart_katalogus.pdf

Measuring limit: Depends on the mass of the reactor

Type: Electronic tank balance with 3 pcs measuring cells