INTRA

ENGINEERING SOLUTIONS AND TECHNOLOGY
FOR MAXIMUM PRODUCTION EFFICIENCY

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INTRA SERVICES COMPANY

ENGINEERING COMPANY PERFORMING A COMPLEX OF WORKS FOR REPAIR AND MAINTENANCE OF EQUIPMENT AND PIPELINES OF COMPANIES IN FUEL AND ENERGY SECTOR

The company's activity is aimed at increasing production efficiency, reduction of planned and prevention of unplanned downtime periods, ensuring maximum service life of equipment, reduction of costs of maintenance, repair and overhaul.

INTRA SERVICES COMPANY PROVIDES A FULL RANGE OF SERVICES IN THE FIELD OF ONLINE SERVICES

EFFICIENCY

- Prevention of transported medium leakages
- Reduction of the risk of emergencies and man-made disasters
- Ensuring safe operating conditions for long periods of time
- No production cycle disturbances or equipment downtime
- Repair cost minimization
- Operating costs minimization
- Longer intervals between overhauls
- Overall improvement of plants performance

APPLICATION OF TECHNOLOGIES

- OIL AND GAS PROCESSING
- ENERGY INDUSTR
- CHEMICALS, PETROCHEMICALS
- OFFSHORE FACILITIES
- PULP AND PAPER INDUSTRY
- FOOD INDUSTRY
- METALLURGY
- MINING INDUSTRY
- OIL AND GAS EXTRACTION AND TRANSORTATION

COMPANY IN FIGURES

>1000 EMPLOYEES

All employees are highly qualified engineers and technicians with extensive experience in installation and repair.

>100 PRODUCTION FACILITIES

INTRA Services Company has performed works at over 100 production facilities.

18 BRANCHES AND REPRESENTATIVE OFFICES

Its branches and representative offices are working in 18 cities and towns in Russia, the Commonwealth of Independent States, European Union, the Middle East.

Carrying out repairs without stopping production, INTRA Services Company has made significant progress in the sphere of occupational safety and health, environmental protection.

The company makes systematic efforts to achieve the "Zero Goal" in respect of accidents in the sphere of HSES (health, safety, environment and security), and is constantly improving approaches and techniques of rearing a strong safety culture in each employee.

STRICT COMPLIANCE WITH REQUIREMENTS OF INDUSTRY AND IN-HOUSE STANDARDS IN THE SPHERE OF OCCUPATIONAL SAFETY AND ENVIRONMENTAL PROTECTION — ONE OF THE BASIC VALUES OF INTRA SERVICES COMPANY.

- Management system certificate ISO 45001:2018
- Management system certificate ISO 14001:2015
- Management system certificate ISO 9001:2015
- Certification for performance of works at PJSC Gazprom

GLOBAL REACH

АГЕНТСТВО СТРАТЕГИЧЕСКИХ ИНИЦИАТИВ

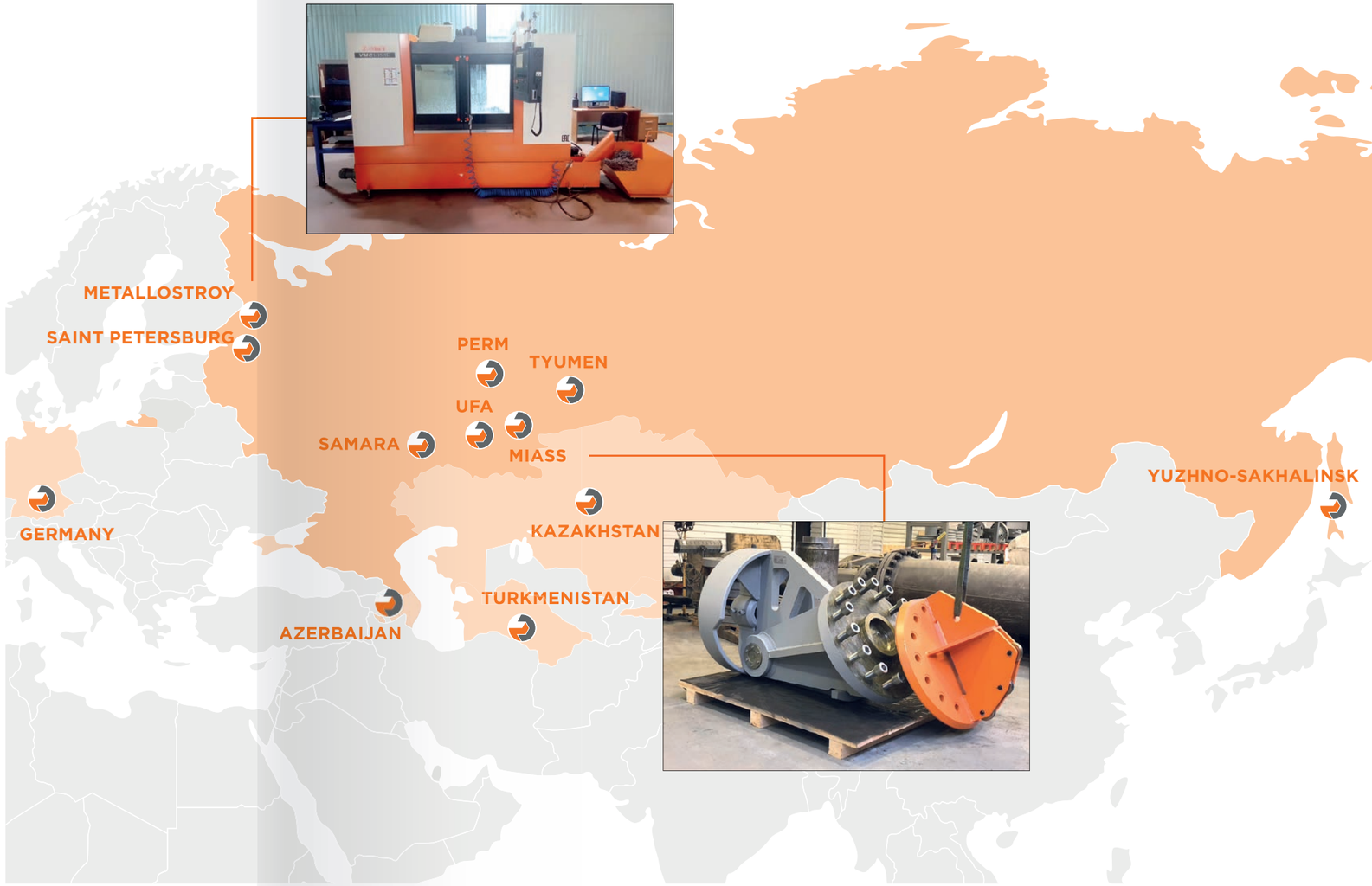
The support of **AGENCY FOR STRATEGIC INITIATIVES** in the context of the New Business program

РОССИЙСКИЙ ЭКСПОРТНЫЙ ЦЕНТР

Participation in all major Russian and global events in concert with **RUSSIAN EXPORT CENTER**

фрп

Support and financing of the project by the **INDUSTRIAL DEVELOPMENT FUND**



RUSSIA

SAINT PETERSBURG
MIASS
PERM
TYUMEN
UFA
SAMARA
YUZHNO-SAKHALINSK

GERMANY
AZERBAIJAN
TURKMENISTAN
KAZAKHSTAN

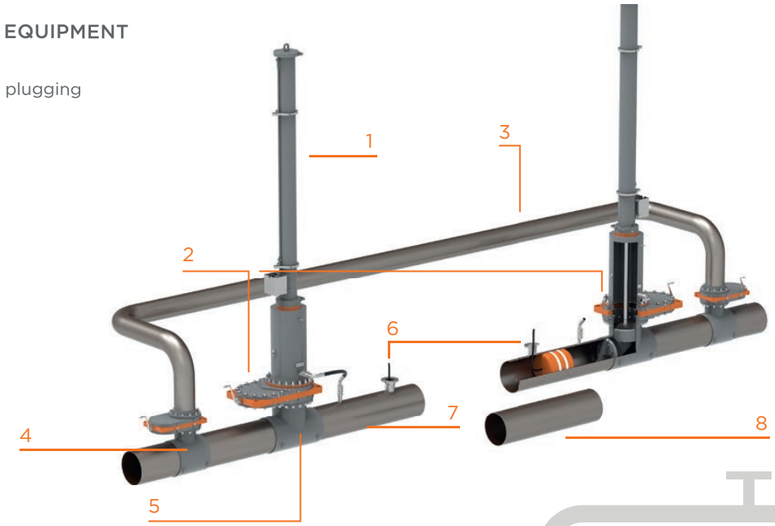
HOT TAPPING AND LINE PLUGGING OF PIPELINES UNDER PRESSURE 2.0-11.8 MPa

HOT TAPPING AND LINE PLUGGING TECHNOLOGY ALLOWS TO PERFORM PIPELINE UPGRADING AND REPAIR WITHOUT STOPPING TRANSPORTATION OF THE MEDIUM

THE WORKS ARE PERFORMED WITHOUT STOPPAGE OF PRODUCTION

SPECIFIC FEATURES OF EQUIPMENT

1 – Hydraulic actuator for line plugging
2 – Sandwich valves
3 – Bypass
4 – Bypass tee
5 – Line plugging tee
6 – Ball valve
7 – Pipeline to be plugged
8 – Element to be replaced



SCOPE OF APPLICATION

- Oil and gas transmission pipelines
- Process pipelines
- Field pipelines
- Water pipelines etc.

THE TECHNOLOGY IS USED FOR

- Connection of the newly built lines without stoppage of product transportation to active pipelines
- Plugging of pipeline sections under pressure for repair or upgrading
- Tie-in of unions for installation of temperature sensors, flow meters and other instruments

Hot-tapping temperature is **up to 200°C**
for plugging **up to 80°C**

Diameter
For hot tapping **up to DN1600**
For plugging **up to DN1400**

Flow rate **up to 5-10 m/s**

OPERATING MEDIA

NATURAL GAS, OIL, WATER, STEAM, LIGHT OIL PRODUCTS, DIFFERENT CHEMICAL SUBSTANCES AND GASES, COMPRESSED AIR ETC.

PIPELINE MATERIALS

STEEL, STAINLESS STEEL, CAST IRON, ASBESTOS CEMENT, REINFORCED CONCRETE ETC.

INTRAFIT OWN MANUFACTURE OF EQUIPMENT, COMPONENTS, FITTINGS AND LINE PLUGGING EXPENDABLES

INTERGAZCERT GAZSERT
CERTIFICATION

>900 hot tapping
WORKS PERFORMED

at **85**
HAZARDOUS PRODUCTION FACILITIES

+

100%
PHASEOUT OF IMPORT

HOT TAPPING AND LINE PLUGGING OF PIPELINES UNDER PRESSURE 0-2.0 MPa

SCOPE OF APPLICATION

- Low-, high- and medium-pressure gas pipelines of gas distribution network
- Heat supply
- Water supply

Hot-tapping temperature is **up to 200°C**

for plugging **up to 80°C**

Diameter

For hot tapping **up to DN1600**

For plugging **up to DN1400**

OPERATING MEDIA:

NATURAL GAS, WATER, AGGRESSIVE MEDIA

PIPELINE MATERIALS:

STEEL, STAINLESS STEEL, POLYPROPYLENE

ADVANTAGES

- Repair was performed without disconnection of consumer
- Considerable reduction of economic losses related to production downtime
- Performance of the works without reduction of transportation medium parameters, with operating pressure maintained
- Work performance in strict compliance with the requirements of safety guidelines
- Elimination of environmental pollution
- Reliable, cost-saving and effective temporary plugging of pipeline

THE WORKS ARE CARRIED OUT WITHOUT STOPPAGE IN PRODUCTION

GAZSERT
CERTIFICATION

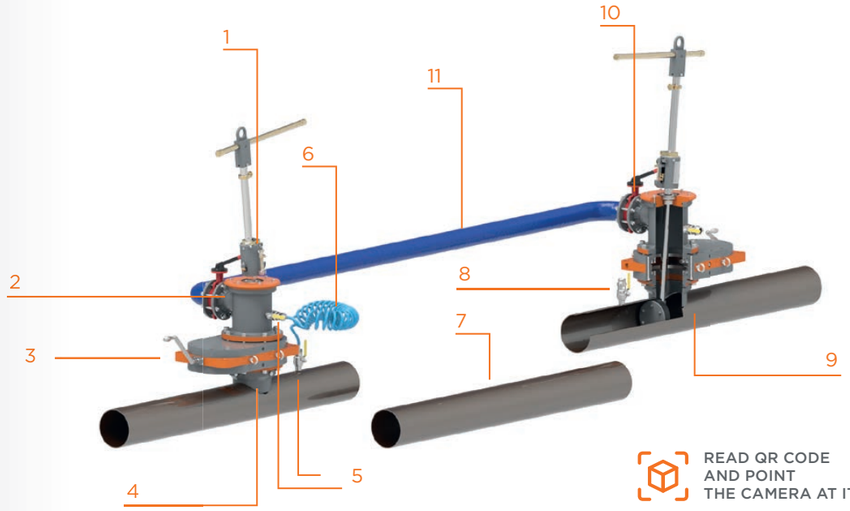
400 projects
WERE COMPLETED IN THE LAST 3 YEARS

at **73**
HAZARDOUS PRODUCTION FACILITIES

100%
PHASEOUT OF IMPORT

SPECIFIC FEATURES OF EQUIPMENT

1 – Mechanical actuator for line plugging
2 – Universal adapter
3 – Sandwich valves
4 – Welded fitting
5 – Ball valve
6 – Pressure equalization line
7 – Element to be replaced
8 – Vent pipe
9 – Plugging head
10 – Butterfly valve
11 – Temporary bypass (layflat hose)



READ QR CODE AND POINT THE CAMERA AT IT

LEAK SEALING

PACKAGE OF MEASURES FOR DEFECT CONFINEMENT WITH SPECIALIZED FITTINGS (BANDAGE) OR A DETACHABLE CLAMP FOLLOWED BY FORMING OF A SEALING AREA WITH UNIQUE COMPOUNDS (FILLERS) ON THE BASIS OF SYNTHETIC RUBBER

The properties of the compounds depend on the nature of the sealed leak - temperature, medium, pressure, type and configuration of equipment.

SCOPE OF APPLICATION

- Flanged joints
- Valve packing chambers
- Welding jointss
- The body of pipeline elements and valves of various configurations

ADVANTAGES

- Considerably reduced costs related to process equipment downtime and stoppage of production process
- Considerably reduced risk of emergencies and man-made disasters
- Reduced level of environmental release of hazardous substances, fewer instances of emergency oil spills (environmental safety)
- Ensuring safe operating conditions for equipment during inter-repair periods
- Increased lifespan of the main stock, economy of materials
- Reduced amounts of product waste and power consumption

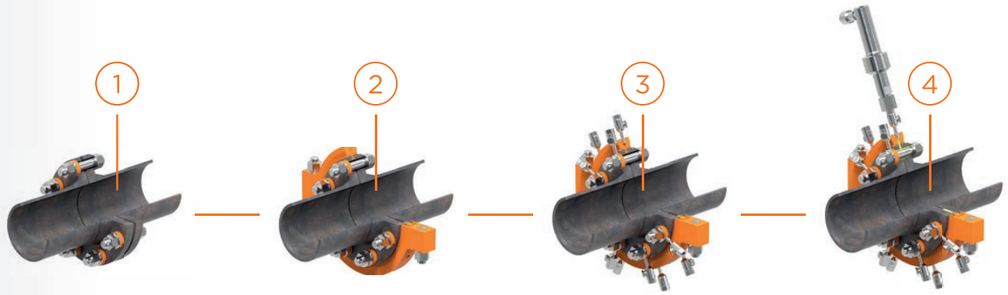
Temperature
from -196°C to 1200°C

Pressure
from 0.001 MPa to 35 MPa

OPERATING MEDIA:

STEAM, WATER, HEAVY GAS OIL, LIGHT GAS OIL, GASOLENES, HYDROGEN, AMMONIA, NITROGEN, SULFURIC ACID, HYDROFLUORIC ACID ETC.

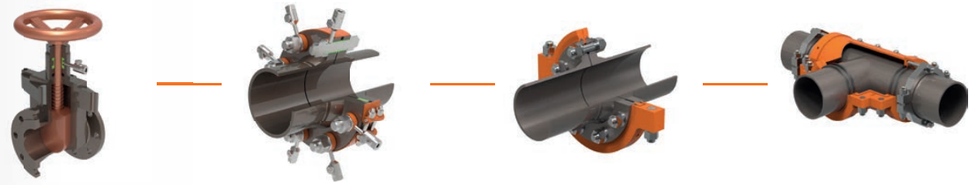
LEAKS ARE SEALED UNDER PRESSURE WITHOUT PRODUCTION STOPPAGE AND ENSURES COMPLETE SEALING



1 preparatory stage
2 leak confinement
3 preparation to compound introduction
4 introduction of a compound

Special clamps are fixed onto the leak area creating an air-tight cavity around it. Special hydraulic tool builds up pressure in the clamp cavity to exceed the pressure in the process system, after which the cavity is filled with a sealing compound. A new sealing structure is formed as a result of a higher pressure and vulcanization in response to heat.

LEAK REPAIR TECHNIQUES



sealing of pipeline valves | sealing without a clamp | with a ring clamp | sealing of a pipeline section

>5000 leaks → at **96**

WERE SEALED IN THE LAST 5 YEARS

HAZARDOUS PRODUCTION FACILITIES

READ QR CODE AND POINT THE CAMERA AT "SEALING WITHOUT A CLAMP"

+

100%

PHASEOUT OF IMPORT →

INTRAFIT

Own manufacture of leak repair clamps
INTRACASE / INTRASEAL

INTRACOMPOUNDS

Own manufacture of compounds

INTRA SERVICES COMPANY IS THE ONLY COMPANY AT THE TERRITORY OF THE RUSSIAN FEDERATION SUPPORTED BY RF PRESIDENT AND LEGALIZED IN RESPECT OF LEAK SEALING TECHOLOGY AT THE EXISTING EQUIPMENT BY THE FEDERAL SERVICE FOR ENVIRONMENTAL, TECHNOLOGICAL AND NUCLEAR SUPERVISION OF THE RUSSIAN FEDERATION (ROSTEKHNADZOR).

COMPOSITE REPAIR

CORROSION PROTECTION AND RESTORATION OF AIR-TIGHTNESS AND LIFTING CHARACTERISTICS OF DEFECTIVE SECTION OF PIPELINES

Reinforcing and restoration material is applied onto the pipeline surface creating a hard integrated coupling with the required set of operational characteristics.

SCOPE OF APPLICATION

- Restoration of lifting capacity
- Removal of consequences of mechanical damage: cracks, dints, corrugations, chatter marks, defects of circular welds
- Removal of consequences of external corrosion and erosive wear
- Feasibility of works on complex-geometry pieces (tees, bends, clamps)
- Removal of through defects

ADVANTAGES

- Feasibility of use at curved sections, tees, bends
- Complete restoration of lifting capacity of the structure
- Increased service life of equipment
- High operational characteristics of couplings
- Highest level of chemical resistance
- Corrosion-proof and wear-resistant
- High adhesive strength to steel surfaces
- Eco-friendly
- Online technique

THE WORKS ARE PERFORMED WITHOUT PRODUCTION STOPPAGE

>800 works → at **42**

HAVE BEEN PERFORMED ON PIPELINE SECTIONS AND PRESSURE VESSELS

HAZARDOUS PRODUCTION FACILITIES

+

100%

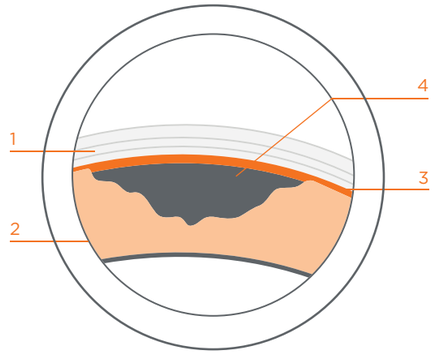
PHASEOUT OF IMPORT →

INTRACOMPOSITE®

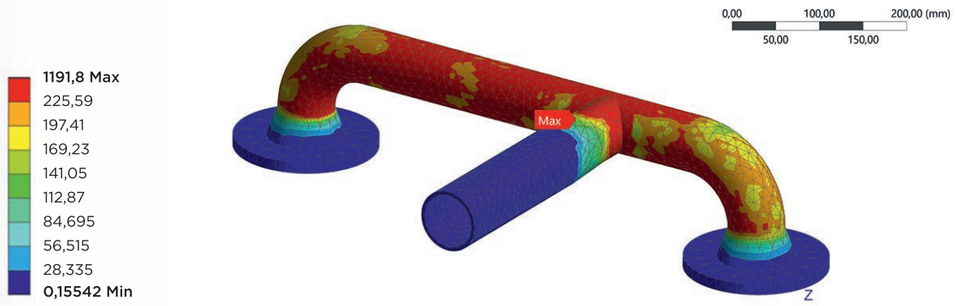
Own production of composite materials **complies with ISO 24817 international standard**

SPECIFIC FEATURES OF THE TECHNIQUE

1 – composite material
2 – pipeline wall
3 – primer
4 – filler



ANALYSIS OF THE MODEL



ENGINEERING ANALYSIS WAS DONE IN COMPLIANCE WITH ISO TS 24817 AND ASME PCC-2, ARTICLE 4.1.

LEAK DETECTION AND REPAIR

TECHNIQUE FOR DETECTION OF INFRARED RADIATION OF VOLATILE ORGANIC COMPOUNDS BY MEANS OF A SPECIAL DEVICE. OWING TO ITS SUPER-SENSITIVE MATRIX, THE DEVICE ALLOWS TO SEE THE DIFFERENCE IN THE REGISTERED GAS RADIATION AGAINST ENVIRONMENTAL BACKGROUND

SCOPE OF APPLICATION

- Process vessels
- Assemblies
- Shutoff and control valves
- Pipeline elements
- Tanks

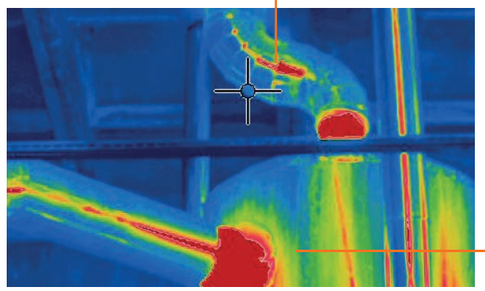
Temperature of transported media ranging
from -20°C to 350 (600)°C

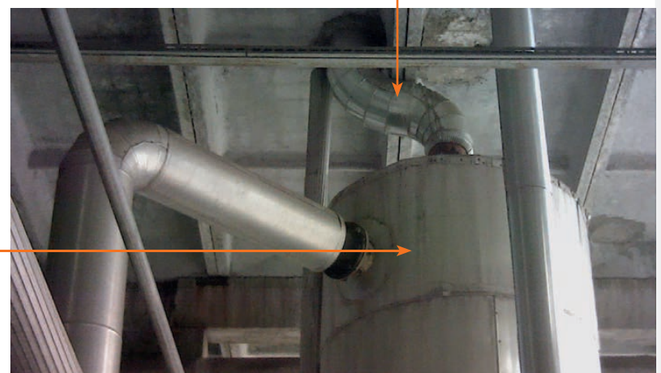
OPERATING MEDIA:

STEAM, WATER, REFINABLE RAW MATERIALS AND PRODUCTS OF ITS REFINEMENT, PROCESS MEDIA (CHEMICALLY AGRESSIVE SUBSTANCES)

ADVANTAGES

- Assessment of condition of pipeline elements and pipeline valves (thinning, defects, corrosive wear, welding defect, damaged gasket)
- Prevention of pre-emergency situations and leakages of the transported medium
- Detection of “developing” leaks of hydrocarbons at the initial stage
- Grading of transported media leakages and analysis of fugitive emission volumes
- Objective assessment of repair works quality
- Identification of pre-accident state of equipment and pipeline sections
- Identification of sections with damaged heat insulation and installation defects
- Optimization of mechanisms and algorithms for repair works arrangement





MAGNITOMETRIC DIAGNOSTICS

TECHNIQUE OF DETECTION OF POSITION AND DEGREE OF DAMAGE SEVERITY IN INSULATION AND METAL OF THE PIPELINE

Transition from single-time diagnostics to intermittent monitoring of technical condition and collection of statistical data on defects

Electronic mapping of defect positions with their accurate georeferencing in terms of GPS/Glonass coordinates.

SCOPE OF APPLICATION

- At pipelines unaccessible for smart pigging
- At pipelines in districts of high seismic activity and challenging geological conditions
- At sections of field pipelines of high risk categories belonging to a “very high” category with the number of bursts exceeding 0.1 pcs/km/year
- For express diagnostics and early detection of critical conditions of underground pipelines
- At new pipelines for assessment of technical condition of welds before commissioning
- For the search of unauthorized tie-ins

ADVANTAGES

- Simplicity of pipeline diagnostic technique from the earth’s surface
- Does not involve stoppage or reduced amounts of product transportation
- Low cost of works
- High reliability of defects detection - up to 75-85 %
- High accuracy of defect position - from 0.1 to 0.5 m
- High productivity - up to 15 km/day moving on foot and up to 70 km/day on carriers (means of transport, quadrocopters)
- Special expert mathematical methods of processing help identify defect types

Underwater diagnostics

Application of a robotic complex for non-contact diagnostics and pipeline defects detection under water.

- Detection and identification of position of pipeline insulation defects
- Detection of linear and Glonass/GPS coordinates of abnormalities (sections with defects and increased local loads)

Speed
up to 3 knots/hour

Depth
up to 100 m

Accuracy
not more than 1 m

Range
up to 5 m

Synchronization of own spatial position data and data received from measuring system recorded onto the flight data recorder with an option of its subsequent reading.

SAFETY VALVE TESTING

THE PROPRIETARY “ARMTEST” DEVICE ALLOWS FOR VALVE CALIBRATION IN PROCESS OF WORK WITHOUT THE NEED TO INCREASE PRESSURE IN THE SYSTEM IT ALSO DETECTS FAULTY VALVES IN NEED OF MAINTENANCE FOR PERFORMANCE OF SCHEDULED OR EMERGENCY REPAIRS

The testing system can provide for adjustment of the set pressure withing ±1 %. It can also identify potentially dangerous problems:

- leaky valve
- valve saddle sticking to valve disc
- critical spring defects

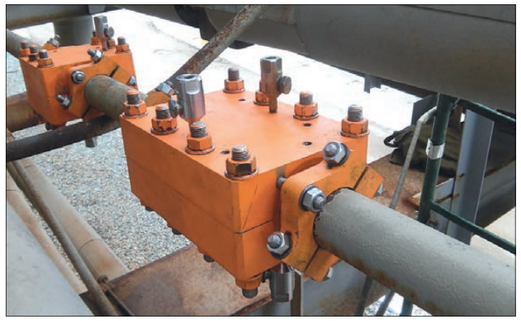
Temperature **below 300°C**

OPERATING MEDIA:
GAS, WATER, STEAM

THE WORKS ARE PERFORMED WITHOUT PRODUCTION STOPPAGE

ADVANTAGES

- Suitable for all sizes of the tested equipment
- High accuracy of measurements
- Cost saving, as there is no need for dismantling and inspection at a test bench
- Valve testing during operation with no need to increase pressure in the system



MANUFACTURE

MANUFACTURE OF EQUIPMENT AND COMPONENTS FOR ONLINE LEAK SEALING TECHNOLOGY FOR PRESSURIZED PIPELINES

INTRAFIT → OWN MANUFACTURE OF EQUIPMENT, COMPONENTS, FITTINGS AND LINE PLUGGING EXPENDABLES

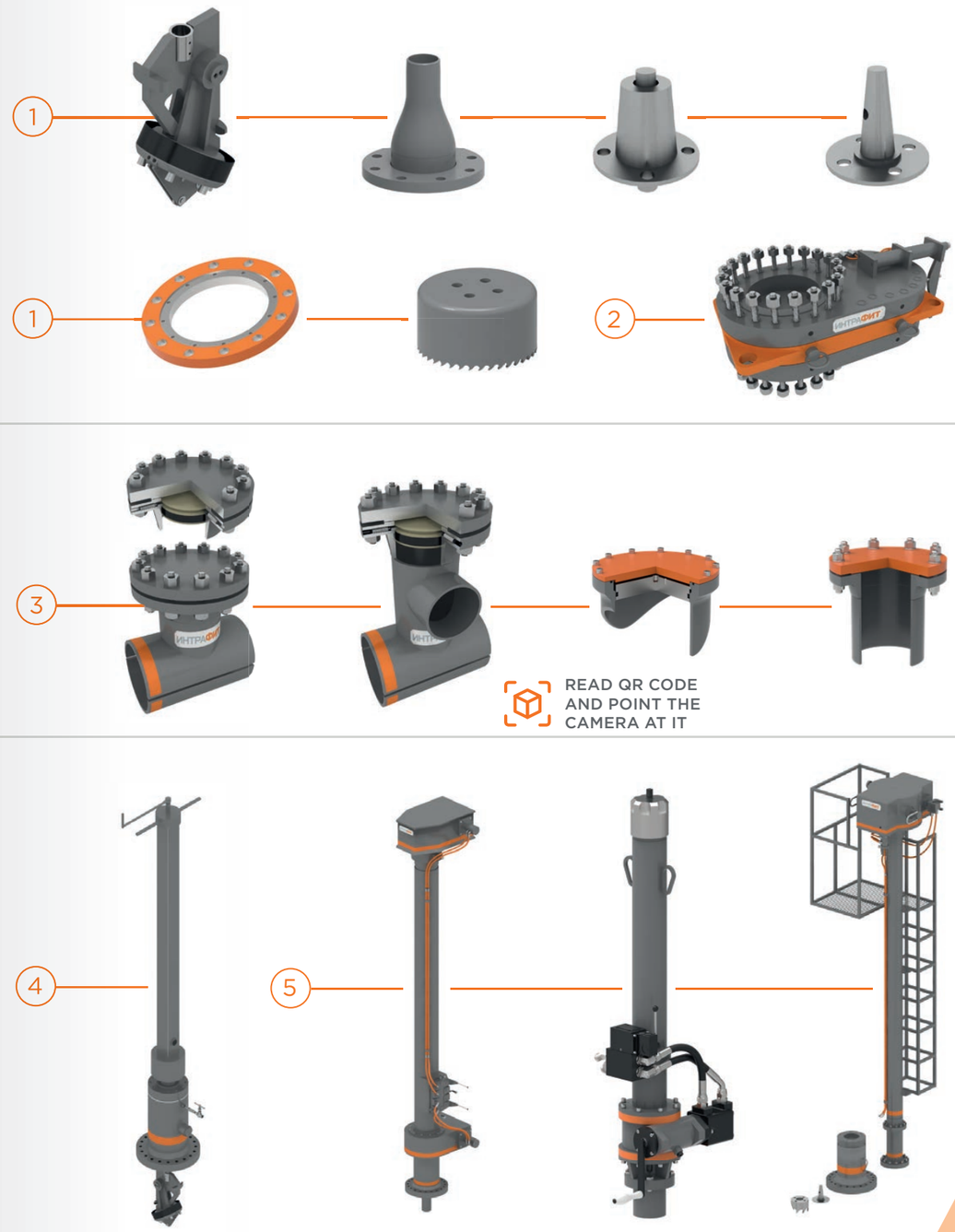
Intrafit plant:

Location: Chelyabinsk region, Miass (established in 2007)
Facility area: 15,000 m2
The plant has own dead-end railway track

Location: Leningrad region, Metallostroy (established in 2020)
Facility area: over 2,000 m2

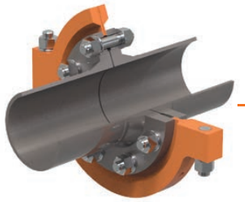
PRODUCTION OF EQUIPMENT AND COMPONENTS FOR HOT TAPPING AND PLUGGING

- Sealing elements
- Split tees
- Repair and leak sealing clamps
- Custom-built parts
- Cutting tools (drills, milling cutters)
- Equipment for hot tapping and plugging of pressurized pipelines, including equipment and components for gas distribution networks
- Sandwich valves
- Additional equipment, accessories, components

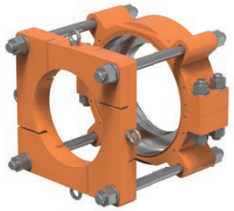


1 — Additional equipment, accessories, components
2 — Sandwich valves
3 — Tees and pipes for hot tapping and plugging
4 — Plugging equipment
5 — Equipment for hot tapping into pipelines

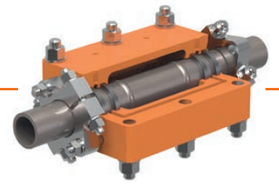
MANUFACTURE OF LEAK SEALING EQUIPMENT — INTRASEAL CLAMPS




Detachable ring, box-shaped flanged joint clamps



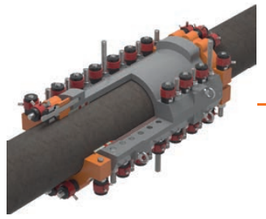
Non-standard box-shaped clamps



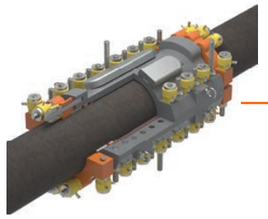

Detachable box-shaped clamps

Sector box-shaped clamps

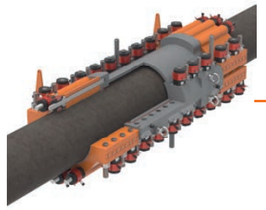
INTRACASE SELF-SEALING DETACHABLE CLAMPS



INTRACASE-C (cross-asset), ovality and non-alignment compensation coupling



INTRACASE-S (subsea), coupling, subaquatic version



INTRACASE-M (mechanical), compression-type coupling

INTRACASE-W (welded), combined-type coupling (compression coupling, welded coupling)

INTRACOMPOUNDS

MANUFACTURE OF COMPOUNDS FOR LEAK SEALING TECHNOLOGY

INTRACOMPOSITE®

MANUFACTURE OF COMPOSITE MATERIALS

IMPLEMENTING A SYSTEMATIC APPROACH TO DESIGNING, DESIGN ENGINEERS USE ANSYS COMPUTATION TECHNOLOGIES FOR MODELLING OF INNOVATIVE EQUIPMENT

Location: Saint Petersburg (established in 2007)

Facility area: over 1,000 m2

- OVER 80 TYPES OF COMPOUNDS
- HIGH-TECH EQUIPMENT FOR MANUFACTURE OF COMPOSITE MATERIALS
- OWN LABORATORY PERFORMS QUALITY CONTROL OF INCOMING RAW MATERIALS, AS WELL AS READY-MADE MATERIALS

CERTIFICATES

Manufacture

- INTERGAZSERT VOLUNTARY CERTIFICATION SYSTEM split tees
- INTERGAZSERT VOLUNTARY CERTIFICATION SYSTEM hot tapping machine
- GAZSERT VOLUNTARY CERTIFICATION SYSTEM hot tapping equipment
- GAZSERT VOLUNTARY CERTIFICATION SYSTEM plugging equipment
- GAZSERT VOLUNTARY CERTIFICATION SYSTEM steel fittings
- Certificates of Conformity
- Certificates of Customs Union
- Accreditation, standard ASME B31.8/4
- Accreditation, standard ISO 24817

Manufacture quality management

- INTERGAZSERT VOLUNTARY CERTIFICATION SYSTEM STO GAZPROM 9001-2018
- TUV Thüringen ISO 9001:2015

THE PRODUCTS ARE ENTERED INTO LOGISTICS REGISTER OF PJSC GAZPROM

INTRASOFT INTEGRITY RELIABILITY MANAGEMENT

INTRASOFT IS AN INTEGRATED SYSTEM OF MEASURES FOR IMPROVEMENT OF PREPARATION AND PLANNING OF REPAIR WORKS AND THEIR QUALITY ENHANCEMENT

EFFICIENCY:

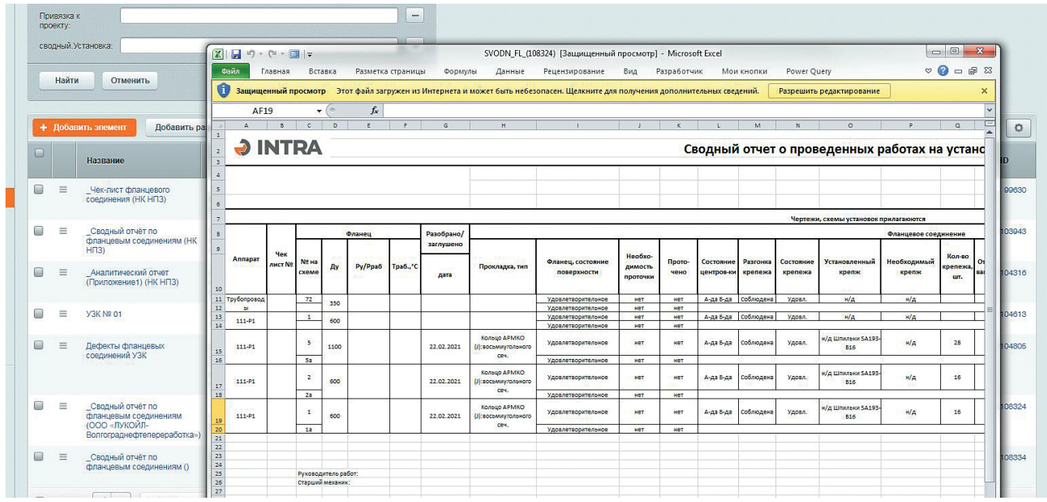
- Reduction of expenses related to the quality of preparation to repair works
- Reduction of repair-related wastage
- Increase in equipment load factor and production output

TYPES OF WORK

- Pre-engineering

  Processing of technical documentation, data base creation, updating
- Flange joints management
- Calculation of tightening torque, optimization and selection of packing material, fixtures
- Development of repair flowcharts and repair data cards

  Operations: selection, sequence, result
  Resources: personnel, equipment, MTTR, time
- Integrated planning of repairs, control of preparation to repairs



SUPERVISING

SUPERVISING IS AN INDEPENDENT TECHNICAL CONTROL OF REPAIR AND CONSTRUCTION WORKS

EFFECT OF REPAIR AND CONSTRUCTION WORKS SUPERVISING:

- Work performance periods get shorter due to optimized contractor interaction
- There is considerable reduction in number of repeated hydrostatic tests and equipment start-up time
- Facilities are put into operation in time and in operable state
- Operational integrity of process equipment increases
- Accident-free time between repairs is ensured for subsequent operation period
- Absence of injuries, rise of work culture level owing to compliance control with respect to safety guidelines and the use of personal protective equipment

ADVANTAGES

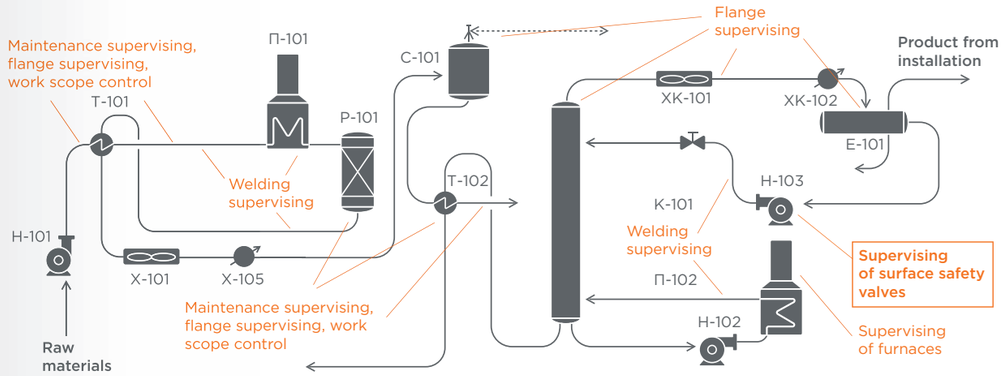
105 370 flanged joints

INSPECTED BY EXPORTS OF INTRA SERVICES COMPANY FOLLOWING THE RESULTS OF 2022

- Ensuring the quality of repair works at the customer's premises
- Collection, systematization and analysis of data on the actual state of equipment dismantled and collected during repair

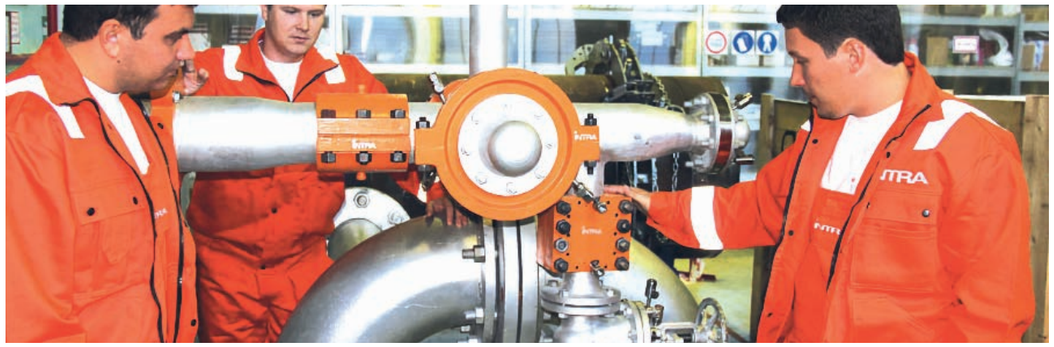
- Certified NDT laboratory as regards the types of ultrasonic testing, visual and measuring control, penetrant testing
- Own fully equipped production facilities, localization. Phaseout of import
- Development of reporting documents as required by the customer. Automated filling system
- Availability of software for data collection and processing, automation of reports, ensuring reports reliability
- Most current Supervisor's reference books, training of the customer's personnel, creation of schemes prior to operation

TYPES OF SUPERVISING:



TRAINING CENTER

IMPLEMENTATION OF FURTHER PROFESSIONAL EDUCATION OF OWN PERSONNEL AND CONTRACTOR PERSONNEL



USE OF CONTEMPORARY EDUCATION TECHNOLOGIES:

- Electronic educational resources (electronic diary, the system of lecture tracking system allows a teacher to create visual imagery of 2D graphics and SD-graphics and animation)
- Training simulators allow to effectively train the whole set of operations of assembly-disassembly of different flanged joints by using hand tools and power tools, learn to seal leaks and restore pipeline lifting capacity, do flange facing for large-diameter flanges
- Multi-level practical training

TRAINING PROGRAMS

- Maintenance of flanged joints (by using power tools and tensioners)
- "Mechanical cutting and pipe beveling for welding"
- "Repair of sealing surfaces of flange connections with the use of portable machining devices"
- "Hot tapping and line plugging"
- "Quality control of repair works at companies in fuel and energy sector"
- "Management of repair works quality control at companies in fuel and energy sector"
- "Ensuring environmental safety when working in the sphere of hazardous waste management"
- "Sealing of leaks (depressurizing) in pressurized pipelines, vessels and heat exchangers"
- "Input/output testing methodology"

LICENSE FOR EDUCATIONAL ACTIVITY

OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT SYSTEM ENSURES IMPROVEMENT AND FORMATION OF A STABLE MOTIVATIONAL MECHANISM OF SAFE BEHAVIOUR AT WORK

In order to provide education, a classroom room has been set up and fully equipped with study guides, manuals and video materials required for training and testing in all fields, a dummy simulator with a controller and a wall-mounted scoreboard for cardiopulmonary resuscitation drills, a site has been arranged for firefighting drills with the use of primary fire-extinguishing equipment.

TRAINING PROGRAMS

- Refresher training courses "General industrial safety requirements"
- Occupational safety and health for company executives and specialists
- Safe methods and techniques when working at height
- Basics of fire safety for different categories of learners

ACCREDITATION OF THE COMPANY'S RESEARCH AND EDUCATION CENTER UNDER THE MINISTRY OF LABOUR AND SOCIAL PROTECTION OF THE RUSSIAN FEDERATION IN PROVISION OF TRAININGS UNDER "OCCUPATIONAL SAFETY" PROGRAMS

ADVANTAGES

- The programs are implemented in the form of intramural, extramural and mixed-type courses
- When implementing training programs, distance learning technologies and/or e-learning are used
- Teachers providing training have proficiency testing and take career development courses on an annual basis
- After completion of training, learners get standard-type credentials and certificates
- Training instructors in first aid and basic cardiopulmonary resuscitation have international provider certificates from European and National Resuscitation Councils
- Fire safety programs have been agreed with the Ministry of Emergency Situations of Russia

CORROSION UNDER INSULATION

WORKS FOR PREPARATION OF SURFACES, RESTORATION OF ANTI-CORROSION PROTECTION, INSTALLATION OF NEW INSULATION AND APPLICATION OF PROTECTIVE COATING LAYER

SCOPE OF APPLICATION

- Upper surfaces of pipelines, vessels under pressure and tanks due to a wrong choice of heat insulation type
- Marine and offshore facilities
- Facilities located in humid climatic regions

ALL SPECIALIST ARE CERTIFIED UNDER NACE LEVEL 2, ICORR LEVEL 2!

THE WORKS ARE PERFORMED WITHOUT PRODUCTION STOPPAGE

ADVANTAGES

- The surfaces are ideal for use in cryogenic conditions
- UV resistance Prevents corrosion of uninsulated surfaces exposed to atmospheric effects
- The use of Jotun and PPG coatings ensures corrosion resistance in extreme temperature range. It prevents most types of corrosion including external corrosion cracking

Temperature
from -185°C to 650°C

OPERATING SEQUENCE:

1. Removal of protective coating layer and heat insulation
2. Assessment of the condition of heating cable and paint coating of the pipeline
3. Visual examination, detection of corrosion, nondestructive testing
4. Removal of paint coating by means of specialized mild abrasive blast cleaning using Sponge-Get technology
5. Performance of roughness tests and surface salt tests
6. Application of new corrosion protection
7. Installation of heat insulation and heating cable
8. Installation of a protective coating layer

THERMAL SPRAY ALUMINUM

THERMAL SPRAYING, SURFACE TREATMENT OR COATING PROCESS WHERE A BROAD RANGE OF METALS AND CERAMICS IS SPRAYED ONTO THE SURFACE OF ANOTHER MATERIAL

SCOPE OF APPLICATION

- To ensure corrosion protection for ferrous metals or alter their surface properties
- To improve parameters of wear resistance, firmness or thermal conductivity

BASIC TYPES OF SPRAYING:

- **Flame spray**
- **ARC spray**
- **Plasma spray**
- **High velocity oxygen fuel spraying** (HVOF)

Zn

Used for spraying under the conditions of moderately low corrosion, for water tanks, bridges and conventional structures made of structural steel.

Al

Used under the conditions of a more severe corrosion, in sea coastal zones and under high temperature conditions, at oil drilling rigs.

ALL TYPES OF THERMAL SPRAYING INVOLVE THE FORMATION OF MOLTEN METAL PARTICLES AND THEIR TRANSFER TO THE TREATED SURFACE, WHERE THEY ARE RETAINED, FORMING A DENSE COATING.

ADVANTAGES

- Longer inspection periods — reduced costs of maintenance
- Long-term protection under the conditions of aggressive environments
- Withstands temperature changes
- Application in the wide range of environmental and climatic conditions
- Simple surface preparation
- High speed of application
- High resistance to mechanical stress

THE WORKS ARE PERFORMED WITHOUT PRODUCTION STOPPAGE

HEAT INSULATION

APPLICATION OF HEAT INSULATION MATERIAL TO REDUCE HEAT TRANSFER PROCESS

SCOPE OF APPLICATION

- Pipelines, tanks, reservoirs (storage of fuels and lubricants, oil, drinking water etc.)
- Equipment
- Shutoff and control valves
- Heat networks
- Conditioning and ventilation systems
- Refrigeration units

OBJECTIVES

- Providing the required temperature on the surface of insulation (protection from heat burns)
- Condensation prevention
- Cooling to a given value of substance temperature in a reservoir for a certain time
- Reduction of temperature of a substance transported by pipelines to a given value
- Prevention of freezing when liquid substance transfer is stopped

Operating sequence:

1. Installation of heat insulation layer
2. Installation of a protective coating layer
3. Heat insulation of valves

TYPES OF HEAT INSULATION LAYER

- FOAM GLASS
- MINERAL WOOL
- FOAM RUBBER
- CERAMIC WOOL
- AEROGEL-BASED MATERIAL
- POLYISOCYANURATE FOAM

PIPELINE AND EQUIPMENT CLEANING

Pressure washing

Internal surface cleaning involves insertion of high-pressure hose into the inner cavity of equipment to be cleaned (tube) by means of rotation of the spray nozzle (pulverizer) and directed jet of water under high pressure up to 2,800 bar, whereupon depositions on pipe walls (heat exchangers, pipelines) are destroyed and washed out.

UHP (ULTRA HIGH PRESSURE) — ULTRA HIGH PRESSURE WATERJET TECHNOLOGY

ADVANTAGES

- Work performance in hard-to-reach areas
- Safety of work performance
- Mobility and efficiency of work performance, arrival at equipment location sites in case of emergency
- Top-degree cleaning of hard-to-reach areas along with chemical methods
- Reduced repair time
- Eco-friendliness

Hydrochemical cleaning

Cleaning of inner surfaces from scale-corrosive deposits by mixing chemical substances and water in certain proportions, special technical detergents, mineral or organic acids with special additives fed to the equipment or heat exchanger pipes under high pressure.

ADVANTAGES

- Penetrating power of technical detergents ensures quick dissolution of deposits without affecting finning material, following which dissolved deposits are washed off by a high-pressure washer (up to 2,800 bar)
- Working at any elevation spot

Chemical cleaning

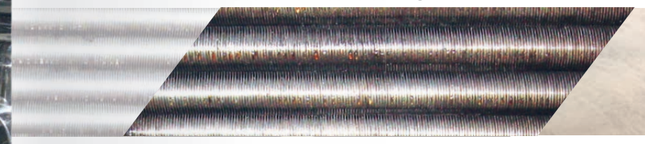
Cleaning is performed by circulating technical detergents in a closed loop under a certain temperature and pressure in compliance with cleaning methodology for at least 24 hours. Technical detergents may consist of several components. The choice of composition, proportions, concentrations of components depends on the particular task, as well as the developed formulation and cleaning technique.

ADVANTAGES

- Reduced repair time
- Reduced period of installation works
- Increased time between repairs
- No unreasonable repairs
- Reduction in amounts of spare parts ordering and optimized order schedules

Before hydrochemical cleaning (A)

After chemical cleaning (B)



Before chemical cleaning (A)

After hydrochemical cleaning (B)

PIPELINE AND EQUIPMENT CLEANING

Hydrochemical cleaning

TECHNOLOGY:

Mechanical destruction of solid (carbonate) and polymer deposits on inner surfaces of heat exchanger pipes by chipping them off with a rotating cleaning tool (roller head, milling cutter or special carbide drills) followed by deposits removal with moving water flow.

ADVANTAGES

- Water supply to the tool operation area results in considerable increase in efficiency of cleaning pipes, in increased longevity of equipment
- 100% cleaning of pipes without damage to their walls
- Cleaning speed and reliability

TANK AND RESERVOIR CLEANING

TECHNOLOGY:

- Preparation of equipment for transfer of technological residue of commercial oil product to another tank to the minimum level
- Pumping off bottom sediments of the tank by TKM-629 vehicle (vacuum plant). While pumping off, deposits remain on the walls of the tank, which must be steamed for 24 hours in order to soften the deposits and make them flow down to the tank bottom
- Tank degassing to the values of maximum permissible explosive concentration
- Washing of the tank by means of high-pressure pump and chemical reagents

SCOPE OF APPLICATION

- Keeping the tank in an operable condition, when preparing for repairs and hot work
- The tank cleaning technology ensures reduction of hydrocarbon vapours concentration to the values of maximum permissible concentration and lower concentration limit, as well as cleaning of tank surfaces from deposits to maximum permissible fire load
- Feasibility of oil product change, repair work performance

BOLTING

A COMPLEX OF FITTING AND ASSEMBLY WORKS FOR BOLTED JOINTS MAINTENANCE

Works are always performed in succession, in compliance with the approved bolt tightening procedure and with the use of lubrication materials, which allows for even tightening of a flanged joint and avoiding possible product leakage in the future.

The works are performed with the use of high-tech professional equipment from the leading European manufacturers, all specialists have international certificates from Hi-Force.

SCOPE OF APPLICATION

- Equipment installation at gas compressor stations
- Maintenance of heat exchangers and column equipment at oil refineries and chemical plants
- Equipment installation at drilling platforms, oil and gas fields
- Equipment repair in ports in shipbuilding and ship repair yards
- Installation of tower cranes, bridge trusses at construction sites
- Installation of furnace equipment, as well as crushing and screening equipment at cement plants and quarries

ADVANTAGES

- Highly qualified personnel experienced in performance of the works
- Works in hard-to-reach areas with minimum installation space
- Tackling nonstandard bolting problems
- Feasibility to calculate recommended torques
- Reduced work performance deadlines
- Minimum probability of leaks in course of equipment operation in the future
- Maintained integrity of fasteners
- Safety of work performance

Adjustable torque
from 48 Nm to 181,000 Nm (accuracy ± 3%)

Maintenance of fasteners with nut sizes
from 12 mm to 165 mm

WORK PERFORMANCE:

BY MEANS OF PROFESSIONAL HYDRAULIC TOOLS, AS WELL AS TENSIONERS, TORQUE WRENCHES, PNEUMATIC MULTIPLIERS.

FLANGE FACING

RESTORATION OF SEALING SURFACES OF FLANGED JOINTS

APPLICATION PARAMETERS

- Range of machining from 0 mm to 4,045 mm (up to 12,000 mm — custom-made)
- High quality of machining, achievable roughness is Ra 0.8-1.6 μm
- Can be used for flange surface machining for different flange profiles: tongue-groove, male-female, O-ring, ARMCO ring, V-shaped groove
- The machine may be installed at both inner and outer flange diameters
- In case of mounting on tube plate, two-side machining is possible from one installation position
- Machining of square and rectangular flanges
- Feasibility study with respect to non-standard technical queries

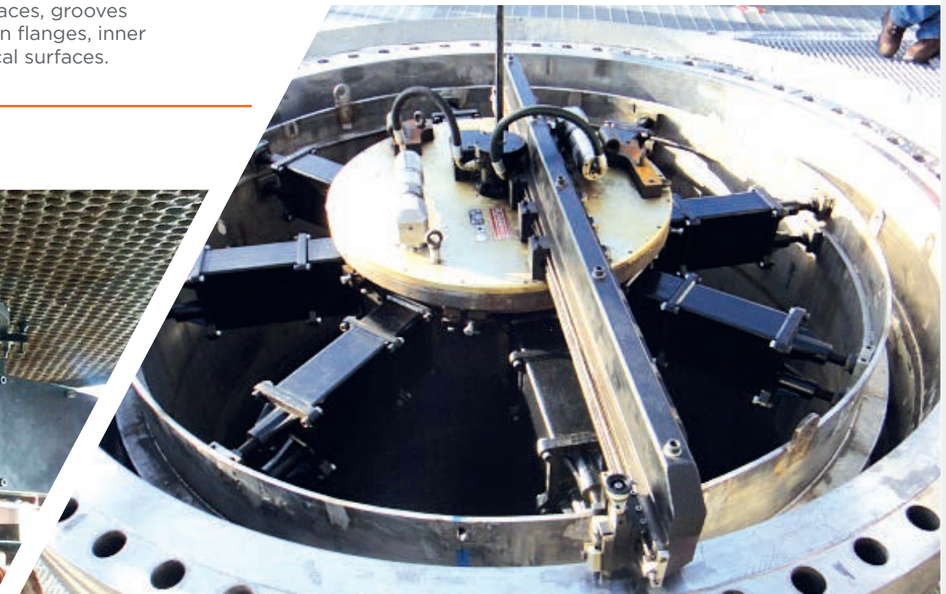
ADVANTAGES

- Works are performed without disassembling of flanges and equipment in general (works performed in-situ)
- Service life extension due to restoration of sealing surfaces of flanges
- No need to perform labour-intensive works with subsequent defectoscopy of a welded joint in case of flange disassembling for subsequent facing
- Feasibility of machining in any spatial position
- Minimum working space is needed in the area of the surface to be machined (in cramped conditions)
- Helps avoid product leaks through a flanged joint, and consequently, nonscheduled production stoppage in the future
- Considerable reduction of overall repair time

SCOPE OF APPLICATION

Turning, grinding, milling of various surfaces and equipment parts:

flange sealing surfaces, grooves of any geometry on flanges, inner and outer cylindrical surfaces.



PIPE CUTTING, BEVELING

MAKING TIE-INS AND CHAMFERS ON PIPES OF VARIOUS DIAMETERS BY A MECHANICAL METHOD — BY USING HIGH-SPEED STEEL CUTTERS AND PORTABLE METALWORKING MACHINES

APPLICATION PARAMETERS:

- Pipe cutting to size (machining range is 20 to 1,448 mm)
- Making chamfers of various profiles (set by cutting tool geometry)
- Simultaneous pipe cutting and chamfering (on open ended pipes)
- Internal boring of pipes (using a boring module at a depth of up to 254 mm)
- Pipe boring in axial direction (by using axial feed module)
- Cutting and machining of oval pipes (possible ovality compensation is up to 25.4 mm)
- Different types of drives (hydraulic, electric, pneumatic), with explosion-proof design

ADVANTAGES

- Work performance in hard-to-reach areas (minimum installation space is up to 115 mm)
- Feasibility of machine installation on a continuous pipeline section, including bends, tees, crossings etc.
- Pipe cutting and making chamfers with a minimum offset from the edge (at least 10 mm)
- Machining of pipes of up to K100 strength class and wall thickness up to 100 mm, made of different steel grades, including heat-resistant and stainless steels
- Pipe cutting with residual content of a product in the pipeline

Conclusion Report No. 31323949-061-2010 was obtained, as well as recommendations for the use of weld repair technology with application of Camshell Series pipe-working lathes made by «Hydratight / D. L. Ricci» and «H&S».

SCOPE OF APPLICATION

- Pipe cutting to size and preparation for welding at the time of pipeline laying
- Cutting off defective sections of pipeline and repair of defective welding joints in accordance with STO Gazprom
- Edge beveling for tie-in of a new spool
- Machining of pipes with different thickness, pipeline fittings for their subsequent welding

MECHANICAL STUD EXTRACTION

SPECIAL PORTABLE MACHINES ALLOW FOR DRILLING OUT BROKEN STUDS FROM HEAT EXCHANGER BODIES, FLANGES, TURBINES WITHOUT DAMAGING THE THREAD

TECHNOLOGY:

- Drilling out studs from an exchanger keeping the thread inside the apparatus intact
- Calibration of the retained thread with tap and die
- Flanged joint assembly

APPLICATION PARAMETERS

- Drilling holes 110 mm deep
- Maximum hole diameter is 100 mm

ADVANTAGES

- Stud extraction keeping the thread intact in the body of the apparatus
- Extension of equipment service life and repair time reduction

TUBE BUNDLES EXTRACTION

DISASSEMBLY/ASSEMBLY OF TUBE BUNDLES OF HEAT EXCHANGERS BY MEANS OF CRANE-TYPE HYDRAULIC EXTRACTOR

THE EXTRACTOR CAN WORK FROM GROUND OR IT CAN BE FIXED TO THE CRANE BOOM AND WORK IN A SUSPENDED POSITION

APPLICATION PARAMETERS

- Assembly and disassembly of tube bundles from heat exchanger bodies of different types:
  length up to 12 m,
  diameter up to 2 m,
  weight up to 85 tons

SCOPE OF APPLICATION:

Oil refineries and chemical plants:

heat exchanger tube bundles, reactors, columns, refrigerators, pipelines.

ADVANTAGES

- Reduces overall repair time
- Excludes damage to tubes and partitions of heat exchanger tube bundles
- Requires minimum working space
- Allows to perform pressure testing on the first try
- Increased occupational safety

WELDING

TECHNOLOGICAL PREPARATION, TRACKING AND PERFORMANCE OF WELDING AND ASSEMBLY

TYPES OF WORK

- Assembly and welding of units for hot tapping into pressurized pipelines
- Welding of sealing surfaces of flange joints
- Welding and assembly works at linear pipeline sections
- Performance of special welded joints: polythickness joints, tie-in welds, straight inserts

WELDING AND ASSEMBLY WORKS AND INTEGRATED SOLUTIONS TO CUSTOMER'S TASKS MAY BE COMBINED WITH OTHER TYPES OF SERVICES.

PERSONNEL CERTIFICATION BY NATIONAL WELDING CONTROL AGENCY

All employees were certified in accordance with the requirements of RD 03-495-02 for the following group of process equipment of hazardous industrial facilities:

- field, transmission and process pipelines considering the requirements of STO Gazprom as regards tie-in, welding and inspection of welding joints during construction and repair of gas pipelines
- equipment of chemical, petrochemical plants, oil refineries and production types subject to risks of fire and explosion working under pressure, as well as furnaces, tanks and process pipelines
- gas equipment of boilers, process lines and assemblies, as well as pipelines of internal and external gas supply systems

CERTIFICATE OF SELF-REGULATORY ORGANIZATION (SRO CERTIFICATE)

Permission from SRO for performance of welding and assembly

CERTIFICATION BY STO GAZPROM

Certified technology of work performance on gas pipelines by hot tapping under STO Gazprom 2-2.3-116-2016 with a range of diameters up to 1,420 mm inclusive and a 100 mm wall thickness in welding area.

WELDING PROCEDURE QUALIFICATION BY NATIONAL WELDING CONTROL AGENCY

Conclusion Reports and Certificates permitting work performance at facilities of PJSC Gazpom, including the Certificate of National Welding Control Agency (NAKS Certificate) for welding procedure qualification on transmission pipelines.

Upon agreement with the customer, the company can engage in qualification and certification, as well as performance of work at other sites and facilities that require additional certification.

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