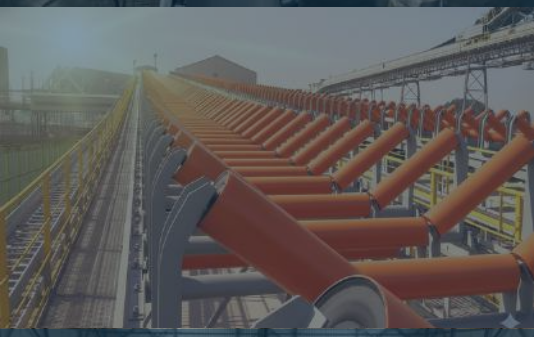
Arudra

Specialist Engineering Solutions For Power, Process & Industrial Plants

Engineering Excellence & Industrial Maintenance Solutions

Protective Coatings . Chemical Cleaning . Material Handling Systems . Maintenance Services



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NDT & Inspection Services

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8. Time Of Flight Diffraction (TOFD)
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Duromar® Coatings & Linings

1. Flue Gas desulphurisation (FGD)
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3. Sea / Circulating water lines (Internal Pipeline)
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plastocor® Technology

1. Plastocor® Cladding System
2. Plastocor® High Performance Coating Systems
3. Plastocor® Tube-Inlet System
4. Plastocor® Tube-Lining System

About Arudra Engineers

Since 1983, Arudra has been delivering turnkey engineering products and services to process industries, including Power, Oil & Gas, Petrochemicals, and Iron & Steel.

Arudra is a leading turnkey engineering solutions provider in India, delivering end-to-end chemical cleaning, protective coatings, surface treatment, maintenance engineering, and NDT/inspection solutions, with successful execution across 200+ public and private sector thermal power plants.

Over the years, we have expanded our portfolio to include performance improvement products and services that address critical maintenance challenges and significantly reduce lifecycle costs for our clients.

Committed to best-in-class delivery, Arudra adopts international best practices through technical collaboration with engineering experts from the USA and Switzerland.

We are also a preferred supplier to several private steel plants in India for the design, engineering, manufacture, and supply of bulk material handling systems, including pulleys and idlers.

Driven by a strong focus on safety, quality, and compliance, our experienced engineers operate in line with international environmental and safety standards. This commitment has enabled Arudra to secure major global contracts, serving process industries across 27 countries.

Arudra Material Handling

Arudra Chemical Cleaning

Arudra Maintenance

Arudra Coatings

Arudra Surface Treatment

Major Industries We Serve

Arudra

Power Plant

Petrochemicals

Oil & Gas

Arudra

Cement

Fertilisers & Chemicals

Iron and Steel

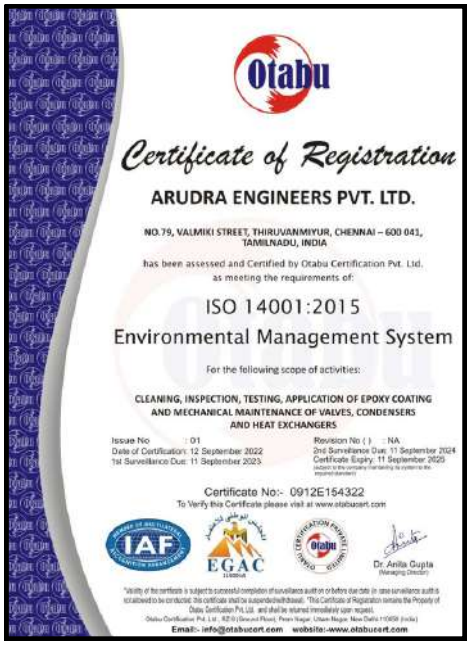
Certifications & Stats


DNV

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of
Arudra Engineers Pvt. Ltd.
RS 130, M G R Nagar, Manjakkam, Chennai - 600116, Tamil Nadu, India
and the sites as mentioned in the appendix accompanying this certificate
has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following scope:
- Manufacture of Idlers & pulleys for conveyors and material handling equipment and providing services of surface preparation including chemical cleaning, tube cleaning, helium leak testing, eddy current test at customer locations
- Manufacture of conveyor idlers and its frames and material handling equipment
- Manufacture and application of epoxy coating and manufacture of cleaning chemicals
- Pretreatment and cathodic electrodeposition


Otabu

Certificate of Registration

ARUDRA ENGINEERS PVT. LTD.

NO.79, VALMIKI STREET, THIRUVANMIYUR, CHENNAI – 600 041, TAMILNADU, INDIA

has been assessed and Certified by Otabu Certification Pvt. Ltd. as meeting the requirements of:

ISO 14001:2015

Environmental Management System

For the following scope of activities:

CLEANING, INSPECTION, TESTING, APPLICATION OF EPOXY COATING AND MECHANICAL MAINTENANCE OF VALVES, CONDENSERS AND HEAT EXCHANGERS

Issue No : 01
Date of Certification: 12 September 2022
1st Surveillance Due: 11 September 2023
Revision No ( ) : NA
2nd Surveillance Due: 11 September 2024
Certificate Expiry: 11 September 2025

Certificate No:- 0912E154322

To Verify this Certificate please visit at www.otabucert.com

IAF EGAC

Dr. Anita Gupta

Email:- info@otabucert.com website:-www.otabucert.com


Otabu

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has been assessed and Certified by Otabu Certification Pvt. Ltd. as meeting the requirements of:

ISO 45001:2018

Occupational Health & Safety Management System

For the following scope of activities:

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IAF EGAC

Dr. Anita Gupta

Email:- info@otabucert.com website:-www.otabucert.com

40+ Years of experience

Worked across 30+ Countries

300+ Employees

300+ Clients

4 Manufacturing Units

Average Revenue of USD 30 million YoY

ARUDRA MATERIAL HANDLING SYSTEMS

Arudra is a leading manufacturer of Bulk Material Handling Systems and have supplied turnkey pulleys, idlers & conveyor systems across India and overseas for the past three decades. Our systems play an important role in transportation of Bulk material like Coal, Coke, Iron ore, Cement etc to the core industry.

We are equipped with a full-fledged design and engineering office backed up by highly qualified engineers and supported by modern CADD Facility. We have the unique advantage of offering conveyor pulleys and idlers customised as per requirement, fully designed and manufactured in-house.

We take pride in supplying state of the art conveyor systems to the largest Iron & Steel manufactures and Mining companies both within India and Globally.

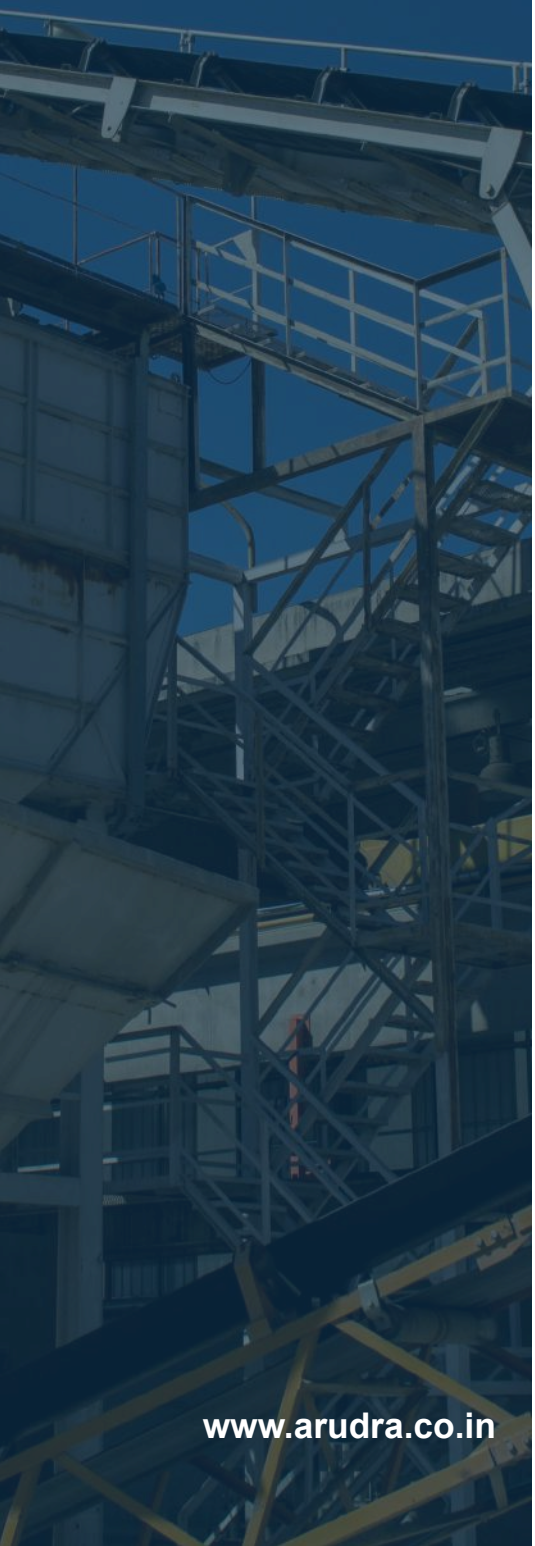
MANUFACTURING OF INDUSTRIAL PULLEYS, IDLERS & CONVEYORS AT SCALE

Arudra specializes in the end-to-end design, manufacturing, and supply of high-performance industrial pulleys, idlers, and conveyor systems tailored for bulk material handling. Our offerings are engineered for durability, efficiency, and adaptability across core industries such as power, steel, cement, and mining.

Our product lineup includes belt conveyors, mobile conveyors, shuttle conveyors, tripper cars, furnace charging equipment, and steel angle conveyors. Every component—be it pulleys or idlers—is designed and manufactured in-house, ensuring quality control and seamless integration in turnkey installations across India and overseas.

Email: mhd@arudra.org

Arudra
Material Handling



www.arudra.co.in

Arudra Material Handling systems

Idlers

1. Carrying Idler/Return Idler
2. Self-Cleaning Idler
3. Conical Idler
4. Friction Idler
5. Non-Magnetic Idler
6. Impact Idler
7. Rubber-Lined Idler
8. Weighing Scale Idler
9. Heavy Duty Idler & assembly

Pulleys

1. Standard Construction Pulley
2. Heavy Duty Pulley
3. Extra Heavy Duty Pulley

Conveyors

1. Belt Conveyors
2. Shuttle Conveyors
3. Tripper Conveyors
4. Wide belt Conveyors
5. High Angle Conveyors
6. Two-way chutes / Divertor gates / Flow Divider / V-Ploughs
7. Filter Cake Belt feeders
8. Rod gates / Rack & Pinion gates / Sector Gates
9. Furnace Charging Equipment
10. Reciprocating Heads
11. Converter Chargers

Idlers

Arudra Engineers' idlers are engineered to deliver high efficiency, precision, and durability in industrial conveyor systems. Designed for long-term reliability, our idlers ensure smooth material transport even under the most demanding operational conditions. With decades of expertise and a state-of-the-art manufacturing facility in Tamil Nadu, Arudra offers products that meet international standards and stringent performance requirements.

Manufacturing Range

- BELT WIDTH - 500mm to 2400mm
- PIPE DIAMETER – 63.5 to 219.1 (IS:9295)
- BEARING DIAMETER – 20mm to 50mm
- Belt Speed & Roller RPM – Upto 7.0 mps & 700 rpm

Features

- Designed and manufactured for a long, trouble-free life
- Equipped with Deep Groove Ball Bearing - Lubricated for Life (SEALED TYPE IDLERS).
- Minimal Rolling Resistance – Low Operating cost
- Low Total Indicator Run-out (TIR)
- Effective Double Labyrinth Seal with Dust Cover and additional Contact Lip Seal for protection against moisture and dust.
- Heavy duty Fabricated Steel frames with precision fitment.

Quality Assurance & Testing

- Bearings sourced directly from SKF/FAG, ensuring high-quality, seize-resistant performance.
- All idlers undergo rigorous testing for water ingress, dust penetration, and friction factor.
- Manufacturing process incorporates CNC machining, SPM welding, and precision assembly, guaranteeing consistency and reliability.
- Designed to maintain optimal performance for up to 40,000 operational hours, minimizing maintenance and downtime.

Self-Cleaning Idler

- Designed to prevent material build-up on the roller surface.
- Reduces belt wear and minimizes carry-back issues.
- Enhances conveyor efficiency and cleanliness in bulk material handling.
- Manufactured with ERW pipes per IS:9295, ensuring precise tolerances for ovality and straightness.
- Shafts made from Bright bar C40, IS:1570, providing strength and reliability.

Conical Idler

- Provides belt guidance and prevents misalignment.
- Commonly used at curves and transitions in conveyor systems.
- Ensures smooth tracking and reduced edge wear.

Friction Idler

- Helps in reducing excessive belt tension by controlling frictional forces.
- Extends the life of conveyor belts by reducing stress.
- Ensures efficient material handling in long conveyor runs

Non-Magnetic Idler

- Manufactured with non-magnetic materials for use in sensitive environments.
- Suitable for industries like mining, power, and steel, where magnetic interference must be avoided.
- Provides reliable operation without affecting magnetic separation processes.

Rubber-Lined Idler

- Covered with a durable rubber lining to resist wear and material abrasion.
- Reduces noise and provides extended roller life in harsh conditions.
- Suitable for handling sharp or abrasive materials.

Impact Idler

- Designed with reinforced rubber rings to absorb the impact of heavy, falling materials.
- Protects both the belt and the supporting structure from damage.
- Ideal for loading zones and transfer points.

Weighing Scale Idler

- Specially designed for use with belt weigh scales.
- Ensures accurate material measurement and weight monitoring.
- Essential for industries requiring process control and inventory management.

Heavy Duty & assembly

- Precision-engineered rollers minimize friction and power use, cutting operational costs while boosting energy efficiency.
- Built with C40 Bright bar shafts and ISO-standard precision pipes, our idlers ensure exceptional strength, stability, and long service life even under heavy-duty conditions.
- Designed for continuous, high-load operation, the carrying idler assembly ensures smooth material flow with precision-machined housings and CO_2-welded ERW pipes for reliability and consistency.

Pulleys

Arudra Engineers' pulleys are designed to provide efficient torque transmission, durability, and reliable performance for industrial conveyor systems. With decades of expertise and state-of-the-art manufacturing facilities in Chennai, we deliver pulleys suitable for general, heavy-duty, and extra heavy-duty applications. Each pulley is engineered for precision, robustness, and ease of maintenance, ensuring long-lasting performance in demanding industrial environments.

Features

- Design uses software programs for optimum selection of shaft, shell, and bearings per relevant standards.
- Manufacturing employs MIG/Submerged arc welding and sophisticated machinery.
- Stringent Quality Control covers every stage, from raw material to final packing.
- Pulley run-out is well within IS standards.
- Pulleys are static balanced (dynamic balancing available upon request).
- Pulleys are supplied as a complete assembly with Bearings and Plummer Blocks.

Rubber Lagging Types

- Natural Rubber lagging (Plain/Diamond groove/herringbone groove)
- Ceramic Embedded Rubber Lagging

Manufacturing range

- Belt width 500 to 2400mm
- Pulley diameter 220 to 2000 mm diameter
- Shaft diameter up to 500mm

Quality Assurance & Testing

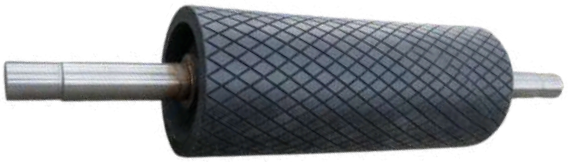
- Pulley components manufactured from high-quality steel, adhering to IS standards.
- Diaphragms and end discs are welded and stress-relieved for maximum durability.
- Machined and inspected to ensure accuracy, torque transfer efficiency, and long operational life.
- Experienced engineers with over 30 years in pulley manufacturing oversee all processes.

Standard construction pulley

- Supports the conveyor belt and material load.
- Features high-precision rollers to minimize friction and power use.
- Ensures stable belt alignment and long service life.
- Shaft-to-hub connection uses a Parallel key arrangement (IS:2048).

Heavy Duty Pulley

- Uses taper lock friction sleeves to securely connect the shaft to the hub.
- Designed for easy installation, maintenance, and separation.
- Steel end discs welded to the shell add strength for high-load applications.
- Ensures precise torque transmission with minimal maintenance.



Extra Heavy Duty Pulley

- Designed for extreme loads and demanding operations.
- Features Turbo-diaphragms (weldable cast steel or mild steel) for even stress distribution.
- The shaft connection uses heavy-duty locking elements (Ring Feeder / equivalent).
- Construction (welded and stress-relieved Turbo diaphragm) provides extended fatigue life for long-term operation.

Conveyer

Arudra Engineers' conveyor systems are designed for efficient, reliable, and precise material handling across industrial operations. With decades of expertise and state-of-the-art manufacturing facilities, our conveyors are engineered to handle heavy loads, harsh environments, and continuous operation, ensuring long-term durability and low maintenance.

Features

- All conveyor systems are manufactured in state-of-the-art facilities with stringent quality control.
- Components are precision-engineered for durability, accuracy, and smooth operation.
- Experienced engineers with over 30 years in material handling solutions ensure optimal design and reliable performance.

Quality Assurance & Testing

- Material & Fabrication Quality Check
- Mechanical Assembly & Alignment Testing
- Functional, Load & Safety Testing
- Precision Installation Checks
- Operational Performance Testing

Belt Conveyors

- Engineered for continuous material transport across production facilities.
- Suitable for steel, cement, power, and bulk material handling industries.
- Designed for smooth operation, minimal maintenance, and reliable performance.
- Ideal for operations requiring consistent material flow over long distances.

Shuttle Conveyors

- Designed for rapid material transfer between production lines or storage areas.
- Ensures efficient, high-speed, and accurate material distribution.
- Optimized for continuous operation with minimal downtime.

Tripper Conveyors

- Creates multiple discharge points along the length of a belt conveyor.
- Allows for selective and flexible material stacking or transfer into different bins or silos.
- Utilizes a movable carriage to redirect bulk material off the main conveyor belt.

Wide belt Conveyors

- Handles large volumes of bulk material or items due to its greater carrying capacity.
- Provides stable support for wide, irregularly shaped, or fragile products.
- Offers versatile applications across various industries, from mining to package handling.

High Angle Conveyors

- Enables material elevation at steep angles, often up to 90° minimizing space requirements.
- Uses specialized sidewall belts and cleats to secure and contain bulk material during vertical transfer.
- Ideal for applications with limited footprint where significant elevation change is necessary.

Two-way chutes / Divertor gates / Flow Divider / V-Ploughs

- Directs the flow of bulk materials from one stream into one of two separate discharge points or process lines.
- Achieves rapid and reliable material routing by using a pivoting gate or blade with minimal interruption to the flow.
- Essential for sorting, batching, or distributing materials to different destinations, such as storage silos or secondary conveyors.

Filter Cake Belt feeders

- Ensures consistent and controlled discharge of wet, sticky, or cohesive filter cake material from filter press.
- Suitable arrangements are provided for shearing the material onto the belt for uniform feeding.
- Designed with heavy-duty construction and specialized belt cleaners to manage challenging materials and minimize build-up.

Furnace Charging Equipment

- Specially designed for precise and safe loading of materials into furnaces.
- Ensures controlled material flow in high-temperature and industrial environments.
- Enhances operational efficiency and safety in critical processes.

Rod gates / Rack & Pinion gates / Sector Gates

- Controls or isolates the flow of dry bulk materials from hoppers, bins, or silos using a movable plate or radial blade.
- Utilizes a rack and pinion mechanism or sliding rods for smooth, precise, and reliable opening and closing of the gate plate.
- Designed for robust operation and suitable for regulating abrasive, granular, or lump materials in a discharge chute.

Sector Gates

Rack & Pinion gates

ROD GATES

Converter Chargers

- Achieve Superior SG Iron Quality: Utilize the specialized Mg Converter system and tilting trolley to precisely control magnesium treatment, transforming cast iron into high-strength, ductile SG Iron.
- Enhance Product Durability: Produce steel pipes with significantly increased corrosion resistance and superior mechanical properties, ensuring longer product lifespan and performance.
- Streamline High-Quality Production: This advanced metallurgical process ensures reliable composition modification, enabling a consistent and controlled method for achieving ductile iron in your steel pipe manufacturing line

Reciprocating Heads

- Distributes material evenly across the width of a receiving area by moving back and forth across the discharge point.
- Creates a flat, uniform layer or pile of material, which is critical for consistent feeding or blending operations.
- Often used at the end of a conveyor to load train cars, bunkers, or large storage piles automatically

ARUDRA CHEMICAL CLEANING SERVICES

Arudra
Chemical Cleaning

Arudra enjoys a position of leadership in India and has established a strong presence across several parts of Asia as a trusted turnkey Chemical Cleaning Contractor. With decades of domain expertise, Arudra delivers end-to-end chemical cleaning solutions for critical industrial systems, ensuring optimal equipment performance, reliability, and long-term asset integrity.

Arudra continues to serve several world-renowned power and heavy-industry clients such as GE Power, Alstom, Siemens, Doosan, L&T, MHPS, BHEL, Shanghai Electric, Samsung, TOYO, and others, successfully executing large-scale chemical cleaning projects across India, Indonesia, the Philippines, Malaysia, the UAE, and Africa. Our proven capabilities span complex boiler systems, HRSGs, condensers, pipelines, and auxiliary plant equipment under demanding operating conditions.

Our Chemical Cleaning team comprises highly skilled and experienced engineers who work round the clock, adhering to stringent safety, quality, and environmental standards. Through meticulous planning, advanced cleaning chemistries, and well-defined procedures, the team ensures safe, prompt, cost-effective, and high-quality execution of every project. This unwavering commitment enables Arudra to consistently deliver superior cleaning performance, minimize downtime, and enhance the operational efficiency of client facilities.

Email: chemical.cleaning@arudra.co

Arudra Chemical Cleaning Services

1. Boiler Chemical Cleaning – Pre-Operation & Post-Operation
2. Steam Blowing Service
3. Pre - Boiler System cleaning
4. Condenser, Heat Exchangers & Coolers
5. Auxiliary Boiler Rental Services
6. Foam Cleaning of Air-Cooled Condensers
7. Oil Flushing of Lube & Seal Oil System
8. Pressure Testing and Flushing of Subsea Pipelines instrumentation System
9. Descaling/Chemical Cleaning Advisory Services
10. Dry Ice Blasting
11. Hydrokinetics TM
12. Hydro-Jet Cleaning
13. Arudra Gel 240 ® – Cleaning & Passivation of Stainless Steel
14. Rotomol/Hydrolazing Cleaning Services

Boiler Chemical Cleaning – Pre-Operation & Post-Operation

Boiler internal surfaces, whether newly fabricated or long in service, accumulate a variety of unwanted materials — from mill scales, oil residues, and welding flux to corrosion products, oxides, and silicates. These deposits significantly impair heat transfer, increase fuel costs, promote localized overheating, and invite under-deposit corrosion.

Our chemical cleaning protocols, developed over 40+ years of field experience, restore the boiler's internals to a clean-metal state — ensuring optimal thermal performance, reduced emissions, and extended equipment life.

Pre-Operational Chemical Cleaning

New boiler systems carry assembly and fabrication residues that must be removed before commissioning. Arudra ensures readiness with:

- Comprehensive contaminant removal: Eliminates grease, silica dust, grit, rust, and hydrotest scales.
- System protection: Ensures clean surfaces for safe firing and long-term performance.

Boiler Tube Cleaning

Post-Operational Chemical Cleaning

Boilers accumulate iron oxides, copper deposits, and hard scale over time, affecting efficiency. Arudra's tailored solutions address these with:

- Customized cleaning strategies: Including two-stage cleaning, copper stripping, and online methods without shutdown.
- Performance validation: Via metal concentration analysis, boroscopy, and visual inspection.

Before After

Steam Blowing Services

Steam blowing is a critical pre-commissioning activity that safeguards turbines, steam lines, and HRSG units by eliminating welding slag, mill scale, and rust. At Arudra Engineers Pvt. Ltd., we specialize in delivering high-velocity steam blowing solutions that ensure operational safety and regulatory compliance before first fire.

We tailor each operation to system conditions, offering both hot and cold blow methods, depending on the line material and expected contamination levels. In cases where in-house steam is unavailable, we deploy rental boilers or portable steam generators to meet on-site needs.

Our core strengths include:

- Target Plate Analysis: Visual confirmation of debris removal using A, B, C grading standards.
- Real-Time Monitoring: Continuous tracking of pressure, temperature, and blow efficiency to validate performance.
- Temporary Systems: Use of engineered piping, silencers, and separators to control noise and discharge.
- Engineering Expertise: Support from planning through execution, including documentation for handover.
- Our steam blowing services comply with international standards including EPRI, ASTM, and VGB guidelines.

Decades of Proven Experience:

With successful execution in over 200+ thermal and process plants, our track record demonstrates both technical depth and timely delivery under pressure.

Custom Design for Each Application

We perform detailed engineering assessments before mobilization, ensuring compatibility with metallurgy, pressure ratings, and steam volumes required for effective cleaning.

Low Impact, High Efficiency

Our silencers and exhaust setups minimize noise and thermal stress, making steam blowing safe even in sensitive environments.

Safety-First Approach

All operations are conducted under strict safety protocols, including isolation checks, controlled pressurization cycles, and regular safety briefings, ensuring a safe work environment throughout.

End-to-End Execution

From mobilizing equipment and personnel to providing final performance reports and cleanliness certificates, Arudra ensures a complete solution—ready for commissioning handover.

Pre-Boiler System Cleaning

Plant delays, shutdowns, or capacity shortfalls shouldn't halt operations. Arudra's Auxiliary Boiler Rental Division offers ready-to-use mobile boiler units for immediate deployment. Our rental fleet supports operations ranging from short-term testing to long-term steam supply for critical processes.

Our Pre-Boiler Cleaning Process Includes:

- Flushing and degreasing of feed lines, pre-heaters, and pumps
- Neutralizing agents to stabilize pH and prevent acidic damage
- Hydrotesting assistance with cleanliness validation
- Passivation of carbon steel components to prevent flash rust
- Flow simulation setup to ensure uniform distribution during actual operation

Flushing Diagrams

Flow Plans

Pressure Hold Documentation

Condenser, Heat Exchanger & Cooler Cleaning

Heat exchangers, condensers, and coolers are prone to fouling — from scale, biological slime, corrosion products, and hydrocarbons. Even a millimeter-thin deposit can reduce thermal efficiency by up to 20%. With rising energy costs and tighter emission norms, maintaining clean heat exchange surfaces is not just maintenance — it's profitability.

Arudra Offers:

- Chemical Descaling: Using inhibited acid or alkaline formulations tailored to deposit type and metallurgy.
- Gel-Based Cleaning: Thickened chemicals cling to vertical or inverted surfaces — ideal for air-cooled heat exchangers and plate-type exchangers.
- High-Pressure Hydro Jetting: Ranging from 400 to 1200 bar — for physically dislodging fouling from shell-and-tube units.
- Online Cleaning Techniques: For lightly fouled exchangers without interrupting process flows.

Auxiliary Boiler Services – Boiler Rental Solutions

Plant delays, shutdowns, or capacity shortfalls shouldn't halt operations. Arudra's Auxiliary Boiler Rental Division offers ready-to-use mobile boiler units for immediate deployment. Our rental fleet supports operations ranging from short-term testing to long-term steam supply for critical processes.

Our Boiler Rental Services Cover:

- Startups & Commissioning: Generate clean steam for line flushing, steam blowing, or system trials.
- Planned Turnarounds: Maintain process continuity during shutdowns.
- Emergency Failures: Temporary backup during major outages or repairs.
- Steam Augmentation: Handle peak load requirements or seasonal demands.

Technical Highlights:

- Boilers from 0.5 TPH to 25 TPH
- Fuel options: Diesel, FO, LDO, or dual-fuel
- Operating pressures: Up to 30 kg/cm²
- Mounted on skids, trailers, or ISO frames for plug-and-play installation
- Integrated accessories: Feedwater tanks, fuel systems, blowdown tanks, safety valves, and PLC-based controls

Trained Boiler Operators

Fuel Management

On-Site Support

This integrated support framework enhances operational continuity, maximizes equipment efficiency, and upholds the highest standards of plant reliability throughout the rental lifecycle.

Foam Cleaning of Air-Cooled Condensers

Foam cleaning is a process uniquely designed to clean the exterior surfaces of Fin Fan Coolers & Air-Cooled Condensers.

This process is used to remove oil, dust, dirt, and other heavy debris that are formed on intricate and inaccessible areas of the coolers

Arudra's unique formulations of foam-ridden solvents have a high penetration capacity combined with suitable properties to reduce surface tension.

Our method has proven to be more efficient and faster than traditional cleaning. Normal high pressure water jetting cleaning destroys the fragile fins, and compacts dirt and debris into the center of the cooling unit, thus significantly reducing cooling efficiency. This is a low pressure cleaning method, which gently soaks away dirt and debris throughout the entire system.

Oil Flushing of Lube & Seal Oil System

Hydraulic systems are highly sensitive to contamination, with even trace particles capable of causing severe issues such as valve malfunction, poor sealing, increased wear, and delayed response in servo valves and cylinders. These disruptions can lead to unexpected downtime, reduced operational efficiency, and costly repairs.

Arudra's Oil Flushing & Sealing Systems are engineered to restore and protect the integrity of hydraulic lines through advanced chemical cleaning techniques. Our process removes residual debris, moisture, and manufacturing contaminants while preserving the system's natural protective oxide layers. This ensures optimal fluid cleanliness and component reliability.
By minimizing the need for repeated flushing and reducing long-term maintenance, Arudra delivers a proven solution that enhances system performance, extends equipment life, and ensures readiness for critical operations.

Pressure Testing and Flushing of Subsea Pipelines instrumentation System.

We specialize in Subsea related Pressure Testing and Oil Flushing of Pipelines using MACDERMID OCEANIC HW 540 and HW 443R Water Glycol.

Our services using MACDERMID OCEANIC HW 540 and HW 443R water Glycol include:

- Hydraulic flushing of small-bore pipelines FAT.
- Pressure testing of 1035 Barg on small bore hydraulic pipeline.
- Preservation of Hydraulic Pipelines.
- Valve actuator flushing and testing.
- Valve actuator function test EFAT.

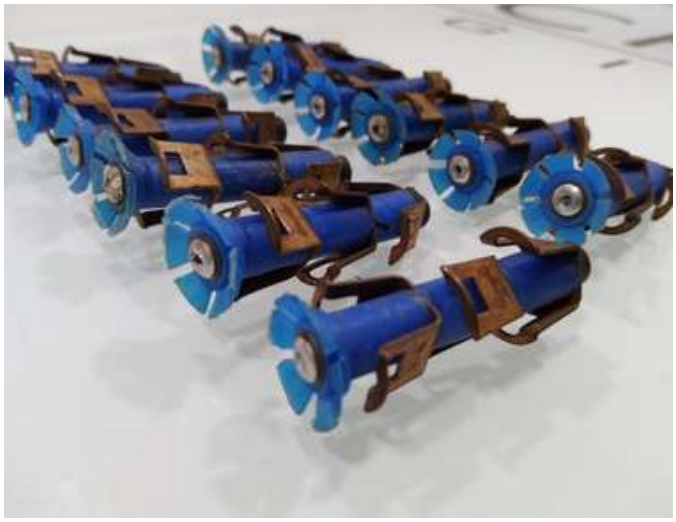
Other services offered:

- Preservation of chemical lines using MEG 50/50.
- Fresh water flushing of chemical lines.
- Hydro testing of 776 Barg on chemical lines.
- Valve seal test using fresh water Test Rig.
- Torquing service for Subsea valves.

Descaling / Chemical Cleaning Advisory Services

Descaling or chemical cleaning advisory services are critical for industries where scale buildup can significantly impact operations. Arudra offers expert advisory services to assist clients in effectively managing scale and corrosion-related issues in their equipment and systems. Our team of experienced professionals provides comprehensive guidance on the selection and application of descaling and chemical cleaning methods tailored to each client's specific needs.

Bullet Cleaning of Condensor And Heat – Exchanger Tubes



Water formed scaling and Bio Fouling stands as a major burden while operating cooling water equipments and such fouling causes severe heat-transfer problems in addition to impacting the asset life of heat- exchanger/condenser systems.

Bullet Cleaning involves the use of specialized springloaded tube cleaners (bullets) that are shot through the fouled condenser tubes using specially designed water guns at 10-15 kg/cm2 pressure. The bullets move through the tube from one end to the other in a linear motion scraping off the deposits and corrosion scales. Water from the gun flushes out the scraped deposits resulting in a clean inside surface for the tube, ideal for good heat transfer.

Arudra were one of the first companies in India to introduce the 'Bullet Cleaning' system to help remove any such fouling inside the condenser tube in the most efficient & environment friendly manner.

Dry Ice Blasting

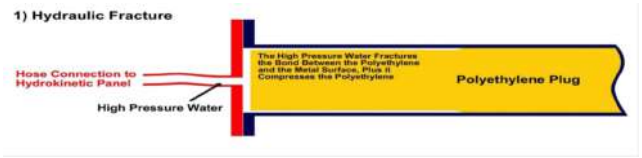
Dry Ice Blasting & Cleaning is an eco-friendly, non-abrasive method that uses dry ice pellets to safely remove scale and debris from industrial equipment such as furnace heaters, HRSG/WHRS boiler tubes, reformer coils, tire molds, and turbine rotors.

The process is clean, leaves no secondary waste, and can be completed quickly without dismantling equipment.

Arudra offers high-performance dry ice blasting services using heavy-duty equipment operated by skilled engineers, ready for global deployment and guaranteed to meet the highest quality standards.

Hydrokinetics TM

- Multi-Velocity Sonic System: Hydrokinetics™ by Arudra/AIMM Technologies uses a multi-velocity sonic system for cleaning.
- Initial Filling: The process starts by filling the pipe with a multi-cylinder positive displacement pump.
- High-Velocity Fluid Release: High-velocity fluid is released into the static fluid to create sonic resonance.
- Sonic Resonance: This generates vibrations at different frequencies, detaching fouling material from pipe walls.
- Safe Projectiles: Non-damaging projectiles can be used to remove stubborn debris.
- Repetition: The cleaning process is repeated as needed until the entire pipe is thoroughly cleaned.
- Hydrokinetics™ Tool: The entire process is executed using the Hydrokinetics™ tool for optimal results.



Hydro-Jet Cleaning

Arudra is fully equipped with advanced Hydro-Jet Cleaning systems designed to effectively de-scale pipelines and tubes in industrial equipment such as condenser heat exchangers, boilers, and other heat transfer units, restoring them to optimal performance.

Unlike conventional manual descaling methods, hydro-jetting offers a high-pressure, precision-based solution that thoroughly removes scale, sludge, and other stubborn deposits. This not only enhances heat transfer efficiency but also significantly reduces the risk of unplanned shutdowns and drainage-related emergencies.

Hydro-jet cleaning is a critical part of annual maintenance schedules in industries such as power generation, petrochemicals, and steel manufacturing. With extensive experience and a strong track record, Arudra proudly delivers world-class hydro jetting services to clients across India and internationally. Our team of trained technicians and engineers ensures safe, efficient, and timely execution, meeting the most demanding industrial cleaning standards.

Arudra Gel 240 ® – Cleaning & Passivation of Stainless Steel

- Specialized for Stainless Steel: Effectively cleans contaminants like iron, oil, rust, and weld slag that reduce corrosion resistance by lowering chromium levels.
- Restores Corrosion Resistance: Boosts chromium levels by forming an oxide-rich barrier after cleaning.
- Versatile Application: Suitable for stainless steel and alloy steel surfaces, including Hastelloy C276.
- Superior Adhesion: Clings well to vertical and overhead surfaces, allowing prolonged contact for deep cleaning.
- Field-Proven Performance: Successfully used on FGD system absorbers in power plants and stainless steel storage vessels in refineries.
- Minimizes Downtime: Enhances post-commissioning performance and reduces operational disruptions.

Rotomol Hydrolazing Cleaning Services

Hydrolazing is a specialized system of water blasting to descale internals of pipelines, that focuses energy. ranging from 15000 -18000 PSI at 190 liters on to a very narrow surface area.

All debris and mill scale removed from the pipe surface is transported out of the pipe when the high-pressure nozzle is retracted.

Arudra is equipped with the Hydrolazing equipment's to carry out the descaling of new pipeline internals, where the process of passivation is not required.

The equipment can be mobilized to sites across the world and is handled by well experienced engineers.

Arudra’s hydrolazing infrastructure can clean 300 NB to 3000 NB pipes, upto 200 meters in a stretch and at a max speed of 0.2 meters per second.

ARUDRA NDT INSPECTION & MAINTENANCE SERVICES

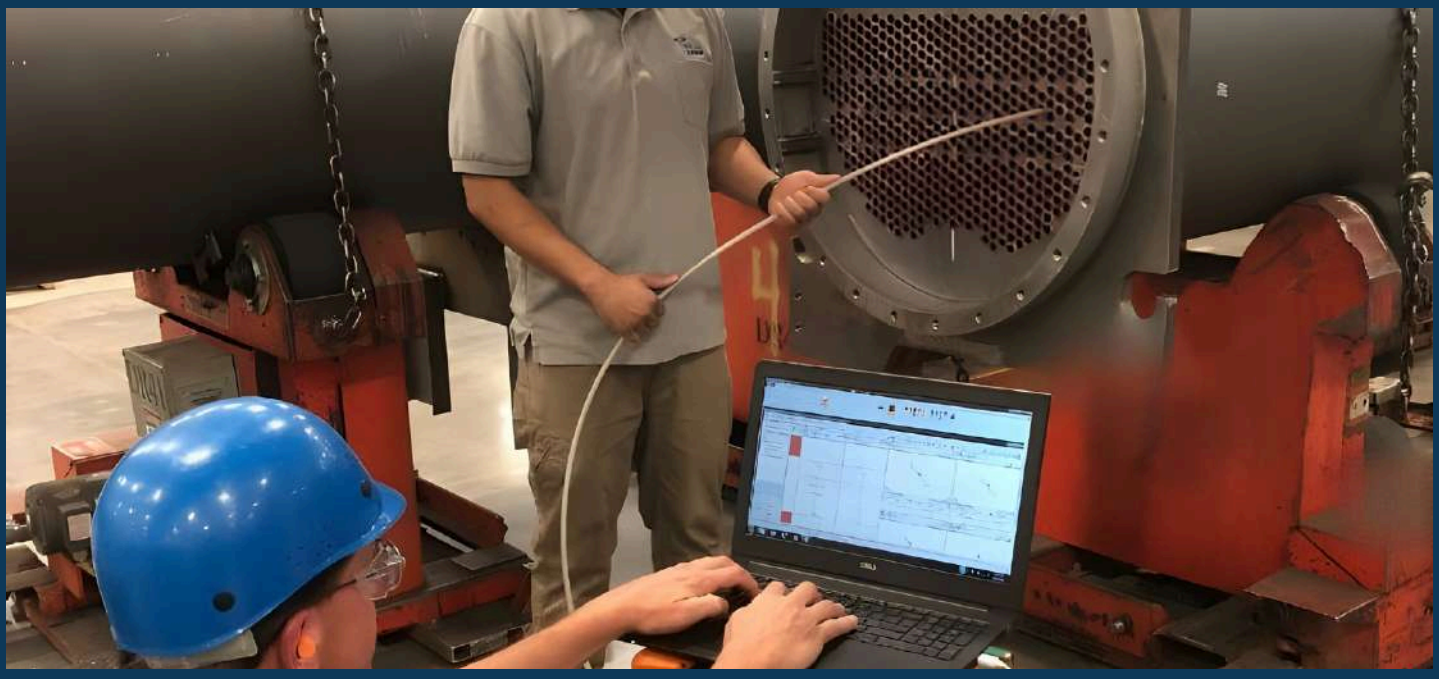
Arudra over the years have served as a one-stop-shop for facilitating a wide range of NDT & Inspection services across process industries.

We are equipped with state-ofthe-art inspection technologies that are operated by highly technical & trained site engineers complying with the required international safety & testing standards.

Arudra's NDT & inspection teams currently attend to over 100 Indian and 30 overseas overhauling operations over the course of a year, with the sole motive of delivering prompt and highquality performance improvement insights for our valuable power plant clients.

Over and above the existing services, we also provide customised services based on the client requirements and the feasibility of operations.

Email: services@arudra.co



Arudra NDT Inspection & Maintenance Services

NDT & Inspection

1. Eddy Current Test
2. Internal Rotary Inspection System (IRIS)
3. Boroscope Inspection Services
4. Fluorescent Leak Test Detection (FLDT)
5. Acoustic Pulse Reflectometry (APR)
6. Helium Leak Detection
7. Phased Array Ultrasonic Testing (PAUT)
8. Time Of Flight Diffraction (TOFD)
9. Acoustic Emission Testing (AET)
10. Magnetic Floor Mapping (MFL)
11. Pulsed Eddy Current Testing (PECT)
12. Long Range Ultrasonic Testing (LRUT)
13. Infra-Red Thermography Testing (IRT)
14. Low Frequency Eddy Current Testing (LFET)
15. Residual Life Assessment Study (RLA)
16. In-Situ Metallography Replica (IMR)
17. In-situ Oxide Scale Thickness Measurement (IOT)
18. Ultrasonic Flaw Detection (UFD)
19. Dye Penetrant Testing (DPT)
20. Magnetic Particle Inspection (MPI)
21. Ultrasonic Testing (UT)
22. Hardness Testing
23. Positive Material Identification (PMI)
24. Failure Root Cause Analysis

Mechanical Maintenance

1. Retubing Services
2. Thermal Spray Coating Systems
3. In-Situ Flange Facing Services
4. Valve Refurbishment & Online Valve Testing Services

Eddy Current Test:

Basic Principle

Eddy Current Testing (ECT) is a non-destructive inspection method based on electromagnetic principles, where induced eddy currents in conductive materials are analyzed to detect defects and degradation. We offer Conventional ECT, Remote Field Eddy Current Testing (RFET), and Near Field Eddy Current Testing (NFET) services.

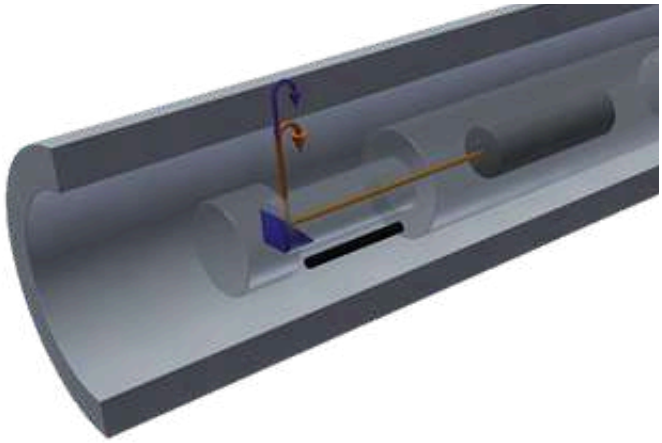
Applications

Used for condition assessment of condenser tubes, heater and cooler tubes, air fin cooler (AFC) tubes, finned tubes, and other heat exchanger tubing.

Benefits

- Prevents unplanned shutdowns caused by tube leakage
- Delivers significant cost savings by early defect detection
- Supports remaining life and integrity assessment of critical assets

Internal Rotary Inspection System (IRIS)



IRIS & MFL

IRIS and Magnetic Flux Leakage (MFL) are advanced non-destructive testing (NDT) techniques and are among the most suitable methods for Air Fin Cooler (AFC) tube inspection, providing highly reliable condition assessment.

IRIS (Internal Rotary Inspection System)

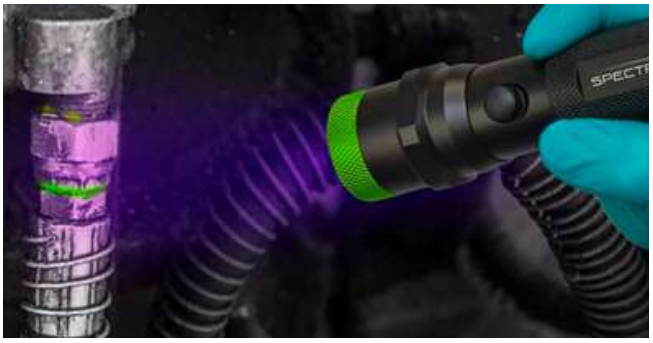
IRIS is used for detailed condition evaluation of feed water heaters, air fin coolers, boilers, heat exchangers, and process piping. The technique is applicable to both ferrous and non-ferrous tubes.

- Detects both internal (ID) and external (OD) defects
- Highly accurate and sensitive method; thorough tube cleaning is essential
- Provides a three-dimensional representation of defects
- Delivers precise defect profile and remaining wall thickness data
- Commonly used to confirm and validate results obtained from ECT, RFET, and MFL inspections

Boroscope Inspection Services

- A boroscope is an optical device consisting of a rigid or flexible tube with an eye piece and an objective lens on the other linked together by a relay optical system in between.
- An internal image of the illuminated object is formed by the objective lens and magnified by the eye piece which presence it too the viewer's eye.

Fluorescent Leak Test Detection (FLDT)



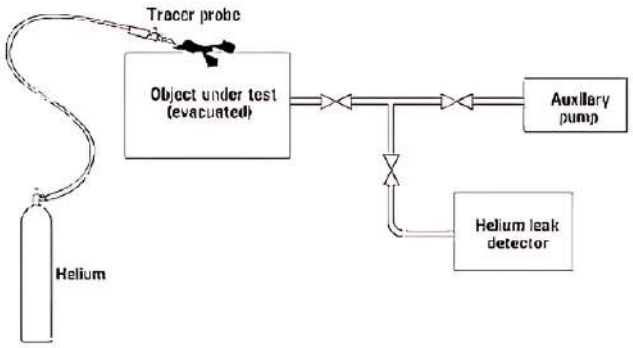
- The FLDT method enables accurate and rapid identification of multiple and intermittent leaks in power plant condensers during shutdown conditions.
- This comprehensive technique reliably detects leaks across all ranges without failure, ensuring precise localization.
- It is a highly economical, eco-friendly, and safe method that poses no risk to equipment or personnel.
- By minimizing excessive fluid loss, FLDT is ideal for preventive maintenance and improved operational reliability.
- The method reduces outage duration by allowing faster decision-making and targeted repairs during planned shutdowns.
- It enhances condenser efficiency and vacuum performance by ensuring leak-free operation before plant restart.

Acoustic Pulse Reflectometry (APR)

- APR is a patented inspection technology suitable for tubes with diameters up to Ø4, offering high accuracy and reliability.
- With an inspection time of less than 10 seconds per tube, this method is ideal for emergency and time-critical situations.
- APR can be effectively applied to twisted tubes, spiral-wound tubes, and U-tubes without limitation.
- The technique is compatible with a wide range of materials, including ferrous and non-ferrous metals, graphite, and plastic.
- Its applications cover critical equipment such as boilers, air fin coolers, and heat exchangers.

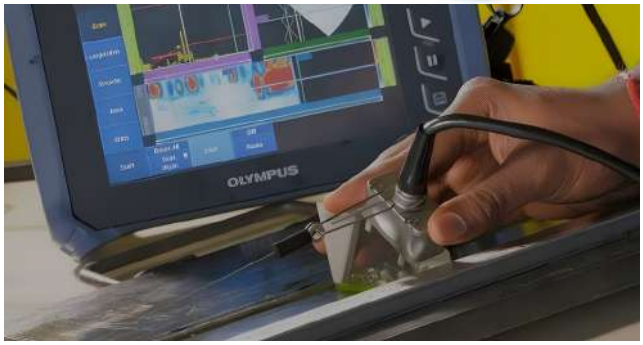
Helium Leak Detection

- Arudra is equipped with advanced helium leak detection instruments that utilize helium gas to accurately identify minute leaks in critical equipment such as columns, reactors, pipelines, and offshore oil platforms.
- Early detection of condenser tube leaks enables timely corrective action, preventing leak escalation and significantly improving the operating efficiency of heat exchanger systems, while also reducing downtime and overall maintenance costs.
- All inspections are carried out by ASNT Level II–certified engineers with extensive experience in delivering advanced leak detection services across power plants in India and the Philippines.
- This proven approach ensures high sensitivity, repeatability, and reliability in leak detection, supporting preventive maintenance programs, enhancing plant safety, and extending the service life of critical assets.



Phased Array Ultrasonic Testing (PAUT)

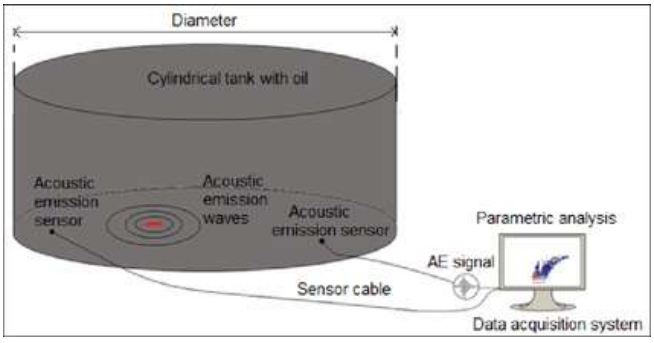
- An array transducer consists of multiple independent elements housed within a single probe, where phasing refers to the controlled, sequential pulsing of these elements to steer and focus the ultrasonic beam.
- This advanced technique enables the detection of defects that are difficult or impossible to identify using conventional non-destructive testing methods such as radiography and manual ultrasonic testing.
- PAUT is widely used for weld inspections in structural and piping applications, as well as for corrosion mapping to assess material loss.
- As an effective, safe, and radiation-free inspection method, PAUT serves as a reliable alternative to conventional radiographic testing.



Time Of Flight Diffraction (TOFD)

- TOFD can be used independently or in combination with other ultrasonic and NDT techniques to enhance inspection reliability.
- It offers rapid weld inspection with excellent flaw detection and highly accurate sizing capabilities.
- The diffraction-based technique enables precise defect sizing and is largely unaffected by weld bevel angles or flaw orientation.
- Due to its high sizing accuracy, TOFD is ideal for flaw monitoring and integrity assessment applications.
- Typical applications include inspection of welded joints in piping systems, nozzles, pressure vessels, and related components.

Acoustic Emission Testing (AET)



- Acoustic Emission Testing (AET) monitoring is an effective and reliable tool for prioritizing conventional non-destructive inspections of above-ground tanks, including both process vessels and storage tanks.
- The results obtained from AE monitoring can be evaluated against established data banks and historical benchmarks, enabling plant management to accurately identify tanks exhibiting high levels of active corrosion or leakage and prioritize maintenance activities accordingly.
- Additionally, AE results can be used to safely extend inspection intervals for tanks that show no evidence of leaks or active corrosion, helping reduce unnecessary inspections while optimizing maintenance costs and improving overall asset integrity management.

Pulsed Eddy Current Testing (PECT)

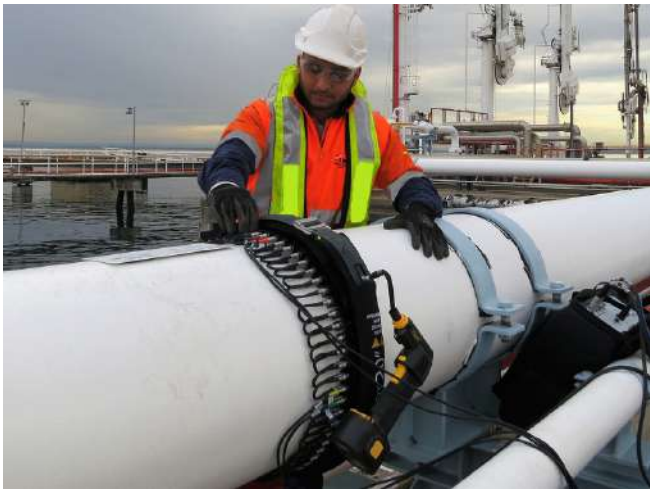
- Can be tested online.
- Applicable for Non-magnetic material.
- Object surface is rough, corroded, inaccessible, coated and under insulation.
- No cleaning, grinding or removed of coating and insulation is required.
- Metal loss from corrosion / erosion on both inside and outside of pipeline.

Magnetic Floor Mapping

To minimize inspection time we offer you a quick and a reliable inspection by combining:

- Magnetic Flux Leakage (MFL) for tank floor inspection.
- Hand scan for the inspection of areas with limited access and Ultrasonic Testing (UT) for verification of some areas expected to undergo corrosion. By using those techniques, corrosion can be effectively detected.
- More reliable results as MFL covers the entire area of tank bottom not only random readings as conventional methods which increase the possibility of detection of anomalies and remaining life assessment RLA.
- Saving time and cost due to the high inspection rate (Min. Productivity is 300 soiree meters per shift and could be much more depending on bottom conditions and cleaning.
- Comprehensive reporting with statistical data, color mapping, patch plate design along with recommendations according to the applicable codes and standards.

Long Range Ultrasonic Testing (LRUT)

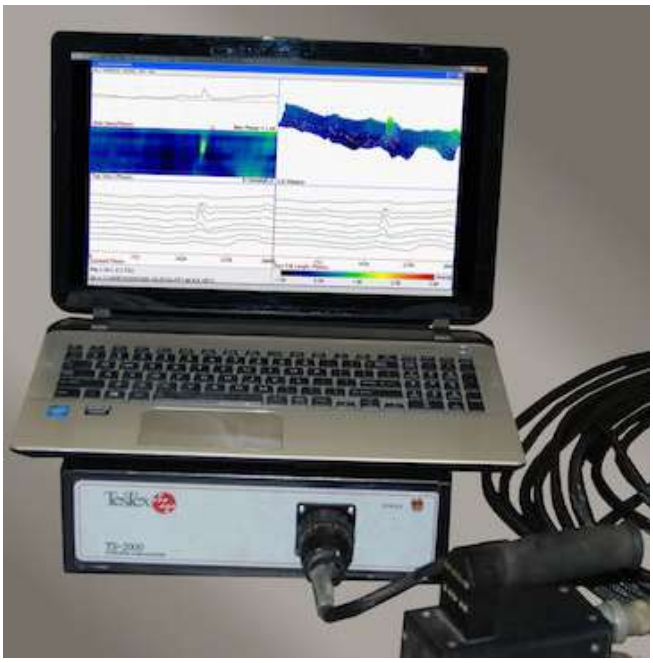


- Can be tested online - Applicable for non magnetic material.
- Object surface is rough, corroded, inaccessible, coated and under insulation.
- No cleaning, grinding or removed of coating and insulation is required.
- Metal loss from corrosion / erosion on both inside and outside of pipeline.

Infra-Red Thermography Testing (IRT)

- Infrared thermography is deployed by two approaches - Passive and active. With the passive approach thermography is used to investigate materials that are at different temperature than ambient (often higher).
- Whilst in the case of the active approach an external stimulus source (i.e optical flash lamps, heat lamps, hot or cold air guns ect) is used in order to induce relevant thermal contrasts.

Low Frequency Eddy Current Testing (LFET)



- The inspection is applicable to superheater, water wall, reheater, and economizer tubes in utility boiler systems.
- Testing is performed from the outer diameter (OD) surface, enabling detection of defects on both the OD and inner diameter (ID) of the tubes.
- Both magnetic and non-magnetic materials can be effectively scanned using this method.
- The technique identifies a wide range of damage mechanisms, including corrosion cells, hydrogen damage, caustic and phosphate gouging, oxygen pitting, departure from nucleate boiling (DNB), ID pitting, general corrosion, and erosion.

Residual Life Assessment Study (RLA)

- It is necessary to keep equipment in efficiently operating condition and maximize the life of the equipment.
- A correlation between the operational parameters and the results are obtained from NDT is drawn which is used to estimate the Residual Life of the particular Equipment.
- The equipment which need to RLA studies include boilers, piping, pressure vessels, storage tanks, pumps, turbines, compressors.

In-Situ Metallography Replica (IMR)

- In-situ metallography is a field inspection technique that involves careful selection of the inspection location followed by mechanical grinding and polishing, electrolytic polishing, and either electrolytic or chemical etching. The process also includes replication and direct microscopic observation.
- The in-situ metallography kit typically consists of a portable grinder, a light grinder with variable speed control, an electrolytic etcher/polisher, a portable microscope, and a range of supporting accessories.
- Consumables used in the process include self-adhesive polishing papers of various grit sizes, self-adhesive velvet cloths, solvents, water bottles, diamond paste, suspended alumina, electrolytes, and replica films.

In-situ Oxide Scale Thickness Measurement (IOT)

- Measurement of thin internal oxide scale layers in steam boiler tubes is a critical tool for predicting the remaining service life of boiler tubing.
- Periodic monitoring of scale thickness enables plant operators to accurately assess tube condition, estimate remaining life, and proactively replace tubes that are nearing failure.
- Arudra is equipped with advanced ultrasonic instruments that provide fast, accurate, and reliable oxide scale thickness measurements, supporting effective maintenance planning and improved boiler reliability.

Ultrasonic Flaw Detection (UFD)

Flaw detection is the process of identifying, locating, and accurately sizing sub-surface defects within materials using non-destructive testing techniques.

Advantages of ultrasonic testing include:

- Access is required from only one side of the component when using pulse-echo mode.
- Superior depth of penetration compared to many other inspection methods.
- High accuracy in determining flaw size, shape, and location.
- Minimal surface preparation is needed prior to inspection.
- Inspection results are available in real time, enabling immediate evaluation and decision-making.

Dye Penetrant Testing (DPT)

- This method is the most common inspection method to identify surface discontinuities e.g. crack, pinholes, laps, seams on non-porous & non absorbing materials.
- It is particularly useful in locating flaws in weldments, joints, tubing & castings.
- The two types of DPT are Dry Penetrant method and Fluorescent Penetrant method.

Magnetic Particle Inspection (MPI)

- This method is very useful for detecting surface and near-surface cracks in weldments and other components.
- It is easier to use than radiographic testing; however, its application is limited to ferromagnetic materials.
- Magnetic Particle Testing (MPT) detects surface and subsurface defects such as cracks and tears, porosity, shrinkage cavities, slag inclusions, voids, forging laps, grinding and corrosion cracks, fatigue cracks, and larger cracks of various orientations, as well as pores.

Ultrasonic Testing (UT)

- This method is primarily used to measure wall thickness.
- It uses beams of high-frequency sound waves to probe the material.
- Internal defects can be detected, located, and accurately sized.
- The same inspection time is required for both thick and thin test pieces.
- It is widely used for flaw detection in welds, castings, forgings, and plates.

Hardness Testing

- Measurement of metal and alloy hardness according to standardised hardness scales" Rockwell (HRC), Brinell (HB), Vickers (HV) and Shore (HSD).
- Hardness measurements of articles of any mass and thickness starting from 1mm (metal coatings, small parts, thin-walled structures, pipes, reservoirs, steel sheets, etc.
- Possibility of hardness control of items that are inaccessible for stationary hardness testers due to their dimensions.
- Does not leave any visible indent on the tested article surface (crankshafts necks, mirror surfaces, knives).

Positive Material Identification (PMI)

The device is capable of accurately identifying a wide range of materials, including:

- Low alloy steels
- Nickel alloys
- Stainless steels
- Cobalt alloys
- Tool steels
- Copper alloys

Failure Root Cause Analysis

- Identifying and correcting the root cause of tube failures is essential to reduce the likelihood of future problems. A comprehensive assessment is the most effective way to determine the root cause of a failure, as tube failure is usually a symptom of underlying issues.

- Failure Mode and Effects Analysis (FMEA) is a systematic procedure that examines each component in a system, evaluates how that component can fail, and determines how such failures will affect the overall operation of the system.

Retubing Services

Condenser and heat-exchanger tubes operate under demanding conditions and are frequently subjected to corrosion, erosion, fouling, and mechanical damage. Timely identification and replacement of damaged tubes is therefore critical to maintain thermal efficiency, prevent unplanned shutdowns, and ensure safe, uninterrupted plant operations.

Arudra's experienced engineering team is fully equipped with advanced tools, qualified manpower, and proven methodologies to carry out tube replacement works on both U-tube and straight-tube heat exchangers. Our technicians follow established industry practices to deliver precise, reliable, and long-lasting retubing solutions.

The retubing scope typically includes safe removal of old and damaged tubes, thorough surface preparation and cleaning of tube sheets, accurate insertion and positioning of new tubes, followed by flaring, bell-mouthing, tube-to-tube-sheet welding, and other customized operations as per design and service requirements.

In addition, Arudra offers complete turnkey retubing solutions, including procurement and supply of new tubes in the required material grades and dimensions, installation, inspection, and final quality checks.

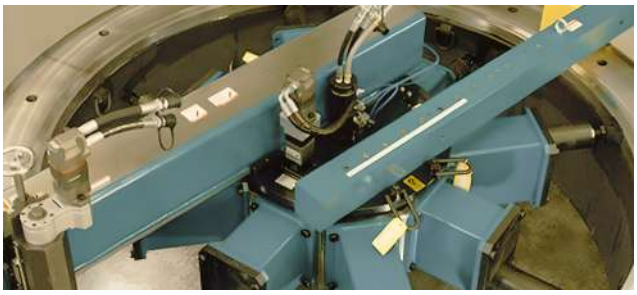
Thermal Spray Coating Systems

Thermal spray coating is a surface engineering process in which metals, alloys, or ceramic materials are heated to a molten or semi-molten state and propelled through specialized spray guns onto a prepared substrate. The sprayed particles rapidly solidify on impact, forming a dense, protective coating that enhances or restores the surface properties of equipment such as boiler tubes, process pipelines, structural components, and other critical assets.

Arudra's thermal spray coating services are widely deployed for protecting boiler tubes operating under aggressive service conditions, including high temperatures, corrosive environments, erosion, and oxidation. By applying carefully selected thermal spray coatings, Arudra helps extend equipment life, improve performance efficiency, and reduce maintenance frequency—ensuring reliable operation even in the most demanding industrial applications.

In-Situ Flange Facing Services

Seasonal valve refurbishment and inspection play a vital role in ensuring reliable plant operation and in preventing unexpected failures, shutdowns, and associated maintenance costs. Regular refurbishment helps restore critical sealing surfaces, maintain design tolerances, and extend the service life of valves and associated equipment.



Arudra's skilled engineers are equipped to perform in-situ machining and flange facing services, minimizing dismantling and downtime. Our capabilities cover flange sizes ranging from 50 mm to 3000 mm in diameter, with provisions to handle larger diameters on request.
Our key areas of operation include:

- Raised Face (RF), Flat Face (FF), and Ring Type Joint (RTJ) flanges
- Re-facing of valve seats and compressor components
- Lens ring flanges
- Tube sheet re-facing in heat exchangers and shells
- Pivot bearing faces on heavy-duty equipment
- Turbine casings
- Pressure vessels and process reactors
- Coupling flanges, hand holes, and ring grooves
- Diesel engine liners and engine block landing surfaces

Valve Refurbishment & Online Valve Testing Services

Integrated Protocol: Comprehensive valve refurbishment and testing are essential to prevent leakages, maintain pressure integrity, and ensure safe, reliable plant operations across all service conditions.

Skilled Service Team: Arudra's experienced specialists carry out systematic valve dismantling, detailed inspection, refurbishment, and reassembly in accordance with applicable industry standards. Our well-planned workflows and in-situ capabilities ensure quick turnaround times with minimal disruption to plant operations.

Wide Valve Coverage: Arudra provides refurbishment and servicing for a broad range of valves, including Ball, Butterfly, Check, Choke, Diaphragm, Gate, Globe, Knife, Needle, Pinch, Piston, Plug, Poppet, and Safety valves—covering diverse process and utility applications.

Seasonal Inspection & Maintenance: Periodic and seasonal valve inspection and refurbishment are critical to ensuring uninterrupted operations, extending valve service life, and avoiding unforeseen maintenance costs, shutdowns, and safety risks.

ARUDRA PROTECTIVE COATING PRODUCTS AND SERVICES

Arudra Coatings

Arudra Coatings is the Industrial Coating arm of Arudra Engineers Pvt Ltd. , Arudra liaises with world class and highly experienced protective coating & lining technology suppliers from USA (Duromar Inc – www.duromar.com) and Switzerland (plastocor international SA – www.plasrocor-international.com), to solve the most challenging corrosion & erosion problems that process industries encounter.

Arudra Coatings offers end to end solutions – from product manufacturing to coating installations – with expert NACE certified engineers, state of the art application machines and globally positioned distributors, to carryout the most challenging and turnkey coating installations at highest quality standards.

The coating ranges are all 100% solid (Zero VOC) polymeric epoxy systems, that are uniquely designed to handling varying ranges of temperatures, chemical attacks and velocity and those that adhere to a wide grade of surfaces.

Email: coatings@arudra.co

Our International Collaborations

DUROMAR®

- Over 50 years of expertise in addressing erosion, corrosion, and process control challenges across industries.
- Pioneers in polymeric epoxy technology, offering 100% solids, zero-VOC systems for demanding industrial applications.
- Proven track record across FGD, Cooling Water Pipelines and Storage Vessel protection across industries with numerous successful coating and lining projects since the the 1970's.
- Collaborative development with FGD system designers and engineers to deliver state-of-the-art repair and protection solutions.

Arudra Engineers Pvt Ltd - in technical collaboration with Duromar Inc (USA), is a licensed Manufacturer, Distributor & Applicator of Duromar® range of products.

www.duromar.com

plastocor®

- Since 1956, plastocor® technologies have protected heat exchangers and condensers in thousands of power plants worldwide.
- Innumerable Thermal, Nuclear power plants and Refineries globally - spanning across North America, Europe, India and South East Asia — rely on plastocor® systems.
- plastocor-international SA delivers turnkey solutions for corrosion and erosion across the full spectrum of power generation — including wind towers.
- Core technologies include Cladding, Tube Inlet Coatings, Tube Lining, and High-Performance Coating Systems.

Arudra is a trained and Approved Applicator of plastocor® Technology: plastocor® coating systems & plastocor® coating materials supplied by plastocor International SA.

www.plastocor-international.com

Arudra Coatings is the Industrial Coatings arm of Arudra Engineers Pvt Ltd - an ISO 9001:2015 certified company that facilitates a wide range of engineering solutions (products & services) at a global scale, particularly across Power, Oil & Gas, Steel, and other heavy industries.

Since 2003, Arudra Coatings have been active in providing state-of-the art coating solutions for large industrial units aimed at solving a range of corrosion & erosion problems - thereby helping enhance asset life, solving maintenance issues and reducing operational costs of major equipment's.

Arudra Engineers Pvt Ltd - in technical collaboration with Duromar Inc (USA), is a licensed Manufacturer, Distributor & Applicator of Duromar® range of products.

www.arudra.co.in

Since 1968, Duromar Inc USA have been heavily involved in solving erosion, corrosion, and process control problems and over the years have emerged as pioneers in the field of manufacturing polymeric epoxies, offering a wide variety of zero VOC, 100% solid materials for use in a broad spectrum of industrial applications.

With the motive of bringing these world class epoxy-based solutions closer to the Indian, Middle Eastern and Asian markets, Arudra joined hands with Duromar Inc USA in 2018, to manufacture the Duromar® range of coatings & linings in India and serve as a licensed applicator and distributor across these regions.

Arudra work very closely with Duromar Inc across Production, Storage, R&D, Application and Distribution – thus covering the entire value chain to make the Duromar® product ranges closely available and accessible to industries across the globe.

www.duromar.com

Arudra Coatings

Arudra Protective Coatings And Linings

Duromar® Coatings & Linings

1. Flue Gas desulphurisation (FGD)
2. Chimney Stack Internal Lining
3. Sea / Circulating water lines (Internal Pipeline)
4. Sea / Circulating water lines (External Pipeline)
5. ASME PCC-2 Pipe Rehabilitation System
6. Tank Linings
7. Pumps & Impellers
8. Coal Mills
9. Abrasion Resistant Putties & Liners
10. Bunker & Silo Protection
11. Civil/ Flooring Applications
12. Structural Liners
13. Transformer Leak Arrest Systems.

plastocor® Technology

1. Plastocor® Cladding System
2. Plastocor® High Performance Coating Systems
3. Plastocor® Tube-Inlet System
4. Plastocor® Tube-Lining System

Flue Gas Desulfurisation (FGD) Systems

Complication:

The environment within a FGD system includes complex solids, liquids, and gasses interface characterized by critical temperature fluctuations and turbulent chemical reactions.

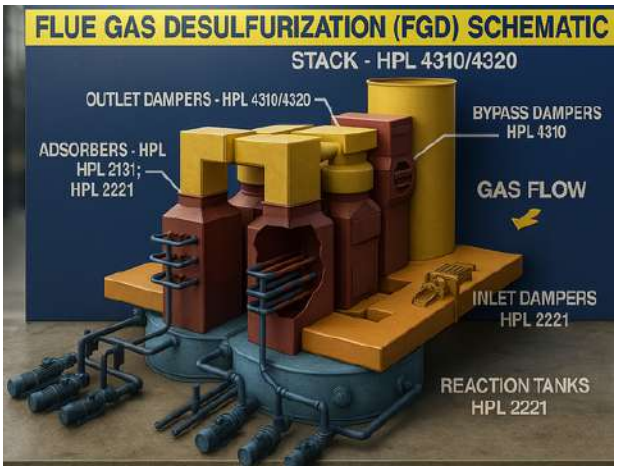
Duromar® coatings & linings have been used to protect innumerable Dry & wet FGD systems since the 1970's.

Duromar® epoxies are custom designed to withstand varying levels of chemical attacks, temperature fluctuations and impact abrasion, whilst also adhering to different grades of concrete and steel surfaces.

Solution:

The commonly used Duromar® systems in the FGD space include the Duromar® HPL – 2131 (installed at 3mm thickness) for absorber towers and the Duromar® HPL – 4320 (installed at 1.5mm thickness) for bypass and outlet ducts, each of them custom designed with glass flakes (optional) and novolac fillers to provide the required level of thickness and flexibility under continuous operation.

Arudra house expert application engineers, with sophisticated plural spray systems, dehumidifiers, abrasive blasting hoppers & hoses and required inspection expertise, to carry out the most challenging, saleable coating installations at highest quality standards.



Product details:

APPLICATION AREA	RESURFACE	REBUILD	LINING
Limestone storage Tanks	EAC	SAR	HPL-2131
Outlet Ductwork	EAC	EXP-THIXSET	EXP-THIXSET
Reaction Tanks	EAC-FE	SAR	SAR
Scrubber Vessels	EAC-FE	SAR	SAR
Stack Linings	EXP	EXP-THIXSET	EXP-THIXSET
Header Slurry Pipes	EAC	HAR	HAR
Spray Dryers	EAC-FE	SAR	SAR
Precipitators	EAC-FE	SAR	SAR

Complication:

Most flue gases produced by the combustion of fuels contain contaminants that can condense into sulfuric, sulfurous, or hydrochloric acid droplets.

Flue Gas Dew Point Corrosion occurs when these aggressive acids condense on carbon and stainless steels in convection sections, flue ducts, and stacks

(Dew point corrosion is corrosion damage that occurs when the air reaches a temperature at which the evaporating and condensing rate of its moisture content are the same at a constant pressure. This is experienced when the air is humid, foggy, moist, sticky and misty)

The amount of contaminants in the fuel is directly correlated with the concentration of the acid droplets, and therefore with the degree of corrosion.

Left unattended for 2 years, the chimney can face severe Wall Thickness Loss – causing the structure to become unsafe.

Solution:

Duromar® HPL-4323 is a flexible epoxy novolac used for lining Chimney Stacks, secondary containment, ductwork or anywhere requiring better flexibility with extremely good chemical resistance.

Duromar® HPL-4323 can be easily applied using a singular spray technology and hence takes fraction of the time to coat large surface areas manually.

It has outstanding resistance to chemical, abrasive and temperature attacks even when applied at a minimal thickness level of 1mm.

It also has excellent bond strength across both concrete and steel surfaces. They are also flexible and can be built up to varying thickness levels.

The nature of an epoxy makes it extremely easy and quick to repair any damage that may have occurred to the protective lining.

Product details:

Duromar® HPL-4323 is a Multi-functional epoxy with a uniquely modified cycloaliphatic amine hardener. It has outstanding resistance to chemical, abrasive and temperature attacks even when applied at a minimal thickness level of 1mm.

Key Features :

- Flexible
- Excellent Adhesion
- High Corrosion resistance
- Increased asset life.

Sea / Circulating water lines (Internal Pipeline)

Complication:

Sea and Circulating Water Lines, especially in power generation and desalination plants, face continuous exposure to highly aggressive environments. The internal surfaces of these pipelines—typically made of carbon steel—are vulnerable to severe corrosion, erosion, and biofouling due to the combination of high flow rates, fluctuating pressure conditions, and the presence of salts, microbes, and abrasive particles.

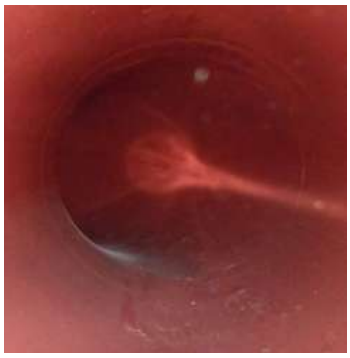
In the case of seawater circulation, metal loss, deep pitting, and surface degradation are common threats, often leading to leaks, costly downtimes, and premature asset failure. Traditional coatings struggle to provide long-term protection under these harsh operating conditions.

Solution:

Duromar® HPL-2510 offers a proven, high-performance coating system designed specifically for demanding marine and industrial water line applications. This 100% solids, solvent-free epoxy system provides superior adhesion and forms a seamless, glossy, and resilient barrier that not only protects but also enhances the appearance and longevity of internal pipelines.

It is ideal for immersion service in all types of water—fresh, brackish, saltwater, and seawater. When applied as per the manufacturer's guidelines, Duromar® HPL-2510 delivers:

- Over 25 years of service life under continuous operation
- Exceptional resistance to corrosion, erosion, and chemical attack
- Reduced maintenance cycles and operational costs
- A premium finish that visually confirms proper application



Product details:

DUROMAR HPL-2510 is an outstanding, versatile and easy to use 100% solids material. It can be used for circulating water pipe, sewage treatment systems, or process water tanks. It can be applied by brush, roller or with conventional spray equipment.

Chemical Description
Multi-functional epoxy with a uniquely modified amido amine hardener.

Sea / Circulating water lines (External Pipeline)

Complication:

External corrosion protection is a critical factor in ensuring the safety, reliability, and durability of Sea and Circulating Water (CW) pipelines, especially when constructed from carbon steel. These pipelines are continuously exposed to harsh outdoor environments such as coastal salt-laden air, high humidity, heavy rainfall, industrial pollutants, emissions, extreme temperature fluctuations, mechanical wear, and UV radiation. In the absence of proper protective measures, these conditions accelerate the onset of oxidation, pitting, and galvanic corrosion. As a result, the pipe's wall thickness begins to degrade, compromising its structural integrity and increasing the likelihood of leaks, ruptures, or complete failure. Over time, this corrosion leads to frequent maintenance, unexpected shutdowns.

Solution:

To combat these challenges, Duromar® coating systems offer a superior line of external protection tailored to withstand the most demanding environmental conditions. Products such as Duromar® SAR & Duromar® HPL-2510 are coupled with unique wrapping system are specially formulated to resist:

- UV degradation
- Chemical splashes and fumes
- High moisture and humidity levels
- Thermal expansion and contraction
- Mechanical abrasion and impact

These 100% solids, high-performance epoxy coatings provide a seamless, durable, and chemical-resistant shield that prevents rust formation, flaking, and surface degradation. The result is long-lasting corrosion protection, enhanced visual appeal, and significantly reduced lifecycle costs.

Product details:

Duromar® HPL-2510 is an outstanding, versatile and easy to use 100% solids material. It can be used for circulating water pipe, sewage treatment systems, or process water tanks. It can be applied by brush, roller or with conventional spray equipment.

Duromar® SAR is a versatile easy-to-use rebuilding putty with excellent abrasion and chemical resistance. This product is heavily filled with aluminum oxide and can be built up to an inch in thickness or more. Typical applications are for rebuilding of pump casings, slurry tanks, weld seams or anywhere requiring the restoration of metal components.

ASME PCC-2 Pipe Rehabilitation System

Complication:

Pipelines and metallic infrastructure across industries often suffer from external erosion and corrosion, internal wall thinning, pitting, or mechanical damage due to operational stresses, harsh environmental conditions, or aging systems. In high-pressure and safety-critical installations, these defects can compromise system integrity and lead to leaks, failures, or unplanned shutdowns.

Traditional repair methods such as cutting, welding, or replacement are time-consuming, expensive, and often require system downtime or hot work, which pose additional safety risks and compliance challenges. Moreover, many systems operate in environments where access is limited, or the geometry is complex—making conventional repair methods unfeasible.

Solution:

The Duromar® Finewrap Rehabilitation System is a cutting-edge composite repair solution, engineered to restore the strength and performance of damaged or degraded metallic pipelines in full compliance with ASME PCC-2 and ISO standards.
This high-performance system is designed for both emergency and long-term repairs of:

- Pressurized pipelines
- Pressure vessels
- Elbows, tees, reducers, and other complex shapes
- Onshore and offshore equipment

Finewrap combines a 100% solids epoxy resin system with custom-formulated carbon or glass fiber wraps and a proprietary consolidation film, delivering exceptional adhesion and mechanical strength. It provides a non-invasive repair solution—with no need for abrasive blasting, hot work, or system shutdown—making it ideal for live repairs in active systems.

Product details:

The Duromar® Finewrap Composite Rehabilitation System is a high-performance solution designed to restore and reinforce damaged pipelines. Fully compliant with ASME PCC-2 and ISO standards, it combines a 100% solids epoxy resin, carbon/glass fiber wraps, and a consolidation film for strong bonding and durability.
Ideal for addressing corrosion, erosion, cracks, and structural defects, it suits complex shapes like tees, elbows, and flanges. Finewrap delivers up to 20 years of maintenance-free service.
The cold-applied system enables live repairs without shutdowns, reducing time and cost. Adaptable to various environments, it pairs well with Duromar SAR and HPL-2510 coatings, offering a complete solution for pipeline rehabilitation and corrosion protection.

Complication:

Storage tanks and process vessels are constantly exposed to aggressive chemicals, moisture, and temperature fluctuations—making them highly susceptible to internal corrosion, contamination, and structural degradation over time. Especially in industries storing acids, alkalis, oils, or lubricants, even minor corrosion can lead to metal loss, leaks, contamination of stored materials, and complete tank failure.

These issues are more pronounced when tanks are made from carbon steel and exposed to highly corrosive agents like sulfuric acid, hydrochloric acid, or high-moisture content oils. Without appropriate protection, operators face increased maintenance costs, safety risks, and shortened asset lifespan.

Solution:

Duromar® Tank Lining Systems offer a comprehensive range of protective coatings designed to safeguard both the internal and external surfaces of storage tanks and process vessels. These high-performance epoxy and novolac-based systems create a tough, chemically resistant barrier between the tank substrate and its contents, effectively preventing corrosion and extending service life.

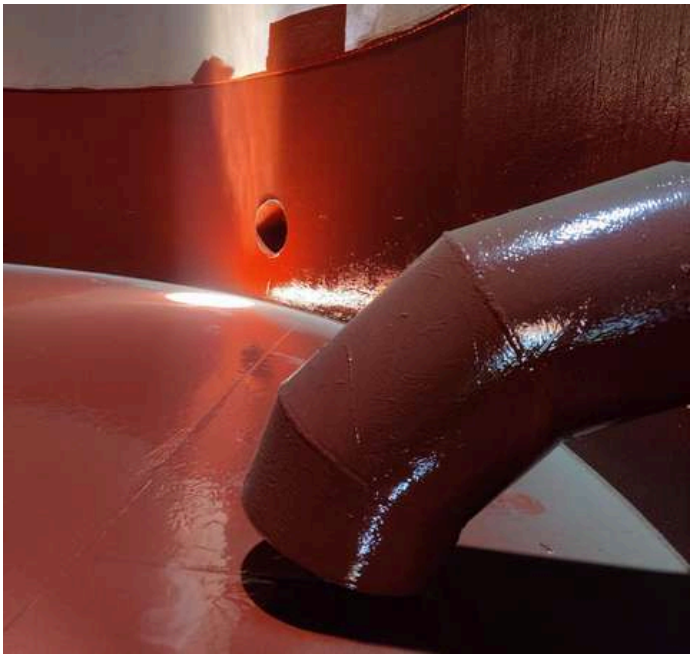
Depending on the stored media and environmental conditions, Duromar offers specialized products for acids, oils, lubricants, and even external weathering protection. All products are solvent-free, ensuring maximum film build, superior adhesion, and safe application—whether through spray or cartridge systems.

Product details:

Duromar® HPL – 4310, is a high functionality, 100% solids novolac material, which can be applied by conventional airless spray equipment. It can be used in power plant outlet ducts, utility systems, petrochemical and acid storage tanks, or anywhere requiring outstanding chemical resistance in an easy to apply coating system.

Duromar® HPL-4320-XC is a more chemical resistant version of the HPL-4320 designed for constant immersion in high concentrations of sulfuric and other inorganic acids. Although it can be applied by hand in small areas, it is most efficiently applied using plural component spray equipment. Requires elevated temperature cure.

Duromar® HPL-2310 is a low viscosity, long potlife coating with excellent chemical resistance in an ambient cured material. It is designed to be applied by brush, roller or with conventional airless equipment.



Complication:

Pumps and impellers are at the heart of fluid handling systems and are constantly subjected to high-pressure flow, suspended solids, and aggressive chemicals. These critical components often face severe corrosion, erosion, and abrasion, especially in industries such as power generation, water treatment, mining, and chemical processing.

The combined effects of fluid turbulence, cavitation, and harsh operating environments result in metal loss, pitting, reduced flow efficiency, and ultimately, frequent breakdowns. As wear progresses, these damages not only impact performance and reliability but also lead to increased energy consumption and higher maintenance costs, reducing the overall efficiency of the operation.

Solution:

Protecting your pumps & impellers with Duromar® 100% Solid (Zero VoC) epoxy coatings, helps do away with the constant threat of corrosion & abrasion.

In addition to enhancing the asset life of these pumps. the top coat of Duromar® EAC - LV provides a glossy finish to ensure smooth and enhanced circulation of fluids.

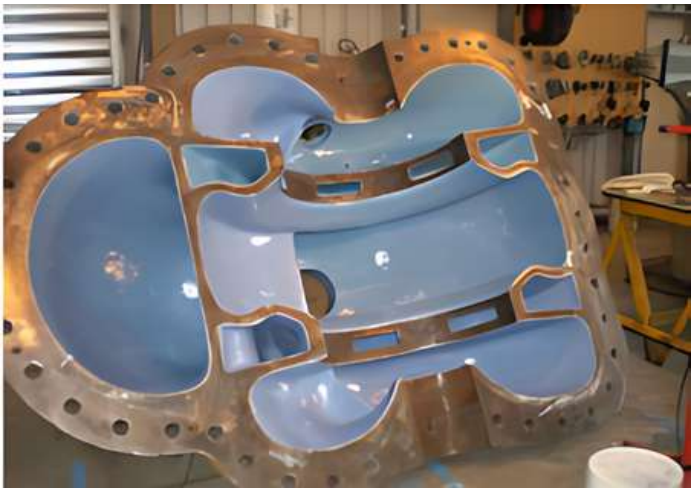
The double layer of protection – ceramic putty & liner - makes it impossible for corrosion promoters such as oxygen and humidity to get beneath the coating, thus helping enhance the Asset Life of the pump for years to come

- Outstanding, long-lasting corrosion & erosion protection.
- Increased energy & cost savings.
- Enhanced smooth flow rate.
- Outstanding surface tolerance & adhesion levels.
- Excellent resistance to slurry & acids.
- Excellent temperature & thermal shock resistance.

Product details:

Duromar® EAC-LV is a brushable version of EAC used to provide a smooth final surface while enhancing fluid for resisting cavitation. EAC –LV should be used anywhere a smooth , abrasion and impact resistance coating system is required.

Duromar® EAC-LV has the consistency of a thick paint and can be applied up to 30 mils per coat. Theoretical coverage at 20 mils is 12.8 sq. ft. per kg.



Complication:

Coal mills are vital components in coal-fired power plants, responsible for pulverizing raw coal into fine powder to ensure efficient combustion in the furnace. However, the internal surfaces of coal mills—including liner plates, classifier cones, and outlet ducts—are continuously exposed to severe erosion, abrasion, and impact caused by high-velocity coal particles.

Over time, this leads to thinning of metal surfaces, frequent failures, and even unexpected shutdowns, affecting the plant's critical operational parameters and overall reliability.

Solution:

To overcome these challenges, advanced surface protection solutions using ceramic and carbide-based systems are recommended. A proven approach involves the combined use of Duromar® Duro-Tile (Aluminium Oxide Tile) and Duromar® HAR (Carbide Putty), offering superior wear resistance and cost-effectiveness.

Duromar® Duro-Tile consists of hexagonal tiles made from >90% aluminum oxide, designed for exceptional hardness and abrasion resistance. These tiles are installed using Duromar® HAR, a high-performance, carbide-filled trowelable refractory bonding epoxy, providing a strong, durable protective layer on the most vulnerable surfaces inside coal mills.

Product details:

Duromar® Duro-Tile (Aluminium Oxide Tile) is made from high-purity (>90%) aluminum oxide, these tiles are supplied in convenient hexagonal sheets, ensuring excellent fit and easy application. They are specifically engineered to withstand severe erosion, extending the life of mill internals significantly.

Duromar® HAR (Carbide Putty) is a heavy-duty, abrasion-resistant putty designed to resist fine particulate slurries and high-velocity impacts. Duromar® HAR is used to bond ceramic tiles and can also be applied directly to surfaces to build up and protect areas prone to wear. Typical applications include coal mills, chutes, elbows, ash hoppers, and deflector plates in FGD systems.

Abrasion Resistant Putties & Liners

Complication:

Industrial equipment and critical surfaces across sectors such as mining, power generation, steel, cement, and chemical processing are constantly exposed to severe erosion and abrasive forces.
Continuous exposure to high-velocity slurries, abrasive particle impact, and harsh material flows gradually wears down metal and concrete surfaces. This leads to frequent failures, unexpected shutdowns, and expensive replacement of components. In many cases, traditional metal or concrete repairs are short-lived and do not provide the long-term protection required for continuous, heavy-duty operations.
Such recurring damage not only increases maintenance and operational costs but also compromises plant efficiency and safety.

Solution:

Duromar® Abrasion Resistant Putties and Liners are specifically engineered to address these challenges by providing superior protection against wear, erosion, and mechanical impact.

Formulated with high-performance epoxy systems, these products create a robust, durable barrier that resists extreme abrasion, extending the life of industrial equipment and reducing the need for frequent repairs.

Ideal for repairing, rebuilding, and protecting high-wear surfaces, Duromar® solutions minimize downtime, improve operational reliability, and deliver significant savings on maintenance and replacement costs.

Product Details:

Product	Description
Duromar® HAR	A carbide-filled, trowelable putty designed for ultimate abrasion resistance in areas exposed to fine slurries and aggressive particulate flow. Commonly used in coal mills, chutes, elbows, and deflector plates.
Duromar® UltraBuild	A high-build repair compound ideal for rebuilding heavily damaged surfaces before applying protective coatings or linings.
Duromar® SAR	A versatile, ceramic-filled putty for restoring and protecting surfaces exposed to moderate abrasion and chemical attack.
Duromar® DuroTile	Ceramic-based tile system offering maximum wear resistance, perfect for areas subjected to severe sliding abrasion.
Duromar® DuroFil	A structural repair and rebuild compound used to fill voids and restore substrate integrity prior to top-coating.
Duromar® CrackFil	Specially designed for repairing cracks and filling joints, ensuring a smooth and continuous protective surface.
Duromar® EAC	Brushable epoxy with excellent chemical and abrasion resistance, ideal for final top-coats in high-wear areas.

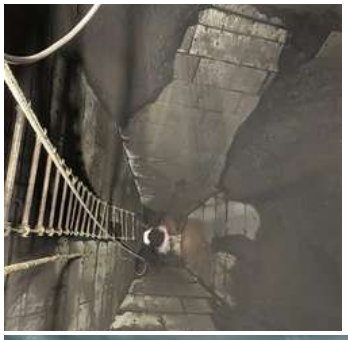
Product	**Description**
Duromar® HPL-2131	A novolac-based lining system providing outstanding resistance to both abrasion and chemical exposure.
Duromar® HPL-4330	A heavy-duty novolac trowelable lining designed for extreme chemical and abrasive environments, efficiently applied by grout pump or trowel.

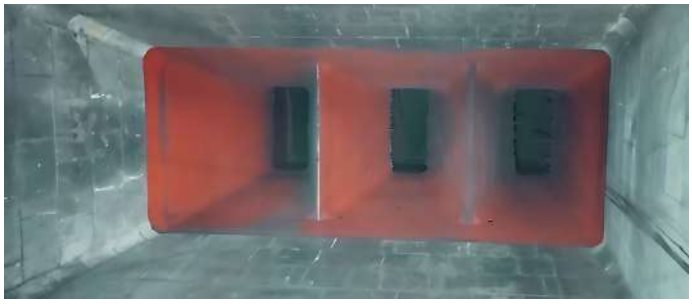
Complication:

Bunkers and silos play a crucial role in the storage and handling of bulk solids such as coal, sulfur, cement, phosphates, and various minerals. However, these structures are constantly exposed to challenging service environments, with fluctuating moisture levels significantly impacting their performance.

When the moisture content of stored materials increases, particles tend to stick to the internal surfaces of silos, hoppers, chutes, and feeders — whether constructed from concrete or steel. This adhesion leads to frequent blockages, reduced flow efficiency, and increased downtime for cleaning and maintenance. Additionally, trapped moisture can lead to corrosion, erosion, and the formation of aggressive acids (such as sulfuric acid), further accelerating equipment deterioration and increasing operational costs.

Solution:





To combat these complications, advanced protective lining systems are required to ensure smooth material flow and provide robust resistance to corrosion and abrasion.

Duromar® EAC and Duromar® EAC-LV have been specially developed to address these critical issues. Applied at a thickness of approximately 1 mm, these high-performance coatings create a smooth, non-stick surface that eliminates the tendency of materials to adhere to silo and bunker walls. In addition, these linings offer exceptional chemical resistance, effectively protecting against corrosive attacks, particularly from sulfuric acid formed by moisture-laden bulk materials

.

This dual-action approach not only helps prevent sticking and buildup but also significantly extends the service life of bunkers and silos, reducing maintenance frequency and associated costs.

Product details:

Duromar® EAC is a versatile, brushable maintenance coating designed to protect against both chemical and mechanical attacks. Duromar® EAC provides excellent resistance to acids and alkalis, making it highly effective in harsh industrial environments. Its superior abrasion resistance makes it ideal for protecting areas exposed to continuous material flow and impact.

Duromar® EAC-LV is a lower viscosity, brushable version of Duromar® EAC, specifically engineered to provide a smoother final surface finish. EAC-LV enhances flow efficiency and offers superior protection against cavitation, abrasion, and impact. This product is particularly valuable when a slick, easy-to-clean surface is required to maintain uninterrupted material flow.

Complication:

Heavy Duty industrial floors are exposed to cracking & vibration due to the constant movement of heavy equipment over the course of operation.

This causes the concrete floors to weaken with time and there exists an inept need to protect the civil areas with a robust, long lasting solution.

Neutralisation Pits and Concrete floors are often exposed to excessive corrosion/erosion due to the aggressive operating environment of Industrial units. With time, the corrosion & erosion issues become so excessive that they would have to be entirely replaced with a more wear resistant solutions

Solution:

To address these challenges, robust and long-lasting flooring and civil protection systems are essential. Duromar® has developed advanced epoxy-based solutions designed to significantly enhance the durability and chemical resistance of industrial floors and civil structures.

A combination of Duromar® DuroFil or Chemcrete, top-coated with Duromar® DF-1310 at a thickness of 3mm to 5mm, provides exceptional reinforcement to concrete floors. This system effectively extends the service life of heavy-duty floors by 20–30 years, even under continuous, harsh operational conditions.

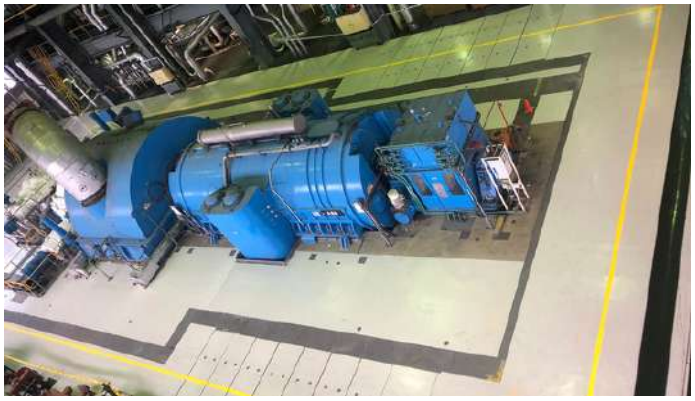
Product details:

Duromar® DuroFil / Chemcrete is a High-performance grouting and resurfacing materials designed to repair and rebuild damaged concrete surfaces. These materials provide excellent mechanical strength and serve as an ideal foundation layer for further protective coatings.

Duromar® DF-1310 is a heavy-duty, chemically resistant top coat that enhances wear resistance and protects against corrosion and chemical attack. When applied over DuroFil or Chemcrete, it delivers a smooth, durable finish capable of withstanding high mechanical loads and aggressive chemical environments.

Duromar® DF-4301 is a 100% solids, novolac epoxy floor coating known for outstanding resistance to acids, bases, and solvents. It is especially suited for secondary containment areas and floors exposed to frequent chemical splashes and spills.

Duromar's range also includes specialized grouting and flooring systems such as HydroFlor and Chemcrete Super, designed to cater to diverse industrial maintenance needs.



Structural Liners

Complication:

Metallic structures form the backbone of various heavy industries, including power generation, chemical processing, mining, and marine applications. However, these structures are constantly subjected to harsh operating conditions such as acidic fumes, high humidity, and aggressive chemical exposure.

Prolonged exposure to these environments leads to rapid corrosion and surface degradation, compromising the strength and stability of critical structures. As a result, frequent repair or even complete replacement becomes necessary — often involving high costs, extended downtimes, and safety risks for maintenance crews.

Solution:

To effectively combat these issues and enhance the durability of metallic structures, advanced protective lining systems are essential. Duromar® offers specialized structural liner solutions designed to provide long-lasting protection against corrosion and environmental attacks.

Applying **Duromar® HPL-4330** for acidic environments and **Duromar® HPL-1110** for non-acidic environments at a thickness of just 0.5–0.7 mm offers superior corrosion resistance and structural integrity that can last for decades.

These high-performance linings boast outstanding adhesion and tensile strength, creating a seamless, impermeable barrier that shields metallic substrates from moisture, chemicals, and mechanical wear.

Product details:

Duromar® HPL-4330 is a trowelable, 100% solids novolac lining system designed for the most aggressive chemical and abrasive environments. With excellent chemical resistance and durability, it is ideal for protecting structures exposed to strong acids and harsh industrial conditions. HPL-4330 can be efficiently applied using a grout pump, trowel, or squeegee, ensuring precise coverage and minimal application time.

Duromar® HPL-1110 is a flexible, low-viscosity, easy-to-apply coating system tailored for non-acidic environments. It provides exceptional corrosion protection on structural steel, tank exteriors, and other exposed metallic surfaces. Its ease of application and DOT non-corrosive classification make it a highly versatile and safe solution for on-site use.

Complication:

Transformer systems are critical assets in power distribution and industrial facilities. However, they are prone to oil leaks, particularly at ceramic insulators and metallic joint areas such as gaskets.

These leaks commonly occur due to inadequate welding or imperfect sealing around the joints and insulators in immersed transformers. Over time, even minor imperfections can lead to significant oil seepage, posing severe operational and environmental risks.

Persistent leaks demand frequent and labor-intensive repairs, increasing downtime, manpower requirements, and overall maintenance costs. Additionally, uncontrolled oil leaks compromise transformer efficiency and may lead to costly unplanned outages.

Solution:

To address these challenges effectively, a rapid and reliable sealing system is essential. The Duromar® Transformer Leak Arrest kit offers a high-performance, easy-to-apply solution designed specifically for stopping leaks in transformer systems.

This specialized kit includes Duromar® DuroStik — an extremely fast-curing putty — and Duromar® SAR-UW, a versatile ceramic putty that can cure even under wet or submerged conditions. Together, these materials create a strong, long-lasting barrier that seals leaks quickly and effectively, minimizing downtime and preventing further oil loss.

Product details:

Duromar® DuroStik is a single-tube, fast-curing putty material ideal for quick and emergency repairs. It is designed for use on steel, aluminum, fiberglass, and concrete surfaces. Thanks to its compact packaging and rapid cure properties, DuroStik is perfect for toolbox storage, allowing technicians to address leaks immediately on-site without complex equipment.

Duromar® SAR-UW is a ceramic-filled putty that cures underwater, making it exceptionally versatile for situations where the component must return to service before complete cure or where wet conditions are unavoidable. SAR-UW is suitable for both freshwater and saltwater applications, and it is highly effective for rebuilding and sealing areas exposed to continuous oil and moisture.

Arudra is a trained and approved applicator of plastocor® technologies systems and plastocor® Coating materials manufactured by plastocor® International SA.

Arudra's applicators are well trained by plastocor® International SA to ensure to meet world class application standards.

Arudra operate with state-of-the art technologies for application of epoxy products – Blasting equipment, plastocor® Tube Lining machine & Oil Free Air compressors/dehumidifiers to name a few.

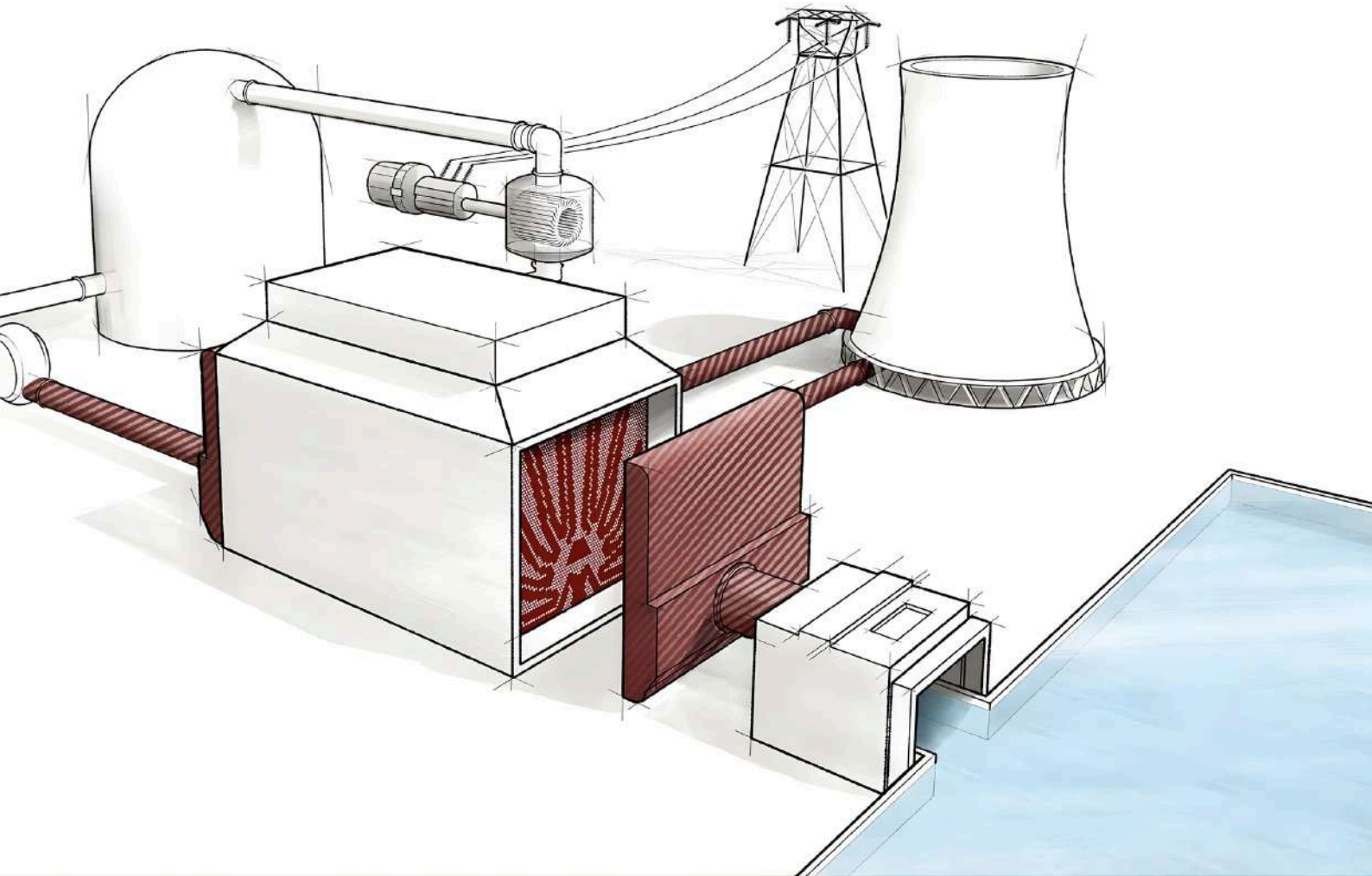
www.arudra.co.in

Since 1956, the Plastocor technology has been leveraged to protect condensers and heat exchangers across Thermal, Neuclear power plants and Refineries globally - spanning across North America, Europe, India and South East Asia.

plastocor-international SA supplies a "one-stop turnkey solution" for corrosion and erosion problems across the entire power generation industry, including wind towers

plastocor® technology include Cladding, Inlet, Tube-Lining and High - Performance coating Systems.

www.plastocor-international.com



Plastocor® Cladding System.

Due to dissimilar materials of construction of tube sheet and the tubes used in Heat-Exchangers, the tube sheet is susceptible to galvanic corrosion as well as erosion.

Applying the thick layer plastocor® Cladding system to the tube sheet ensures no contact of water between dissimilar metals, thereby ruling out galvanic corrosion and protecting the tube sheet from erosion. It is also suitable to rebuild lost tube sheet material to a near to new condition, thereby extending the lifespan of your Heat-Exchanger up to 25 years and more.

Heat-Exchanger Tube Sheet protected using plastocor® Cladding system.

Plastocor® High Performance Coating Systems

The water box plays a critical role in the overall operation and efficiency of heat exchangers and condensers. However, it is constantly exposed to harsh operating conditions and aggressive cooling water environments, making it highly vulnerable to galvanic corrosion. This type of corrosion occurs when dissimilar metals come into contact in the presence of an electrolyte, leading to accelerated material degradation. If not properly addressed, galvanic corrosion can severely compromise the structural integrity of the water box, cause unexpected shutdowns, and lead to costly repairs and replacements.

Similar to the plastocor® Tube Sheet Cladding System, plastocor® High-Performance Coating Systems (HPC) offer an effective, long-term solution for protecting water boxes operating in different types of cooling water environments such as river water, lake water, sea water, or brackish water.

These advanced coating systems are specially engineered to withstand the most demanding conditions by providing a highly durable, impermeable barrier that isolates the substrate from corrosive elements. When correctly applied, plastocor® HPC systems completely eliminate galvanic corrosion problems, significantly reduce abrasion and erosion losses caused by high-velocity water flow, and prevent the in-leaking of ground or contaminated water. Furthermore, biological and marine growth—such as algae, barnacles, and other fouling organisms—is minimized.

Heat-Exchanger Water Box coated using plastocor® High-Performance Coating System

Plastocor® Tube-Inlet System

Because of turbulent flow in the first few inches of any inlet of Heat Exchanger tubes, there is every possibility of accelerated erosion and consequential corrosion taking place at the inlets.

To overcome this problem, the original plastocor® Tube Inlet Coating System provides a sophisticated 3-step method which indefinitely protects and repairs condensers and heat exchanger tubes against inlet and outlet corrosion and erosion and allows for expert planning and budget optimisation, saving a plant operator time and money.

In combination with plastocor® tube sheet cladding, it offers the optimal life extension system of >20 years, plus the elimination of step- and general erosion

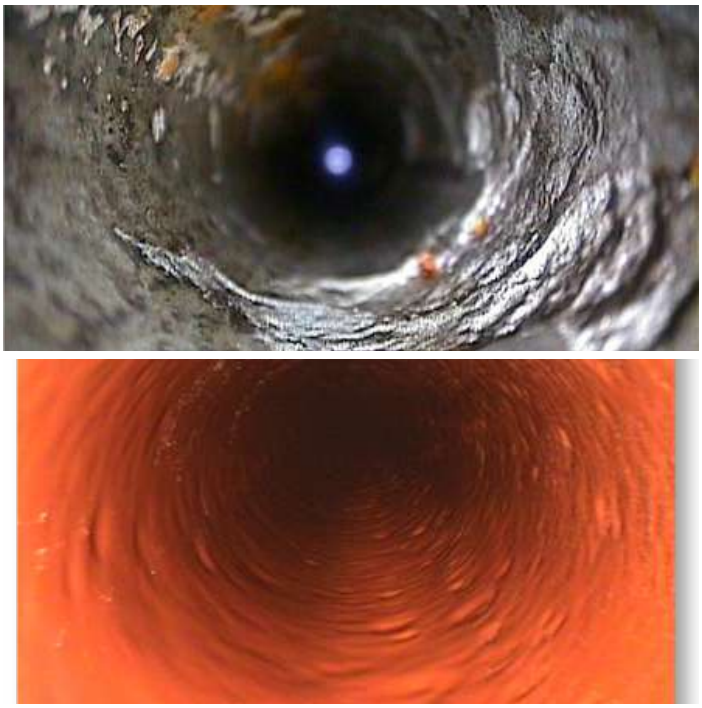
Heat-Exchanger tube inlets coated using plastocor Inlet System

Plastocor® Tube-Lining System

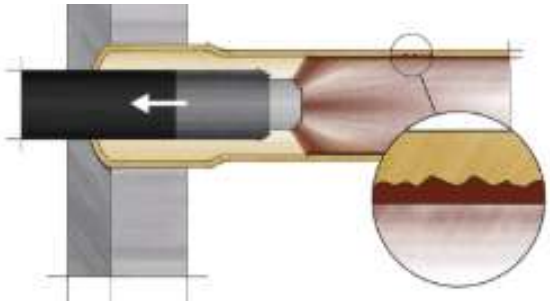
After a long period of operation, there are every possibility of Heat–Exchanger tubes getting weakened by erosion/corrosion throughout the entire length of the tubes. This may result in pits or excessive thinning of the tubes as well as increased fouling.

The original patented plastocor® Tube Lining System for the full length of the tube is a unique on-site application system carried out during regular outages to extend the lifespan of small Caliber tubes (3-4mm) of condensers and heat exchangers damaged by erosion and corrosion.

The patented technology, machinery and services allow for full-length tube coatings of approx. 15m length. The coating is additionally so smooth that the propensity for biofilm formation and silt deposition is greatly reduced. As a result, plastocor® Tube Lining further eliminates almost all metal ion discharges, such as e.g. copper, zinc, arsenic, resulting in not only expert tube protection, but also protection of the environment.



Heat Exchanger tubes upon application of plastocor® Tube Lining System



plastocor® Tube Lining process

REGISTERED OFFICE	COLLABORATORS	DISTRIBUTORS	JOBS EXECUTED			
India	USA	India	India	Vietnam	Senegal	Lebanon
Philippines	Switzerland	Thailand	Srilanka	Singapore	Nigeria	Bahrain
	UAE	Philippines	Philippines	Laos	Egypt	Jordan
	Philippines	Malaysia	Bangladesh	Indonesia	OMAN	
	Malaysia	Vietnam	Nepal	Australia	UAE	
	Singapore	Singapore	Thailand	Uzbekistan	Kuwait	
		UAE	Malaysia	Iraq	Qatar	

Arudra Major Client Lists

State-of-the-Art Manufacturing Facility











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