Bid Evaluation Report

Name of Procuring Agency	Agriculture, Supply & Prices Department, Government of Sindh, through Directorate Agriculture Engineering, Sindh, Hyderabad.
Tender Reference No:	TENDER NOTICE NO. DAE/STORES-970/3727/17 DATED: 14.11.2017
Tender Description/Name of work/item	***Pre-qualification of Contractors for the Installation of:-*** i. Controlled Atmospheric Store on Turnkey basis. ii. Hot Water Treatment Plant on Turnkey basis. Under ADP Scheme # 32 (2017-18) **"Preservation and Storage Facility of Fruits & Vegetable through Hot Water Treatment & Controlled Atmospheric Store on Subsidy to Farmer in Sindh"**
Method of Procurement	As per Sindh Public Procurement Regulatory Authority Rules 2010. (amended 2013 & 2017)
Tender Published	**Tender Notice was published in Newspapers:-** ▪ Daily Aass dt: 16-11-2017 ▪ Daily Sadae Sindh dt: 16-11-2017 ▪ Daily Sobh dt: 17-11-2017 ▪ Daily Business Recorder dt: 17-11-2017
Total Bid documents Sold	04 firms
Total Bids Received:	03 firms
Technical Bid Opening date:	12.12.2017.
No. of Bid technically qualified	02 Nos.
Bid(s) Rejected	01 No.
Financial Bid Opening date	02.03.2018,

Bid Evaluation Report:

COMPARISON WITH PC-I APPROVED RATES

S No	*Name of Firm or Bidder*	*Cost offered by the Bidder*	*Ranking in terms of cost*	*Comparison with Estimated cost*	*Reasons for acceptance/ rejection*	*Remarks*
0	1	2	3	4	5	6
	INSTALLATION OF CONTROLLED ATMOSPHERIC STORE					
1.	M/s Izhar Steel Pvt. Ltd. Lahore	Rs. 200,000,000 Per Unit	Ist Lowest	Offer is in-line with the estimated cost in PC-I	Lowest evaluated bid	Accepted as Lowest Evaluated bid as per SPPRA Rule 48
	INSTALLATION OF HOT WATER TREATMENT PLANT					
1.	M/s Bachani & Company, Hyderabad	Rs. 9,000,000 Per Unit	Ist Lowest	Offer is **12.59%** higher than the estimated cost in PC-I but within the permissible limited of 15%	Lowest evaluated bid	Accepted as Lowest Evaluated bid as per SPPRA Rule 48

SIGNATURES OF THE MEMBERS OF THE PROCUREMENT COMMITTEE.

(SHEIKH SHAKIL AHMED)
Director
Agriculture Engineering
Sindh, Hyderabad
CHAIRMAN

(FARRUKH RASHEED ANSARI)
ADDITIONAL DIRECTOR (ENGG)
DIRECTORATE GENERAL, AE&WM
SINDH HYDERABAD
MEMBER

(SAIFULLAH MAGSI)
Additional District Accounts Officer-i
District Accounts Office,
Hyderabad, **MEMBER**

(MUMTAZ AHMED SIDDIQUI)
DEPUTY DIRECTOR (MECH)/HQ
Agriculture Engineering Sindh
Hyderabad **MEMBER / SECRETARY**

(MUSARRAT MOKHTAR)
Deputy Director (Inspection)
Industries & Commerce Department,
Government of Sindh, Karachi **MEMBER**

GOVERNMENT OF SINDH
AGRICULTURE, SUPPLY & PRICES
DEPARTMENT

NOTIFICATION

No.13(347)SO(DEV:)/2013: In supersession of this department's Notification of even number dated 06-02-2017 in pursuance of rule – 7 of SPP Rules 2010, Government of Sindh, Agriculture, Supply & Prices Department is pleased to reconstitute a Procurement Committee for the schemes / Projects of Agricultural Engineering Sindh with following composition and Terms of References:-

I. COMPOSITION

1.	Director, Agricultural Engineering, Sindh, Hyderabad.	Chairman
2.	Mr.Farrukh Rasheed Ansari. Additional Director (Engg), Directorate General, AE&WM, Sindh Hyderabad.	Member
3.	Representative of Industries and Commerce Department GoS, Karachi.	Member
4.	District Accounts Officer / Representative of District Accounts Officer, Hyderabad.	Member
5.	Deputy Director (Head quarter), Agricultural Engineering Sindh Hyderabad.	Member/Secretary

II. Terms of References:

i. Prepare bidding documents.
ii. Carry out Technical as well as Financial evaluation of the bids.
iii. Prepare evaluation report as provided in Rule – 45 of SPPRA.
iv. Make recommendations for the award of contract to the Competent authority.
v. Perform any other function ancillary and incidental to the above as per SPPRA Rules.

SAJID JAMAL ABRO
SECRETARY TO GOVT. OF SINDH

No.13(347)SO(DEV:)/2013 **Karachi, dated the 28-02-2018**

A copy is forwarded for information and necessary action to:

1- The Secretary to Government of Sindh, Industries Department, Karachi.
2- The Managing Director, Sindh Public Procurement Regulatory Authority, Karachi.
3- The Director General, Agricultural Engineering & Water Management Sindh, Hyderabad.
4- All Members of Committee.

(ABDUL AZIZ CHANNA)
DEPUTY SECRETARY (TECH:)

C. c. to:-

- P.S. to Minister Agriculture, Supply & Prices Department, Govt. of Sindh, Karachi.
- P.S. to Secretary Agriculture, Supply & Prices Department, Govt. of Sindh, Karachi.

GOVERNMENT OF SINDH
AGRICULTURE, SUPPLY &
PRICES DEPARTMENT

NOTIFICATION

No.13(347)SO(DEV.)/2016: In supersession of this Department Notification of even number Dated 22.3.2013 and in compliance with Rule 31 of SPP Rules, 2010, Government of Sindh, Agriculture, Supply & Prices Department is pleased to re-constitute a Committee for Complaint Redressal with the following composition and terms of reference:-

I. COMPOSITION:

1-	Director General, Agricultural Engineering & Water Management Sindh, Hyderabad.	Chairman
2-	Col. (Rtd.) Zia Siddiqui (An Independent Professional).	Member
3-	Representative of Office of the Accountant General Sindh, Karachi.	Member

II. Terms of References:-

i. Committee may examine the complain of bidder as per SPPRA Rules.

ii. The Complaint Redressal Committee upon receiving a complaint from an aggrieved bidder may, if satisfied:

a. Prohibit the procurement committee from acting or decision in a manner, inconsistent with these rules and regulations;

b. Annual in whole or in part, any authorized act or decision of the procurement committee; *and*

c. Reverse any decision of the procurement committee or substitute its own decision for such a decision;

Provide that the Complaint Redressal Committee shall not make any decision to award this contract.

iii. The committee shall announce its decision within seven days. The decision shall be intimated to the bidder and the Authority within three working days by procuring agency. In case of failure of the committee to decide the complaint the procuring agency shall not award the contract.

iv. The procuring agency shall award the contract after the decision of the Complaint Redressal Committee.

v. Mere fact of lodging of a complaint shall not warrant suspension of the procurement proceedings.

DR. SAEED AHMED MANGNEJO
SECRETARY TO GOVT. OF SINDH

Contd: P/2

P/2

No.13 (347) SO (DEV:)/2017. Karachi, dated the 05-01-2017

A copy is forwarded for information & further necessary action to:

1. The Principal Secretary to Governor of Sindh, Karachi
2. The Principal Secretary to Chief Minister Sindh, Karachi
3. The Accountant General Sindh, Karachi
4. The Managing Director, Sindh Public Procurement Regulatory Authority, Karachi
5. The Additional Secretary (Staff) to Chief Secretary, Sindh, Karachi
6. The Director General, Agricultural Engineering & Water Management, Sindh, Hyd.
7. The Director General, Agriculture Extension Sindh, Hyderabad
8. The Director General, Agriculture Research Sindh, Tandojam.
9. Members of the Committee

(ABDUL AZIZ CHANNA)
DEPUTY SECRETARY (TECH.)

C.c. to:

1- P.S. to Minister Agriculture, Supply & Prices Department, Govt. of Sindh, Karachi.

2- P.S. to Secretary Agriculture, Supply & Prices Department, Govt. of Sindh, Karachi.

DIRECTOR GENERAL (AE&WM) SINDH HYDERABAD

ANNUAL PROCUREMENT PLAN OF DIRECTORATE AGRICULTURE ENGINEERING SINDH HYDERABAD FOR FISCAL YEAR 2017-18

Rs. in Million

Sr. No.	Description of Procurement	Quantity (Where Applicable)	Estimated Unit Cost (Where Applicable)	Estimated Total Cost	Funds Allocated	Source of Funds (ADP / Non-ADP	Proposed Procurement Method	Timing of Procurement				Remarks
								1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	
1	**ADP # 28** Provision of Assistance to Farmers on Purchase of Wheel Type Tractors Phase-IV (SDG # 2)	5492 Nos. Wheel Type Tractors	-	Rs. 1500.0 Million	Rs. 1500.0 Million	ADP	Pre-qualification of Tractors Manufacturers	✓	✓	-	-	All Procurement under SPPRA Rules and subjected to the Release of funds.
2	**ADP # 29** Provision of Solar Water Pumps / Tubewells on Subsidized Rate to Farmers in Sindh. (Revised) GOS Share Rs. 802.00 Million Farmers Share Rs. 198.00 Million Total Rs. 1000.00 Million. (SDG # 2, 6)	138 Nos. Solar Water Pumps	-	Rs. 563.858 Million	Rs. 563.858 Million	ADP	Pre-qualification of Contractors	✓	✓	-	-	All Procurement under SPPRA Rules and subjected to the Release of funds.
3	**ADP # 30** Replacement of Earth Moving Machinery Phase-III (SDG # 2)	32 Nos. Bulldozers & Allied Transportation Equipment	-	Rs. 600.0 Million	Rs. 600.00 Million	ADP	Single Stage Two Envelope Procedure	✓	✓	-	-	All Procurement under SPPRA Rules and subjected to the Release of funds.
4	**ADP # 31** Subsidy Assistance on Agriculture Implements for Farm Mechanization Phase-II. (SDG # 17)	555 Nos. Various Agriculture Implements	-	Rs. 60.0 Million	Rs. 60.0 Million	ADP	Pre-qualification of Manufacturer / Supplier	-	✓	✓	✓	The different of cost would be adjusted through re-appropriation All Procurement under SPPRA Rules and subjected to the Release of funds.
5	**ADP # 32** Preservation and Storage Facility of Fruits & Vegetable through Hot Water Treatment & Controlled Atmospheric Store on Subsidy to Farmers	02 Nos. Hot Water Treatment Plant 02 Nos. Controlled Atmospheric Stores	-	Rs. 336.00 Million	Rs. 242.027 Million	ADP	Pre-qualification of Manufacturer / Supplier	-	-	✓	✓	All Procurement under SPPRA Rules and subjected to the approval of Scheme and release of funds.

Sr. No.	Description of Procurement	Quantity (Where Applicable)	Estimated Unit Cost (Where Applicable)	Estimated Total Cost	Funds Allocated	Source of Funds (ADP / Non-ADP	Proposed Procurement Method	Timing of Procurement				Remarks
6	**ADP # 34** Provision of Assistance to Farmers on Purchase of Wheel Type Tractors Phase-V (SDG # 2)	1832 Nos. of Wheel Type Tractors	-	Rs. 500.0 Million	Rs. 500.0 Million	ADP	Pre-qualification of Tractors Manufacturers	✓	✓	-	-	All Procurement under SPPRA Rules and subjected to the Release of funds.
7	**ADP # 35** Provision of Power Drilling rigs Machine on Hire Charges basis to Farmers in Sindh (SDGS # 1, 2, 6)	01 No. Power Drilling Rigs & Allied Transportation Equipment	-	Rs. 130.0 Million	Rs. 100.00 Million	ADP	Single Stage Two Envelope Procedure	✓	✓	-	-	All Procurement under SPPRA Rules and subjected to the Release of funds.
8	**ADP # 37** Strengthening Agricultural Engineering through Capacity Building of Staff, Youth Entrepreneurship through Technology Support (SDGS # 1, 2, 6)	Procurement of Furniture, Machinery & Equipments for the 14 Agriculture Engineering Workshops	-	Rs. 200.0 Million	Rs. 200.00 Million	ADP	Single Stage Two Envelope Procedure	✓	✓	-	-	All Procurement under SPPRA Rules and subjected to the Release of funds.
9	**ADP # 38** Provision of Combined Harvester, Wheat and Paddy on (50%) Subsidy to Farmers in Sindh (SDGs # 17) (GOS Share Rs. 300.00 Million + Rs. 284.500 Million)	08 Nos. Combined Harvesters + 10% Spare Parts	-	Rs. 75.0 Million	Rs. 75.00 Million	ADP	Single Stage Two Envelope Procedure	✓	✓	-	-	All Procurement under SPPRA Rules and subjected to the Release of funds.

DIRECTOR
AGRICULTURE ENGINEERING SINDH
HYDERABAD

MINUTES OF THE MEETING FOR THE MEETING OF PROCUREMENT COMMITTEE HELD ON 18-01-2018 AT 02:00 PM, IN THE COMMITTEE ROOM OF DIRECTOR, AGRICULTURE ENGINEERING SINDH, HYDERABAD TO EVALUATE THE PRE-QUALIFICATION DOCUMENT OF TENDER NOTICE NO. DAE/STORES-971/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE & HOT WATER TREATMENT PLANT (2017-18)

Meeting started with the name of Almighty Allah.

List of participants attached.

The Chairman welcomed all the participants of the meeting and asked the Member / Secretary to brief the participants about the agenda of the meeting.

INSTALLATION OF CONTROLLED ATMOSPHERIC STORE ON TURNKEY BASIS

The Pre-qualification documents were opened on 12.12.2017, 03 (three) firms submitted their pre-qualification document, after detailed technical evaluation, the procurement committee declares the pre-qualification document of (1) M/s S.M. Engineering & Contractor, Quetta technically Non-responsive and declares the proposals of following firms as technically responsive.

1. M/s Izhar Steel Pvt. Ltd. Karachi
2. M/s T.S. Builders Pvt. Ltd. Karachi.

INSTALLATION OF HOT WATER TREATMENT PLANT ON TURNKEY BASIS

The Pre-qualification documents were opened on 12.12.2017, 03 (three) firms submitted their pre-qualification document, after detailed technical evaluation, the procurement committee declares the pre-qualification document all three firms as Technically responsive.

1. M/s Izhar Steel Pvt. Ltd. Karachi
2. M/s T.S. Builders Pvt. Ltd. Karachi.
3. M/s Bachani & Company, Hyderabad

The Procurement committee advised the department to inform all qualified / disqualified firms about the result and hoist the technical evaluation report & financial document on SPPRA website.

MEMBER / SECRETARY
PROCUREMENT COMMITTEE

NO. DAE/STORES-971/ 311 /18 Dated: 19 /01/2018.

C.C. to:

- The Director General Agricultural Engineering & Water Management Sindh, Hyderabad for kind information.
- The Additional Secretary (Tech) Agriculture Department Government of Sindh Karachi for kind information.
- PS to Secretary Agriculture Department Government of Sindh, Karachi for kind information.
- Member Procurement Committee _____ (All).

MEMBER / SECRETARY
PROCUREMENT COMMITTEE

LIST OF MEMBERS OF PROCUREMENT COMMITTEE PARTICIPATED IN THE TECHNICAL EVALUATION MEETING OF PRE-QUALIFICATION DOCUMENT AGAINST TENDER NO. DAE/STORES-971/3727/17 DATED 14.11.2017 FOR THE PRE-QUALIFICATION OF CONTRACTORS FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE & HOT WATER TREATMENT PLANT HELD ON 18.01.2018 IN THE COMMITTEE ROOM OF DIRECTOR, AGRICULTURE ENGINEERING SINDH

S. #.	NAME	DESIGNATION	SIGNATURES
01	**SHEIKH SHAKIL AHMED**	**Director,** Agriculture Engineering Sindh, Hyderabad	IN CHAIR
02	**SHAKIL AHMED RAHEMOON**	**Director,** Water Management, Hyderabad Division **MEMBER**	
03	**SAIFULLAH MAGSI**	Representative of District Accounts Officer, District Hyderabad **MEMBER**	
04	**MUSARRAT MOKHTAR**	**Deputy Director (Inspection)** Industries & Commerce Department, Government of Sindh, Karachi **MEMBER**	
05	**MUMTAZ AHMED SIDDIQUI**	**Deputy Director (Mech)** Agriculture Engineering Sindh Hyderabad **MEMBER / SECRETARY**	

EVALUATION CRITERIA AGAINST TENDER NOTICE NO. DAE/STORES-970/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS/FIRM FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE FOR THE YEAR (2017-18)

S #	Description	M/s T.S. Builders Pvt. Ltd. Islamabad	M/s Izhar Steel Pvt. Ltd. Karachi	M/s SM Engineers & Contractors, Quetta
1	Type of Bidders	Private Limited	Private Limited	Proprietor
2	Complete Address with Telephone Numbers & email address of local partners.	Provided	Provided	Provided
3	Complete Address with telephone Numbers & email of Turnkey Partner and Foreign Partner.	Provided	Provided	Not Provided
4	Registration Certificate of PEC in a category of C3 or above, in a sub categories of BC01, ME01 & ME06.	Provided	Provided	Provided
5	Registration Certificate from Income Tax (FBR) NTN of Local Partners.	Provided	Provided	Provided
6	Registration Certificate from Sales Tax (FBR) Local Partners.	Provided	Provided	Provided
7	Registration Certificate from Sindh Revenue Board (SRB) Local partners.	Provided	Provided	Provided
8	Registration of Chamber / Federation / SECP (Valid Certification)	Provided	Provided	Not Provided
9	Evidence of completing Turnkey basis assignment in last three years (At-least one) Local/abroad. (Evidence from Capital manufacturer is acceptable).	Provided	Provided	Not Provided
10	Evidence indicating the firm is in business since last 3 years Local / Abroad.	Provided	Provided	Not Provided
11	Evidence from the Turnkey Partner of its Establishment from chamber of commerce.	Provided	Provided	Not Provided

S #	Description	M/s T.S. Builders Pvt. Ltd. Islamabad	M/s Izhar Steel Pvt. Ltd. Karachi	M/s SM Engineers & Contractors, Quetta
12	Evidence of Sole representation /Certificate/letter from the Turn key Partners.	Provided	Provided	Not Provided
13	Provision of After sales & Service (Provide complete details of Capabilities).	Provided	Provided	Not Provided
14	Provision of Warranties on Installed Equipment / Structure.	Provided	Provided	Provided
15	Provide complete Mechanism / Road Map for the Installation	Provided	Provided	Not Provided
16	Standards / Certifications from IEC / ISO or equivalent	Provided	Provided	Not Provided
17	Audited Financial Reports of last three years.	Provided	Provided	Not Provided
18	Detailed Presentation for the execution of turnkey project.	Provided	Provided	Not Provided
	STATUS	**QUALIFIED**	**QUALIFIED**	**DIS-QUALIFIED**

SIGNATURE OF THE PROCUREMENT COMMITTEE

(SHEIKH SHAKIL AHMED)
Director, Agriculture Engineering
Sindh, Hyderabad
CHAIRMAN

(SHAKIL AHMED RAHEMOON)
DIRECTOR, Water Management,
Sindh Hyderabad
MEMBER

(SAIFULLAH MAGSI)
Additional District Accounts Officer-i
District Accounts Office,
Hyderabad
MEMBER

(MUMTAZ AHMED SIDDIQUI)
DEPUTY DIRECTOR (MECH)/HQ
Agriculture Engineering Sindh
Hyderabad
MEMBER / SECRETARY

(Musarrat Mokhtar)
Deputy Director (Inspection)
Industries & Commerce Department,
Government of Sindh, Karachi
MEMBER

COMPARISON OF OFFERED PRODUCTS AGAINST TENDER NOTICE NO. DAE/STORES-970/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS/FIRM FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE FOR THE YEAR (2017-18)

Technical Requirement of the Procuring Agency	M/s T.S. Builders Pvt. Ltd. Islamabad	M/s Izhar Steel Pvt. Ltd. Karachi	M/s SM Engineers & Contractors, Quetta
i. Installation and erection of pre-engineered building ▪ Pre engineered building of 20,000 sq ft ▪ Electrical panel room 3000 sq ft ▪ Chiller platform ▪ Foundation for Pre Engineered Building ▪ Gas tight flooring ▪ Over head and under ground water tank	8 Room =s: 14 x 6,6 x 6,4 h mts (C.A. rooms) 1 room: 4x 3 x h mts (0 room) 1 room: 33 x 20 x 6 h mts (Processing room) 1 corridor: 27 x 5 x 4 h mts	Izhar Steel Pvt. Ltd. install all items mentioned in Section I	The number of cold stores, the storage capacity, the dimensions and the volume, 08 CA Store for storing +- 125 tons of apples or pear per store, volume +-565m^3 The capacity of a CO^2 scrubber / adsorber is determined depending on the product to be store the quantity and the storage conditions. 1000 Tons | Apples or pears | 35 kg per 100 tons
ii. Machinery & equipment: **Controlled Atmosphere Storages for 1000 Ton** ▪ 8 rooms of 14,00 x 6,60 x 6,40 H (meter) ▪ 1 0°C room of 3,00 x 4,00 x 3,00 (meter) ▪ 1 corridor of 27,00 x 5,00 x 4,00 (meter) ▪ 1 processing room 20,00 x 33,00 x 6,00 (meter) **Panelling** Prefabricated sandwich panels of polyurethane foam contained within galvanized or prepainted sheet metal. The	Panel thickness 120 mm PV/PV, durface of 2.318m2 (for C.A. rooms) Polyurethane Average density 38-40kg/m3 Coefficient of thermal conductivity 0.020 w/m°K (=0,017 Kcal/mh°C) Global coefficient of thermal conductivity (re: hickness 10mm) 0,020 W/m°K(=0,017 Kcal/mh°C) Compression strength 1.8-2.5kg/cm2 Flame propagation resistance (Self-extinguishing) : according to ASTM 1692 norms Heat and hot bending resistance : 127°C Dimensional stability : from -50°C to 100°C CFC free	Polyurethane panels are fire friendly, cause cancer in humans and its chemicals causes damage to Ozane layer therefore are abandoned worldwide. World Health Organization already imposed sanctions o 141B which is blowing agent chemical in manufacturing of Polyurethane. Manufacturing of Polyurethane manufacturing machine till 2019 including from Pakistan. Polyurethane is replaced with fireproof, human and nature friendly polyiscoyanurate (PIR) panels. Izhar Steel is the only manufacturer of PIR panels in Pakistan. For CA Store project of Sindh Government. Izhar Steel will install modern PIR panels according to International Standard instead of Polyurethane panels. All the panels. Accessories, doors and windows mentioned in section in section it	Based on these details which you supplied we have calculated a total CO^2adsorber with a capacity of 400 kg net per 24 hours. The capacity of the PSA nitrogen generator is determined in part by the size of store, the number of stores and the time during which the pull-down (oxygen reduction) must occur. The duration of the pull-down with a besseling UP1 22 PSA nitrogen generator is shown below. The calculation is based on the volume of the 565m^3 cold store with a cell fill of 100%. The oxygen consumed by the fruit has not been taken into account here. Cold Store Protection and accessories:- During the storage season a col store is constantly subjected to changing circumstances which can directly affect the atmospheric condition in your cold store. Besseling provides well considered solutions for optimum protection.

panels are used for building the room walls and ceiling.

Panels with injected joints
Panel thickness 120 mm LZ/LP, surface of 2318 m^2

Panels with dry joints
Panel thickness 120 mm LP/LP, surface of 196 m^2 *(for corridor)*
Panel thickness 120 mm LP/LP, surface of 1134 m^2 *(for processing room)*
Panel thickness 120 mm LP/LP, surface of 42 m^2 *(for 0° cold room)*

Panel characteristics:
Polyurethane
- Average density 38-40kg/m^3
- Coefficent of thermal conductivity 0.020 W/m°K (=0,017 Kcal/mh°C)
- Global coefficent of thermal conductivity (re: thickness 100mm) 0,020 W/m°K (=0,017 Kcal/mh°C)
- Compression strength 1.8-2.5kg/cm^2
- Flame propagation resistance (self-extinguishing) : according to ASTM 1692 norms
- Heat and hot bending resistance : 127°C
- Dimensional stability : from -50°C to + 100°C
- CFC free
- It does not degrade in time
- It does not absorb smells

It does not degrade in time
It does not absorb smells

Galvanized sheet metal
"SENDZMIR" system. The sheet metal is suitably profiled to give the necessary stiffness to the panels.
The sheet metal is top quality, 5/10 thick.

Polyurethane
-Average density : 38-40kg/m3
-coefficient of thermal conductivity: 0,020 Wm°K (=0,017 kcal/mh°C)
-Global coefficient of thermal conductivity (re: thickness 100mm): 0,020 Wm°K (=0,017 kcal/mh°C)
-Compression strength: 1.8-25kg/cm2
-Flame propagation resistance (Self-extinguishing: according to ASTM 1692 norms
-Heat and hot bending resistance: 127°C
-Dimensional stability: from -50°C to + 100°C
-Percentage of closed rooms: 90% minimum
-CFC FREE
-It does not degrade in time
-It does absorb smells

Galvanized sheet metal
Hot galvanized sheet metal according to "SENDZMIR" system. The sheet metal is suitably profiled to give the necessary stiffness to the panels. The steel used is FE E250 GZ 150 type A according to EURONORM regulations 10147-92. The sheet metal is top quality, 5/10mm thick, tolerances according to UNI regulations 5753-5.1.1.3.

Preprinted sheet metal
The sheet metal is suitably profiled to

will be provided and installed according to the specification of client.

Our range is geared to practical experience and comprises all the components required, designed for years of trouble free operation. After all good CA/ULA storage demands the best quality in cold store protection and accessories.

Buffer lung:
Because of changing air pressures resulting from atmospheric changes and temperature differences(incl. cooling actions), the volume of air in the cold store is continuously subjected to underpressure and overpressure. A flexible air buffer, also known as a 'buffer lung', is installed to compensate these small pressure differences. The excess air in the cold store is captured in it (at overpressure) and, if necessary (at underpressure) returned to the cold store. This prevents the undesired penetration of oxygen-rich air.
- Buffer lung volume 4 m^3 for a store volume up to 600 m^3
- Made from flexible PU
- Dimensions 360 x 115 cm (length*diameter)
- Sleeve diameter 135 mm for fitting to a 125 mm PVC pipe

Flange Ø 125 mm:
Besseling flanges ensure a gas-tight seal and 90 degree connection to the cold store. We recommend one flange outside and one flange inside the cold store.

Overpressure valve Ø 160 mm:
Cold stores should be fitted with an overpressure valve to protect against excessive overpressure. The Besseling overpressure valve has a diameter of 160 mm which means that more air can be transported than with a 125 or 110 mm overpressure valve. In short: better protection.
- Set to 10 mm water column pressure
- Connection Ø 160 mm / area 200 cm^2

Flange Ø 160 mm
Besseling flanges ensure a gas-tight seal and 90 degree connection to the cold store. We recommend one flange outside and one flange inside the cold store.

Galvanized sheet metal

"SENDZMIR" system. The sheet metal is suitably profiled to give the necessary stiffness to the panels.
The steel used is FE PO2 GZ 150 NA according to EURONORM regulations 142-79.
The sheet metal is top quality, 5/10 thick.

Pre-painted sheet metal

The sheet metal is suitably profiled to give the necessary stiffness to the panels.

The pre-painted film is 25 ± 3 microns on the exposed surface and 5 microns on the internal surface. The base sheet metal, hot galvanized using the Sendzemir system, is of the type FE E250 GZ 200 – A conform with Euro norms 10147-92; it is phosphate and treated with primer and then painted. The colour is half brilliant white 21; the painter used is non toxic as it does not contain lead and cadmium. The global migration test results are under the maximum value accepted by the Ministerial Decree 21/03/73 and following amendments.

Hardness: - ECCA T4 - Equivalent to "F" on the Koh-i-Noor scale.

Gloss: - ECCA T2 - Specular gloss: 30 ± 5% measured on the GARDNER gloss meter with 60° angulation.

Forming strength: - ECCA T7 - There are no flaws on folds with T over 2.5.

give the necessary stiffness to the panels.
The repainted film is 25± 3 microns on the exposed surface and 5 microns on the surface.
The base sheet metal is hot galvanized according to "SENDZIMR" system, type FE E250 GZ 150 type A, according to EURONRM regulations 10147-92 and it is phosphate, treated with printer and then painted.
The sheet metal is painted with semi-gloss white color 21; the paint is non-toxic as it does not contain lead and cadmium, the values resulting from the Global Migration Test are lower than the higher limit provided by the D.M. (Departmental Execute order) of March 21, 1973 and subsequent amendments.
Hardness: - ECCA T4 – Equivalent to "F" on the koh-i-Noor scale.
Gloss: -ECCA T2 – Specular gloss: 30 ±5% measured on the GARDNER gloss meter with 60 angulations.
Forming strength: -ECCA T7- There are no flaws on folds with T over 2.5.
Environmental strength: After 10 years there will be no color difference over 8 Celiab units of measure.

The CHALKING value will not be lower than "6" on the scale ASTM D 659 regulation. The sheet metal is top quality, 510mm thick, tolerances according to UNI regulations 5753-5.1.1.3.

Reaction to fire
The panel is classified as "0" (zero) – "3" (three) according to the D.M. f June 26, 1984 and Subsequent D.M. of January 14,1985.
Assembly
Place the panels next to one another, then

Store connection with screw cap Ø 50mm:

A store connection is primarily used for leak testing, additional temperature measurements and any supply of gases.
Ø 50 mm connection with screw cap
Including 2 flanges for gas-tight fitting

Micro pressure gauge including sample valve:

A micro pressure gauge is used to measure over- or under-pressure (mm H^2O) in the cold store during the storage process, and is also used during testing of the cold store for gas-tightness. The store connection with sample valve can be used to take periodic test-measurements of the gas conditions in the CA cold store.
- Ø 12 mm connection
- Including 2 flanges for gas-tight fitting
- Measurement range +25 to -/-25 mm H^2O

O2 - Oxygen
Lowering the oxygen content inhibits the fruit's respiration. When the oxygen content is too low however, the fruit will suffocate resulting the entire content of the cold store being considered as lost. Supplying oxygen (aeration) is therefore required to ensure that the oxygen level in the cold store does not fall too low. Reason enough to choose the security of Besseling.

Aeration ventilator with underpressure valve Ø 160 mm
The Besseling aeration ventilator introduces dosed oxygen-rich fresh air into the cold store using a toggle switch, timer or an external gas measurement station such as the Besseling ACS for example. We are offering a separate aeration ventilator in combination with an underpressure valve for each CA cold store.

Environmental strength: After 10 years there will be no colour difference over 8 Celiab units of measure.
The CHALKING value will not be lower than "6" on the scale of ASTM D 659 regulation.
The sheet metal is top quality, 5/10 thick.

Reaction to fire
The panel belongs to the class "0 (zero) – 2 (two)", conforming with the Ministerial Decree 26/6/84 und following M.D: 14/1/85.

Assembly Accessories for injected joints
- Fixing hooks;
- Galvanized and/or pre-painted joint coverings;
- Stiff PVC spacers;
- Galvanized and/or prepainted angulars;
- Screws and rivets;
- Polyurethane for the joints;
- All other necessary assembly components.

Assembly for dry joint panels

Place the panels next to one another, then insert them in one another;
- In the joint insert the soft gasket or silicone to close it;
- White joint coverings made of soft PVC are to be fixed on the joints, both on the internal as well as on the external face of the panel;
- Angular sheets are to be assembled in the intersections between walls and ceilings, fixed with self-drilling screws or

insert them in one another;
In the joint insert the soft gasket or silicone to closer it;
White joint coverings made of soft PVC are to be fixed on the joints, both of the internal as well as on the external face of the panel;

The advantages of aerating using an external ventilator are:
✓ Energy-efficient aeration during filling of the cold store when the oxygen content is too low or when the CO2 content is too high.
✓ Aerate every cold store individually.
✓ No loss of capacity of the CO2 adsorber.
✓ Simple and accurate introduction of oxygen during the storage period.
✓ Before the CA store is opened an aeration ventilator can ensure that a safe oxygen level is achieved and that the store can be entered without danger.

The aeration ventilator has a built-in underpressure valve with a diameter of 160 mm meaning that more air can be transported than with a 125 or 110 mm underpressure valve.
- Connection Ø 160 mm / area 200 cm²
- Power rating 230 V, 75 watts
- Air capacity 370 m³ per hour at 100 Pa
- Underpressure valve set to 10 mm water column pressure .

Flange Ø 160 mm
Besseling flanges ensure a gas-tight seal and 90 degree connection to the cold store. We recommend one flange outside and one flange inside the cold store

CO2 - Carbon Dioxide

During respiration fruit and vegetables convert oxygen into CO^2. An important effect of an increased CO^2 content is the inhibition of respiration. However, if the CO^2 level is too high this can damage your precious product and it will thus have to be removed.

aluminium rivets;
- All corners are to be filled with polyurethane foam injected using a suitable machine.

Assembly Accessories for dry joint panels

- Gaskets and/or silicone;
- Galvanized and/or pre-painted angular;
- Screws c/w anchors and rivets;
- Polyurethane for the corners;
- All other necessary assembly components.

CO^2 adsorber

A Besseling CO^2 adsorber disposes the surplus of carbon dioxide without changing the low oxygen percentage in the cold store. During adsorption the low-oxygen air flows out of the store through the adsorber and in doing so the CO^2 molecules bind with the active carbon in the adsorber. The CO^2 scrubbed air then flows back into the cold store. When the active carbon is fully or partially saturated it will be regenerated (cleaned) using fresh air. Extending this regeneration time will limit the transfer of ethylene between the various cold stores to a minimum.
After regeneration the adsorber vessel is filled with oxygen-rich fresh air which could return to the store in the next adsorption process. However, the adsorber lung developed by Besseling replaces the oxygen-rich air with low-oxygen air. The most important advantages of this are:
✓ Minimum introduction of oxygen during the entire process.
✓ No use of air from the cold store to make the adsorber low-oxygen. This can, after all, cause underpressure resulting in unwanted oxygen from outside.
The Besseling CO^2 adsorber operates using "recipes" in which various processes can be set. A separate recipe can be set for each store which facilitates storing and optimally treating a different product per store.

A built-in timer can ensure that the adsorber treats the store a number of times each day. In addition, the adsorber can be controlled fully automatically by an external gas measurement station such as the Besseling ACS for example.

Besseling combines a frequency controlled low-pressure ventilator with the correct diameter PVC pipe.It reduces the energy consumption to a minimum.This is a significant advantages as theCO^2 absorber is running for most of the day.

For your application we recommend a Besseling CO2 adsorber, type USC 805:

- Capacity 400 kg CO^2 net per 24 hours
- Power rating 1,6 - 3 kW (400 V, 3 phases)
- Average power consumption 2,5 kW
- Connection diameter for PVC pipes and double valves 125 mm
- Volume of the adsorber lung 8 m^3, made from flexible PU
- Dimensions 2150 x 1400 x 2050 (width*depth*height)
- Weight 1120 kg

For your application we recommend a Besseling CO2 adsorber, type USC 805:

- Capacity 400 kg CO^2 net per 24 hours
- Power rating 1,6 - 3 kW (400 V, 3 phases)
- Average power consumption 2,5 kW
- Connection diameter for PVC pipes and double valves 125 mm
- Volume of the adsorber lung 8 m^3, made from flexible PU
- Dimensions 2150 x 1400 x 2050 (width*depth*height)
- Weight 1120 kg

Double valve CO2 adsorber

The CO^2 adsorber is connected to the cold stores by a PVC pipe system. For a gas-tight connection between each store and the adsorber we supply a Besseling double valve which opens and closes automatically during a "adsorber action". Our double valves are controlled electronically by the adsorber and are driven by a pneumatically powered rotary actuator. Our double valves are characterised by the high degree of operational security and a long service life from:

- ✓ Shape-retaining, pressed aluminium housing.
- ✓ EBRO rotary actuator, made for intensive use under extreme conditions.
- ✓ Butterfly valve specially ground for the application.
- ✓ Specifically developed EPDM rubber for gas-tight sealing of the butterfly valve. The diameter of the double valve is adapted to the capacity of the CO^2 adsorber. If the diameter is too small air friction will introduce too much heat into the CA cold store. On the other hand, an overly large double valve would be unnecessary expensive.
- Diameter 125 mm
- Including 4 flanges for gas-tight fitting to the store
- Pneumatically actuated at 8 bar compressed air
- 24 V control from the CO2 adsorber control unit

Gas-sealing with special paint on panels joints Gas sealing of the controlled atmosphere rooms is achieved by applying a white-coloured polymeric elastic product with high adhesion and resistance to all joints of the internal surfaces (ceilings and walls). Panel joints and ceiling and floor corners, are to be reinforced by applying a special glass-fibre tissue. After that a second coat is to be applied. It can withstand very high and low temperatures and is resistant to mineral acids and solvents. Water dispersing it is neither inflammable nor deflagrable. Total surface to be treated: only on joints on a total panel's surface of 2850 m². Gastight sliding doors Net span m 2,50 x 3,00 manual type. Each door consisting of: – Sturdy flat silled doorpost, made of isophtalic resin reinforced with fibre glass, suitable for food industry, grey colour; – Insulated panel made of polyurethane injected under press, density 38-40kg/m^3, thickness 100mm.; – 12/10 thick stainless steel edging; – Galvanized plasticized sheet metal coating; – Neoprene rubber sections for gastight sealing; – Electrostatically galvanized iron sliding wheels, mounted on ball bearings;	Prepainted sheet metal The sheet metal is suitably profiled to give the necessary stuffiness to the panels. The prepainted film is 25 ± 3 microns on the exposed surface and 5 microns n the internal surface. The base sheet metal, hot galvenizzed using the Sendzemir system, is of the type FE E250 GZ 200 – A conform with Euro norms 10147-92; It is phosphate and treated with primer and then painted. The color is half brilliant white 21; the painter e used is non- toxic as it does not contain lead and cadmium. The global migration test results are under the maximum value accepted by the Ministerial Decree 21/03/73 and following amendments. Hardness: -ECCA T4 – Equivalent to"F" on the Koh-i-Noor scale. Gloss: -ECCA T2 – Specular gloss: 30 ± 5% measured on the GARDNER glossmeter with 60° angulation. Forming strength: -ECCA T7 – There are no flaws on folds with T over 2.5. Environmental strength: After 10 years there will be no colour difference over 8 Celiab units of measure. The Chalking vale will not be lower than "6" on the scale of ASTM D 659 Regulation. Reaction to fire The panel belongs to the class "0 (zero) Assembly Place the panels next to one another, then insert them in one another; in the joint insert the soft gasket or silicone to close it; white joint coverings made of soft PVC are to be fixed on the joints, both on the	Will be provided according to specification of client.	Air compressor A robust piston compressor with cast iron cylinders handles the compressed air supply for both the double valves and the pneumatic valves on the Besseling CO2 adsorber. Capacity 204 litres per minute at 10 bar Pressure regulator including pressure gauge 90 litre buffer tank Power rating 2,2 kW (230 V) Dimensions 1000 x 420 x 800 (width*depth*height) Weight 50 kg Auto-drain on air compressor Automatic draining of the buffer tank based on a timer. The drained condensed water can be collected in a jerry-can or disposed of directly. N2 - Nitrogen Lowering the oxygen content inhibits the fruit's respiration. When this occurs naturally it can sometimes take more than 3 weeks with normal respiration of the fruit. This period demands a great deal of energy from the fruit, which will result in a loss of quality and reduced shelf life. We therefore recommend that the oxygen in the cold store is reduced in a controlled/quicker manner using nitrogen injection. PSA nitrogen generator PSA is Pressure Swing Adsorption, a technique for producing pure nitrogen from the environmental air. The Besseling PSA comprises two vessels filled with a high-grade CMS (Carbon Molecular Sieve), an air compressor, compressed air tank and the necessary filters. Pressure. The CMS works more efficiently at high pressure than at low pressure. As a result of this fact a PSA can produce larger quantities of nitrogen with a higher degree of purity than low-pressure or vacuum systems.

– Gastight closing system with eccentric manoeuvre; – Double paned 45 x80 cm termopan inspection window (can be opened from both sides); – Prepared for installation for opening to the right or to the left; – Prepared for automation. <u>0° Sliding Door</u> Net span m 2. 50 x 3,00 manual type. <u>0° Hinged Door</u> Net span m 1, 20 x 2,20 manual type. Each door consists of: – Sturdy flat silled doorpost, made of isophtalic resin reinforced with fibre glass, suitable for food industry, grey colour; – Injected polyurethane insulated panel, 100mm. thick; – 12/10 thick stainless steel edging; – Galvanized plasticized sheet metal coating; – Neoprene rubber sections for gastight sealing; – Prepared for installation for opening to the right or to the left; – Prepared for automatism. <u>Inspection windows</u> Net span 60 x 80 cm. Each window includes: – Supporting frame made of isophtalic resin; – Window cast in aluminium; – Gastight locking;	internal as well as on the external face of the panel; angular sheets are to be assembled in the intersections between walls and ceilings, fixed with self-drilling screws or aluminium rivets; all corners are to be filled with polyurethane foam injected using a suitable machine. Assembly Accessories • gaskets and/or silicone; • galvanized and/or prepainted angulars; • screws c/w anchors and rivets; • polyurethane for the corners; • all other necessary assembly components. Prefabricated sandwich panels of polyurethane foam contained within galvanized or prepainted sheet metal. The panels are used for building the room walls and ceiling. **Doors and inspection windows** Gastight sliding doors Net span m. 2,5 x 3,0 manual type. Each door consisting of: • sturdy flat silled doorpost, made of isophtalic resin reinforced with fibre glass, suitable for food industry, grey colour; • insulated panel made of polyurethane injected under press, density 38-40kg/m3, thickness 100mm.; • 12/10 thick stainless-steel edging; • prepainted; • neoprene rubber sections for gastight sealing; • electrostatically galvanized iron sliding wheels, mounted on ball bearings; • gastight closing system with eccentric maneouver; • double paned 45 x80 cm termopan inspection window (can be opened from both sides); • prepared for automation.	Sliding doors & higed doors will be provided. All material will be provided according to requirement.	Swing. While the first vessel is producing nitrogen under pressure, the second vessel is regenerated/cleaned. After a specific time the vessels switch process. Adsorption. The CMS adsorbs oxygen molecules under pressure. When the pressure is released from the vessel the adsorbed oxygen molecules are freed and are discharged through the outlet. The advantages of the Besseling PSA nitrogen generator in brief: ✓ Easy to use because the air from the store is not used in the production process. ✓ Efficient due to the production of nitrogen under high pressure. ✓ Effective because larger quantities of pure nitrogen can be produced than using a membrane, VSA or VPSA ✓ Energy efficient. The Besseling PSA only uses a single compressor and has no other moving parts. ✓ Reliable. Because of its simplicity the service requirements and fault susceptibility are lower than with other nitrogen generators. The Besseling PSA nitrogen generator has filters and automatic condensate disposal as standard, so that no oil, moisture or dust can enter the CMS. For your application we recommend a Besseling PSA nitrogen generator, type UP1-22 ① Production capacity of 22 Nm³ per hour with a purity of 1% residual oxygen ② Equipped with an integrated adsorption dryer ③ Selection lever to switch between two pre-programmed purity levels ④ Mattei rotary vane compressor with rotation direction protection and air cooler ⑤ Compressor power rating 5,5 kW (400V, 3 phase) ⑥ PLC control power rating 25 Watt (230V) ⑦ Pressure switch to automatically start and stop the PSA ⑧ Oil/moisture filters, grade 1µ and grade 0,01µ

– Double-paned Termopan. Sectional door Net span m 5,00 x 4,00 Insulated sectional door with vertical action, counterweighted by a group of springs. The runners consist of galvanized angular supports, in which the side seals are inserted, and a special C-shaped profile on which the door runs by means of nylon wheels. The door also features a motor for automatic operation, completed with wall-mounted control panel.	0° Sliding Door Net span m 2,50 x 3,00 manual type. 0° Hinged Door Net span m 1,20 x 2,20 manual type. Each door consists of: Sturdy flat silled doorpost, made of isophtalic resin reinforced with fibre glass, suitable for food industry, grey colour; Injected polyurethane insulated panel, 100mm. thick; 12/10 thick stainless steel edging; Galvanized plasticized sheet metal coating; Neoprene rubber sections for gastight sealing; Prepared for installation for opening to the right or to the left; Inspection windows Net span 60 x 80 cm Each window includes: Supporting frame made of isophtalic resin; Window cast in aluminium; Gastight locking; Double-paned Termopan. Sectional door Net span m 5,00 x 4,00 Insulated sectional door with vertical action, counterweighted by a group of springs. The runners consist of galvanized angular supports, in which the side seals are inserted, and a special C-shaped profile on which the door runs by means of nylon wheels. The door also features a motor for automatic operation, completed with wall-mounted control panel.		In addition, there are many other features in the BatNetWin™ software which allow you to easily optimise the gas composition in the cold stores. If the software is installed on a PC with access to the internet, Besseling can examine your entire system and provide any advice required. The advantages of the BatNetWin™ software, in brief: ✓ All important data at a glance. ✓ User-friendly operation. ✓ Control and operation remotely via the internet. ✓ Immediate display of various alarms on screen. ✓ Shortcut keys for the most commonly used functions. Communication module The communication module is needed in order to create a network among the Besseling CA/ULO equipment themselves and the PC with BatNetWin™ software. This module includes a built-in industrial Ethernet switch with RJ45 ports for connection with CAT5 or CAT6 cable. It is also possible to connect the CA/ULO equipment to an existing network in order to reach and control the machines virtually anywhere. PC and printer This PC has at least one free RS232 / USB port for connecting the ADAM communication module and official Microsoft 7 operating system software. Other specifications are: keyboard, optical mouse, 17 inch TFT monitor, network card, DVD player, internal modem, network card and an HP inkjet colour printer. We can provide support at any time if this PC is continuously connected to the internet via a network or modem.In addition, you can access the PC with the BatNetWin software from any PC with an internet connection and operate the CA equipment.

Carbon dioxide scrubbing circuit Carbon Dioxide scrubber ADSO 50 BASIC Carbon dioxide absorption capacity: 50kgs. In 24 hours at 3%. The scrubber is designed to remove carbon dioxide produced by stored goods. The process takes place as follows: A blower sucks the air containing carbon dioxide from the room, forces it through a filter of molecular sieves and returns it to the storage room. When the filter is completely saturated, the regeneration with atmospheric air is carried out automatically by a valve system. Upon completion of the regeneration, the scrubber reverts back to absorption. During the regeneration phase, the oxygen left in the filtering chamber is completely removed using a special procedure. The changing of phases (absorption, regeneration and oxygen removal from the	**CO2 SCRUBBING CIRCUIT** **Nr. 4 Carbon dioxide absorbers type IS 50 M on two rooms** Absorption capacity Kg 50 of CO2 in 24 hours at 3%. **The CO2 absorber IS model represents the latest technology in the field of CO2 absorbers and results from the demand arisen in the field of controlled atmosphere of preservation at increasingly extreme levels of O2 and CO2. The IS (Intelligent Scrubber) absorber standard version, patented by Isolcell, implements the following revolutionary functions:** -Automatic Cycle Adjustment (A.C.A.) -Cycle Ending Function (C.E.F.) **Automatic Cycle Adjustment (A.C.A.)** This function provides for the connection in real-time of the absorber to the computerised analysis system. The CO2 absorber dynamically modifies the functioning modes in regards with atmosphere values occurring in the rooms. Thanks to this function the absorption cycle is optimized reducing both the power consumption and the residual amount of oxygen	4 time bigger capacity B 200 INTELLIGEM absorbers represent the most advance centralized system for CO2 adsorption in ULO stores Carbon dioxide absorption capacity of 200 kg CO_2per 24 hours at an average concentration of 3% CO_2in cell. Old technology of one small scrubber for 2 room represent old technology I which Carbon dioxide absorption capacity is 50kg in 24 hours at 3% and this system is no more in use. State of the art system provided by Fruit control with a absorption capacity of 200 kg/24 hours. Specifications are attached. Energy saving using a patented system, for optimal application of the regeneration and adsorption cycles.	Measurement and control technology: Measurement and control technology is the key to everything. Without accurate measurement and the corresponding correct control of the equipment all kinds of things can go wrong. Quality and reliability of the heart of your system are therefore extremely important. ACS - Atmosphere Control Station The Besseling atmosphere control station allows you to control your cold store fully automatically. You only need to input the desired target values and the system measures, checks, regulates and maintains your chosen atmosphere. Every cold store has its own measuring hose which is connected directly to the ACS. The gas samples are drawn-in successively per cold store using a membrane pump. As a result of this the CO2 adsorber and all other installed equipment can continue to work normally while the measurements are being taken. The ACS then compares the measured values with the target values after which the system will carry out the corresponding action automatically. Operation via a touch screen according to a simple menu structure. All components of the measurement and control technology are mounted in a control cabinet. Control cabinets are tailor-made and are built to customer specifications. For your application we recommend a Besseling combi-system; ACS is integrated into the control cabinet of the CO2 adsorber. Measurements per cold store: ① O2 and CO2 in 8 cold stores ② O2 and CO2 in the machinery room ③ O2 value in the adsorber lung Alarms per cold store: ① On deviation from the target value (relative or absolute) ② If the measurement is blocked (flow alarm)

filter) occurs automatically at programmed intervals. Running of the scrubber running can be continuous or it can be regulated by a timer or by a computerized system. The controls are housed on an electric board mounted on the front panel of the scrubber. This unit can be connected to a U.L.O. (Ultra Low Oxygen) system. Technical specifications - Dimensions LxWxH 700x740x1925mm; - Weight 320kg; - Power consumption 680W. O_2 valves For the automatic oxygen injection into the rooms. Air compressor Reciprocating air compressor with receiver of suitable capacity, equipped with adjustable manostat and monitoring manometer. It provides the compressed air for operation of our pneumatic valves and humidification system.	introduced in the interchanges, which even gets to be halved., thus allowing not only U.L.O. (Ultra Low Oxygen) preservations, but also D.C.A. (Dynamic Controlled atmosphere) ones. **Cycle Ending Function (C.E.F.)** This functions operates so that the CO2 absorber finishes the cycle on the room it is working on and starts its activity on the next room always having the tank regenerated. Thanks to this function it is possible to avoid, in case the absorber works on several rooms with carbon dioxide values different one from the other, the downtime due to the injection of CO2 in the selective carbon saturation phase, and the following downtime necessary to the absorption of this CO2. It follows that there is an energy saving/ performance increase up to 30% and a further reduction of the O2 injection in the system of the same quantity. **Absorber functioning process description** Through a perfectly gas tight electric-blower the air containing CO2 is sucked from the room and it is made pass through a tight tank containing appropriate molecular sieves (CO2 filter) and finally it is injected back in the room. Once the saturation of the filter is completed, through a specific automatic valves system, the CO2 saturated one shifts to the regeneration phase. The oxygen remained in the absorbing material during the regeneration phase is entirely eliminated through a peculiar procedure. The commutation of the phases (absorption, regeneration and oxygen cleaning from the filter) occurs automatically in proportion with the	Dimension cm 189x103x198 Weight: 840 kg Performance 200kg CO_2/24h at an average concentration of 3% CO2 in cell Compressed air supply pressure 6 atm connection with 6x8 pipe Connections to cells supply and return to be carried out with 100 mm PVC tube. Electrical supply: three phase supply 380V – 50 Hz Installed Power: 2,6 Kw consumption: 2,6 Kw/h	⏱ Defective sensor ⏱ Unstable measurement (measurement signal fluctuation) CO2 adsorber control based on target values per cold store: ⏱ Adsorption of CO2 during the storage period (CO2 🔗) Besseling uses a ceramic zirconia sensor for oxygen measurement. Zirconia has a quicker response time and, unlike chemical cells, is not subject to diminishing function, temperature changes and atmospheric pressure changes. Other properties are: ⏱ Measuring range 0 to 25% ⏱ Resolution 0.01% ⏱ Accuracy 0.1% (calibrated at 5 points ex-factory) ⏱ Expected service life more than 5 years. The CO2 sensor is of the dual beam infrared type. The sensor uses this technology to check itself and deviations in the sensor are corrected automatically. This sensor is not subject to diminishing functioning, temperature changes and atmospheric pressure changes either. Other properties are: ⏱ Measuring range 0 to 10% ⏱ Resolution 0.01% ⏱ Accuracy 0.1% (calibrated at 5 points ex-factory) ⏱ Expected service life more than 5 years Control of 8 aeration ventilators For additional ease of control Besseling installs one switch/output relay per aeration ventilator in the ACS control cabinet. This switch has three positions: 1. Off 2. Continuous 3. Automatic

	atmosphere values to be kept in the room. The commands are held in an elegant control panel placed on the front of the absorber. Inside it a special programming electronic card provides both for the automation of the absorber cycles (at variable times), and for displaying the active phases and possible under way anomalies to the operator. The card is provided with microprocessor allowing the programming of the functioning times in the different rooms and thus enables the absorption functioning in a semi-automatic mode in absence of computerization. Optional it is possible order an absorber equipped with the O2-CO2 analyser on board machine. The adsorber is equipped with an O2 valve for the automatic injection of air in the rooms. Technical Data: - dimensions: mm 700X740X1925 - weight: Kg 320 - absorbed power: kW 0,68		
Oxygen reduction circuit Nitrogen Generator "PSA 16 NT" This unit is a revolutionary machine capable of producing nitrogen at high levels of purity, using the most up to date technology: molecular separation of atmospheric gases, where the major part is nitrogen (approximately 78%). The process occurs by forcing compressed air through a system of "molecular sieves" composed of two filters one of which adsorbs while the second is regenerated.	**N2 GENERATION CIRCUIT** Nr. 1 Nitrogen Generator (N2) PSA NL21 This unit is a revolutionary machine capable of producing nitrogen at high levels of purity, using the most up to date technology: molecular separation of atmospheric gases, where the major part is nitrogen (approximately 78%). The process occurs by forcing compressed air through a system of "molecular sieves" composed of two filters, one of its which adsorbs while the second is regenerated. In the adsorbing filter oxygen is separated and kept in the filter, while nitrogen is delivered to the room.	**PSA SYSTEM MOD STORM 7.2** Nitrogen purity upto 99.99% as compared to 78%. Gas Production / hour is 33.60 Nm3/hour at 99% purity which is exceeds system requirement. Proposed system comes with: • A series of STORM modules in two containers housing activated carbons (molecular sieves) • Silencer upto International Standard. • Electro pneumatic valves and flow regulators	

In the adsorbing filter oxygen is separated and kept in the filter, while nitrogen is delivered to the room.

The system is equipped with an oxygen analyzer to control the purity of the nitrogen produced.

Technical specifications

- Nitrogen production at 97 39,6 m³/h;
- dimensions: mm 1000 x 1040 x 1960
- Weight 745 kg;
- Installed Power 0. 5 kW.

Rotative air-screw compressor 15 kW

Designed for continuous operation is supplied. It is complete with disoiling filters, air cooling, air filters and a modulating valve to achieve higher efficiency in the whole nitrogen production system.

Header

For 8 rooms, to centralize manual control of nitrogen injection into the rooms.

Gate valves

To be assembled on the header.

The system is equipped with an oxygen analyser to control the purity of the nitrogen produced.

Technical specifications

- Air supply pressure: 8 barg
- nitrogen production at 97%: 40,1 m³/h
- dimensions L x W x H: 900 x 1150 x 2070 mm
- Weight: 410 kg

The performance data in the following table refer to the generator's operation on the conditions indicated hereafter:

Max. oil content <0,003 mg/m3
Dew point (under pressure*4) < +3°C
Impurity in the compressed air <0,01 µm
Column pressure = 8 barg
Working temperature = 18-20°C
PSA inlet air temperature = 18-20°C
Test performance altitude ~ 250 mslm
The processing tank's volume and pressure must be appropriate.
*1 N2 purity 99% must be considered as 1% of residual O2 with fixed tolerance not higher than 0,1%.
*2 The air volume refers to 20 –C, 0% R.H. and 100000Pa. The volume survey was performed by means of calorimetric flowmeters graduated for air and compensated in temperature and pressure. Tolerance: +/-5%.
*3 The N2 volume refers to 20 –C, 0% R.H. and 100000Pa. The volume survey was performed by means of calorimetric flowmeters graduated for air and compensated in temperature and pressure. Tolerance: +/-5%.
*4 This data is measured on the compressed air line after the dryer, where the pressure is approximal to that of the generator's functioning.
Nr.1 Air-screw compressor 11,0 kW - 8 barg
Rotative air-screw compressor designed

- All cabling. Instruments and piping inside the machine.
- Safety valves calibrated for an appropriate pressure level
- Compressed air system connection
- Air accumulation tank
- Nitrogen accumulation tank

Pressure of gas produced: 7/8 bar inlet pressure: 8/10 bar PSA Nitrodgen generator dimensions (without compressor) cm 90x99x196 (h) weight kg 620 (without compressor).

1N, COMPRESSED AIR GROUP 10 BAR SILENCED, AIR COOLED COMPLETE WITH DRIER AND ELECTRONIC COMMAND AND CONTROL

The compressed air groups are designed and built following the most advanced technology in this field.

Specs:

Dimension: cm75x124x126 h
Weight 387 kg
Compressed air Supply: only in output toward the nitrogen generator.

Electrical supply three phase 380V – 50 Hz + Earth

Installed Power: 11KW

Nitrogen injection control is automatic instead of manual control.

In the automatic position the connected aeration ventilator is activated based on the TPA (Time per Action) control. Unique to this TPA control is that the difference between the measurement and the target value is automatically converted to a short or long aeration period. As a result of this, large deviations in relation to the target value are avoided resulting in a stress-free storage of your sensitive, precious product.

The TPA control is based on the following, independent per cold store, controls:

① Aeration with oxygen during the storage period (O2 ↘)
② Maintaining the level of O2 & CO2 during filling of the cold store (O2 ↘ / CO2 ↗)
③ Quicker increase of oxygen shortly prior to opening the cold store (O2 ↘)

Control of 8 nitrogen injection valves

For additional ease of control Besseling installs one switch/output relay per nitrogen injection valve in the ACS control cabinet. This switch has three positions:

1. Off
2. Continuous
3. Automatic

In the automatic position the connected injection valve is activated based on the TPA (Time per Action) control. Unique to this TPA control is that the difference between the measurement and the target value is automatically converted to a short or long injection period. As a result of this, large deviations in relation to the target value are avoided resulting in stress-free storage of your sensitive, precious product.

The TPA control is based on the following, independent per cold store, controls:

① Pull-down using nitrogen (O2 ↗)
② Maintaining the level of O2 during the storage period (O2 ↗

	for continuous operation is supplied. It is complete with disoiling filters, air cooling and air filters to achieve higher efficiency in the whole nitrogen production system. Header For 8 rooms, to centralize manual control of nitrogen injection into the rooms. Gate valves To be assembled on the header.		Nitrogen buffer tank purity measurement An additional measurement and a pressure regulator with pressure gauge are installed in the ACS for checking and optimising the settings of your nitrogen supply. This module shows the purity of the nitrogen that is produced Ease of operation and registration All connected Besseling equipment can be controlled even more easily using our software specially developed for this purpose. BatNetWin™ software license The BatNetWin™ software allows you to see at a glance, per cold store, the measured values and which actions are currently being performed. BatNetWin™ is based on a database so that you can also retrieve measurements that were taken in the past. These data can be compared with each other per cold store in both graph and table format. In addition, these data can be exported to another program (Excel). The most important features of the BatNetWin™ software are: ⏲ Overview of all measured values on the main screen. ⏲ Further subdivision by all significant parameters and measured values per cold store. ⏲ The real-time control and operation of all connected equipment remotely. ⏲ Storage and printing of all data such as measured values, operating hours, injection times, alarms, etc. ⏲ Operation at different authorization levels ⏲ Various freely adjustable overviews in graph and table format

REGULATION AND CONTROL ACCESSORIES Manometers Equipped with a 250mm water column mounted on a wood panel, for the reading of pressure variations occurring in the storage room. PVC Flap overpressure valves ø 100mm, to control pressure and vacuums occurring in the storage rooms during normal plant operation. PVC pipe sleeves Gas-tight sleeves that pass through the room walls for analysis pipes, nitrogen injection, carbon dioxide scrubbing circuit, overpressure valves, breathing bags and all necessary components for operation of the controlled atmosphere plant. Pressure breathing bags Constructed of PVC, reinforced with nylon, to compensate for the pressure occurring in the rooms during plant operation.	**REGULATION AND CONTROL ACCESSORIES** Nr. 8 Manometers Equipped with a 250mm water column mounted on a wood panel, for the reading of pressure variations occurring in the storage room. PVC Flap overpressure valves for 8 rooms ø 100mm, to control pressure and vacuums occurring in the storage rooms during normal plant operation. PVC pipe sleeves for 8 rooms Gas-tight sleeves that pass through the room walls for analysis pipes, nitrogen injection, carbon dioxide scrubbing circuit, overpressure valves, breathing bags and all necessary components for operation of the controlled atmosphere plant. Pressure breathing bags for 8 rooms Constructed of PVC, reinforced with nylon, to compensate for the pressure occurring in the rooms during plant operation.	All items will be provided. Details and specs are attached with technical proposal.	**In addition, there are many other features in the BatNetWin™ software which allow you to easily optimise the gas composition in the cold stores. If the software is installed on a PC with access to the internet, Besseling can examine your entire system and provide any advice required.** **The advantages of the BatNetWin™ software, in brief:** **✓ All important data at a glance.** **✓ User-friendly operation.** **✓ Control and operation remotely via the internet.** **✓ Immediate display of various alarms on screen.** **✓ Shortcut keys for the most commonly used functions.** **Communication module** **The communication module is needed in order to create a network among the Besseling CA/ULO equipment themselves and the PC with BatNetWin™ software. This module includes a built-in industrial Ethernet switch with RJ45 ports for connection with CAT5 or CAT6 cable. It is also possible to connect the CA/ULO equipment to an existing network in order to reach and control the machines virtually anywhere.** **PC and printer** **This PC has at least one free RS232 / USB port for connecting the ADAM communication module and official Microsoft 7 operating system software. Other specifications are: keyboard, optical mouse, 17 inch TFT monitor, network card, DVD player, internal modem, network card and an HP inkjet colour printer.** **We can provide support at any time if this PC is continuously connected to the internet via a network or modem.In addition, you can access the PC with the BatNetWin software from any PC with an internet connection and operate the CA equipment.**

Computerized Electronic Analyzer For 8 rooms, designed specifically for the analysis of oxygen and carbon dioxide in controlled atmosphere rooms. An elegant, varnished cabinet houses the following units: – 1 carbon dioxide analysis unit with infrared rays: volume range 0-10%; – 1 oxygen analysis unit with paramagnetic cell: volume range 0-25%; – integrated circuits, silicon transistors, micro relays; – 2 diaphragm pumps; – 1 flow meter with needle cock; – 1 high efficiency macrolon body filter; – 1 programming board for automatic connection of the rooms; – 8 solenoid valves assembled on the analysis header.	**Nr. 1 "Isolcell MULTIPLEX "** **Computerized Electronic Analyzer** for 8 rooms, designed specifically for the analysis of oxygen and carbon dioxide in controlled atmosphere rooms. An elegant, varnished cabinet houses the following units;: 1 carbon dioxide analysis unit with infrared rays: volume range 0-10%; 1 oxygen analysis unit with electrochemical cell: volume range 0-25%; integrated circuits, silicon transistors, micro relays; 2 diaphragm pumps; 1 flow meter with needle cock; 1 high efficiency macrolon body filter; 1 programming board for automatic connection of the rooms; 8 solenoid valves assembled on the analysis header. Calibration kit For the periodical calibration of the analyzer.	All items will be provided. Details and specs are attached with technical proposal.	Accessories Portable O2 and CO2 analyzer **We supply an extremely reliable portable analyzer with a ceramic zirconia O2 sensor and dual beam infrared CO2 sensor, display, built-in battery and charger to periodically check the O2- and CO2 values. The sensors in the portable analyzer have the same specifications as the sensors in the Besseling ACS. Besseling uses a ceramic zirconia sensor for oxygen measurement. Zirconia has a quicker response time and, unlike chemical cells, is not subject to diminishing function, temperature changes and atmospheric pressure changes. Other properties are:** **⏲ Measuring range 0 to 25%** **⏲ Resolution 0.01%** **⏲ Accuracy 0.1% (calibrated at 2 points ex-factory)** **⏲ Expected service life more than 5 years.** **The CO2 sensor is of the dual beam infrared type. The sensor uses this technology to check itself and deviations in the sensor are corrected automatically. This sensor is not subject to diminishing functioning, temperature changes and atmospheric pressure changes either. Other properties are:** **⏲ Measuring range 0 to 10%** **⏲ Resolution 0.01%** **⏲ Accuracy 0.1% (calibrated at 2 points ex-factory)** **⏲ Expected service life more than 5 years** Calibration gas bottle N2 **The accuracy of the sensors of both the Besseling ACS and the portable analyser should be checked regularly using certified calibration gas.** **⏲ The composition of the calibration gas is 0% oxygen and 0% carbon dioxide** **⏲ Content 10 Litre**
onal Computer With the following specifications: – Intel corei7 (ongoing generation) – RAM 16 GB – Hard Drive 2 to 5 TB – Branded Dell or Equivalent – Wireless keyboard & Mouse – LED 32" Dell or Equivalent – Operating system Windows 8 Registered – HP Colour Printer	**Computerization of CA Plant** Personal computer with the following specifications: • installed operating system Windows 10 Professional SP1 with 64Bit ; • Monitor VGA 24" LCD 1280x1024 HD and optic mouse Laser printer • Software"ISOLCELL-ISOSOFT" (see description) Carbon Dioxide and Oxygen monitoring and control Monitoring and control of carbon dioxide and oxygen in the @ CA-rooms will occur	Personal Computer with required specs will be provided.	Agreed.

Carbon Dioxide and Oxygen monitoring and control Monitoring and control of carbon dioxide and oxygen in the CA-rooms will occur by means of a suitable interface equipped with special devices for connection of carbon dioxide absorbers and injection of air into the rooms.	by means of a suitable interface equipped with special devices for connection of carbon dioxide absorbers and injection of air into the rooms. nr. @ motor-operated valves for injection of oxygen into the rooms. Monitoring of the cooling plant Indication for each room of the intervention number and operation duration of the cooling battery and of the ventilation, defrosting and humidity systems.	Carbon dioxide and Oxygen monitoring will be provided. Specs are attached.	**Content 10 litre** **Other compositions are available on request.** **Pressure regulator for calibration gas bottle:** **The pressure regulator ensures proper usage of the calibration gas bottle and will be delivered including:** **Main valve** **Flow meter** **Pressure regulator** **Pressure gauge** **Gas-tight PG7 store connection :** **The PG7 ensures that the measuring hose on the atmosphere control station can have a gas-tight connection with the cold store. The store connection has two flanges for the gas-tight seal and an IPON cable gland.** **Standard length is 250 mm** **Ø 12 mm store connection** **Internal Ø 7 mm**

Computer operation The programme provides for the display of data and, at predetermined times or on request of the operator, the printing of this data. The operator will set the minimum and maximum percentage values of carbon dioxide and oxygen and the other parameters to be maintained in the controlled atmosphere rooms. The operator can request printing of the last 24 hrs, or of the last from 2 to 365 days, also graphically with different scales. Each printout will show: – Day, hour and minutes; – The number of the room under analysis; – Carbon dioxide percentage; – Oxygen percentage; – Indication of the interventions of carbon dioxide scrubbers and air injection into the rooms; – Alarm signals if the threshold values are exceeded, totally or partially. Calibration kit For the periodical calibration of the analyzer.	Computer operation The program provides for the display of data and, at predetermined times or on request of the operator, the printing of this data. The operator will set the minimum and maximum percentage values of carbon dioxide and oxygen and the other parameters to be maintained in the controlled atmosphere rooms. The operator can request printing of the last 24 hrs, or of the last from 2 to 365 days, also graphically with different scales. Each printout will show: • day, hour and minutes; • the number of the room under analysis; • carbon dioxide percentage; • oxygen percentage; • air temperatures in the room OPTIONAL (T1,T2,T3 ...); • (OPTIONAL cooling plant temperature-optional); • Air humidity R.H. in the room; • (OPTIONAL indication of the number and duration of the cooling plant intervention in each room); • indication of the interventions of carbon dioxide scrubbers and air injection into the rooms; • alarm signals if the threshold values are exceeded, totally or partially; • (OPTIONAL indication of the number and of the total duration of the interventions of the humidification, ventilation and defrosting systems in each rooms - optional).	All items and services will be provided according to clients requirements.	Agreed
COOLING PLANT Each refrigeration unit is composed as follows: Glycol-water refrigeration unit	**COOLING PLANT** Each refrigeration unit is composed as follows: Glycol-water refrigeration unit Each composed by two screw open type compressors for ammonia, with following specifications:	Glycol-Ammonia refrigeration unit each composed by two Screw Compressor (Bitzer) of 1332 Kw each. (Piston Compressor technology is old and no more in use). Plant with 15 times bigger cooling capacity.	

Each composed by two piston compressors for ammonia, with following specifications: Cooling capacity: 187 kW Glycoled solution (30%) in/out temperatures: -4/-8°C The unit is complete with oil separator with coalescent filter and heat elements, water circulation oil cooler. Receiver, filtering elements, safety valves, cut-off electric valve, refrigerant charging valves, flooded plates direct expansion evaporator, interceptor taps, steel pipes. <u>Primary circuit electric pumps</u> With horizontal axis, three phase electric motor, complete with manual gate valves, strainers, check valve, interceptor taps, and manometers for the glycol circulation from the tank to the refrigeration unit. <u>Defrost service electric pumps</u> With horizontal axis, three phase electric motor. <u>Glycol-water storage steel tank</u> With epoxy painting treatment, having a capacity of 7 m^3, to be charged with anticorrosive, inhibited, monoethylenic glycol solution at 30% concentration. <u>Hanging air coolers</u> Unit surface 320 m2, with copper/aluminium fins battery, fins space 6 mm, working with	Cooling capacity: 235,4 kW Glycoled solution (30%) in/out temperatures: -4/-8°C The unit is complete with oil separator with coalescent filter and heat elements, water circulation oil cooler. Receiver, filtering elements, safety valves, cut-off electric valve, refrigerant charging valves, flooded plates direct expansion evaporator, interceptor taps, steel pipes. Primary circuit electric pumps With horizontal axis, three phase electric motor, complete with manual gate valves, strainers, check valve, interceptor taps, and manometers for the glycol circulation from the tank to the refrigeration unit. Defrost service electric pumps With horizontal axis, three phase electric motor. Glycol-water storage steel tank With epoxy painting treatment, having a capacity of 7 m3, to be charged with anticorrosive, inhibited, monoethylenic glycol solution at 30% concentration. Nr. 8 Hanging air coolers for C.A. rooms Unit surface 352 m2, with copper/aluminium fins battery, fins space 6 mm, working with glycol-water, complete with 4 axial fans Ø 560 mm, having total air capacity of 28.400 m3/h aluminium fairing, capacity 54,3 kW at ΔT 10°C, water defrost. Nr. 1 Hanging air cooler for corridor Unit surface 53 m2, with copper/aluminium fins battery, fins space 6 mm, working with glycol-water, complete with 1 axial fan Ø 500 mm, having total air capacity of 7.000 m3/h aluminium fairing, capacity 9 kW at ΔT 10°C, water defrost .	Cooling Capacity 270kw instead of 187KW. Operating conditions : 12°/+40°c Running speed 2.900 RPM Absorbed Power 49.4 KW C.O.P:2.7 The compressors are equipped with: • Centralized Oil Separator with coalescent filters. • Automatic Capacity Control. • Internal Relief Valve • Thermosiphon Oil Cooler • Suction and discharge stop and check valves. • Oil heaters • Pressure and temperature probes • N.2 Eleectric Motor 75Kw – 2 poles – 400V 50 Hz – 3 Ph – IP-23 – EFF 2+ N.1 Ammonia evaporative condenser with axial fan, type CFRC019: • Condensing Capacity 415kw • Fans motor power 4kw • Pump Motor Pump 1.1kw • Air flow 7.11 m^3/S • Water Flow 6.48 I/S • D: 2480c1.640x2830(h)mm • Weight in operation 3.2kg Equipped with automatic capacity control and special anticorruption Painting decorating Plus. N.1 Automatic Chemical dosing system for makeup water. N.1 Carbon Steel receiver 300 L. capacity with level indicator and safety valve.	**Prices:** **Cold store protection and accesories:** **No. Part** **8 Buffer lung 4m³** **16 Flange Ø 125mm** **8 Over pressure valve Ø160mm** **16 Flange Ø 160mm** **8 Store connection with screw cap Ø 50mm** **8 Micro pressure gauge with sample valve** **O2 Oxygen** **8 Aeration ventilator** **16 Flange** **CO2-Carbon dioxide** **1 Co2** **8 Double valve** **1 Compressor** **1 Aoto drain** **N-2 Nitrogen** **1 PSA nitrogen generator UP1-22** **1 Temperature protection PSA** **1 Nitrogen buffer tank 270 Litres** **8 N2 Injection valve 1/2" with connector** **Measurement and Technology:** **1 ACS combi 8 cold stores** **1 Control of 8 aeration ventilators** **1 Control of 8 nitrogen injection valves** **1 Nitrogen buffer tank purity measurement** **Ease of Operation and Registration:** **1 BatNetWiin software license** **1 Communication module** **1 PC and Printer** **1 Network PCB & connection set** **1 Restart after power faliure**

glycol-water, complete with 1 axial fan Ø 560 mm, having total air capacity of 29.200 m^3/h aluminium fairing, capacity 49,4 kW at ΔT 10°C, water defrost .

Hanging air cooler

Unit surface 53 m2, with copper/aluminium battery, fins space 6 mm, working with glycol-water, complete with 1 axial fan Ø 500 mm, having total air capacity of 7.600 m^3/h aluminium fairing, capacity 9,2 kW at ΔT 10°C, water defrost .

Glycol-water feeding assemblies

Composed of 3-way mixing valve (iron PN6), proportional electric actuator 0-10V with safety closure, electronic temperature regulator/indicator with PT100 probe, two temperature dipping probes to measure the glycol inlet-outlet temperature, ambient probe, circulation pump with check valve, pressure indicator and ball interceptor valves.

General electric control board
Tension 380 V / 50 Hz
Auxiliary tension 220 V
Command tension 24 V
Rack component board complete with following devices:

General magnet-thermal switch,
Voltmeter and general ammeter with TA,
Protection for measure devices,
Transformer 380/220 V,
Control transformer 220/24 V,

Glycol-water feeding assemblies
Composed of 3-way mixing valve (iron PN6), proportional electric actuator 0-10V with safety closure, electronic temperature regulator/indicator with PT100 probe, two temperature dipping probes to measure the glycol inlet-outlet temperature, ambient probe, circulation pump with check valve, pressure indicator and ball interceptor valves.
General electric control board
Tension 380 V / 50 Hz
Auxiliary tension 220 V
Command tension 24 V
Rack component board complete with following devices:
General magnet-thermal switch,
Voltmeter and general ammeter with TA,
Protection for measure devices,
Transformer 380/220 V,
Control transformer 220/24 V,
Protection for in- and out transformers,
Fuses group,
Automatic valves,
Main circuits supply through copper bars,
Remote control switches,
Auxiliary contacts block,
Refrigerators control thermostat with digital indication of the tank temperature
Electronic regulators of the condensation pressures, with Digital display of the values,
Signalling LEDs for operation and stoppage,
Glycol level control in the tank,
Hour meter for compressors,
ON/OFF switches,
Diodes blocks,
Clamps, wiring passages, cable and wiring material
Computerization of the cooling plant
Supervision and control of the cooling plant is achieved through a PC with our

N.1 S/S Plate evaporator for ethylene glycol water solution, dx type.

Cooling capacity: 270KW
Water Solution temp. in/out -4/-8C-
Water solution flow 65 m3/h
n. of plates: 35
surface:18 m2- pressure drop solution side : 83,8kps
-plates material: AISI 304comlete with electronic thermo expansion valve.
N.1 Safety flow switch
N.1 Safety low temperature switch
N.2 Double safety valves o low and high-pressure Sides of the circuit.
N.2Centrifugal solution pumps, one as stand by, each one:
-flow 65 m3/h
-head 22m.w.g.
-power 5,5 kW
Complete with valves and pressure gauges.
N.1 Glycol solution preparation and filling system with transfer pump.
N.8 Air coolers with copper aluminum coil, each one:
-capacity 37,6kW
-air flow 22.800 m3/h
-n. of fans 3 x 0,7 kW
-fins spacing 6 mm
-surfaces 219,2 m2
-electric defrosting
Equipped with modeling 3 way valves and solution circulator 0.55 kW.
N.1 Air cooler with copper aluminum coil for corridor:
-capacity 14,4 kW.
-air flow 7.700 m3/h
-n. of fans 3x 0,18kW
-fin spacing 6mm
-surface 37,9 m2

Accessories:

1 Portable O2 &Co2 analyzer(0-25% /0-10%)
1 Calibration gas bottle 0%O2 / 0% CO2
1 Calibration gas bottle 1%O2 / 5% CO2

No.	Part
2	Pressure regulator for calibrationgas bottle
8	Gas-Tight PG7 store connection

Protection for in- and out transformers, Fuses group, Automatic valves, Main circuits supply through copper bars, Remote control switches, Auxiliary contacts block, Refrigerators control thermostat with digital indication of the tank temperature Electronic regulators of the condensation pressures, with Digital display of the values, Signalling LEDs for operation and stoppage, Glycol level control in the tank, Hour meter for compressors, ON/OFF switches, Diodes blocks, Clamps, wiring passages, cable and wiring material <u>Computerization of the cooling plant</u> Supervision and control of the cooling plant is achieved through a PC with our proprietary software. <u>Monitoring of the cooling plant</u> Indication for each room of the intervention number and operation duration of the cooling battery and of the ventilation and defrosting systems. <u>Interfaces</u> For the control of the cooling plant. <u>Temperature sensors</u> 2 for each room and 2 for each mixing valve.	proprietary software. Monitoring of the cooling plant Indication for each room of the intervention number and operation duration of the cooling battery and of the ventilation and defrosting systems. Interfaces For the control of the cooling plant. Temperature sensors 2 for each room and 2 for each mixing valve.	-time defrosting Equipped with 3 way valves on-off type n. of plates: 35 surface: 18 m2- pressure drop solution side : 83,8 kPa -plates material: AISI 304 Complete with electronic thermo expansion valve. N.1 Safety flow switch N.1 Safety low temperature switch N.2 Double safety valves on low and high-pressure sides of the circuit. N.2 Centrifugal solution pumps, one as stand by, each one: -flow 65m3/h -head 22m.w.g. -power 5,5 kW Complete with valves and pressure gauges. N.1 Glycol solution preparation and filling system with transfer pump. N.8 Air coolers with copper aluminum coil, each one: -capacity 37,6 kW -air flow 22.800 m3/h -n. of fans 3 x 0,7 kW -fins spacing 6mm -surface 219,2 m2 -electric defrosting Equipped with modulation 3 way valves and solution circulator 0.55 kW. N.1 Air cooler with copper aluminum coil for corridor: -capacity 14,4 kW -air flow 7.700 m3/h -n. of fans 3 x 0,18 kW -fins spacing 6mm -surface 37,9m2 -time defrosting Equipped with 3 way valves on-off type All parts and materials required for Ammonia Glycol refrigeration plant having a cooling capacity of 270 kW will be provided	

Ethylene scrubbing installation Deoxyl 500 Catalitic ethylene converters *each connected to two rooms* The harmful effects of ethylene in the storage of vegetable products are generally well known. The scrubbing of ethylene from the storage room slows senescence processes, preserves the quality of the produce and reduces its sensitivity to pathogenic agents. The Deoxyl removes the ethylene present in the atmosphere, using a system of forced air recirculation on a catalytic bed kept at an average temperature of 250°C. The treatment sequence, which occurs with the help of an electric blower, sees the preheating of the air in an exchange section, heat recovery, reaction with the catalyst and final cooling. The process is highly efficient with limited energy consumption to maintain the catalyst temperature. The main advantages of the system are: - Optimal ratio efficiency/consumption - Excellent heat recovery - Simple operation - Absence of process residues (with respect to the environment) - Installation outside the room and capable of working in both regular storage and controlled atmosphere conditions. Technical specifications	**Ethylene scrubbing circuit** Nr. 4 Catalytic ethylene converter Deoxyl 500 LE on 2 rooms The harmful effects of ethylene in the storage of vegetable products are generally well known. The scrubbing of ethylene from the storage room slows senescence processes, preserves the quality of the produce and reduces its sensitivity to pathogenic agents. The Deoxyl removes the ethylene present in the atmosphere, using a system of forced air recirculation on a catalytic bed kept at an average temperature of 250°C. The treatment sequence, which occurs with the help of an electric blower, sees the preheating of the air in an exchange section, heat recovery, reaction with the catalyst and final cooling. The process is highly efficient with limited energy cionsumption to maintain the catalyst temperature. The main advantages of the system are: optimal ratio efficiency/consumption excellent heat recovery simple operation absence of process residues (with respect to the environment) installation outside the room and capable of working in both regular storage and controlled atmosphere conditions. Technical specifications - dimensions: mm 1000 x 1000 x 1970 h - weight Kg. 790 - power consumption kW/h. 3,0	N.2 swingtherm MOD.BS500 Catalytic Ethylene converter. Each machine will be connected with 4 rooms Catalytic converters "Swingtherm" permit a low level of ethylene concentration in the rooms, about 0 p.p.m. The electrical consumption is up to 20 times lower than conventional catalytic converters. The flow of circulating air over the catalytic reactor is cyclically inverted, so as not to let the heat out of the reaction zone. In other words the heat oscillates between the catalyzer and the ceramic filling layers and does not escape from the apparatus. The apparatus should preferably be installed close to the cold store, in the anti- cell. The apparatus is made o steel sheet. The tanks containing the reactor and filling layers are made of steel and the special filling material has a high thermal capacity so that leaks of hot air towards the cold store are avoided. The catalyzer used has been chosen among the best on the world market and gives a high yield. - Dimensions: cm 200 x 100 x 170 h - Weight: kg 2000 compressed air service : only for twin units - Rooms connections : delivery and return PVC pipes - Electric power connection: three phase 380 V/ 50 Hz + Terra absorbed power: kW 2,7	Preventive maintenance: Besseling equipment is synonymous with quality and durability, but moving parts are susceptible to wear and tear. For preservation, service life and correct functioning of the equipment it is important regular/preventive maintenance is carried out. This will reduce the risk of malfunctions and guarantee the continuity of the equipment and your company. PSA nitrogen generator - Annually or every 2000 hours, replace two oil/moisture filters. - Every two years or every 4000 hours, replace two oil/moisture filters and full maintenance of the comressor. - Check system functions. CO2 adsorber - Operation of the double valves on the CO2 adsorber and on the cold stores. - Check dust filters and replace if necessary. - Check system functions. - Pressure test of the pipe system. ACS - Atmosphere Control Station Verify/calibrate the sensors. Check hydrophobic filters and replace if necessary. Check system functions. Besseling has its own service department with professional and customer oriented service technicians. We can offer you a service contract based on the intensity of use.

-Dimensions: 1220 x 750 x 1580 mm; -Weight 600kg; -Power consumption 3.8kW/h. Headers 2 rooms, to centralize automatic control of ethylene conversion into the rooms. Pneumatic valves Butterfly valves mounted on the blowing and suction pipes of the rooms, complete with double effect actuator with adjustable limit switch.			
Humidification system **Air System" Humidification** ***for 8 rooms*** The "Air System" humidification system was designed to satisfy the need to obtain high hygrometric levels in large capacity storage rooms. Operation of the "Air System" is very simple; it is based on the nebulizing of water using compressed air. Using several simple calibrations, carried out in a full plant, optimal values of nebulized water can be achieved for each single requirement. The plant includes: - Electronic panel with intervention	**Air System" Humidification for 8 rooms** The "Air System" humidification system was designed to satisfy the need to obtain high hygrometric levels in large capacity storage rooms. Operation of the "Air System" is very simple; it is based on the nebulizing of water using compressed air. Using several simple calibrations, carried out in a full plant, optimal values of nebulized water can be achieved for each single requirement. The plant includes: 1. Electronic panel with intervention programmes for each single room, for the desired time 2. Electronic header, controlled by the operator. 3. Nozzles - generally installed near the refrigeration unit. This system demonstrates the soundest method of room humidification for fruit storage, uniting high circulation capacity and delicate nebulization. In addition, the plant does not require	Air system cannot be used for CA room because in the case will be an oxygen injection inside the room. HUFO 65 is a water centrifugal adiabatic humidifier with adjustable capacity ranging from 1,3 to 6,5 It/hour specifically designed for use in controlled atmosphere plants. The unit works on the principle of water atomization and its expulsion via a self-generated air flow. The HUFO 65 is normally fixed at the wall or hang from the ceiling (optional kit chain supply) and directed towards the evaporator to maximize the air distribution and circulation inside the cell.	All Items will be provided

programmes for each single room, for the desired time - Electronic header, controlled by the operator. - Nozzles - generally installed near the refrigeration unit. s system demonstrates the soundest method of room humidification for fruit storage, uniting high circulation capacity and delicate nebulization. In addition, the plant does not require regular maintenance.	regular maintenance.		

CA PVC CONTAINERS Nr. 3 PVC Containers Nr. 1 CO2 absorber for containers Nr. 3 ethylene absorbers for containers Nr. 1 interface for the control of CO2-O2-N2 Nr. 1 Header for 3 containers for nitrogen injection Nr. 1 Header for 3 containers for oxygen injection Nr. 1 Header for 3 containers for carbon dioxide Nr. 6 Sensors for temperature Nr. 6 Sensors for Relative Humidity Nr. 2 Interfaces for sensors	**C.A. PVC CONTAINERS** Nr. 3 PVC Containers Nr. 1 CO2 absorber for containers Nr. 3 ethylene absorbers for containers Nr. 1 interface for the control of CO2-O2-N2 Nr. 1 Header for 3 containers for nitrogen injection Nr. 1 Header for 3 containers for oxygen injection Nr. 1 Header for 3 containers for carbon dioxide Nr. 6 Sensors for temperature Nr. 6 Sensors for Relative Humidity Nr. 2 Interfaces for sensors	All Items will be provided	All Items will be provided
SPARE PARTS FOR GLYCOL PLANTS • Nr. 1 blower for evaporator model FAM • Nr. 1 pump Calpeda mod NM4 40/20 AE 1,1 kW • Nr. 1 3 way valves DN 40 PN6 VXF21-40 • Nr. 1 sevocontrol SQX62 24 V. 0-10 V • Nr. 1 stem heater ASZ 6.5 • Nr. 2 manometers 0-2,5bar • Nr. 1 valve UNIVERSAL 2V ball 1"½ 24V.	*SPARE PARTS FOR GLYCOL PLANTS* • Nr. 1 blower for evaporator model FAM • Nr. 1 pump Calpeda mod NM4 40/20 AE 1,1 kW • Nr. 1 3 way valves DN 40 PN6 VXF21-40 • Nr. 1 sevocontrol SQX62 24 V. 0-10 V • Nr. 1 stem heater ASZ 6.5 • Nr. 2 manometers 0-2,5bar • Nr. 1 valve UNIVERSAL 2V ball 1"½ 24V.	All Items will be provided	All Items will be provided

SPARE PARTS FOR AMMONIA PLANT (CHILLER) • Nr. 1 motor for evaporative condenser ATC • Nr. 1 set of belts SPA L=2.360 mm (5 pcs) • Nr. 1 supply valve NH3 EVRAT 15 • Nr. 1 coil 200 V for EVRAT • Nr. 1 filter FA 15 for EVRAT • Nr. 1 Circulator UPS 25-60 • Nr. 1 valve for EVRA • Nr. 1 filter FA 15 DN15 for EVRA3 • Nr. 1 series of counters and thermal for control board for the compressor	*SPARE PARTS FOR AMMONIA PLANT (CHILLER)* • Nr. 1 motor for evaporative condenser ATC • Nr. 1 set of belts SPA L=2.360 mm (5 pcs) • Nr. 1 supply valve NH3 EVRAT 15 • Nr. 1 coil 200 V for EVRAT • Nr. 1 filter FA 15 for EVRAT • Nr. 1 Circulator UPS 25-60 • Nr. 1 valve for EVRA • Nr. 1 filter FA 15 DN15 for EVRA3 • Nr. 1 series of counters and thermal for control board for the compressor	All Items will be provided	All Items will be provided

SPARE PARTS FOR ELECTRIC PLANT • Nr. 1 PLC room control MD 147 • Nr. 1 CY200 interface for control of CA plant • Nr. 5 sensors PT 100 • Nr. 1 humidity sensor • Nr. 2 converters for sensors PT100-4/20 ma • Nr. 1 set of spare for room control board	*SPARE PARTS FOR ELECTRIC PLANT* • Nr. 1 PLC room control MD 147 • Nr. 1 CY200 interface for control of CA plant • Nr. 5 sensors PT 100 • Nr. 1 humidity sensor • Nr. 2 converters for sensors PT100-4/20 ma • Nr. 1 set of spare for room control board	All Items will be provided	All Items will be provided
Plant & Machinery for Packing/Grading line ▪ Desapping Conveyor 1.2*2.0 meter ▪ Prewashing with manual sorting ▪ Hot water Treatment ▪ Brushing/washing machine ▪ Brushes with soap spraying system. ▪ Drying Tunnel. ▪ Connecting Belt. ▪ Sizing plant. ▪ Fruit grading system. ▪ Packing bins ▪ Electric Board ▪ Compressed air system ▪ Crane and forklift ▪ Fuel reservoir pumps and pipe fittings ▪ Hydraulic pump assemblies.	**Plant & Machinery for Packing/Grading line** ▪ Desapping Conveyor 1.2*2.0 meter ▪ Prewashing with manual sorting ▪ Hot water Treatment ▪ Brushing/washing machine ▪ Brushes with soap spraying system. ▪ Drying Tunnel. ▪ Connecting Belt. ▪ Sizing plant. ▪ Fruit grading system. ▪ Packing bins ▪ Electric Board ▪ Compressed air system ▪ Crane and forklift ▪ Fuel reservoir pumps and pipe fittings ▪ Hydraulic pump assemblies.	All Items will be provided	All Items will be provided

LOCAL PLANT & MACHINERY FOR CA STORAGES: - SS and PVC pipes of different dimension - Compressor - Standby electrical generator 150KVA - Fuel Tank - Electrical Panels - Electrical fittings Design & Drawing of CA Store is attached as Annexure "A-1" Calculation of Expenditure, sheets attached as Annexure "B"	**LOCAL PLANT & MACHINERY FOR CA STORAGES:** - SS and PVC pipes of different dimension - Compressor - Standby electrical generator 150KVA - Fuel Tank - Electrical Panels - Electrical fittings Design & Drawing of CA Store is attached as Annexure "A-1" Calculation of Expenditure, sheets attached as Annexure "B"	All Items will be provided	All Items will be provided

SIGNATURE OF THE PROCUREMENT COMMITTEE

(SHEIKH SHAKIL AHMED)
Director, Agriculture Engineering
Sindh, Hyderabad
CHAIRMAN

(SHAKIL AHMED RAHEMOON)
DIRECTOR, Water Management,
Sindh Hyderabad
MEMBER

(SAIFULLAH MAGSI) 29/07/18
Additional District Accounts Officer-i
District Accounts Office,
Hyderabad
MEMBER

(MUMTAZ AHMED SIDDIQUI)
DEPUTY DIRECTOR (MECH)/HQ
Agriculture Engineering Sindh
Hyderabad
MEMBER / SECRETARY

(Musarrat Mokhtar)
Deputy Director (Inspection)
Industries & Commerce Department,
Government of Sindh, Karachi
MEMBER

EVALUATION CRITERIA AGAINST TENDER NOTICE NO. DAE/STORES-970/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS/FIRM FOR THE INSTALLATION OF HOT WATER TREATMENT PLANT FOR THE YEAR (2017-18)

S #	Description	TS Builder Pvt. Ltd.	Izhar Steel Pvt. Ltd.	Bachani & Company
1	Type of Bidders	Private Limited	Private Limited	Engineering Company
2	Complete Address with Telephone Numbers & email address.	Attached	Attached	Attached
3	Registration Certificate of PEC in a category of C6 or above in relevant sub categories.	Attached	Attached	Attached
4	Registration Certificate from Income Tax (FBR)	Attached	Attached	Attached
5	Registration Certificate from Sales Tax (FBR)	Attached	Attached	Attached
4	Registration Certificate from Sindh Revenue Board (SRB)	Attached	Attached	Attached
5	Evidence of completing Hot Water Treatment in last 03 years in Sindh / Pakistan / Abroad.	Attached	Attached	Attached
6	Evidence of completing similar nature assignment in last three years (At-least one) Local / abroad.	Attached	Attached	Attached
7	Evidence indicating the firm is in business since last 3 years.	Attached	Attached	Attached
8	Bank Statement of last three years indicating a minimum turnover of Rs. 15.00 Million in a year.	Attached	Attached	Attached

S #	Description	TS Builder Pvt. Ltd.	Izhar Steel Pvt. Ltd.	Bachani & Company
9	Key Personal Qualification & Experience, at-least one Professional Engineer & 1 Registered Engineer with Supporting Technical Staff (Provide their CV's)	Attached	Attached	Attached
10	Provision of After Sales & Service Mechanism	Attached	Attached	Attached
11	Provision of Warranties, Brochure on Installed Equipment / Structure	Attached	Attached	Attached
	STATUS	**Qualified**	**Qualified**	**Qualified**

SIGNATURE OF THE PROCUREMENT COMMITTEE

(SHEIKH SHAKIL AHMED)
Director, Agriculture Engineering
Sindh, Hyderabad
CHAIRMAN

(SHAKIL AHMED RAHEMOON)
DIRECTOR, Water Management,
Sindh Hyderabad
MEMBER

(SAIFULLAH MAGSI)
Additional District Accounts Officer-i
District Accounts Office,
Hyderabad
MEMBER

(MUMTAZ AHMED SIDDIQUI)
DEPUTY DIRECTOR (MECH)/HQ
Agriculture Engineering Sindh
Hyderabad
MEMBER / SECRETARY

(Musarrat Mokhtar)
Deputy Director (Inspection)
Industries & Commerce Department,
Government of Sindh, Karachi
MEMBER

COMPARISON OF OFFERED PRODUCTS AGAINST TENDER NOTICE NO. DAE/STORES-970/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS/FIRM FOR THE INSTALLATION OF HOT WATER TREATMENT PLANT FOR THE YEAR (2017-18)

Description of Work	Unit	Qty.	TS Builder Pvt. Ltd.	Izhar Steel Pvt. Ltd.	Bachani & Company
Mango hot Water Treatment Line based on 1000 kg / h with complete system	Job	1	Responsive	Responsive	Responsive
Fruit feeding / Dumping System	Job	1	Responsive	Responsive	Responsive
Dewatering Roller Conveyor	Unit	1	Responsive	Responsive	Responsive
Roller Inspection Conveyor	Unit	1	Responsive	Responsive	Responsive
Washer	Unit	1	Responsive	Responsive	Responsive
Sprayer System	Unit	1	Responsive	Responsive	Responsive
Hot Water Treatment Tank	Unit	1	Responsive	Responsive	Responsive
Drying Tunnel	Unit	1	Responsive	Responsive	Responsive

SIGNATURE OF THE PROCUREMENT COMMITTEE

(SHEIKH SHAKIL AHMED)
Director, Agriculture Engineering
Sindh, Hyderabad
CHAIRMAN

(SHAKIL AHMED RAHEMOON)
DIRECTOR, Water Management,
Sindh Hyderabad
MEMBER

(SAIFULLAH MAGSI)
Additional District Accounts Officer-i
District Accounts Office,
Hyderabad
MEMBER

(MUMTAZ AHMED SIDDIQUI)
DEPUTY DIRECTOR (MECH)/HQ
Agriculture Engineering Sindh
Hyderabad
MEMBER / SECRETARY

(Musarrat Mokhtar)
Deputy Director (Inspection)
Industries & Commerce Department,
Government of Sindh, Karachi
MEMBER

LIST OF PRE-QUALIFIED FIRMS FOR YEAR 2017-18 FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE

1. M/s Izhar Steel Pvt. Ltd. Karachi
2. M/s T.S Builders Pvt. Ltd. Karachi

LIST OF PRE-QUALIFIED FIRMS FOR YEAR 2017-18 FOR THE INSTALLATION OF HOT WATER TREATMENT PLANT

1. M/s Izhar Steel Pvt. Ltd. Karachi
2. M/s T.S Builders Pvt. Ltd. Karachi
3. M/s Bachani& Company, Hyderabad

MINUTES OF MEETING OF PROCUREMENT COMMITTEE HELD ON 02.03.2018 AT 12:30PM, IN THE COMMITTEE ROOM OF DIRECTOR, AGRICULTURE ENGINEERING SINDH, HYDERABAD TO OPEN & EVALUATE THE FINANCIAL DOCUMENT OF TENDER NOTICE NO. DAE/STORES-970/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE & HOT WATER TREATMENT PLANT (2017-18) AGAINST SPPRA SR. NO. 36820

List of participants attached.

The meeting started with the name of Allah.

Opening of the discussion Chair welcomed the participants, and briefed about the pre-qualification process and informed that in last meeting of procurement committee was held on 18.01.2018 wherein the procurement committee has decided to pre-qualify category wise following firms for the further process.

CONTROLLED ATMOSPHERIC STORE

- M/s Izhar Steel Pvt. Ltd. Lahore.
- M/s T.S. Builders Pvt. Ltd. Lahore.

HOT WATER TREATMENT PLANT

- M/s Izhar Steel Pvt. Ltd. Lahore.
- M/s T.S. Builders Pvt. Ltd. Lahore.
- M/s Bachani & Company, Hyderabad.

Letter No. DAE/Stores-970/794/18 dated 14.02.2018 was sent to all qualified bidders for the obtaining of Financial document on payment of Non-refundable fee Rs. 1000/- in shape of Pay Order / Demand Draft from the office of Director, Agriculture Engineering Sindh or can be downloaded from SPPRA website.

M/s Izhar Steel Pvt. Ltd. has issued financial offer and submits on the day of opening for Controlled Atmospheric Store, whereas M/s Bachani & Company has issued financial offers and submits on day of opening for Hot Water Treatment Plant.

The total rates offered by the firm are as under:-

Amount in Million

S. #,	Name of Firms	Total Bid Value	Amount required (2%)	Amount Deposited
CONTROLLED ATMOSPHERIC STORE				
1	M/s Izhar Steel Pvt. Ltd. Lahore.	Rs. 400.00 Million	Rs. 8.00 Million	Pay Order # 04611567 dated 01.03.2018 amounting to Rs. 4,000,000 & Pay Order # 04611568 dated 01.03.2018 amounting to Rs. 4,000,000 of Bank Al Habib Limited Lahore
HOT WATER TREATMENT PLANT				
1	M/s Bachani & Company, Hyderabad	Rs. 18.00 Million	Rs. 0.360 Million	Pay Order # 50605820 dated 02.03.2018 amounting to Rs. 360,000 Summit Bank Limited, Hyderabad

The Procurement Committee evaluated the financial proposal and found that deposited amount of Bid Security from every firm is in-line with the tender requirement. Lowest rates offered by the firms in all categories are as under:-

Sr. No.	Name of Category	Unit Cost	Offered by firm
CONTROLLED ATMOSPHERIC STORE			
1.	M/s Izhar Steel Pvt. Ltd. Lahore. Controlled Atmospheric Store, Fruit Control Equipments SRL Via, R Luxemburg, 55-20085 locate di Triulzi (Millano) Italy	Rs. 200.00 Million Per Unit	Lowest rates recommended by M/s Izhar Steel Pvt. Ltd. Lahore
HOT WATER TREATMENT PLANT			
1.	M/s Bachani & Company, Hyderabad. Fresh Mango Processing Plant, One Ton Capacity in 60 Minutes at 46-48°C Faislabad,	Rs. 9.00 Million Per Unit	Lowest rates recommended by M/s Bachani & Company, Hyderabad

The Procurement Committee calculated the amount on 80% Subsidy on the basis of lowest rates offered as under:-

Sr. No.	Category of Tubewell	Estimated Cost in Approved PC-I	Lowest Unit Price Offered by the firms	Subsidy Amount	Farmer Share	Status
1	Installation of Controlled Atmospheric Store.	Rs. 200.00 Per Unit	Rs. 200.00 Per Unit	Rs. 160,000,000 Per Unit	Rs. 40,000,000 Per Unit	Offer is in-line with the requirement.
2	Installation of Hot Water Treatment Plant.	Rs. 8.00 Per Unit	Rs. 9.00 Per Unit	Rs. 6,400,000 Per Unit	Rs. 2,600,000 Per Unit	Offer is **12.5%** higher than the estimated cost

It was decided during the meeting that the additional amount Rs. 1.00 Million per unit will be borne by the Beneficiary farmers.

The Procurement Committee observed that single offer is received for the Controlled Atmospheric Store and Hot Water Treatment Plant, so procurement committee advised the department to compare the offered price from market price, prior to get approval from the competent authority.

The meeting ended with vote of thanks.

MEMBER / SECRETARY
PROCUREMENT COMMITTEE

NO. DAE/STORES-970/1080/18 Dated: 02 /03/2018.

C.C. to:

- The Director General Agricultural Engineering & Water Management Sindh, Hyderabad for kind information.
- The Additional Secretary (Tech) Agriculture Department Government of Sindh Karachi for kind information.
- PS to Secretary Agriculture Department Government of Sindh, Karachi for kind information.
- Member Procurement Committee _____ (All).

MEMBER / SECRETARY
PROCUREMENT COMMITTEE

LIST OF MEMBERS OF PROCUREMENT COMMITTEE PARTICIPATED IN MEETING FOR THE OPENING OF FINANCIAL PROPOSAL AGAINST TENDER NO. DAE/STORES-970/3727/17 DATED 14.11.2017 FOR FINANCIAL PROPOSAL OF CONTRACTORS FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE & HOT WATER TREATMENT PLANT OPENED ON 02-03-2018 AT 12:30 PM FOR THE YEAR (2017-18)

S. #.	NAME	DESIGNATION	SIGNATURES
01	**SHEIKH SHAKIL AHMED**	**Director,** Agriculture Engineering Sindh, Hyderabad	IN CHAIR
02	**FARRUKH RASHEED ANSARI**	Additional Director (Engg), Directorate General, AE&WM Sindh Hyderabad	
03	**SAIFULLAH MAGSI**	Representative of District Accounts Officer, District Hyderabad **MEMBER**	
04	Musarrat Mokhtar.	**Deputy Director (Inspection)** Industries & Commerce Department, Government of Sindh, Karachi **MEMBER**	
05	**MUMTAZ AHMED SIDDIQUI**	**Deputy Director (Mech)** Agriculture Engineering Sindh Hyderabad **MEMBER / SECRETARY**	02/03/18

COMPARATIVE STATEMENT SHOWING OFFERED RATES (INCLUDING ALL APPLICABLE TAXES) AGAINST TENDER NOTICE NO. DAE/Stores-970/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE & HOT WATER TRETMENT PLANT (2017-18)

S #	Description	PC-I Rates (Rs. in Million)	M/s Izhar Steel Pvt. Ltd. Lahore	Market Rates as per SPPRA Rule 48	
				Abel Construction Pvt. Ltd. Lahore	Irshad Associates, Karachi
1	Installation of Controlled Atmospheric Store on Turnkey basis	Rs. 200.00 Per Unit	Rs. 200.00 Million Per Unit	Rs. 222.00 Million Per Unit	Rs. 230.00 Million Per Unit

SHEIKH SHAKIL AHMED
DIRECTOR
AGRICULTURE ENGINEERING
SINDH HYDERABAD
CHAIRMAN

MUSARRAT MOKHTAR
DEPUTY DIRECTOR (INSP)
INDUSTRIES & COMMERCE DEPARTMENT
KARACHI
MEMBER

FARRUKH RASHEED ANSARI
ADDITIONAL DIRECTOR (ENGG)
DIRECTORATE GENERAL, AE&WM,
SINDH, HYDERABAD
MEMBER

(SAIFULLAH MAGSI)
ADDITIONAL DISTRICT ACCOUNTS OFFICER-I
DISTRICT ACCOUNTS OFFICE, HYDERABAD
MEMBER

(MUMTAZ AHMED SIDDIQUI)
DEPUTY DIRECTOR (MECH)
AGRICULTURE ENGINEERING SINDH
MEMBER/ SECRETARY

COMPARATIVE STATEMENT SHOWING OFFERED RATES (INCLUDING ALL APPLICABLE TAXES) AGAINST TENDER NOTICE NO. DAE/Stores-970/3727/17 DATED: 14.11.2017 FOR PRE-QUALIFICATION OF CONTRACTORS FOR THE INSTALLATION OF CONTROLLED ATMOSPHERIC STORE & HOT WATER TRETMENT PLANT (2017-18)

S #	Description	PC-I Rates (Rs. in Million)	M/s Bachani & Company	Market Rates as per SPPRA Rule 48	
				M/s Faizan Engineering Industries Faislabad	M/s National Pre-Cast Industries Hyderabad
1	Installation of Hot Water Treatment Plant on Turnkey basis	Rs. 8.00 Per Unit	Rs. 9.00 Million Per Unit	Rs. 9.500 Million Per Unit	Rs. 9.800 Million Per Unit

SHEIKH SHAKIL AHMED
DIRECTOR
AGRICULTURE ENGINEERING
SINDH HYDERABAD
CHAIRMAN

MUSARRAT MOKHTAR
DEPUTY DIRECTOR (INSP)
INDUSTRIES & COMMERCE DEPARTMENT
KARACHI
MEMBER

FARRUKH RASHEED ANSARI
ADDITIONAL DIRECTOR (ENGG)
DIRECTORATE GENERAL, AE&WM,
SINDH, HYDERABAD
MEMBER

(SAIFULLAH MAGSI)
ADDITIONAL DISTRICT ACCOUNTS OFFICER-I
DISTRICT ACCOUNTS OFFICE, HYDERABAD
MEMBER

(MUMTAZ AHMED SIDDIQUI)
DEPUTY DIRECTOR (MECH)
AGRICULTURE ENGINEERING SINDH
MEMBER/ SECRETARY