HUM ELIT OIL

CATALOGUE

OIL & GAS
PROCESS EQUIPMENT

CERTIFICATES


ZERTIFIKAT

(Konformitätsbescheinigung)

Certificate of conformity

Prüfung des Produktes (Modul F) nach Richtlinie 97/23/EG

Name und Anschrift : HUM MAKINA SANAYİ VE TİCARET KOLL. ŞTİ

des Herstellers: Ege Serbest Bölgesi , Mümtaz Sok No:28 Gaziemir İZMİR / TURKEY

CE 0036

Prüfbericht Nr.: P-IS-TGK-IST-16-06-1210000305-01- 16-IS-0273-34-B

Geltungsbereich: : 500 m² EVAPARATOR Shell: 0,137 Bar & Tubes: 1,0347 Bar Drawing No: EV0216-00

Fertigungsstätte: Ege Serbest Bölgesi , Mümtaz Sok No:28 Gaziemir İZMİR / TURKEY

(Ort, Datum) İstanbul 12.06.2019

TÜV Süddeutschland Bau und Betrieb GmbH TÜV-CERT-Zertifizierungsstelle für Druckgeräte


TÜV SILA AUSTRIA KALİTE

NONDESTRUCTIVE TESTING CERTIFICATE

TAHRİBATSIZ MUAYENE SERTİFİKASI


TÜV NORD

Test certificate for a welding procedure qualification record (WPQR)

Certificate no.: 2354/203/C/00004/23/PQR/000/00


TÜV AUSTRIA

Konformitätsbescheinigung

Certificate of Conformity

Modul F / module F

Konformität auf der Grundlage einer Einzelprüfung

Conformity based on unit verification

gemäß Richtlinie 2014/68/EU / according to Directive 2014/68/EU

Bescheinigung Nr.: KOB-2019-TURK-462-18-IS-2114

Hersteller / manufacturer: HUM MAKINA SANAYİ ve TİCARET KOLL.ŞTİ

Fertigungsstätte / place of manufacture: EGE SERBEST BÖLGESİ MÜMTAZ SOKAK NO:28 GAZİEMİR-İZMİR

CE 0408

Objekt: Druckbehälter / pressure vessel

Bezeichnung: HEATING TRAYS DT TRAY-3 P.D.8 Bar

Fabrik Nr.: OR 028-18 / 1

Baujahr: 2019

Inspektionsbericht Nr.: 18-IS-2114-PED-IR-OR 028-18

ISTANBUL 12.03.2019

MURAT ERDOĞAN


CERTIFICATE

The Certification Body of TÜV SÜD Management Service GmbH certifies that

HUM

HUM MAKINA SANAYI VE TICARET KOLL. STI..

EGE SERBEST BÖLGESI MÜMTAZ SOK. NO: 28

35410 GAZIEMIR-IZMIR

TURKEY

has established and applies a Quality Management System for

MANUFACTURING AND SALES OF MACHINES, PRESSURE VESSELS AND TANKS FOR THE PROCESS PLANTS.

An audit was performed, Order No. 70092611.

Proof has been furnished that the requirements according to

DIN EN ISO 9001:2015

are fulfilled.

The certificate is valid from 2023-04-27 until 2026-04-17.

Previous certificate valid until 2023-04-17.

Certificate Registration No.: 12 100 24959 TMS.

Head of Certification Body

Munich, 2023-04-27


TÜV NORD

CERTIFICATE

(of conformity)

Conformity Based on EC Unit Verification according to directive 2014/68/EU Annex III Module G

Certificate No.: 2354/202/C/00008/21/PC/000/00

Name and address of issuer/ manufacturer: HUM MAKINE SANAYİ VE TİCARET KOLL. ŞTİ EGE SERBEST BÖLGESİ MÜMTAZ SOKAK NO:28 GAZİEMİR - İZMİR

We hereby certify that according to the results of the conformity based on unit verification the pressure equipment mentioned below fulfills the requirements of directive 2014/68/EU. The pressure equipment is marked with

CE 2354

Tested according to 2014/68/EU: Conformity based on Unit Verification (module G)

Manufacturing Standards: EN 13445

Test report No.: 2354/203/R/00048/21/PE/000/(00)

Description of pressure equipment: RISING FILM EVAPORATOR

Serial number: 40E/405

Category: IV

Place of manufacture: EGE SERBEST BÖLGESİ MÜMTAZ SOKAK NO:28 GAZİEMİR - İZMİR

İstanbul , 24.03.2021

Certifier for Pressure Equipment of TÜV Teknik Kontrol ve Belgelendirme A.Ş

Ahmet Can GÜNGÖRMEZ

MANUFACTURING PROCESS, WELDING TECHNOLOGY AND PERSONNEL OF HUM CERTIFIED IN ACCORDANCE WITH REQUIREMENTS DINEN ISO 3834 «QUALITY REQUIREMENTS FOR FUSION WELDING OF METALLIC MATERIALS» AND REQUIREMENTS OF EUROPEAN DIRECTIVE PED2014/68/EU FOR MANUFACTURING PRESSURE EQUIPMENT.

PRODUCTION

EQUIPMENT WITH EXCELLENT EFFICIENCY

Perfect location in Agean Free Zone Area, our facility ensures consistently high quality, adhering to international codes and standards such as CE, GOST, EAC, ISO, UNI EN, and ASME. We guarantee excellence through rigorous testing methods, including X-ray, magnetic particle, ultrasonic, and liquid penetrant testing. Our custom-tailored solutions are designed to meet each customer's unique needs, with dedicated supervision of installation and commissioning to ensure optimal performance.

THE MACHINERY PRODUCED

THE EQUIPMENT PRODUCED IN OUR HUM WORKSHOP IS THE RESULT OF ADVANCED ENGINEERING PRACTICES COMBINED WITH CUTTING-EDGE TECHNOLOGY. EVERY SINGLE PIECE IS METICULOUSLY CRAFTED WITH EXCEPTIONAL WORKMANSHIP, ENSURING IT IS PERFECTLY GRADED AND SUITED FOR ITS SPECIFIC APPLICATION. OUR WORKSHOP PROUDLY HOLDS AN ISO 9001 QMS CERTIFICATION, WHICH GUARANTEES THAT THE HIGHEST QUALITY STANDARDS ARE RIGOROUSLY MAINTAINED.

FURTHERMORE, OUR MACHINERY AND EQUIPMENT ARE DEVELOPED USING THE MOST SOPHISTICATED TECHNOLOGIES AVAILABLE GLOBALLY. THEY ARE CAREFULLY DESIGNED AND MANUFACTURED IN STRICT COMPLIANCE WITH EN STANDARDS FOR PRESSURE VESSELS AND MECHANICAL DESIGN PROGRAMS. OUR DESIGN PROCESS LEVERAGES POWERFUL TOOLS SUCH AS INVENTOR-3D DESIGN AND SIMULATION, SOLIDWORKS-3D DESIGN, AND AUTOCAD-2D DESIGN TO ACHIEVE PRECISION AND EXCELLENCE IN EVERY PROJECT.

ENGINEERING

QUALIFIED ENGINEERING SERVICE

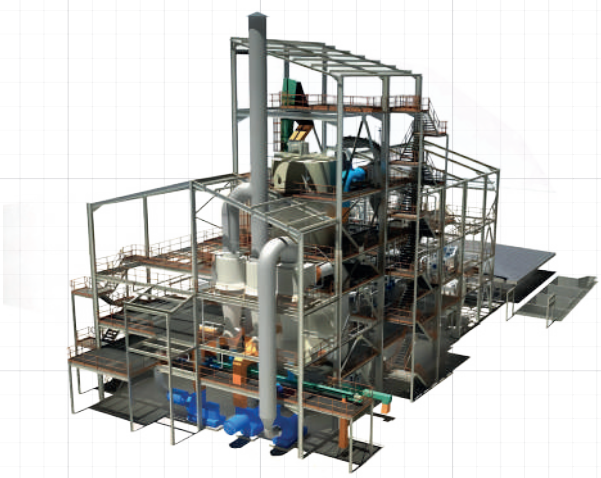
Our approach to project planning and execution is comprehensive and detailed, adhering to the latest industry standards and best practices. We utilize modern 3D design and simulation programs to ensure precision and efficiency in every project. Additionally, all our processes are aligned with the ISO 9001 Quality Management System, guaranteeing the highest level of quality and consistency.

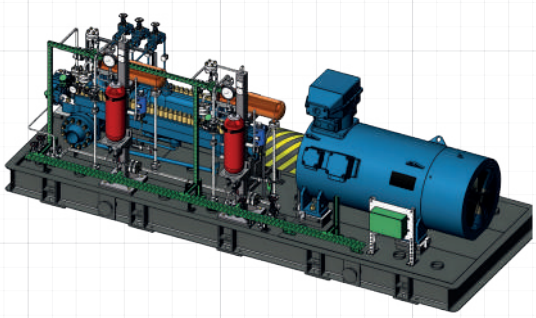
TEAM OF EXPERTS

HUM'S TEAM OF ENGINEERS CONSISTENTLY STRIVES TO EXCEED CLIENT EXPECTATIONS BY DELIVERING INNOVATIVE AND COST-EFFECTIVE ENGINEERING SOLUTIONS THAT ARE CUSTOMIZED TO MEET THE UNIQUE NEEDS OF EACH PROJECT. THE HIGHEST DEGREE OF CARE AND SKILL IS GIVEN IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRACTICE AND THE BEST ACKNOWLEDGED TECHNOLOGICAL PRINCIPLES.

THE ENGINEERING SERVICES ARE DESIGNED ON CE STANDARDS WITH 3D PIPING AND ARRANGEMENT DESIGN, AS WELL AS SIMULATION PROGRAMS.

- AUTOCAD PIANT 3D
- SOLIDWORKS SIMULATION
- AUTODESK INVENTOR 3D
- AUTODESK MECHANICAL
- NAVISWORKS
- FINITE ELEMENT ANALYSIS - FEA
- 3D ANIMATION
- PASSAT PRESSURE VESSELS ANALYSIS
- PV ELIT PLUS





1 PLANT DESIGN

2 PROCESS DESIGN

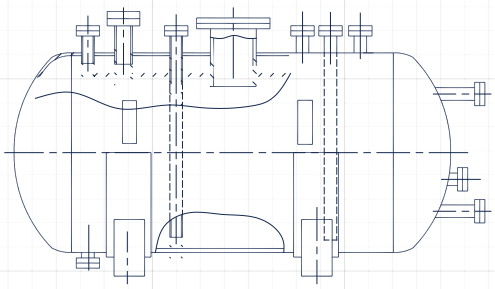
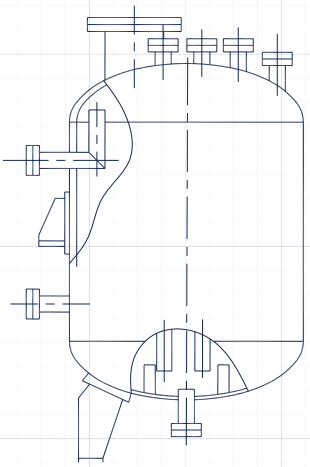
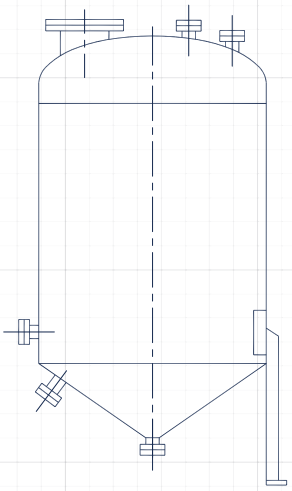
3 EQUIPMENT DESIGN

PRESSURE VESSELS

Pressure vessels are designed for receiving, storing and dispensing of liquid and gaseous products under overpressure up to 10 MPa (100 kgf/cm2) and temperatures from 63K (-21°C) to 973K (+70°C), as well as at atmospheric pressure and under vacuum (with residual pressure not lower than 5 mm Hg). atmospheric pressure and under vacuum (with residual pressure not lower than 5 mm Hg).

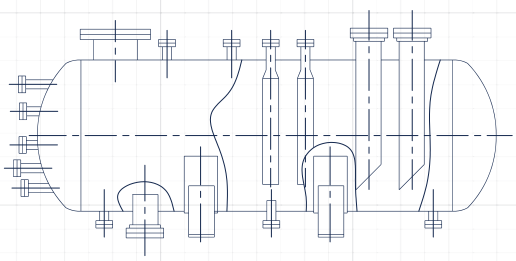
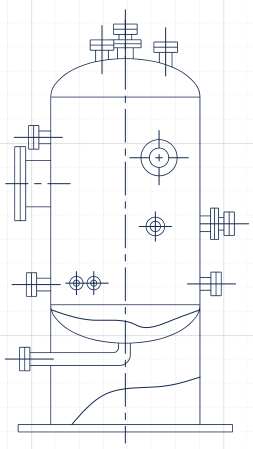
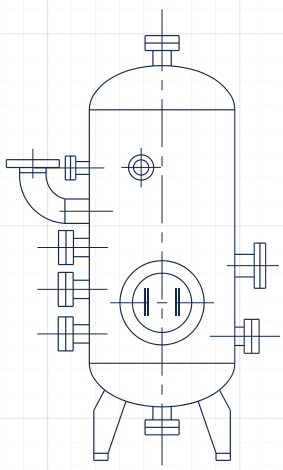
The pressure of the coolant in the jacket or coil for the above-mentioned types of apparatuses should not exceed 0.6 MPa (6.0 kgf/cm2). Discharge of liquid media can be carried out both by gravity and squeezing by compressed air, process and inert gas. Vertical apparatuses without jackets and coils can be used as settling tanks. can be used as settling tanks.

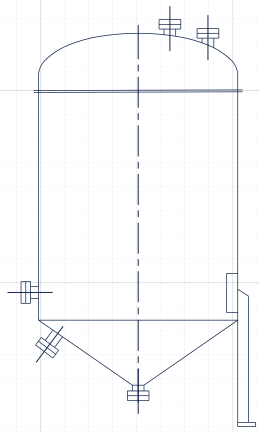
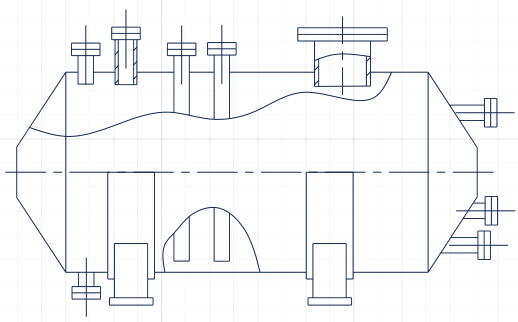
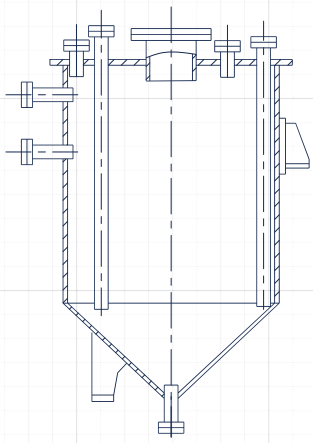
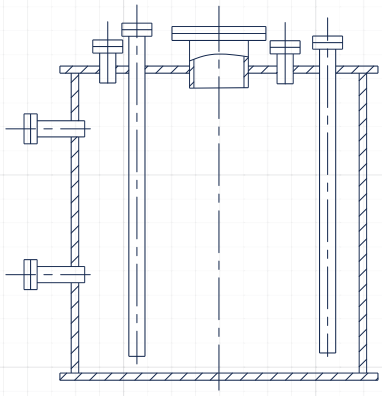
STEEL VESSELS
FOR CHEMICAL MEDIUM

TYPE OF VESSEL	GENERAL PARAMETERS		SKETCH
	Rated volume, m^3	Rated pressure, MPa	
HORIZONTAL WITH ELLIPTICAL BOTTOMS ГЭЭ*	6,3; 10; 16; 25; 40; 50; 63; 80; 100	0,6; 1,0; 1,6	
VERTICAL WITH ELLIPTICAL BOTTOMS ВЭЭ*	1; 2; 3,2; 5; 6,3; 10; 16; 25; 32; 40; 50; 63	0,3; 0,6; 1,0; 1,6	
VERTICAL WITH CONICAL BOTTOM AND ELLIPTICAL TOP COVER (ВКЭ) *	1; 2; 3,2; 5; 6,3; 10	0,6; 1,0	

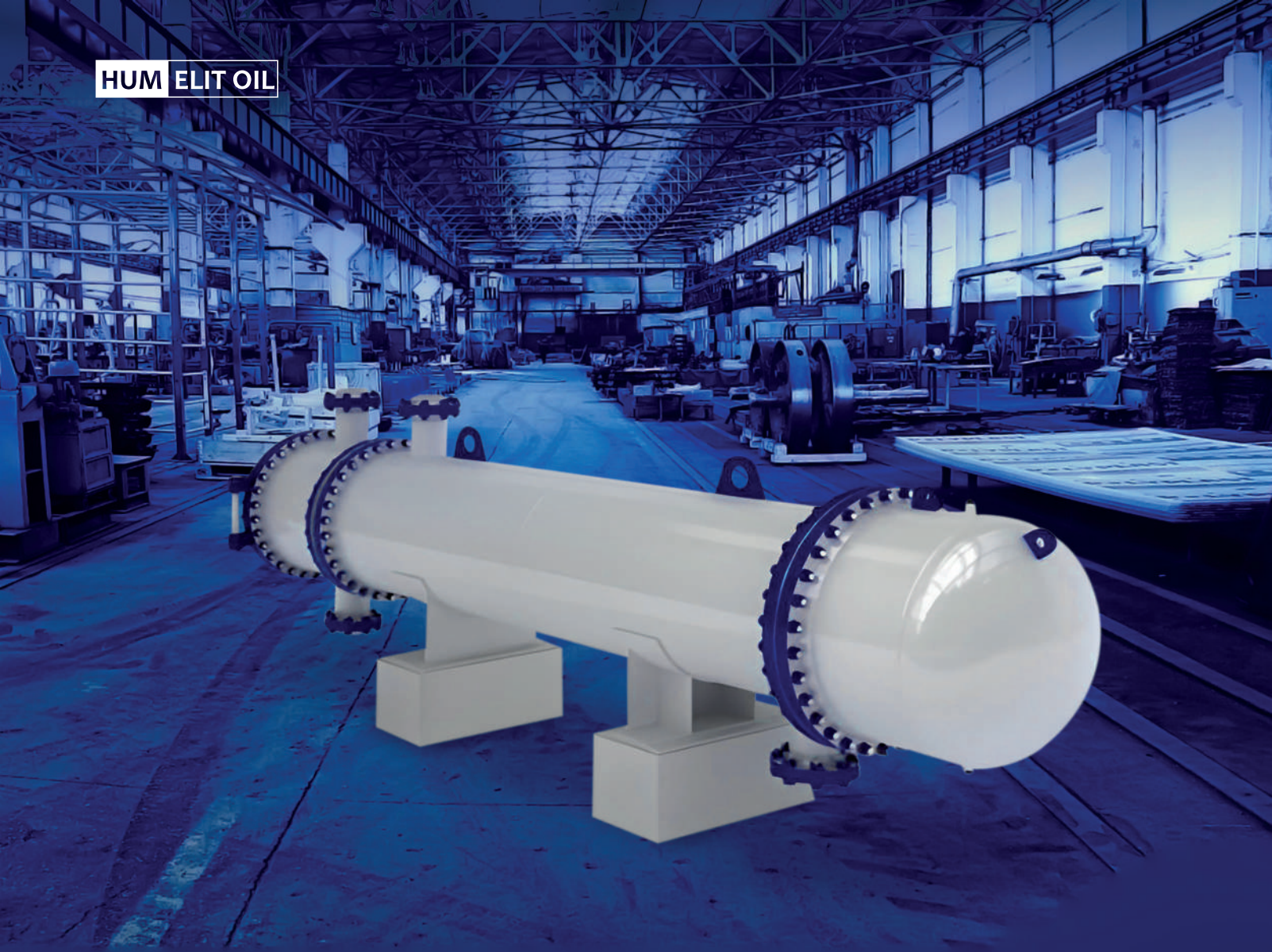
STEEL VESSELS

FOR AIR AND HYDROCARBON MEDIUM

TYPE OF VESSEL	GENERAL PARAMETERS		SKETCH
	Rated volume, m^3	Rated pressure, MPa	
HORIZONTAL CYLINDRICAL (ГЦ)*	4; 8; 10; 16; 20; 25; 32; 50; 80; 100; 200	1,0; 1,6; 2,5	
VERTICAL CYLINDRICAL FOR LIQUID MEDIUM (ВЦЖ)*	2; 4; 6,3; 10; 16; 25; 32; 50; 80; 100	0,3; 0,6; 1,0; 1,6	
VERTICAL CYLINDRICAL FOR GAS MEDIUM AND AIR (ВЦГ)*	0,5; 1; 1,6; 2; 3,2; 4; 6,3; 8; 10; 16; 20; 25	1,0; 1,6; 2,5	

VERTICAL WITH CONICAL BOTTOM AND ELLIPTICAL TOP COVER (ВКЭ) *	1; 2; 3,2	0,6	
HORIZONTAL CYLINDRICAL WITH CONICAL BOTTOM (ГКК)	10; 16; 25; 40; 50; 63; 80; 100	0 (atmospheric)	
VERTICAL WITH CONICAL BOTTOM AND FLAT TOP COVER (ВКП)*	10; 16; 25	0 (atmospheric)	
VERTICAL WITH FLAT BOTTOM AND FLAT TOP OR WITH CONICAL TOP AND FLAT BOTTOM (ВПП, ВПК)*	10; 16; 25; 32; 40; 50; 63	0 (atmospheric)	

*if it is necessary to maintain the set temperature in the vessels, the vessels can be equipped with external or internal heat-exchanging devices, as required in the Data Sheet. To order all types of vessels it is necessary to fill in the Data Sheet.



SHELL AND TUBE HEAT EXCHANGERS

Fixed tubesheet shell-and-tube heat exchangers with increased thermal effectiveness c with expansion pipe on shell in diameter 159, 273, 325, 400, 600, 800, 1000, 1200, 1400, 1600, 1800 mm are intended for heating and cooling of liquids and fluids in technological processes of oil refining, chemical, petrochemical and natural gas industries.

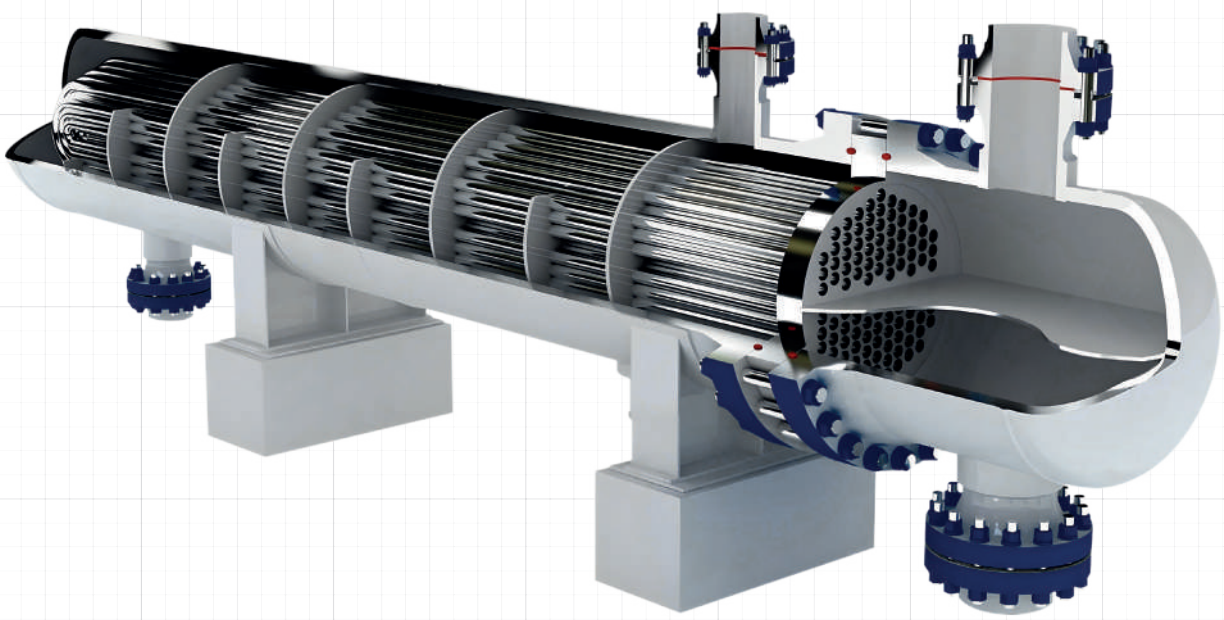
Heat exchangers are subdivided: for its intended purpose into heat exchangers (Т), refrigerators (Х), condensers (К), evaporators (И); in design into fixed tubesheet heat exchangers (Н) and heat exchangers with expansion pipe on shell (К). In vessels the smooth tubes (Г) are used, as well as the tubes with moving ring grooves — diaphragmatic tubes (Д).

Design standards: ISO, API, ОСТ, TEMA, ASME

- Horizontal and vertical type with float head
- With straight pipes and U-type pipes
- With fixed tube sheet

SHELL AND TUBE HEAT EXCHANGERS

TECHNICAL CHARACTERISTICS	
NOMINAL PRESSURE, MPA (KGF / CM²)	0,6 (6); 1,0 (10); 1,6 (16); 2,5(25); 4,0 (40)
HEAT-TRANSFER SURFACE, M²	1 - 1536
THE DIAMETER AND WALL THICKNESS OF THE HEAT EXCHANGE TUBES, MMTHE DIAMETER AND WALL THICKNESS OF THE HEAT EXCHANGE TUBES, MM	20x2; 25x2
TUBE LENGTH, M	1, 2, 3, 4, 6, 9
NUMBER OF STROKES ALONG THE TUBES	1, 2, 4, 6
TEMPERATURE OF HEAT EXCHANGE MEDIUM, °C	from -70 to +350
MATERIAL OF CONSTRUCTION	carbon steel, stainless steel, brass



FINNED TUBE AIR COOLED HEAT EXCHANGERS

Finned tube air heat exchangers are intended for cooling gases and liquids, condensing steam and vapor-liquid media in technological processes of the chemical, petrochemical, oil refining, oil and gas industries with a medium pressure from 0.6 to 6.3 MPa, or under vacuum with residual pressure not lower than 665 Pa and temperature not higher than 300 ° C.

In our production range exist following type and models:

- Horizontal: AVG, 1AVG (АВГ, 1АВГ)
- Zigzag type: 1AVZ, AVZ, AVZ-D (1АВЗ, АВЗ, АВЗ-Д)
- Small flowtype: ACM-G, AVIM-V (АВМ-G, АВМ-В)

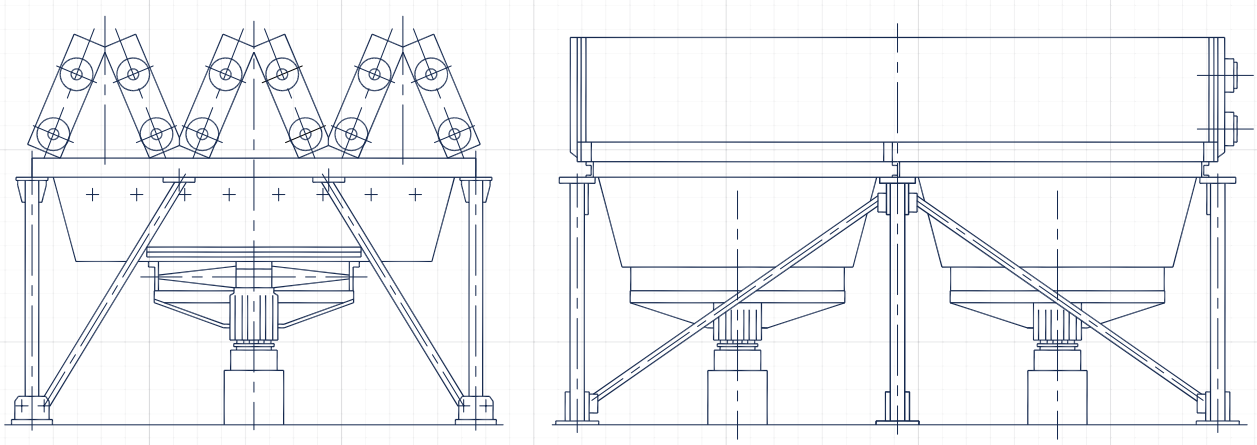
Depending on the model of the device, the geometric dimensions can vary in width from 1.38 m to 6 m, and in length from 1.5 m to 15 m. The materials used for the production of these models comply with the standards for pressure vessels according to ISO 16528-1:2007/ GOST 34347- 2017, as well as EN 13445-2 and ASME Section II.

Depending of Customer order in scope of supply may be included foundation frame/support, set of blinds (hand operated or pneumatically operated), air humidifier, air heater, pneumatic controller of fan blades.

AIR COOLED HEAT EXCHANGERS

TECHNICAL CHARACTERISTICS UNITS АВЗ-Д	
NUMBER OF BAYS, PCS.	6
FINNED SURFACE FACTOR OF TUBES	9; 14,6; 20
HEAT EXCHANGE SURFACE AREA, M^2	3528-12672
NOMINAL PRESSURE, MPA	0,6; 1,6; 2,5; 4,0; 6,3
NUMBER OF BANKS OF TUBES IN THE BAY	4; 6; 8
NUMBER OF STROKES THROUGH THE TUBES IN THE BAY	1; 2; 2a; 4; 4a; 8
LENGTH OF TUBES, M	8
WHEEL DIAMETER OF FAN, MM	2800
ELECTRIC MOTOR NOMINAL RATING, KW	22; 30
THE NUMBER OF FANS IN THE UNIT	2
UNIT WEIGHT, KG (DEPENDING ON SIZE)	21260 - 43300

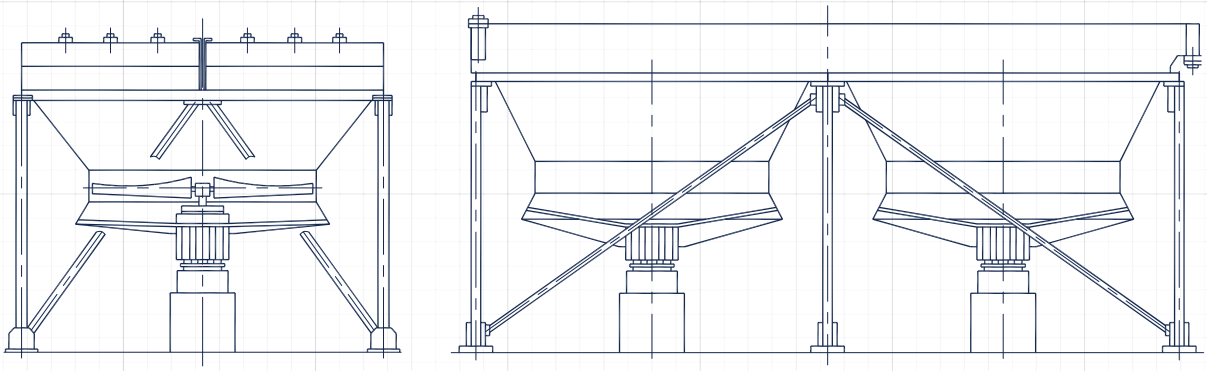
SKETCH



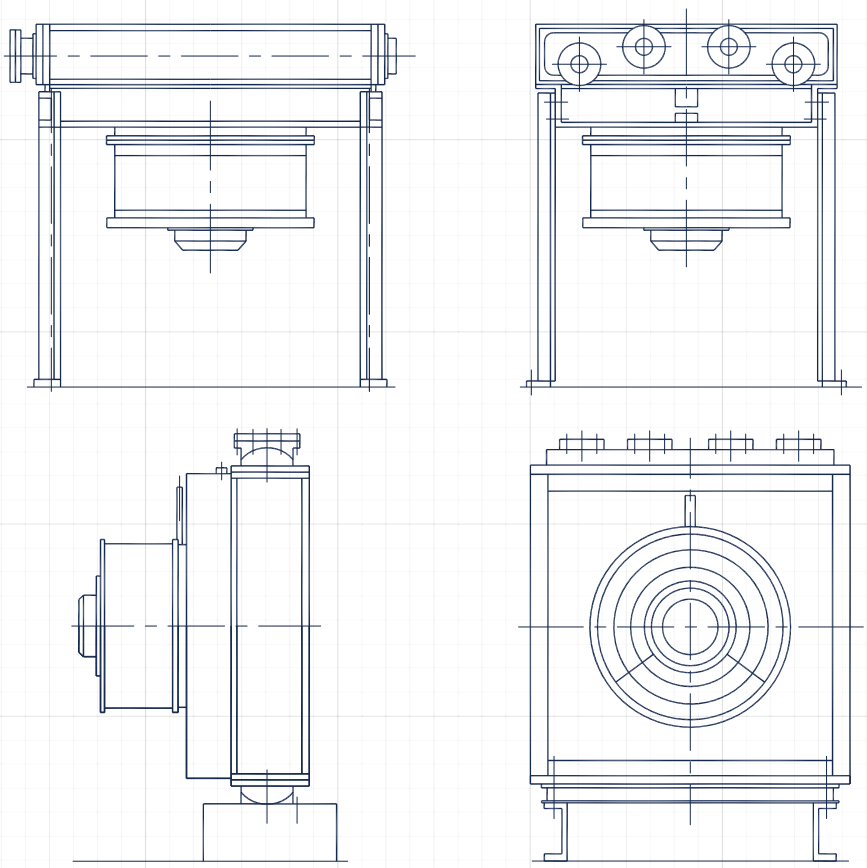
AIR COOLED HEAT EXCHANGERS

TECHNICAL CHARACTERISTICS	UNITS 1АВГ	UNITS АВМ	UNITS АВ33, 1АВ3
NUMBER OF BAYS, PCS	2	1	6
FINNED SURFACE FACTOR OF TUBES	9; 20	9; 14.6; 20	9; 20
HEAT EXCHANGE SURFACE AREA, M^2	848-4766	105-815	2298-6396
NOMINAL PRESSURE, MPA	0,6; 1,6; 2,5; 4,0; 6,3	0,6; 1,6; 2,5; 4,0; 6,3	0,6; 1,6; 2,5; 4,0; 6,3
TUBE BANKS COUNT PER BAY	4; 6	-	-
NUMBER OF BANKS OF TUBES IN THE BAY	IN A 4-ROW BAYS 1; 2; 4 IN A 6-ROW BAYS 1; 2; 3; 6	4; 6; 8	4; 6
NUMBER OF STROKES THROUGH THE TUBES	-	1; 2; 3; 4; 6; 8	-
NUMBER OF STROKES THROUGH THE TUBES IN THE BAY	-	-	1; 2; 2a; 4; 4a; 8
LENGTH OF TUBES, M	4; 8	1,5; 3	6
WHEEL DIAMETER OF FAN, MM	2800	800	5000
ELECTRIC MOTOR NOMINAL RATING, KW	22; 30	3	37; 55; 75
THE NUMBER OF FANS IN THE UNIT	1; 2	1; 2	1
UNIT WEIGHT, KG (DEPENDING ON SIZE)	6640-20120	1176-3510	16900-27000

SKETCH UNITS 1АВГ



SKETCH UNITS ABM



SKETCH UNITS AB33, 1AB3

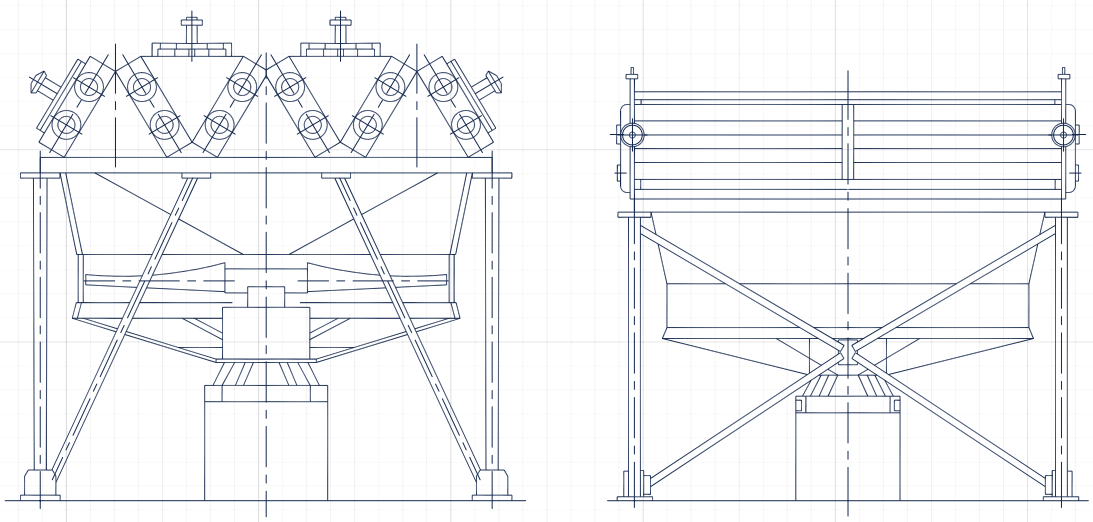


PLATE TYPE HEAT EXCHANGERS

Plate-type heat exchangers are characterized by their long period of operation and easy execution of routine maintenance.

The service life of the first unit being out of service – joint packing – is up to 10 years. Operating term of fins is 20-25 years. The cost of replacement seals is in the range of 15-25% of the cost of plate-type heat exchanger, that is more economically of the similar process of replacing the brass tube block in shell-and-tube exchanger, that is 80-90% of the cost of unit.

Development, design and manufacture of plates is certified by by the Board of Technical Management (TÜV CERT/Germany) in accordance with DIN ISO 9001/EN 29001.

THE MAIN COMPONENTS

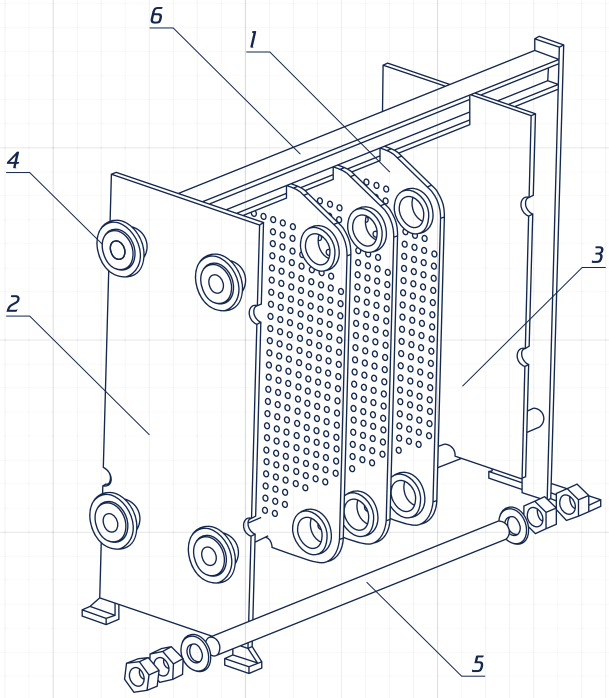


PLATE PACK 1, CONSISTING OF A NUMBER OF PLATES IN ACCORDANCE WITH THE REQUIREMENTS FOR HEAT TRANSFER SURFACE.

SEALS ON THE PLATES, WHICH PROVIDE RELIABLE INSULATION OF CHANNELS FROM EACH OTHER, AND THE LACK OF FLOWS AND LEAKS. SEALS ALSO DETERMINE THE DIRECTION OF FLOW INSIDE THE HEAT EXCHANGER.

FRAME 6, WHICH COVERS THE PLATE PACK VIA STATIONARY PLATE 2 AND PRESSURE PLATE 3, WHICH IS SUSTAINED BY MEANS OF TIGHTENING BOLTS 5.

CONNECTOR 4 FOR THE INLET AND DISCHARGE OF COOLANTS ARE USUALLY LOCATED ON THE FIXED PLATE HEAT EXCHANGER. IN CASE OF MULTIPASS FLOW, THE NIPPLES ARE LOCATED ON STATIONARY AND PRESSURE PLATES.

THANKS TO PRECISE MANUFACTURING AND RATIONAL DESIGN, GASKETED HEAT EXCHANGERS CAN BE EASILY DISASSEMBLED FOR INSPECTION, MECHANICAL CLEANING OF SURFACE OR OR REPLACEMENT OF PLATES AND SEALS. THE UNIT CAN BE EASILY ASSEMBLED INTO A SINGLE BLOCK. THIS PROCESS CAN BE REPEATED AS MANY TIMES AS IT IS PROVIDED BY THE CONSTRUCTION OF APPARATUS.

WE OFFER THREE STANDARD TYPES OF FRAMES WITH LATERAL COMPRESSIVE BOLTS THAT CAN BE EASILY INSTALLED.

- FRAMES FOR EXTRA LONG PLATE PACKS
- FRAMES FOR SHORT PACKETS WITH THE LENGTH OF 250 MM
- FRAMES WITH SMALL TYPES OF PLATES AND THE AVERAGE LENGTH OF PACKET
- THE MODULAR TYPE OF CONSTRUCTION ALSO ALLOWS YOU TO CONSISTENTLY ADAPT TO NEW OPERATING CONDITIONS

GAS SEPARATORS

Gas separators are intended for cleaning of natural and associated gas from condensed liquid and mechanical impurities. Input gas separators with an operating pressure of more than 6.3 MPa are intended for previous gas cleaning; final cleaning is carried out in gas separators of second category under the pressure up to 8,8 MPa.

Gas-oil separators of horizontal-shell-type are intended for degassing of oil and associated gas cleaning.
The separators are made of carbon and alloy steels. Separators can be installed in all climatic zones.

Our company design and manufacture complete 2-phase and 3-phase separation units.

GAS SEPARATORS

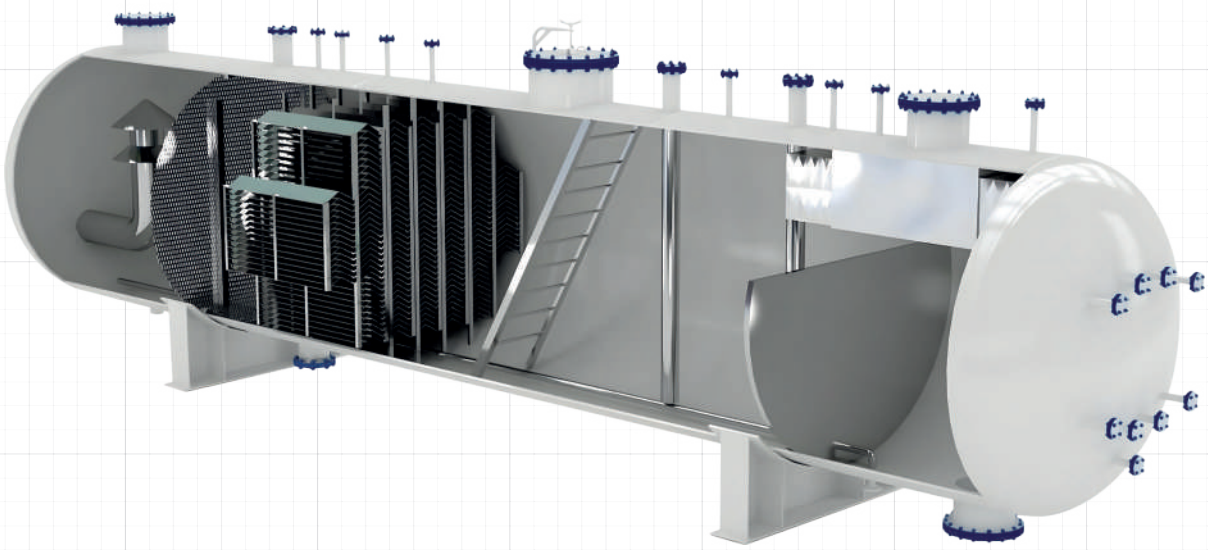
FUNCTION AND APPLICATION:

- OIL AND GAS SEPARATORS ARE USED FOR OIL DEGASSING AND ASSOCIATED GAS PURIFICATION
- GAS SEPARATORS DESIGNED TO PURIFY GASES FROM DROPLETS OF LIQUID AND MECHANICAL IMPURITIES
- LIQUID SEPARATOR IS DESIGNED FOR GRAVITATIONAL SEPARATION OF INSOLUBLE LIQUIDS AND HYDROCARBON GAS IN PROCESS PLANTS

GAS SEPARATORS CLASSIFIED BY FOLLOWING PARAMETERS:

By installation	By stage of cleaning:	By operation method:	By working pressure:
VERTICAL TYPE HORIZONTAL TYPE HYDROCYCLON TYPE	2-PHASE 3-PHASE	CENTRIFUGAL TYPE INERTIAL TYPE GRAVITATIONAL TYPE	BELOW 0,6 MPA 0,6-2,5 MPA OVER 2,5 MPA

GENERAL SKETCH WITH INTERNAL DESIGN



PROCESS COLUMNS AND MASS EXCHANGE APPARATUS

Equipment designed for mass transfer processes (absorption, desorption, rectification, distillation, etc.), evaporation equipment is used for concentrating solutions in technological installations of oil and gas refining, chemical. petrochemical plants, with a medium pressure Ru of up to 16.0 MPa and a temperature not higher than 350 °C

Depending on the type of device, the geometric dimensions can be up to 4500 mm in diameter. The materials used for the production of these types comply with the standards for pressure vessels according to ISO 16528-1:2007/GOST 34347-2017 as well as EN 13445-2 and ASME Section II

STEEL VESSELS

FUNCTION AND APPLICATION:

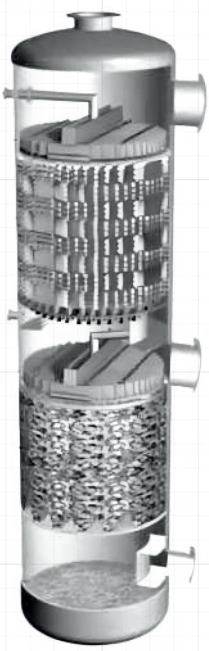
MASS EXCHANGE APPARATUS AND COLUMNS ARE DESIGNED TO CARRY OUT PROCESSES IN WHICH THE DISTRIBUTED COMPONENT (ONE OR MORE) IS TRANSFERRED FROM ONE PHASE TO ANOTHER.

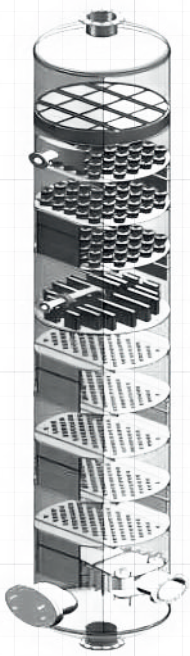
MASS EXCHANGE EQUIPMENT CLASSIFY BY APPLICATION AS FOLLOW:

- DISTILLATION APPARATUS
- DISTILLATION COLUMNS
- DISSOLUTION APPARATUS
- LON EXCHANGE APPARATUS
- MEMBRANE APPARATUS ABSORBERS
- ABSORBERS
- ADSORBERS
- EXTRACTORS
- CRYSTALLIZERS
- DRYERS

BY FUNCTION MASS EXCHANGE APPARATUS DIVIDED BY:

- WITH CONTINUOUS PHASES CONTACT (FILM & NOZZLE TYPE)
- WITH STEPPED PHASE CONTACT (DISC SHAPED TYPE)





HUM ELIT OIL AS

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12 / 2024