



Since 1991 in the market of equipment for
petrochemistry, oil refining, gas production and gas
processing in Russia and the CIS countries

LLC Engineering-Promotional Center “Ingehim”

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LLC Engineering-Promotional Center “Ingehim”



- Established in 1991

- Employs 95 people

- 20 employees hold Ph.D. or D.Sc. degrees

- Over 20 patents and over 400 publications

- Over 400 reconstructions of plants in Russia and the CIS countries

- 10 000 m² of occupied floorspace

- Experimental stand for studying fluid dynamics and mass transfer through column internals





Main areas of activity:

- ***Inspections of existing plants aimed at determining reserves for reducing raw material and energy consumptions***
- ***Redesigning of existing industrial units***
- ***Modernizations of existing heat and mass transfer and reactor equipment***
- ***Designing and manufacturing of:***
 - ***units, block modules, equipment***
 - ***separation equipment including internals***
 - ***column equipment including internals***
 - ***pilot units on the “turnkey” basis***
- ***Development of processes***
- ***Laboratory (pilot) studies and optimizations of processes and apparatuses***

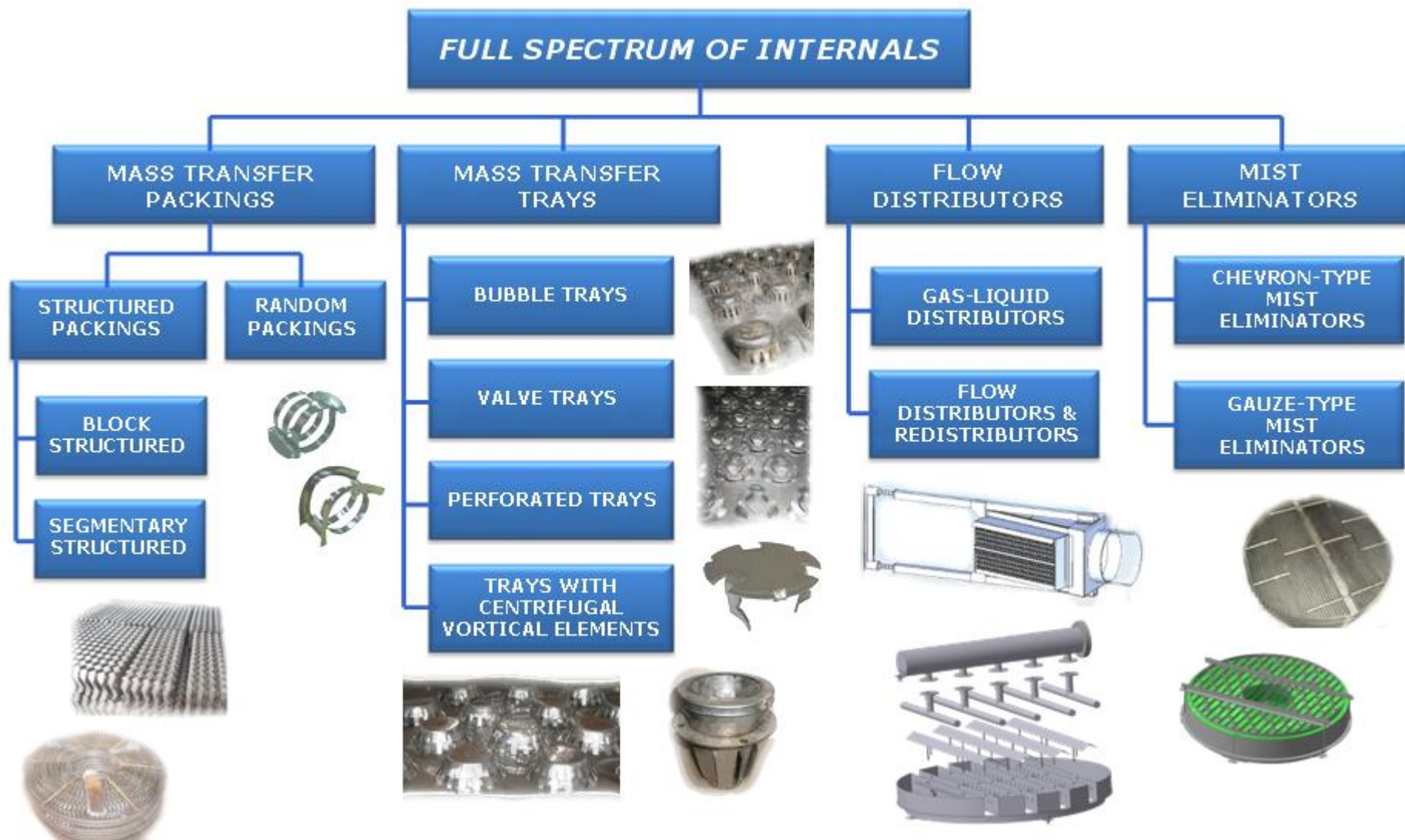
Our main customers

Our main partners



Products

Internals of mass transfer apparatuses

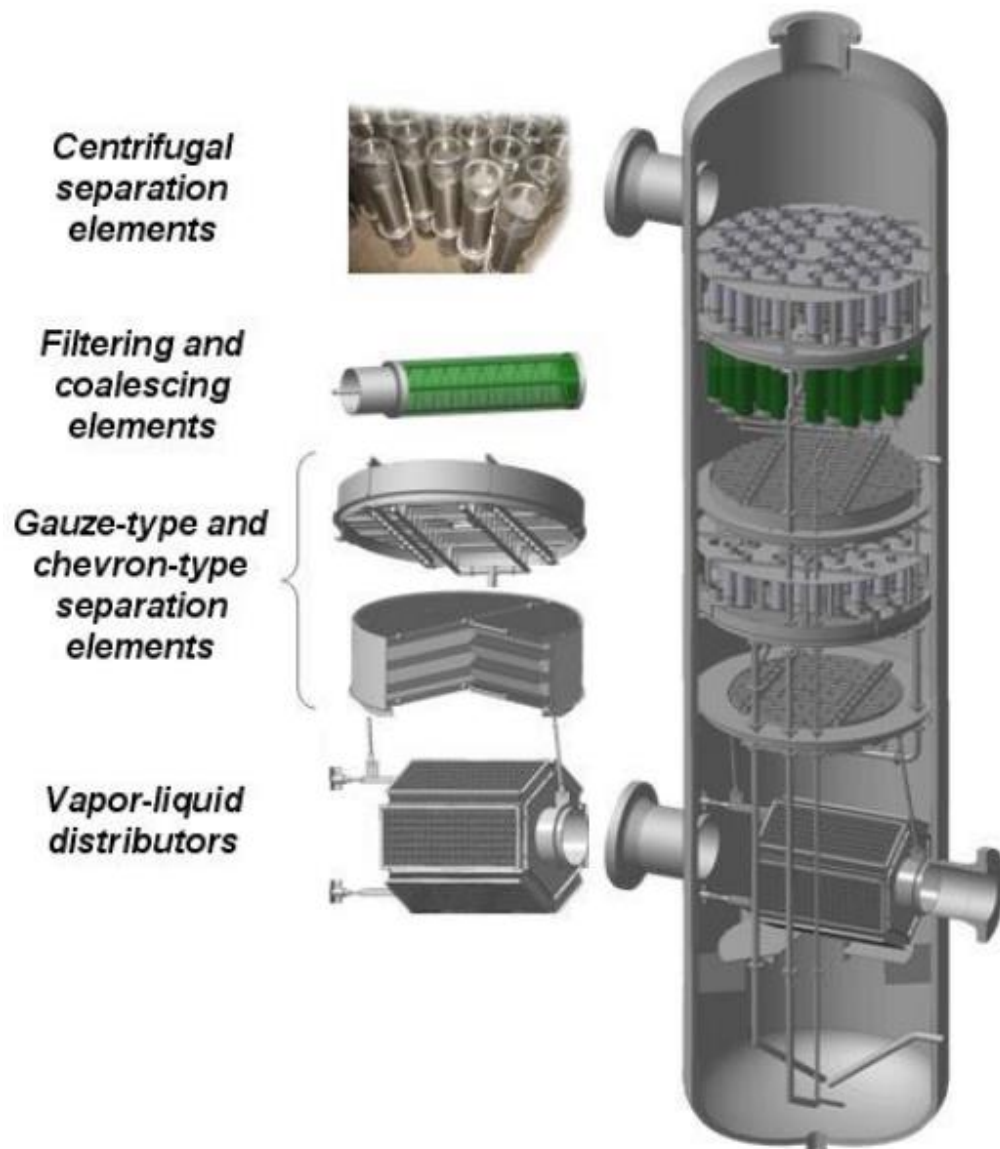


Comparative results for modernizations of columns used at production of ethanolamines at JSC “Kazanorgsintez”, Kazan, Russia

K-29		K-40		K-56		K-92	
tray column	packed column	tray column	packed column	tray column	packed column	tray column	packed column
COLUMN DIAMETER, M							
1.0	0.5	1.6	1.2	1.6	1.0	1.6	0.6
COLUMN HEIGHT, M							
13.7	12.575	16.1	22.36	22.8	23.580	22.8	17.56
FEED FLOW RATE, M ³ /H							
2.2÷2.5	2.85	1÷2.3	2.3÷2.4	1÷1.2	1.0÷1.1	1.1	0.34÷0.35
DISTILLATE FLOW RATE, M ³ /H							
0.2–0.3	0.31÷0.33	1÷1.3	1.1÷1.16	0.7÷0.9	0.06÷0.07	0.3	0.2
FLOW RATE OF BOTTOM PRODUCT, M ³ /H							
2÷2.2	2.3÷2.4	1÷1.2	1.0÷1.1	–	0.34÷0.35	–	–
REFLUX FLOW RATE, M ³ /H							
1.4÷1.8	0.3÷0.33	1.2÷1.5	0.15÷0.2	0.1	0.64÷0.78	0.9÷1.0	0.0
FLOW RATE OF MONOETHANOLAMINE, M ³ /H							
–	–	1.1÷1.2	1.1÷1.16	–	–	–	–
FLOW RATE OF DIETHANOLAMINE, M ³ /H							
–	–	–	–	0.65	0.65÷0.75	–	–
FLOW RATE OF TRIETHANOLAMINE, M ³ /H							
–	–	1÷1.2	–	–	–	–	0.2÷0.21
THERMAL LOAD IN COLUMN REBOILERS, GCAL/H							
1.19	0.49	1.19	0.33	0.85	0.22	0.71	0.62

Products – Separation equipment

Gas separator with internals

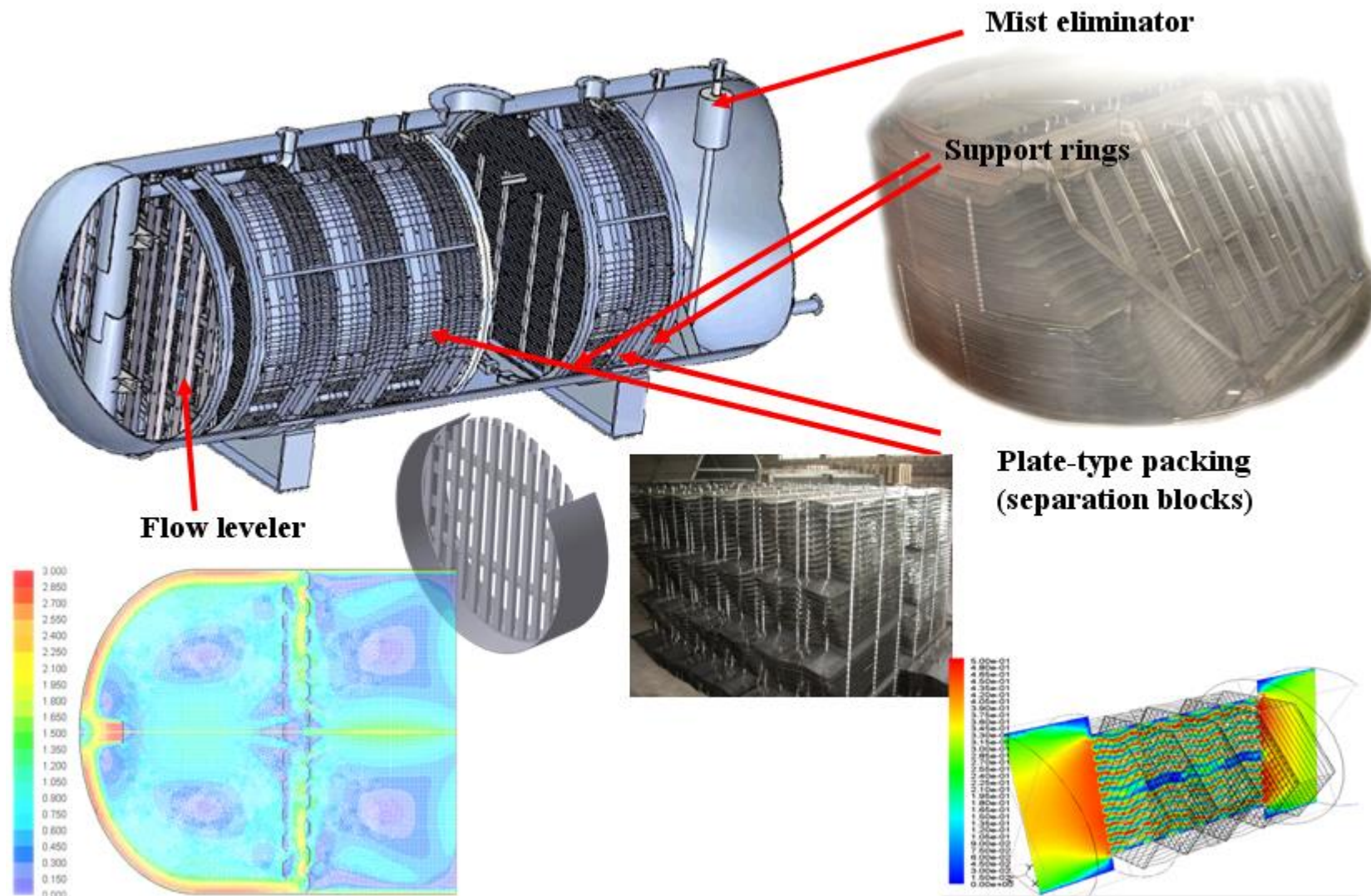


Comparative results for modernizations of gas separators

	Pall			CKBN			Ingehim		
Diameter of apparatus, m	1.8			1.8			1.8		
Pressure in apparatus, MPa	76			76			76		
Amount of liquid at the apparatus entrance, g/1000 scm	500-1200			500-1200			500-1200		
Gas flow rate, 1000 scm /h	350	400	450	350	400	450	350	400	450
Amount of liquid at the apparatus exit, g/1000 scm	-	7.9	6.3	7.7	8.9	9.6	3.8	3.9	4.3
Pressure drop in apparatus, kPa	23-25			3.4÷5.9			4÷5.6		
Separation efficiency, %	99.1÷99.4			81.5÷88.9			99.3÷99.6		
Capacity achieved for 99% efficiency, 1000 scm/h	500			-			580		

Products – Separation equipment

Phase separator with internals

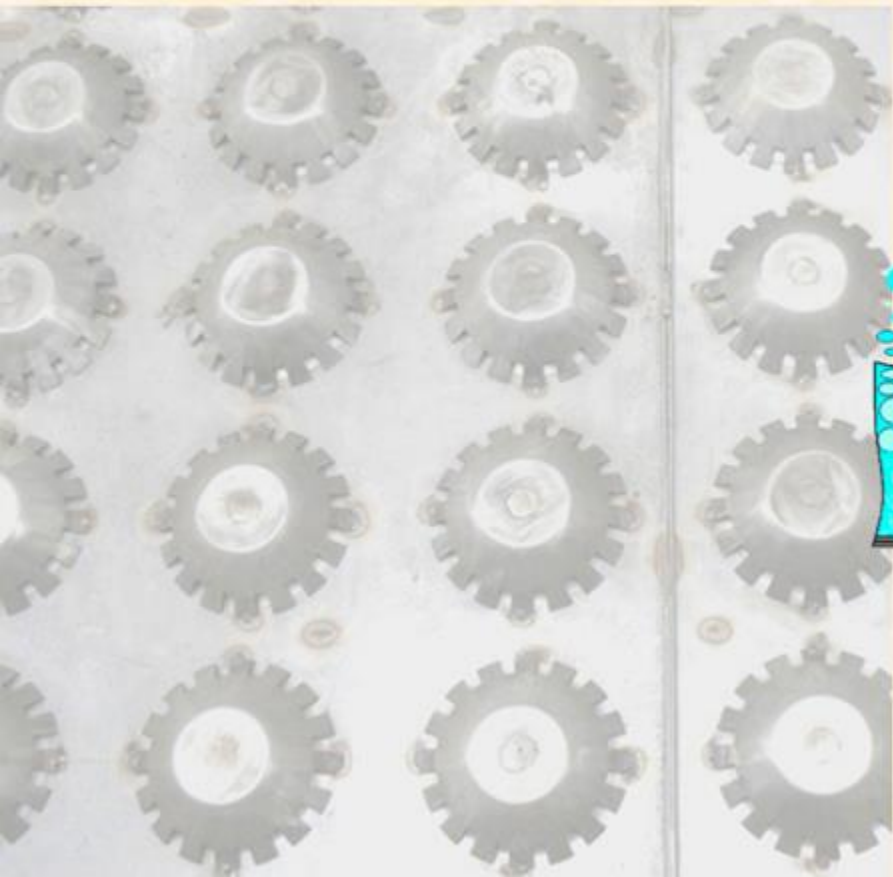
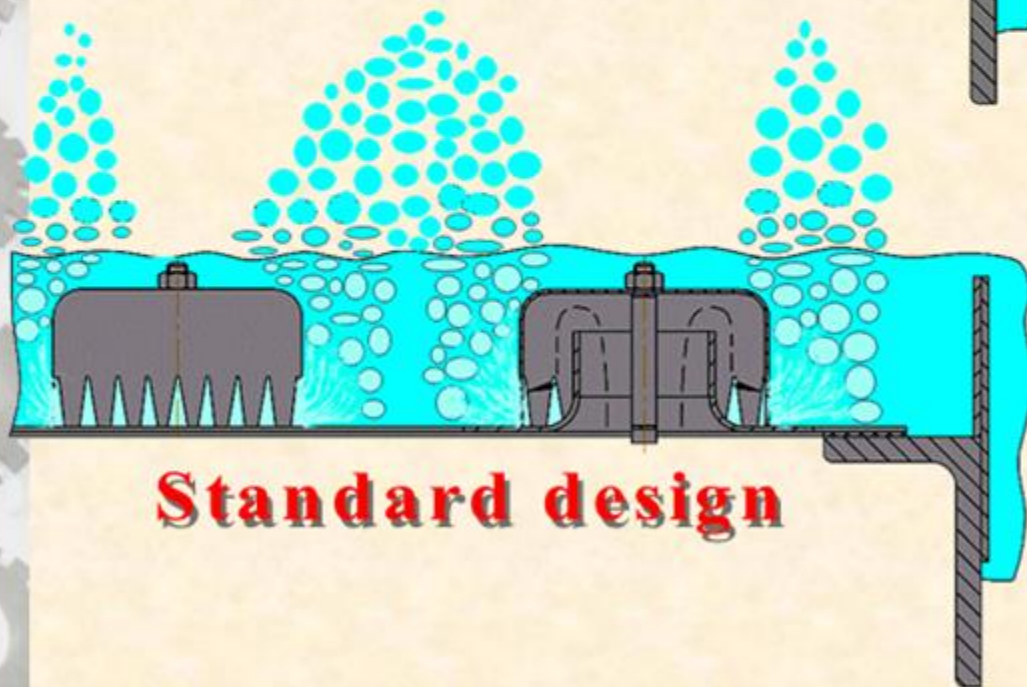


Comparative results for modernizations of phase separators

Parameter	Units	Before modernization	After modernization
Diameter of apparatus	mm	3000	3000
Flow rate of:	ton/h	200	203.6
- product 1	ton/h	171	175
- product 2			
Pressure in apparatus	kg/m ²	6.5	6.5
Temperature in apparatus	°C	40	40
Amount of liquid:			
in product 1	wt %	2.5	traces
in product 2	wt %	2.9	traces
Composition of product 1:	wt %		
Water		2.5	traces
Methanol		up to 0.7	up to 0.6
C ₂		1.63	1.64
C ₃		32.93	33.26
i-C ₄		21.5	22.5
n-C ₄		30.15	31.15
i-C ₅		6.78	7.78
n-C ₅		3.71	3.71
		0.1	0.06
Composition of product 2:	wt %		
Water		2.9	traces
Methanol		up to 0.9	up to 0.7
C ₂		1.79	1.89
C ₃		34.31	35.31
i-C ₄		24.51	25.41
n-C ₄		34.91	35.91
i-C ₅		1.31	1.41
		0.14	0.14

Products – Column equipment

Low-profile bubble trays





- Designing
- Completing with necessary components
- Manufacturing and integrated delivery on the "turnkey" basis
- Field supervision
- Installation, start-up and commissioning

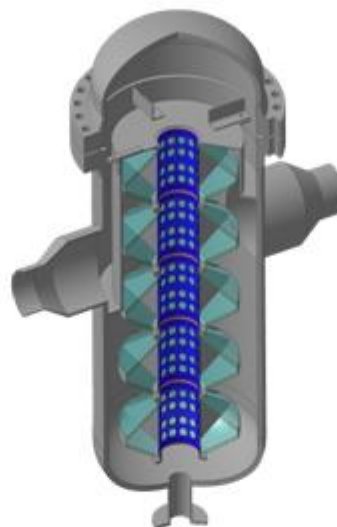
Products

Miscellaneous products

Flow redistributors for reactor and extractor equipment



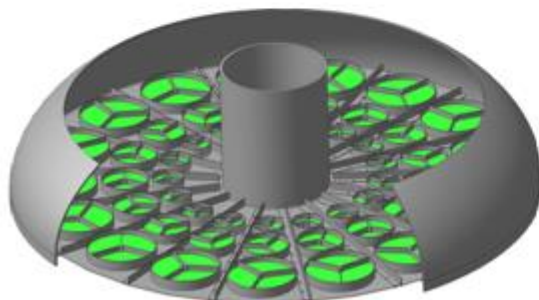
Filters for separating suspensions



Loader device for uniform loading with adsorbents and catalysts



Support structure with built-in filter elements for fine materials



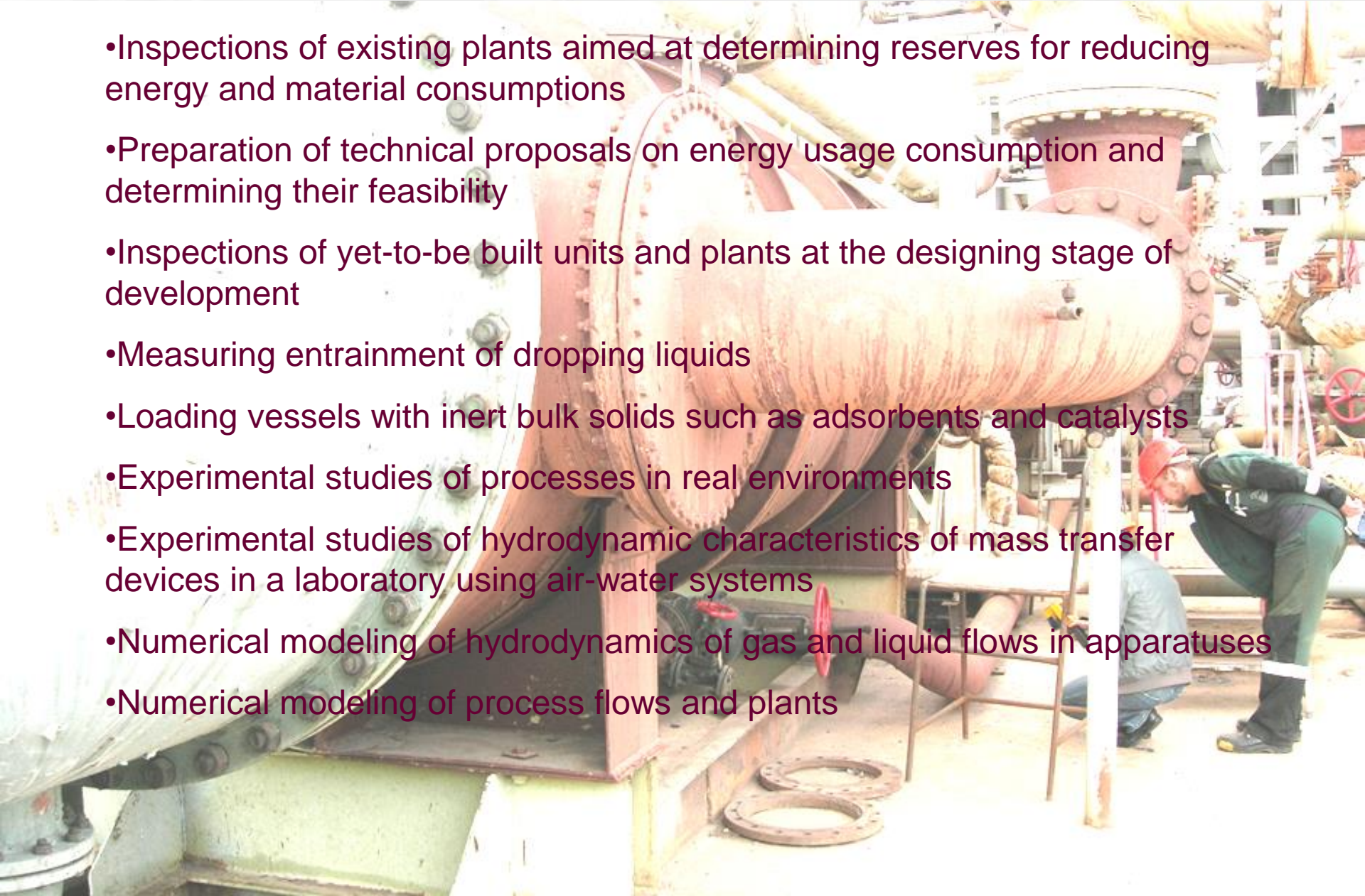
Flow distributors for reactor equipment



Static mixers

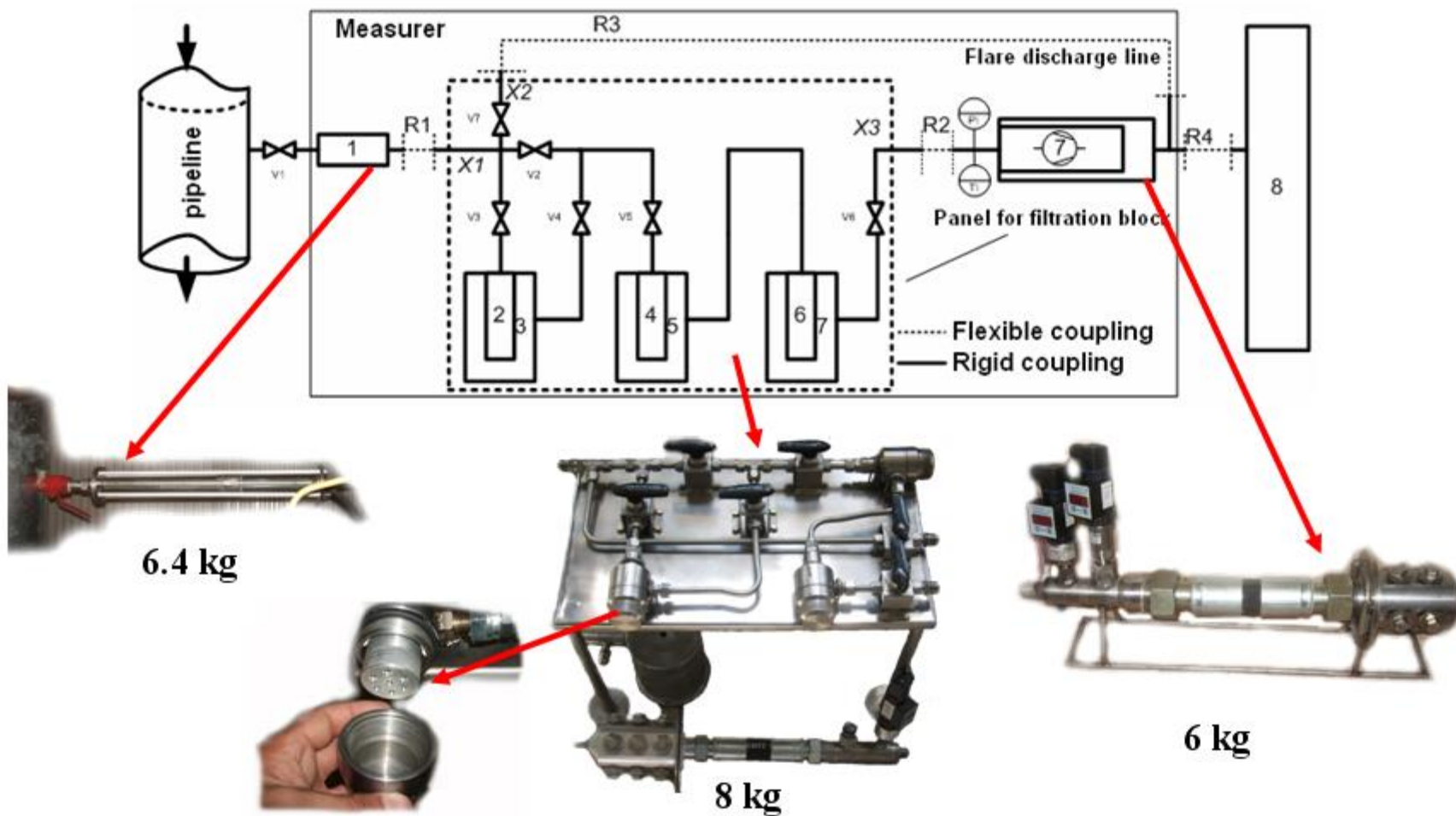


- Inspections of existing plants aimed at determining reserves for reducing energy and material consumptions
- Preparation of technical proposals on energy usage consumption and determining their feasibility
- Inspections of yet-to-be built units and plants at the designing stage of development
- Measuring entrainment of dropping liquids
- Loading vessels with inert bulk solids such as adsorbents and catalysts
- Experimental studies of processes in real environments
- Experimental studies of hydrodynamic characteristics of mass transfer devices in a laboratory using air-water systems
- Numerical modeling of hydrodynamics of gas and liquid flows in apparatuses
- Numerical modeling of process flows and plants



Services (cont.)

Measuring entrainment of dropping liquids



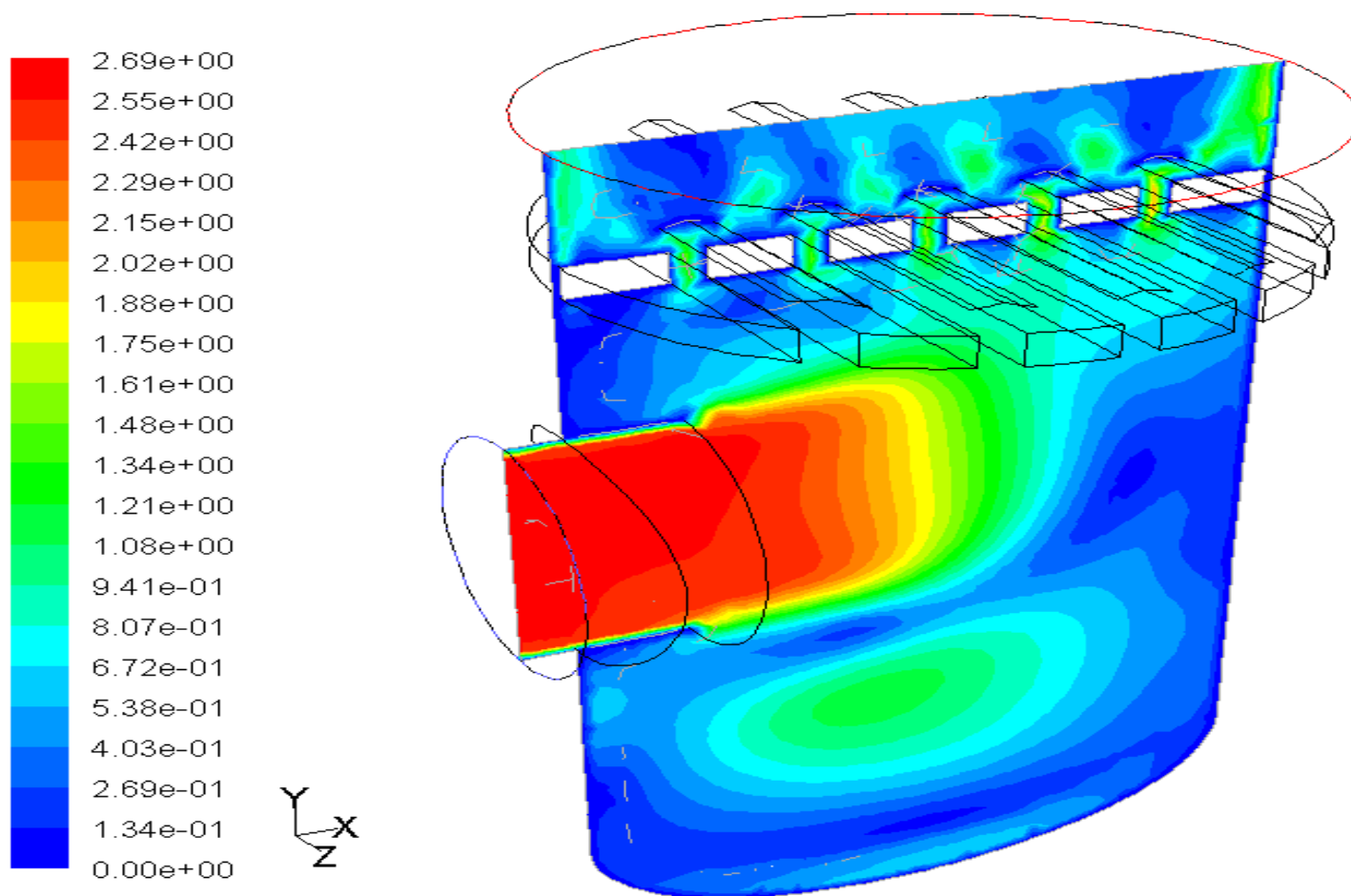
Services (cont.)

Experimental research laboratory for studying hydrodynamics and heat and mass transfer



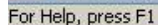
Services (cont.)

Numerical modeling of hydrodynamic and heat transfer processes in apparatuses



Contours of Velocity Magnitude (m/s)

May 19, 2008
FLUENT 6.3 (3d, pbns, ske)



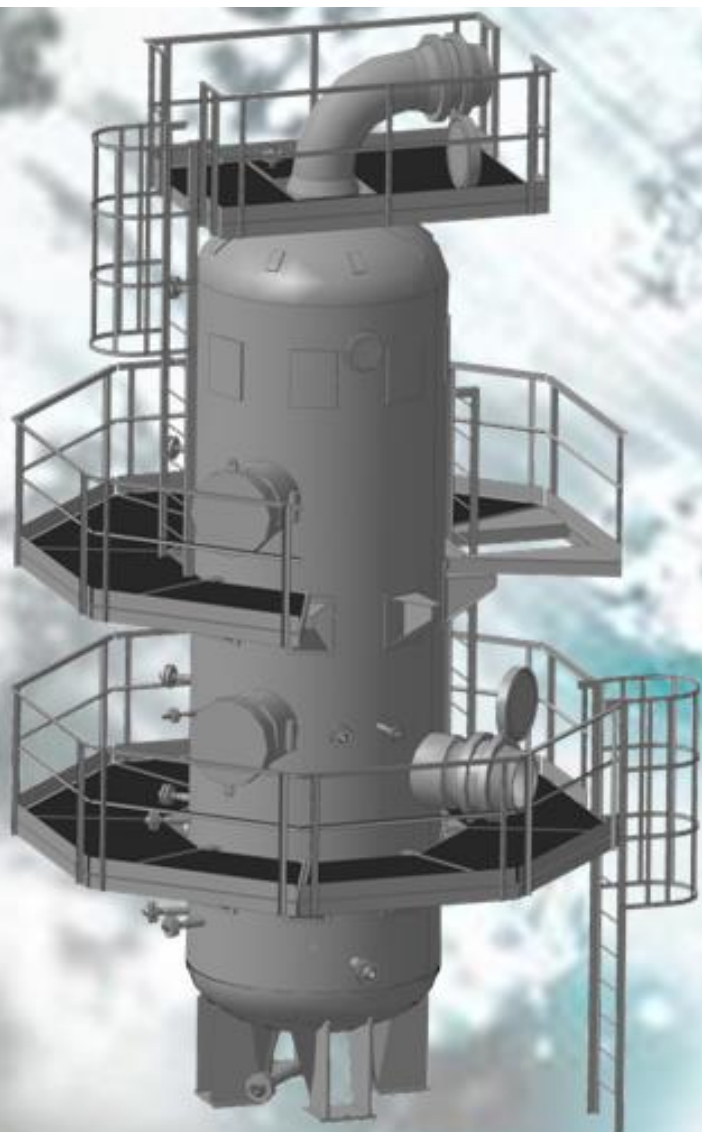
Work package on manufacturing of modular pilot units

Stages of development of pilot units

- Pre-design work
- Designing
- Completing with components, manufacturing, maintenance, field supervision.
- Installation, start-up and commissioning.



Block module of filter-separator



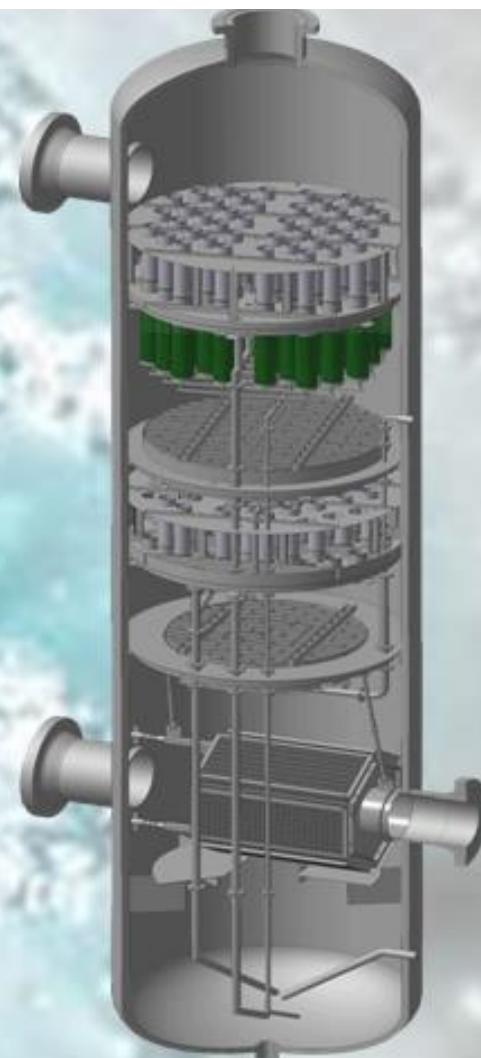
Designing

**Completing with
components**

**Manufacturing and
integrated delivery on
the “turnkey” basis**

Field supervision

**Installation, start-up
and commissioning**



Processing and engineering

Development of catalytic systems of synthesis of various products

Development of technology, pre-design work, manufacturing of a pilot unit, pilot scale testing of the catalytic system

LLC "Unisit"

LLC EPC "Ingehim"

Technology, feed data, base project functions of prime contract during selling (upon agreement)





Manufacturing facilities

4 manufacturing buildings, 12 sites
Highly qualified engineers and labor

More than 100 pieces of metal working equipment.
Unique special-purpose in-house equipment.



Welcome to cooperate with us!

