UNG
Shurtan GKM

CONFIRM

Chairman of the technical expert
commission of Shurtan GCC LLC
_____ Kh. Toshboev
"__" _____ 2021

Reg. No 074/026-1784

TECHNICAL ASSIGNMENT

for purchasing of catalyst for the selective hydrogenation of acetylene in ethane and ethylene fraction with the corresponding ceramic balls for the needs of Shurtan gas chemical complex LLC

TEXNIK TOPSHIRIQ va TEXNIK XULOSALAR uchun

SGCC 2021

1. GENERAL INFORMATION

1.1. Name
1. A catalyst for the selective hydrogenation of acetylene in ethane and ethylene fraction **2.** Inert heat-resistant ceramic balls
1.2. Basis and purpose of purchasing goods
1.Basis: Applications for purchasing of catalyst for 2021 **The purpose** of purchasing a catalyst for selective hydrogenation is: - Chemical conversion of acetylene obtained in the ethane cracking to ethylene by catalytic hydrogenation using high purity hydrogen. The necessity for this process is due to strict requirements for the content of salable ethylene and the production of additional ethylene. **2. Basis:** Applications for purchasing of catalyst for 2021 **The purpose** of purchasing of ceramic balls is: - ceramic balls are used in the acetylene converter DC –1401 as equal distribution of the reaction mixture of ethane and ethylene fraction (EEF) and hydrogen to prevent and carryover an expensive catalyst.
1.3 Information about novelty (year of production/manufacture of goods)
The goods must be new, manufactured no more than two months before the date of shipment.

2. SCOPE OF APPLICATION

1. Application of the catalyst:
- in the acetylene hydrogenation process
2. Application of ceramic balls:
- To accelerate running of gas and liquid distribution and support or protect active catalysts having a relatively lower mechanical strength in the chemical industry.

3. OPERATING CONDITIONS

3.1 Basic operating conditions
According to the manufacturer regulatory and technical documentation

4. TECHNICAL REQUIREMENTS

1. Technical specifications of acetylene hydrogenation catalyst		
Name	-	Selective hydrogenation catalyst
Loss on ignition to constant weight at 537.78^{0}C	%	<5
Crush strength	kg	8.1647
Crush strength	kg/mm	1.215
Surface area	m2/g	3 - 6
Abrasion% (ASTM)		<5
Chemical composition Al2O3 Pd Ag	wt%	 99.3 - 99.6 (balance) 0.03 +/- 0.003 0.200 +/- 0.03
Catalyst shape		Extrudate
Catalyst size	mm	3
Bulk density	kg/m3	832.96 +/- 48.05
2.Technical specifications of ceramic balls		
Appearance		Spherical solid
Outer surface		Smooth, without cracks and grooves

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Characteristics		- high heat and pressure resistance; - low moisture absorption; - chemical properties are more stable; - resistant to acid corrosion, alkali and organic solvent; - resistant to sudden temperature changes
Inert ceramic ball size - As per catalyst supplier recommendation	inch	top layer bottom layer
Al2O3 CaO SiO2	wt%	Min. 95.2 Max. 4.5 Max. 0.07
Bulk density	kg/m3	1601.8 +/- 80.092
Density	kg/m3	1521.7–1681.9
Loss on ignition to constant weight at 537.78°C	%	<5

Regulated parameters of the ethane and ethylene fraction gas entering the reactor			
Name of parameters	**Unit**	**Characteristic quantity (according to the regulations)**	
Gas temperature of ethane and ethylene fraction at the reactor inlet start and end of run	°C	SOR 38.1	EOR 77
Gas pressure in the ethane and ethylene fraction at the reactor inlet	kPa	2016	
Gas flow in the ethane and ethylene fraction at the reactor inlet	t/h	28.5 ÷ 42.7	
Hydrogen supply flow rate to the reactor	kg/h	12 ÷ 15	
Hydrogen pressure at the reactor inlet	kPa	2016	

Characteristic composition of the ethane and ethylene fraction entering the reactor	
Design	
Component composition	vol%
H2	0.59
CH4	0.05
C2H2	0.35
C2H4	58.44
C2H6	40.44
C3H6	0.12
C3H8	0.02

Hydrogen content at the reactor inlet	
Design	
Component composition	vol%
H2	99.95
CH4	0.05

Regulated parameters of the ethane and ethylene fraction gas at the outlet of the reactor

Name of parameters	Unit	Characteristic quantity (according to the regulations)	
Gas temperature of ethane and ethylene fraction at the reactor outlet start and end of run	°C	SOR 53.9	EOR 98
Gas pressure in the ethane and ethylene fraction at the reactor outlet	kPa	1973	

Characteristic composition of the ethane and ethylene fraction at the outlet of the reactor

	Design
Component composition	vol%
H2	0.03
CH4	0.05
C2H2	0.00
C2H4	58.91
C2H6	40.88
C3H6	0.12
C3H8	0.02

Technical information of the reactor

Two adiabatic reactors, one reactor in operation, and the second standby
The reactors are vertical, cylindrical process vessel with an internal volume of 18.6 m3
Content of C2 H2 at the inlet: 0.3-2.8% vol
Content of C2 H2 at the outlet: no more than one ppm
Adding H2 0.9-2.2 vol. per vol. C2 H2
Typical H2/C2 H2 molar ratios:

	start of the run	end of the run
Single bed reactor	1.1-1.5	1.8-2.2
Temperature	38°C - 54°C	77°C - 98°C

The duration between the regeneration cycle of the catalyst: 12-22 months
Catalyst lifetime: At least ten years for one reactor
Ethylene increase: at least 65% Ethylene conversion: at least 98.2%

Ethane and ethylene gas mixture before the acetylene converter inlet is heated in an EA-1405 steam heater using low-pressure steam. The heat exchanger is a horizontal shell-and-tube heat exchanger with a heat exchange surface area of 194 m2.
After the converter ethane and ethylene mixture is cooled in an EA-1407 water heat exchanger. Heat exchanger EA-1407 is a horizontal shell-and-tube heat exchanger with a heat exchange area of 165 m2.
The acetylene converter regenerates periodically when the reactor is dirty, and there is no possibility of increasing the ethylene.
Catalyst loading diagram See Appendix No. 1

4.2 Reliability requirements

Offered goods must fully comply with the technical parameters specified in subsection 4.1 and fulfill the intended purposes as per subsection 1.2 of the present technical assignment. As well as similar products accepted that, does not give up or exceed technical and functional parameters.

4.3 Requirements for labeling

The packing must be labeled following the given type of goods and labeling requirements. Consumer packing should be provided with a paper or self-adhesive

labels made by typographically or marking with a stencil or stamp. Packing labeling must be resistant to water, organic liquids, oil products, mechanical or climatic factors, and be preserved during the storage and transportation period of the liquid.
The content of the marking on the consumer packing must indicate:
- product name;
- name of the country of manufacture;
- name of the manufacturer;
- manufacturer or seller legal address;
- designation of the goods, the scope of application; manufacturer and/or seller address;
- manufacturer trademark (if available);
- date of manufacture (month and year);
- shelf life;
- designation of GOST (TC), ASTM, etc.

4.4 Requirements to size and packing

The goods should be shipped in 200 liters sealed metal drums with a slight vacuum as per the manufacturer's regulatory and technical documentation. Other options and dimensions of packages are subject to additional agreement with the Customer, provided they are acceptable. Goods should be packaged in the manufacturer's standard export packing to ensure their complete safety from all kinds of damage during long-term storage and transportation of goods, taking into account several overloads along the way. Packing should ensure goods safety during transportation without any damage, loading and unloading operation, and movement of goods to the mounting location. If damage is found, goods will not be accepted.

5. REQUIREMENTS TO RULES FOR DELIVERY AND ACCEPTANCE

5.1 Order of delivery and acceptance

The goods should be accepted after incoming inspection and drawing up a report following the contract.
The Customer accepts the goods according to the quantity, quality, completeness of the lot, and the external signs of the safety of the goods (mechanical damage, visible deformation, and other similar damage) following the transport and enclosed documents, the manufacturer's quality certificates.

At receiving the goods from the carrier, the Customer (consignee) should check the conformity of the goods with the information specified in the contract, specifications, or additional agreements to it, as well as in transport, enclosed documents, and the manufacturer quality certificates.
In case receiving the goods from the carrier, if a non-conformity of the goods according to quality/quantity is determined, the Customer (consignee) has to stop receiving the goods. Take measures to ensure the safety of the goods and prevent mixing with other uniform goods as well as notify the Seller about this in writing within 5 (five) working days from the date of finding the shortage.
The Seller is obliged to send the Customer (consignee), no later than 10 (ten) working days from the date of receipt of the notification, a response about the participation of his representative in the further acceptance of the goods. The Seller's representative must participate in the acceptance of the goods within a reasonable time, not exceeding 20 (twenty) calendar days from the date of receipt of the notification.
If Seller refuses to participate in the receipt of goods or fails to respond to the notification or his representative fails to appear within the date specified in the contract, the Buyer has the right to carry out further receipt of goods according to the quality/quantity with the participation of Board of trade's representative or an independent expert organization to draw up report following the contract.
The following information should be pointed out in the acceptance document of the goods:
- the name of the Customer (consignee) of the goods;

- number and date of drawing up the report, place of acceptance of goods, start and end of acceptance of goods;
- surname, initials and position of the persons participating in the receiving of goods, document information confirming the persons' authority to participate in the receiving of goods, their details;
- names and addresses of the manufacturer and the Seller;
- the date and number of the notification of the call to the Seller representative;
- detected non-conformity of the goods, its nature;
- an indication of the contract number and specification;
- name and labeling of goods according to the shipping documents for a corresponding lot of the goods;
- number of packages and weight of metal products according to shipping documents;
- the state of the container (packing);
- the weight of the identified shortage for each package;
- number of the enclosed papers and quality certificate;
- size, steel grade, lot number, presence of a label;
- Conclusion on the nature of the identified defects in the goods and the reason for their origination.

All persons involved in the acceptance of the goods must sign the report.

5.2 Requirements for transfer of technical and other documents to the Customer at goods supply

The goods should be accompanied by the following documentation:
- certificate of conformity of goods;
- Seller's invoice with a description of goods, indicating the quantity, unit price, and total amount;
- Bill of lading issued to the Consignee' name indicating the dispatch station and the destination point, the name of the Customer, the number and date of signing of the current contract;

- certificate of country of origin of goods indicating the number and date of the invoice;

- packing list;

-certificate of quality of goods issued by the manufacturer;

5.3 Requirements for insurance of goods

Not required

6. TRANSPORTATION REQUIREMENTS

The goods must be shipped manufacturer's standard export barrel or container (sealed, tight, and duly packaged) to ensure complete safety from possible kinds of damage during long-term storage and transportation of goods, taking into account several overloads along the way.

7. REQUIREMENTS FOR STORAGE

Storage of goods must be carried out following the manufacturer's regulatory and technical documentation.

8. REQUIREMENTS FOR SCOPE AND/OR GUARANTEE PERIOD

The Supplier must provide a document on the manufacturer's letterhead, which specifies the conditions for fulfilling the guarantee.
The supplier provides a quality guarantee for the goods following the manufacturer's warranty. The guarantee period of operation must be at least 10 years from the date of setting the goods into operation.
If the Supplier supplied goods which did not comply with the terms of the contract, the requirements of the regulatory and technical documentation and the quality of goods is not by an appropriate quality document, the Supplier is responsible for replacing the goods with adequate quality according to the contract within 14 (fourteen) days from

receipt of the claim or within seven days from the date of the Customer's written request to return the means paid for low-quality products.

9. ENVIRONMENTAL AND HEALTH REQUIREMENTS

According to the current laws and regulations of the Republic of Uzbekistan.

10. SAFETY REQUIREMENTS

The goods should meet the safety requirements established by the law of the Republic of Uzbekistan during storage, transportation and operation.
General requirements for safety during operation of the plant should be given in special sections of the operation manual.

11. REQUIREMENTS FOR QUALITY

The goods must be of high quality and meet the requirements of the intended use, having the necessary consumer properties and specifications, characteristics of environmental and industrial safety. A quality certificate issued by the manufacturer must confirm the quality of the goods.

12. ADDITIONAL (OTHER) REQUIREMENTS

Each participating company in the contestant should take into account the inclusion of the technical offer the following information:
- catalyst quality certificate, containing, besides other information average bulk density, the content of precious metals, methods for determining parameters according to the quality certificate with a detailed description.
- Safety data sheet for the catalyst.
- List of companies wherein the selective hydrogenation catalyst ran with similar raw materials over the past three years, indicating the contact information of the Customers (reference list)
- The number of possible regenerations and the whole life of the catalyst (requirements: at least ten years).
-Guaranteed acetylene content at the outlet of the hydrogenation unit during the entire operation cycle (requirement: no more than one ppm)
- Storage conditions for the catalyst as not used in the reactor as unloaded for the period of reactor repair. Methods for the disposal of the spent catalyst at the supplier's expense.
-instructions, recommendations, and methods for loading the catalyst.
-instructions and recommendations on pre-start operations after loading, during running, regeneration, reconditioning of catalyst activity, disposal with a detailed description of the operation plan and personnel functions during the regular run, start-up and shutdown, actions in case of possible malfunctions and emergencies.
The Supplier's obligation to provide after-sales technical support of the catalyst to fulfill and confirm the warranty obligations, namely, must be ensured:
- To arrive the supplier specialist at the plant to control the catalyst loading and start-up operations directly with the outgiving of recommendations.

13. REQUIREMENTS FOR QUANTITY, EQUIPMENT, PLACE AND TIME (PERIODICITY) OF DELIVERY

The total quantity of the required goods is:
1. Catalyst
Selective hydrogenation catalyst - 9 m3
2. Ceramic balls
The total volume of inert ceramic balls - 0.960 m3, of which;
Ceramic balls with a top diameter - 0.480 m3
Ceramic balls with a bottom diameter - 0.480 m3
• a layer of inert ceramic balls 300 mm thick;
• ceramic balls - according to the recommendation of the catalyst supplier
3.Corresponding clearance seal between the support grid/strainer and the process vessel wall is required

The goods should be delivered in full.
The delivery date is determined at the time of signing the contract.
The delivery date may vary as per the actual rate of production and, therefore, the delivery date must be agreed with the Customer and the goods are delivered on the exact date specified. The maximum delivery time is not more than 80 days after placing an order by the Customer or from the date of signing the corresponding contract.
Container/Railway wagon shipping: DAP - railway station Kengsoy (station code - 732602), joint stock company "Uzbekistan Railways"
Truck Delivery: DAP – 180300, Shurtan settlement, Guzar district, Kashkadarya region, the Republic of Uzbekistan

14. REQUIREMENT FOR THE FORM OF SUBMITTED INFORMATION

The submitted technical proposal must:
- have a copy in electronic media (CD/DVDs or USB data carrier);
- Regardless of the original language, submitted documents should be duplicated in Uzbek, Russian, and/or English.

15. LIST OF ACCEPTED ABBREVIATIONS

No.	Abbreviation	Key to Abbreviations
	TA	Technical assignment
	RTD	Regulatory and technical documentation
	GOST	State standard

Developed by

Deputy production coordination department: G. Rashidov

Leading process engineer of technical and process service: A. Abdurakhmanov

Material and technical resources management service engineer: U. Omonov

Chief of ethylene production unit: O. Murtazaev

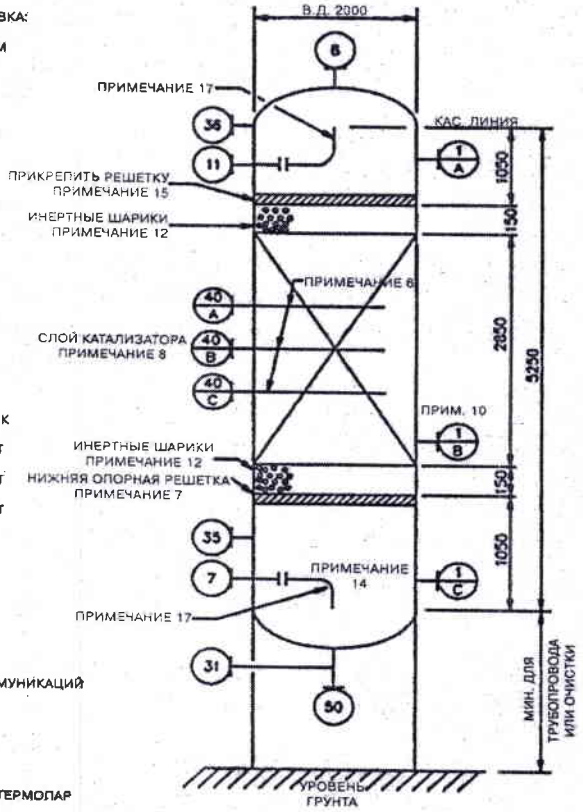
Ethylene production unit technologist: E.Eshkurbanov

Chief of cold section unit: B. Yuldashev

Catalyst loading diagram/чертежи реактора.Appendix No1/*Приложение-1*

№ АППАРАТА: DC-1401A,B
НАИМЕНОВАНИЕ АППАРАТА : КОНВЕРТЕРЫ АЦЕТИЛЕНА
ДИАМЕТР: В. Д. 2000
ВЫСОТА: 5250 ММ РАССТОЯНИЕ МЕЖДУ КАС. ЛИНИЯМИ
ДЛИНА:
РАБОЧАЯ ТЕМПЕРАТУРА:
ВЕРХ: °C НИЗ: °C ЦИЛИНДР ЧАСТЬ ПРИМЕЧАНИЕ 5 °C
РАБОЧЕЕ ДАВЛЕНИЕ:
ВЕРХ ____КПА (ИЗБ.) НИЗ ____КПА (ИЗБ.) ЦИЛИНДР ЧАСТЬ ПРИМЕЧАНИЕ 5 КПА (ИЗБ.)
УДЕЛЬНАЯ ПЛОТНОСТЬ ЖИДКОСТИ:
РАСЧЕТНАЯ ТЕМПЕРАТУРА: ПРИМЕЧАНИЕ 3,5 °C
РАСЧЕТНОЕ ДАВЛЕНИЕ: ПРИМЕЧАНИЕ 3,5 КПА ВАКУУМ
ДНИЩА: ЭЛЛИПТИЧЕСКИЕ: X ВЫПУКЛЫЕ: КОНИЧЕСКИЕ: ПЛОСКИЕ:
СТАНДАРТ: ASME API ДРУГОЙ
МАТЕРИАЛ: КОРПУС: УГЛЕР. СТ. (ИСПЫТАНИЯ ПО ШАРПИ) ФУТЕРОВКА:
КРЫШКА: УГЛЕР. СТ.
ДОПУСК НА КОРРОЗИЮ: КОРПУС: 3,0 ММ КРЫШКИ: ММ
ИЗОЛЯЦИЯ: ТЕПЛОИЗОЛЯЦИЯ: X ЗАЩИТА НЕ ТРЕБУЕТСЯ

№ ИЗД.	ТРЕБ. КОЛ.	РАЗМЕР (ДЮЙМ)	НАЗНАЧЕНИЕ И ОБОЗНАЧЕНИЕ
1	3	20	ЛЮК
2			ЛЮК
3			
4			
5			ЛЮЧОК
6			
7	1	12	ВЫПУСК ПАРА К EA-1407
8	1	2	ВЕНТИЛЯЦИОННАЯ ЛИНИЯ К ВАКУУМНОМУ ОБОРУДОВАНИЮ
9			
10			ФЛЕГМА ОТ
11	1	12	СЫРЬЕ ОТ EA-1405
12			СЫРЬЕ ОТ
13			СЫРЬЕ ОТ
14			К (РИБОЙЛЕРУ) (НАСОСУ РИБОЙЛЕРА)
15			ОТ РИБОЙЛЕРА
16			УРАВНИТЕЛЬНАЯ ЛИНИЯ С
17			НИЖНИЙ ВЫПУСК К
18			ВЫПУСК ЖИДКОСТИ К
19			ОТВОД К
20			ОБРАТНЫЙ ПОТОК ОТ
21			ОТВОД К
22			ОБРАТНЫЙ ПОТОК ОТ
23			ОТВОД К
24			ОБРАТНЫЙ ПОТОК ОТ
25			ОТВОД ФЛЕГМЫ К
26			ФЛЕГМА ОТ
27			ОТВОД ФЛЕГМЫ К
28			ФЛЕГМА ОТ
29			ТЕХНИЧЕСКИЙ ПАР
30			ВЫПУСК КОНДЕНСАТА
31	1	3	ДРЕНАЖ
32			ПРОБООТБОРНОЕ СОЕДИНЕНИЕ
33			ПРЕДОХРАНИТЕЛЬНЫЙ КЛАПАН — АВАРИЙНЫЙ ЛЮК
34			ПРЕДОХРАНИТЕЛЬНЫЙ КЛАПАН
35	1	2	ПРИСОЕДИНЕНИЕ ИНЖЕНЕРНЫХ КОММУНИКАЦИЙ
36	1		МАНОМЕТР
37			РЕГУЛЯТОР ДАВЛЕНИЯ
38			ШТУЦЕР ДЛЯ ИЗМЕРЕНИЯ ДАВЛЕНИЯ
39			ИНДИКАТОР ПЕРЕПАДА ДАВЛЕНИЯ
40	3		ТЕРМОИНДИКАТОР
41			РЕГУЛЯТОР ТЕМПЕРАТУРЫ
42			ТЕРМОГРАФ
43			ИЗМЕРИТЕЛЬНЫЙ КАНАЛ ДЛЯ ВВОДА ТЕРМОПАР
44			ИЗМЕРИТЕЛЬ ТЕМПЕРАТУРЫ
45			УРОВНЕМЕР/ТРУБЧАТЫЙ УРОВНЕМЕР
46			РЕГУЛЯТОР УРОВНЯ И СИГНАЛИЗАТОР УРОВНЯ
47			РЕГУЛЯТОР УРОВНЯ
48			СИГНАЛИЗАТОР УРОВНЯ
49			ПЕРЕТОЧНАЯ ТРУБА
50	1	3	ОЧИСТКА



ПРИМЕЧАНИЯ:
ПРИМЕЧАНИЯ — СМ. ЛИСТ 2.

AL3412D

РЕД.	ДАТА ВЫП.	ОПИСАНИЕ				
2		УТВЕРЖДЕНО ДЛЯ ПРОЕКТИРОВАНИЯ	CB	DLA		
1	24/10/97	ДЛЯ ПАКЕТА БАЗОВОЙ ПРОЕКТНОЙ ДОКУМЕНТАЦИИ	WZ	PLW		
0	15/8/97	ПРЕДВАРИТЕЛЬНЫЙ	AMB	SMR		

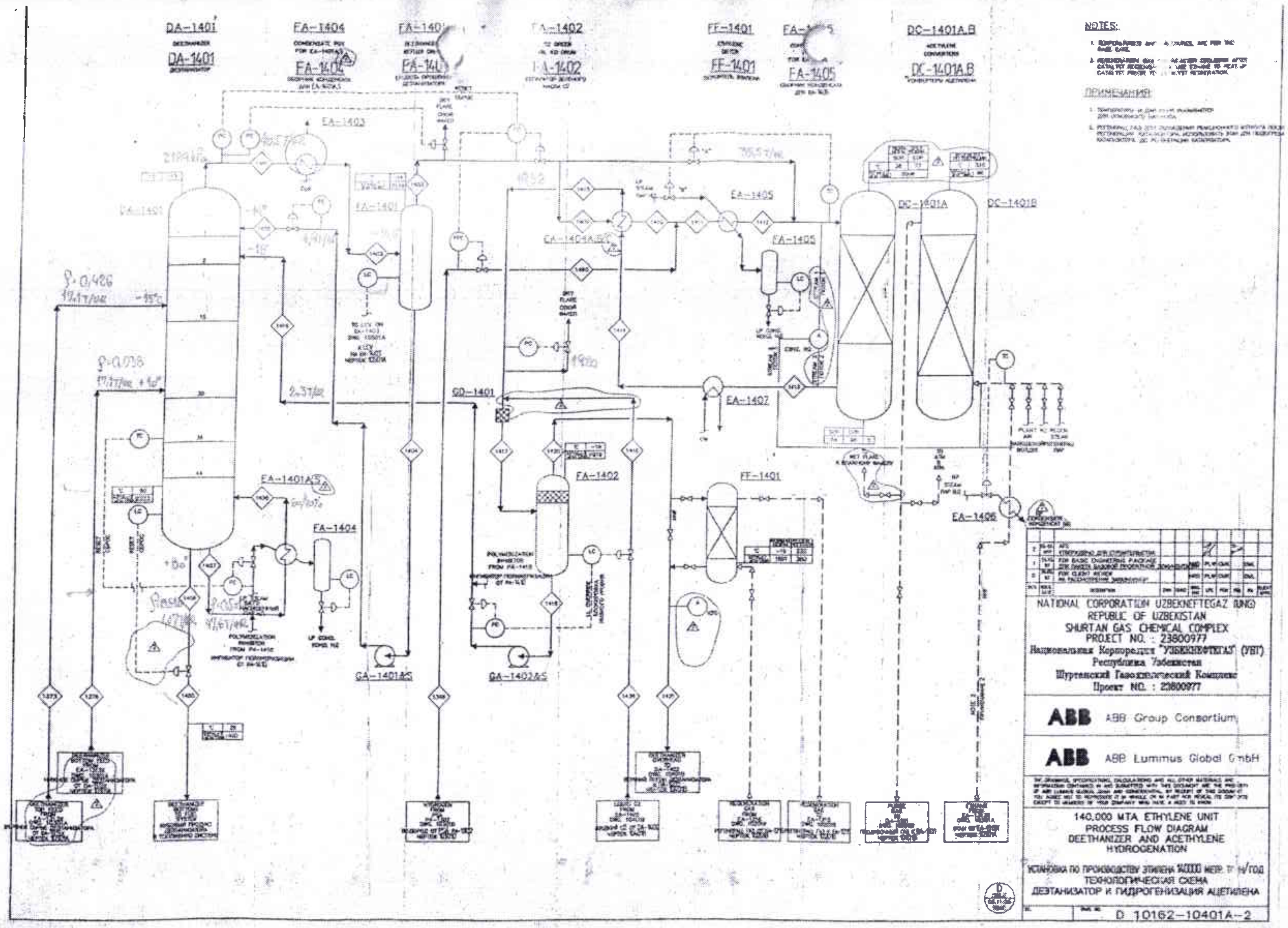
ABB Lummus Global Inc.
Bloomfield, NJ

НАЗВАНИЕ: УСТАНОВКА ПО ПРОИЗВОДСТВУ ЭТИЛЕНА 140000 МЕТР. ТОНН/ГОД
ЗАКАЗЧИК: НАЦИОНАЛЬНАЯ КОРПОРАЦИЯ УЗБЕКНЕФТЕГАЗ
МЕСТОПОЛОЖЕНИЕ: РЕСПУБЛИКА УЗБЕКИСТАН
№ РАБОТ: 08914

ЧЕРТЕЖИ, ТЕХНИЧЕСКИЕ УСЛОВИЯ, РАСЧЕТЫ И ВСЕ ДРУГИЕ МАТЕРИАЛЫ И ДАННЫЕ, СОДЕРЖАЩИЕСЯ В НАСТОЯЩЕМ ДОКУМЕНТЕ И ПРИЛАГАЕМЫЕ К НЕМУ, ЯВЛЯЮТСЯ СОБСТВЕННОСТЬЮ ABB LUMMUS GLOBAL INC. И КОНФИДЕНЦИАЛЬНОЙ ИНФОРМАЦИЕЙ. ПОЛУЧАЯ НАСТОЯЩИЙ ДОКУМЕНТ, ВЫ СОГЛАШАЕТЕСЬ НЕ ВОСПРОИЗВОДИТЬ ЕГО, ПОЛНОСТЬЮ ИЛИ ЧАСТИЧНО, И НЕ РАСКРЫВАТЬ ЕГО СОДЕРЖАНИЯ, КРОМЕ ЧЛЕНОВ ВАШЕЙ КОМПАНИИ, КОТОРЫМ ЭТО НЕОБХОДИМО.

СХЕМАТИЧЕСКИЙ ЧЕРТЕЖ ТЕХНОЛОГИЧЕСКОГО АППАРАТА

№ АППАРАТА: DC-1401A,B | ЛИСТ 1 ИЗ 3



"Shurtan gaz kimyo majmuasi" MCh. MTRB va T xizmati * "O'zbekneftgaz" AJ *
TEXNIK TOPSHIRIQ
va
TEXNIK XULOSALAR
uchun

JOB 08914
Ethylene Unit

SHURTAN GAS CHEMICAL PROJECT
BASE CASE

STREAM NUMBER	1409	1410	1411	1412	1413	1414	1415
STREAM NAME	DEC2 OVD TO ACET CONV F EXC EA-1404	DEC2 OVD FR ACET CONV F EXC EA-1404	FEED TO ACET CONV HTR EA-1405	FEED FR ACET CONV HTR EA-1405	ACET CONV EFFLUENT	EFFL FROM ACET CONV AFT EA-1407	EFFL FROM ACET CON EX EXC-1404
PHASE	MIXED	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR	VAPOR
COMPONENT, MOL PERCENT							
HYDROGEN	0.00	0.00	0.59	0.59	0.03	0.03	0.03
CARBON MONOXIDE							
CARBON DIOXIDE							
HYDROGEN SULFIDE							
METHANE	0.05	0.05	0.05	0.05	0.05	0.05	0.05
ACETYLENE	0.35	0.35	0.35	0.35			
ETHYLENE	58.78	58.78	58.44	58.44	58.91	58.91	58.91
ETHANE	40.68	40.68	40.44	40.44	40.88	40.88	40.88
PROPADIENE/METHYLACT	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PROPYLENE	0.12	0.12	0.12	0.12	0.12	0.12	0.12
PROPANE	0.02	0.02	0.02	0.02	0.02	0.02	0.02
BUTADIENE/C4ACETYLENE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BUTYLENES	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BUTANES	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5 HYDROCARBONS							
C6-C8 NON-AROMATICS							
BENZENE							
TOLUENE							
XYLENE/ETHYLBENZENE							
STYRENE							
C9-2							
204-[illegible]							
288 [illegible]							
NITROGEN							
STEAM/WATER							
TOTAL FLOW, kgmol/h	1231.51	1231.51	1238.78	1238.78	1231.85	1231.85	1231.82
	35,567	35,567	35,582	35,582	35,582	35,582	35,581
MOLECULAR WT	28.88	28.88	28.72	28.72	28.89	28.89	28.89
TEMPERATURE, C	-16.0	31.7	31.4	36.1	53.9	38.0	-12.0
PRESSURE, kPa(G)	2047	2033	2030	2016	1973	1953	1936
VAPOR FLOW, kgmol/h	35,558	35,567	35,582	35,582	35,582	35,582	35,581
	884	1,262	1,273	1,327	1,450	1,363	997
MOLECULAR WEIGHT	28.88	28.88	28.72	28.72	28.89	28.89	28.8
DENSITY, kg/m3	40.21	28.19	27.94	26.81	24.54	26.10	35.6
VISCOSITY, cP	0.010	0.011	0.011	0.011	0.011	0.011	0.010
LIQUID FLOW, kgmol/h	8						
	0.0						
DENSITY, kg/m3	424						
VISCOSITY, cP	0.07						
SURFACE TENSION, dyne/cm	3.89						

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