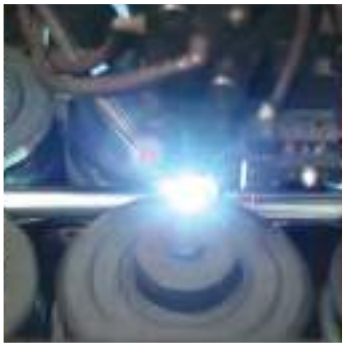
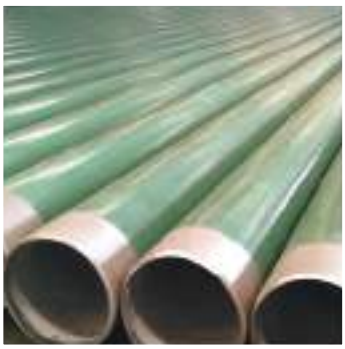
RATNAMANI®
METALS & TUBES LTD.





# PROSPERITY THROUGH PERFORMANCE

ratnamani.com

# COMMITMENT OF QUALITY WITH INTEGRITY

# PROSPERITY THROUGH PERFORMANCE

Since its inception in 1983,
Ratnamani Metals & Tubes Limited is not only manufacturing products but also delighting customers through its unmatched quality.

# OVER THE SPAN OF NEARLY 4 DECADES

**Over the span of nearly 4 decades, Ratnamani has grown to become a multi-location, multi-product company providing critical tubing and piping solutions to diverse range of industries & niche segments in core sectors.**

The products manufactured find a wide range of applications in Oil and Gas Exploration, Petrochemical & Refineries, LNG, Fertilizer Plants, Thermal, Nuclear and Solar Power Plants, Atomic Energy, Desalination Plants, Chemical Industries, Aerospace, Defence, Pharmaceutical, Food and Dairy, Automobile and Marine.

Ratnamani has an impressive clientele comprising of major public, private and joint sector companies across the globe, who are leaders in their respective segments.

At Ratnamani, tubes and pipes are supplied in accordance with appropriate international standards as well as customer specifications in a large variety of steel grades and dimensions.

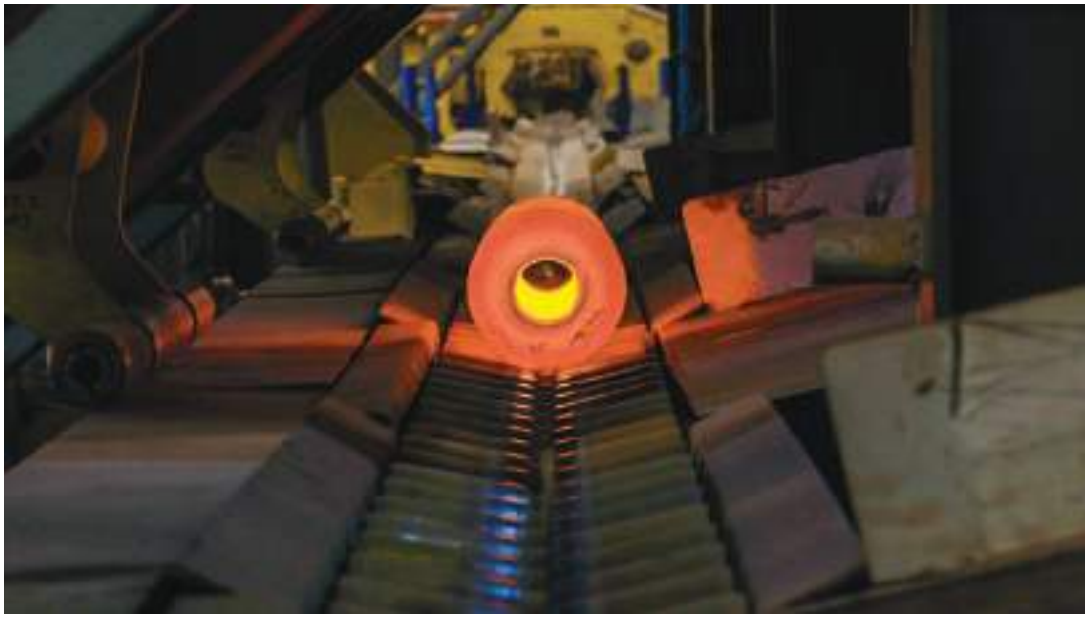
Client specific requirements on technical parameters are offered on request.

Ratnamani ensures high degree of flexibility in production-planning to meet customer's urgent delivery requirements. The company's unflinching commitment to quality and services has ensured client loyalty.

## **About** Ratnamani

Ratnamani's manufacturing facilities employ state-of-the-art technology to produce a wide range of Stainless Steel Welded / Seamless Tubes & Pipes, Titanium Welded Tubes and Carbon Steel Welded Pipes.

This has been made possible by continuous innovation and a focused vision of the management. Ratnamani follows a 'total quality' approach and its products conforms to the highest international standards. The company's credo, "**PROSPERITY THROUGH PERFORMANCE**" ensures a strong domestic & international clientele base.



Ratnamani draws it's strength from technical excellence and highly trained, motivated manpower. The company's unflinching commitment to customer's delight has ensured client loyalty.

Being a responsible corporate citizen, Ratnamani uses green power and has a robust safety, health and environment policy. It regularly takes up healthcare, education and poverty alleviation schemes as part of it's social commitment.

**The company boasts of a strong growth record backed by technology, teamwork and the enthusiasm of a young organization. Ratnamani is poised to become a USD 600 million company in the near future.**

## Vision

To attain Global excellence by continuously developing and providing the best quality products and services. Exceeding expectations of our customers with innovative products & applications.

Building value for all our stakeholders.

To be a value-driven organization that is a benchmark in Corporate Citizenship.

## Mission

To be leading Pipes & Tubes Manufacturing Company in Stainless Steel & Carbon Steel Industry, Making difference in our space through:

**Our Products & Services** – Having a wide range of products & services. Becoming the partner of choice. Delivering premium products and services. Creating value for our customers.

**Our Practices** – Continually improving the finest, strengthening our systems and processes with an eye towards the future.

**Our People** – Fostering teamwork. Nurturing talent. Enhancing leadership capability and acting with passion and pace.

**Our Innovative Mindset** – Developing cutting edge solutions in technology, processes and products.

**Our Conduct**– Providing a safe workplace. Respecting the environment. Caring for the communities we belong to.

## Corporate Values

**Customer Focus –** We simply align our actions and applications to cater to the needs of the customer. Being sincere to our commitment.

**Passion –** Our passion to excel propels us and the commitment to quality guides us towards success.

**Innovation –** Innovation with committed involvement is our work ethic which we live by every phase of the work.

**Respect –** Appreciating people for their character, knowledge, intellect, abilities & values. Honouring them with our complete attention when they communicate and share their point of view with mutual respect. Work with the sustainability of interdependence.

**Integrity –** Being true and transparent to the purpose.

**Responsibility –** Owning responsibility with a sense of belonging and striving for environmental safeguard.

**Self Discipline –** We pursue self-discipline and conduct consistent with our beliefs, culture and code of conduct. Having pride in being disciplined and courageous with all our stakeholders.

# INDUSTRY PRESENCE

Ratnamani Group has high competence in the development and manufacturing of products for the following industries

- Oil & Gas Exploration
- Chemical Industries
- Fertilizer Plants
- Petrochemicals and Refineries
- Aerospace
- Atomic Energy
- Desalination Plants
- Thermal, Solar & Nuclear Plants
- Defence
- Automobile
- Food & Dairy
- Pharmaceutical
- Sugar
- Pulp & Paper Industries
- Marine
- Cross Country Pipe Line for Gas & Water
- CNG + Booster Compressors & Dispensers
- LNG: Liquefied Natural Gas

# SEAMLESS PRODUCTS

Ratnamani's Stainless Steel Seamless Division consists of **a number of Hot Extrusion Press',** a number of Cold Pilgering Mills, Draw Benches, Heat Treatment Furnaces, U-Bending Facilities and all necessary testing equipment to produce high-quality tubes & pipes conforming to various International Standards. These facilities are capable of manufacturing tubular products in Martensitic, Ferritic, Austenitic, Super Austenitic, Duplex/Super Duplex grades and High Nickel Alloys.

**Ratnamani has a dedicated facility for the manufacturing of Stainless Steel Seamless Products.**

The Hot Extrusion Press is the core strength of the company, enabling to produce Mother Hollows with closer dimensional tolerances & good surface finish. Ratnamani is self-sufficient in manufacturing of Mother Pipes with special chemistry.

The Hot Extruded Mother Hollows are used for manufacturing Stainless Steel Seamless Instrumentation Tubes and Heat Exchanger Tubes. The tubes are manufactured using high speed Cold Pilger Mills & Draw Benches.

The tubes are heat treated in Off-Line Bright Annealing / Conventional Annealing Furnaces.

The tubes are supplied according to appropriate standards as well as customer specifications in a large variety of steel grades and dimensions. Specific requirements on execution, tolerances, lengths, and mechanical and corrosion properties are offered on request.

## SALIENT FEATURES

- Hot Extruded Mother Pipes are used to manufacture Seamless Tubes
- Wide manufacturing range terms of Grade and Size
- Tubes are produced with precision tolerances
- Capability to produce Bright Annealed Heat Exchanger U-Tubes upto a developed length of 40 meters
- Stabilization heat treatment facility
- All testing facilities in-house to meet international standards
- Quality assurance laboratory accredited to ISO 17025
- Tubes are supplied as per ASTM, ASME, EN, JIS, GOST and AFNOR Specifications

**Application:** The products manufactured find a wide range of applications in Oil and Gas Exploration, Petrochemical & Refineries, LNG, Fertilizer Plants, Thermal, Nuclear and Solar Power Plants, Atomic Energy, Desalination Plants, Chemical Industries, Aerospace, Defence, Pharmaceutical, Food and Dairy, Automobile and Marine.

# MANUFACTURING RANGE

## NICKEL ALLOYS / STAINLESS STEEL SEAMLESS HEAT EXCHANGER TUBES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Heat Exchanger Tubes | 10.00 MM to 76.00 MM OD | 0.70 MM to 6.00 MM | ASTM A-213, A-268, A-269, A-270, A-688, A-789, EN 10216-5, SB-163, SB-167, SB-407, SB-423 & SB-444 U-Tubes as per Customers Drawing. Tubes can also be supplied as per AFNOR, GOST, JIS & EN specification. |

Grades: TP-304/L/LN/H/N, TP-316/L/LN/H/N/Ti, TP-317L, 317LM, TP-321/H, TP-347/H, UNS S31050, S31254, UNS N08904, N08800, N08825, N08020, N08028, TP-405, TP-410, TP-430, TP-446, UNS S31260, S31500, S31803, S32304, S32205, S32750, S32760, UNS N04400, N06600, N06625, N06601 & N010276

## BOILER TUBES & PIPES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Seamless Boiler Tubes & Pipes | 33.40MM to 114.30MM | 2.00 MM to 20.00 MM | ASTM A-213, A-312, B-407, B-423, B-444, ASME SB-407, SB-423, SB-444, EN 10216-5 & ASME CC2328-2 |

Grades: TP-304/H, TP-310/H, TP-316/H, TP-321/H, TP-347/H, UNS 30432, N08800, N08825, N08020, N08028, N06600, N06625 & N06601

## INSTRUMENTATION TUBES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Instrumentation Tubes | 3.00 MM to 25.40 MM OD | 0.50 MM to 6.00 MM | ASTM A-213, A-269, A-789, EN 10216-5, SB-163, SB-167, SB-407, SB-423 & SB-444 U-Tubes as per Customer's Drawing. Tubes can also be supplied as per AFNOR, GOST, JIS & EN specification. |

Grades: TP-304/L/LN/H/N, TP-316/L/LN/H/N/Ti, TP-317L, 317LM, TP-321/H, TP-347/H, UNS S31050, S31254, UNS N08904, N08800, N08825, N08020, N08028, TP-405, TP-410, TP-430, TP-446, UNS S31260, S31500, S31803, S32304, S32205, S32750, S32760, UNS N04400, N06600, N06625, N06601 & N010276

## SEAMLESS PIPES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Pipes | 1/8 NPS to 10 NPS | Sch. 5s to Sch. 160 | ASTM A-312, ASTM A-376, A-790, SB-167, SB-407, SB-423 & SB-444 |

Grades: TP-304/L/LN/H/N, TP-316/L/LN/H/N/Ti, TP-317L, 317LM, TP-321/H, TP-347/H, UNS S31050, S31254, UNS N08904, N08800, N08825, N08020, N08028, TP-405, TP-410, TP-430, TP-446, UNS S31260, S31500, S31803, S32304, S32205, S32750, S32760, UNS N04400, N06600, N06625, N06601 & N010276

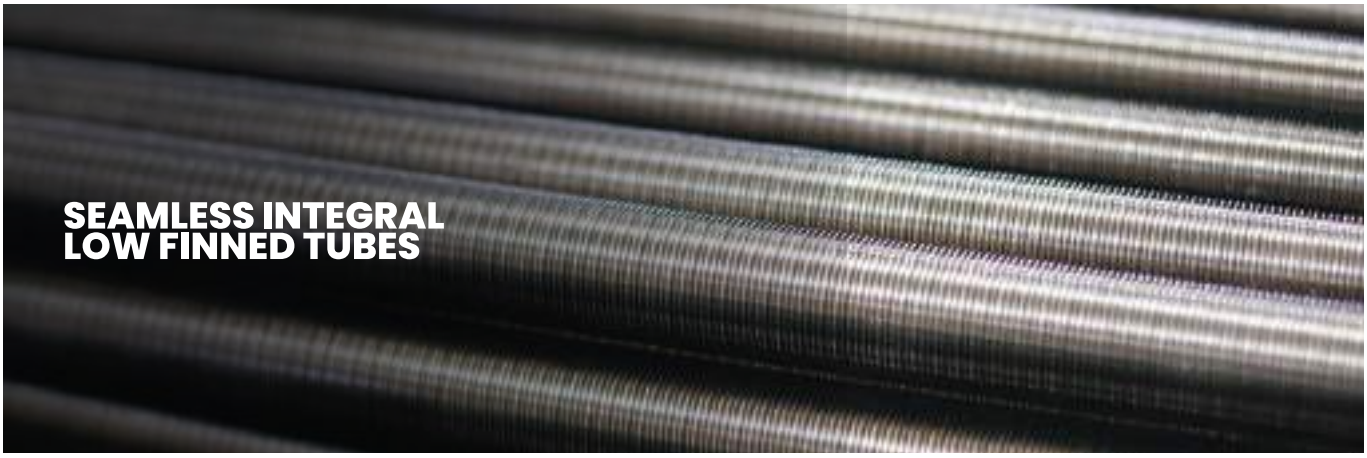
# MANUFACTURING RANGE

## HEATER PIPES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Pipes | 2 NPS to 10 NPS | Sch. 5s to Sch. 160 or any non standard thickness | ASTM A-213, ASTM A-312, ASTM A-376 |

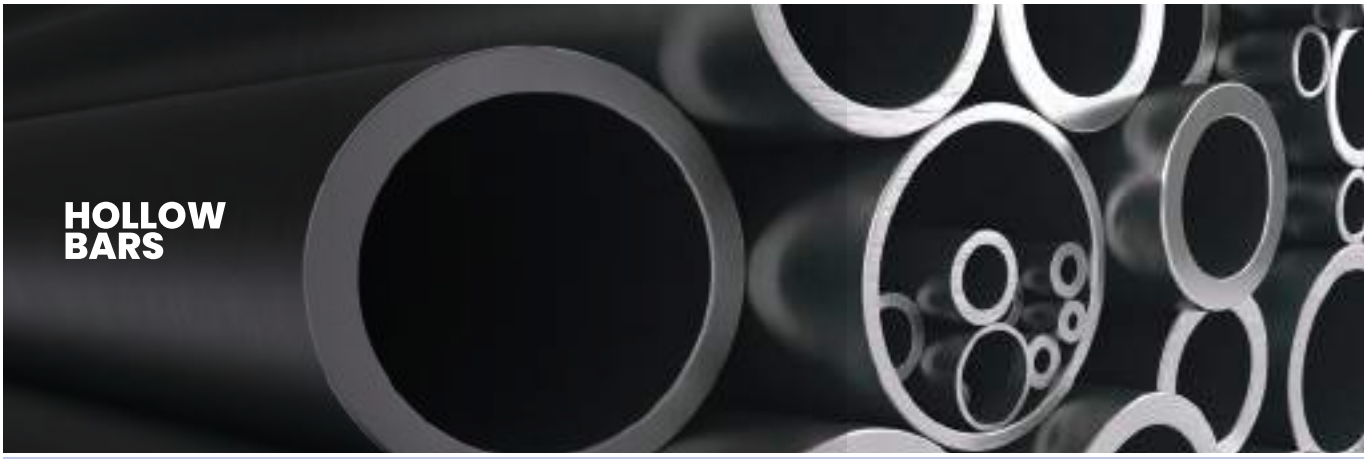
Grades: TP-304/L/LN/H/N, TP-316/L/LN/H/N/Ti, TP-317L, 317LM, TP-321/H, TP-347/H

## SEAMLESS INTEGRAL LOW FINNED TUBES



| Size/Range | Input Length | Specification | Grades |
|---|---|---|---|
| 15mm OD to 38.1mm OD | Upto 15 meters | 19 to 32 FPI<br>Internal Groove as per Customer's requirement | Stainless Steel and Nickel Alloys |

## HOLLOW BARS



| Size/Range | Thickness | Specification | Grades |
|---|---|---|---|
| 32 MM to 250 MM OD | 5 MM to 30 MM | ASTM A-312 & EN 10216-5 | Standard Austenitic Grades (with special sulphur content) |

# WELDED PRODUCTS

Ratnamani's Stainless Steel Welded Tubes & Pipes Division consists of a range of Tube Mills, Cold Finishing Section, Heat Treatment Furnaces, U-Bending Facility and Testing Facilities to manufacture high-quality products conforming to international standards. These facilities are capable of manufacturing tubular products in Ferritic, Super Ferritic, Austenitic, Super Austenitic, Duplex, and Super Duplex grades.

Ratnamani has a dedicated line to manufacture Welded Titanium Tubes.

The tubes & pipes are supplied according to appropriate standards as well as customer specifications in a large variety of steel grades and dimensions. Specific requirements on execution, tolerances, lengths, mechanical and corrosion properties are offered on request.

**Application:** The products manufactured find a wide range of applications in Oil and Gas Exploration, Petrochemical & Refineries, LNG, Fertilizer Plants, Thermal, Nuclear and Solar Power Plants, Atomic Energy, Desalination Plants, Chemical Industries, Aerospace, Defence, Pharmaceutical, Food and Dairy, Automobile and Marine.

# MANUFACTURING RANGE

## WELDED TUBES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Heat Exchanger and General Engineering Tubes in Stainless Steel Grades | 10.00 MM to 114.3.00 MM OD | 0.50 MM to 4.00 MM | ASTM A-249, A-268, A-269, A-270, A-554, A- 688, A-789, A-803 & EN-10217-7, JIS, GOST<br>U-Tubes as per Customer's Drawing. |

## WELDED PIPES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Welded Pipes | 1/8 NPS to 12 NPS | Sch. 5s to Sch. 40s | ASTM A-312, A-554, A-778 & A-790 |

Grades: TP-304/L/LN/H/N, TP-316/L/LN/H/N/Ti, TP-317L, TP-321/H, TP-347/H, UNS S31254 & Various grades as per European Norms, TP-409, TP-410, TP-430Ti, TP-439, UNS S44735, UNS S31803, S32205, S32750 & S32760


## TITANIUM WELDED TUBES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Heat Exchanger Tubes in Titanium Grade | 12.70 MM to 38.1 MM OD | 0.5 MM to 1.6 MM | Various Grades in SB 338 |

# SALIENT FEATURES

**Dedicated Tube Mills for manufacturing**

- Pipes upto 12 NPS as per ASTM A312 / A790 specifications
- Condenser Tubes and Low-Pressure Feed Water Heater Tubes with Online Bright Annealing and Eddy Current Testing Facilities
- High-Pressure Feed Water Heater Tubes with low RSM Values
- DSS/SDSS Tubes for General Engineering and Process Industries
- Wide manufacturing range
- Competence to produce tubes with precision tolerances
- Capability to produce Bright Annealed Heat Exchanger U-Tubes up to a developed length of 40 metres
- Bright Annealed Tubes for hygiene applications
- Stabilization Heat Treatment Facility
- All testing facilities in-house to meet International Standards
- Pipes can also be supplied with external Three Layer Polyethylene / Polypropylene [3LPE / 3LPP] Coating

# LARGE DIAMETER ELECTRIC FUSION WELDED (EFW) STAINLESS STEEL PIPES

Ratnamani's EFW Pipe Division consists of a JCO Forming Press, Inside and Outside Welding System, Heat Treatment Furnace and Testing Facilities.

The welding process employed is GTAW for root-pass and SAW/TIG for a final pass with suitable filler wires as prescribed by AWS specifications and ASME Boiler and Pressure Vessel Code, section-IX. These facilities are capable of manufacturing Austenitic and various Duplex Grades.

# LARGE DIAMETER ELECTRIC FUSION WELDED (EFsW) STAINLESS STEEL PIPES

| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| Longitudinal Pipes | 8 NPS to 48 NPS | 2.77 MM to 50.00 MM | ASTM A-358, A-409, A-778 & A-928 |

Grades: TP-304/L/LN/H, TP-316/L/LN/H, TP-317L, TP-321/H, TP-347/H, UNS S31254, UNS S31803, UNS 32205, UNS 32750 & UNS 32760

## SALIENT FEATURES

- Pipes in diameter ranging from 8 NPS to 48 NPS in Single Long Seam up to a length of 12 metres
- Solution Annealing Facility up to 48 NPS
- Stabilization Heat Treatment Facility
- Testing facilities in-house to meet International Standards
- Pipes can also be supplied with external Three Layer Polyethylene / Polypropylene [3LPE / 3LPP] Coating

**Application:** The products manufactured find a wide range of applications in Oil and Gas Exploration, Petrochemical & Refineries, LNG, Fertilizer Plants, Thermal, Nuclear and Solar Power Plants, Atomic Energy, Desalination Plants, Chemical Industries, Aerospace, Defence, Pharmaceutical, Food and Dairy, Automobile and Marine.

# CARBON STEEL PIPES & PIPE COATING SOLUTIONS

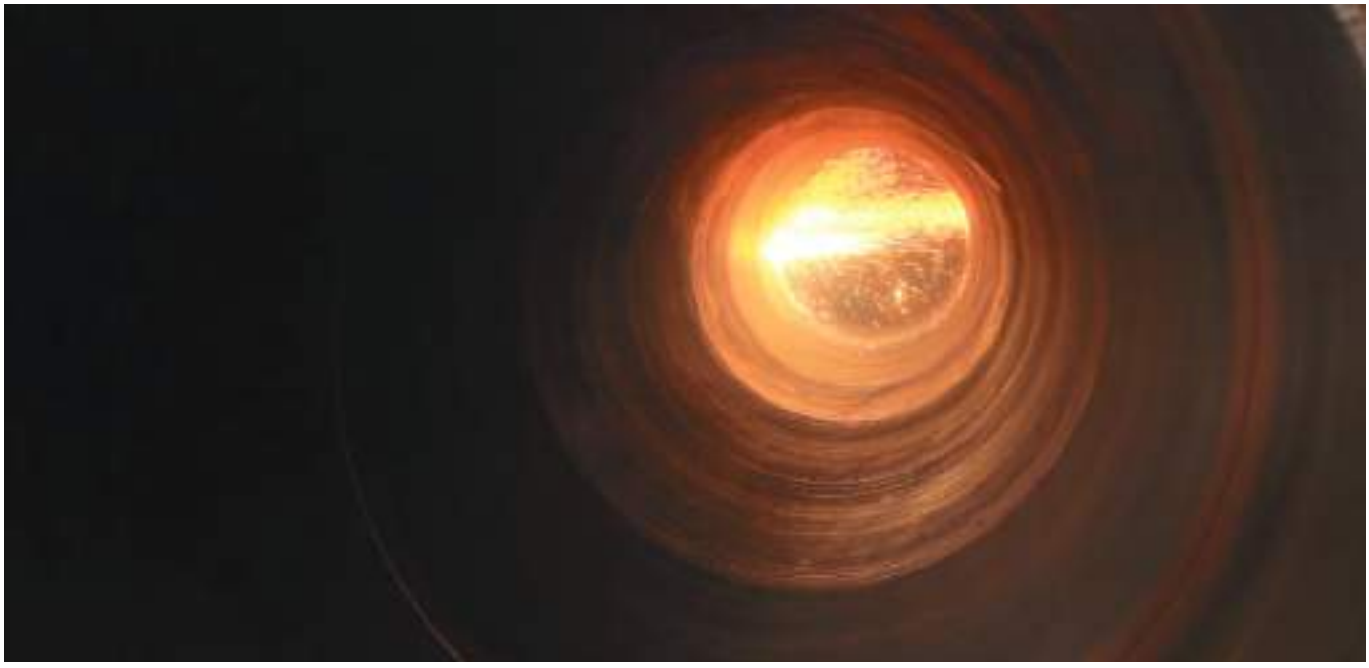
Pipelines are a transportation system that enables the safe movement of an enormous quantity of energy products to industry and consumers, literally fueling our economy and way of life. They are arteries of any Nation's energy infrastructure, as well as the safest and least costly ways to transport energy products.

**All around the globe steel pipes from Ratnamani find a place in a large variety of applications like drinking water pipelines or oil and gas pipelines and provide a swift and safe supply of our most valuable resources.**

Ratnamani ensures a high degree of flexibility in production and planning, making possible economical manufacture, especially of small and medium-sized production lots. In this manner our customers enjoy appreciable economic advantages at an unchanged level of quality.

## EXTERNAL & INTERNAL COATING CAN BE PERFORMED ON THE PIPES

External Three Layer Polyethylene/Polypropylene [3LPE/3LPP] Coating
Single Layer/Dual Layer Fusion Bonded Epoxy [SFBE/DFBE]
External Coal Tar Enamel Coating
External Coal Tar Tape Coating
External Painting
External Cement Mortar Lining
Internal Liquid Epoxy
Internal Cement Mortar Lining



# High-Frequency Electric Resistance Welded [HF-ERW] Pipes

Ratnamani manufactures Carbon Steel High-Frequency Electric Resistance Welded (HF-ERW) Pipes with an annual installed capacity of 1,00,000 MT. HF-ERW pipes are made from hot-rolled flat steel strips, formed into a tubular shape and the longitudinal seam is welded by the application of heating the edges through a High-Frequency Induction Coil or Contact and by squeezing the edges. The weld joint is achieved without the addition of any filler metal.


| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| • Circular Pipe/ Circular Hollow Section | 6 NPS (168.3 MM) to 18 NPS (457 MM) | 0.125" (3.2 MM) to 0.5" (12.7 MM) | As per ASTM \| As per API 5L<br>As per API 5CT \| As per EN/BS<br>AS per IS \| As per Customer's Specification |
| • Square Hollow Sections | 5" (125 MM) x 5"(125 MM) to 12" (300 MM) x 12" (300 MM) | 0.125" (3.2 MM) to 0.5" (12.7 MM) | As per IS<br>As per Customer's Specification |
| • Rectangular Hollow Sections | 4" (100 MM) x 6"(150 MM) to 10" (250 MM) x 14" (360 MM) | 0.125" (3.2 MM) to 0.5" (12.7 MM) | As per IS<br>As per Customer's Specification |

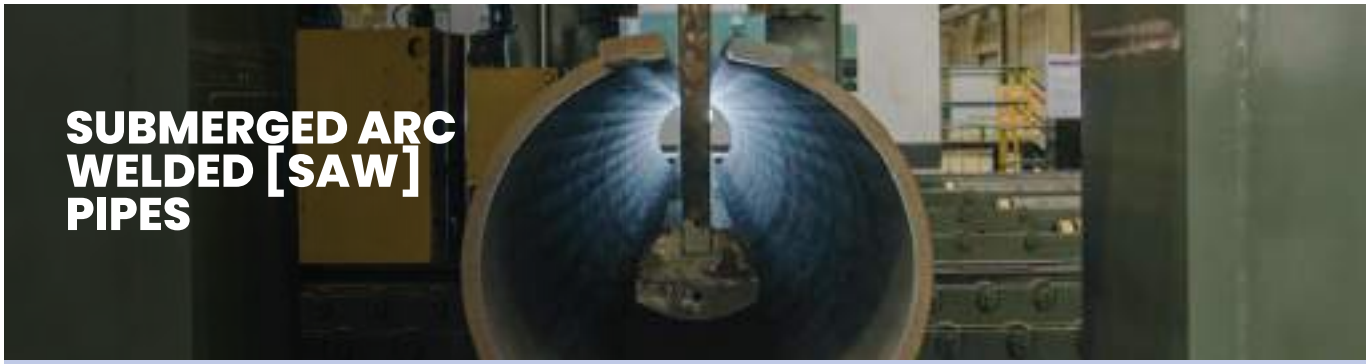
## SALIENT FEATURES

- Capability to manufacture pipes as per API 5L Grade API X-80 or equivalent
- All testing facilities in-house to meet International Standards

**Application:** Oil & Gas Pipeline, Plumbing, Heating, Water Supply Pipeline, General Purpose Pipeline & Structural Pipes

# Submerged Arc Welded [SAW] Pipes

Ratnamani's Carbon Steel and Alloy Steel SAW Pipe manufacturing division consists of a JCO Press, Helical / Spiral Mills, a number of Three Roll Plate Bending Machines, Inside & Outside welding lines, a Heat Treatment Furnace and all necessary Testing Equipment to produce high-quality pipes conforming to various international standards. These facilities are capable of manufacturing pipes in various grades.




| Products | Size/Range | Thickness | Specification |
|---|---|---|---|
| • Carbon Steel & Alloy Steel Longitudinal Submerged Arc Welded [L-SAW] Pipes | 12 NPS (323.9 MM) to 56 NPS (1422 MM) | 0.2" (5 MM) to 2.76" (70 MM) | As per ASTM \| As per API 5L, API 2B As per EN/BS \| AS per IS |
| • Carbon Steel Helical/Spiral Submerged Arc Welded [H-SAW] Pipes | 16 NPS (406.4 MM) to 144 NPS (3658 MM) | 0.2" (5 MM) to 1" (25 MM) | As per ASTM \| As per API 5L, API 2B As per EN/BS \| AS per IS |
| • Carbon Steel & Alloy Steel Longitudinal with Circumferential Seam Submerged Arc Welded Pipes | 32 NPS (813 MM) to 168 NPS (4267 MM) | 0.2" (5 MM) to 2.76" (70 MM) | As per ASTM \| As per API 5L, API 2B As per EN/BS \| AS per IS |

## SALIENT FEATURES

• Capability to produce pipes having a very close diameter-thickness ratio.

• Capability to manufacture pipes as per API 5L Grade X-80 or Equivalent.

• Capability to manufacture Alloy Steel Pipes.

## Application

**Oil and Gas Pipeline**
Cross Country Oil & Gas Pipelines
Spur Lines
City Gas Distribution
Refinery & Petrochemical-High Temperature & Low-Temperature Pipes

**Power Plant**
Cooling Water Line & Auxiliary Cooling Water Line
Ash Handling Line

**Water & Sewerage**
Distribution and Transmission Lines for Irrigation Systems
Pipes for Potable Water
Drainage Pipes

**Structural**
Piling and Casing Pipes | Structural Columns

**Other Industrial**
Pipes for Fertilizer Plant
Mining Pipes
Dredging Pipes
Air Duct Piping
High Mast Pipes for Wind Mill Towers

# EXTERNAL COATING SOLUTIONS

### External Three Layer Polyethylene / Polypropylene [3LPE / 3LPP] Coating

Ratnamani's 3LPE/ 3LPP Coating is a multilayer coating composed of three functional components. This coating consists of the first layer which is a high-performance anti-corrosion fusion bonded epoxy [FBE] second layer of a copolymer PE/PP adhesive for adhesion between the epoxy and PE/PP and an outer/third layer of polyethylene / polypropylene which provides mechanical protection. 3LPE Coatings provide excellent pipeline protection for small and large diameter pipelines with moderate to high operating temperatures whereas 3LPP Coatings not only provide the toughest, and the most durable pipe coating solution but also provide excellent pipeline protection for small and large diameter pipelines with high operating temperatures. Stainless Steel Pipes can also be supplied with external 3LPE / 3LPP Coating.

### Single Layer/Dual Layer Fusion Bonded Epoxy [SFBE / DFBE] Coating

Ratnamani's SFBE is a single layer anti-corrosion coating which is consisting of a high-performance fusion bonded epoxy layer that provides excellent protection in moderate operating temperatures. DFBE is a layer of anti-corrosion coating followed by an abrasion-resistant overcoat which provides excellent results for pipes being used under abrasive conditions.


| Products | Size/Range | Specification |
|---|---|---|
| • External Three Layer Polyethylene/ Polypropylene [3LPE / 3LPP] Coating | 4 NPS [114.3 MM] to 132 NPS [3353 MM] | As per DIN, As per CSA As per NFA, As per ISO |
| • Single Layer / Dual Layer Fusion Bonded Epoxy ISFBE/DFBE] | 4 NPS [114.3 MM] to 132 NPS [3353 MM] | As per CSA, As per NACE As per BS |
| • Note: Pipes can be supplied as per Customer Specitication also. | | |

**Application Industry: Oil & Gas Pipelines & Water Pipelines**

### External Coal Tar Enamel [CTE] Coating

Ratnamani's CTE plant is designed to apply a suitable Coal Tar Enamel [CTE] on the external pipe surface as per AWWA, BS or customer specified coating specifications. This CTE coating plant is used for corrosion & mechanical protection of Oil, Gas and Water Pipelines.

### External Coal Tar Tape Coating

Coal Tar Tape is applied in cold conditions on the external pipe surface as per AWWA, BS or customer specified coating specifications. This tape coating system is used for corrosion & mechanical protection of Water Pipelines.

### External Painting

Ratnamani does various types of External Painting for corrosion protection and insulation properties which can be applied by brush, roller or paint sprayer.

### External Cement Mortar Lining

At Ratnamani mixed mortar is projected against the steel surface of the pipe while wire reinforcement is placed throughout the pipe surface as per the customer's specification to add strength. Once completed, water is sprayed as per the curing procedure and customer specification for guaranteed strength and protection. External Cement Mortar Lining is not only durable and inexpensive but protects buried steel pipe for long term service.

# INTERNAL COATING SOLUTIONS

## Internal Liquid Epoxy

Ratnamani's internal liquid coating plant is designed to apply a suitable spray coating, primer, or epoxy to the abrasively cleaned internal surface of the pipe. Internal Liquid Epoxy coating can be thin-film epoxy, 100% solids, two-component, solvent-free, high build epoxy lining applied to smoothen the internal pipe surface for improved flow and used to provide corrosion protection for the internals of steel pipes. This results in the reduction of friction and increases flow efficiency.


| Products | Size/Range | Specification |
|---|---|---|
| • Internal Liquid Epoxy | 8 NPS [219.1 MM] to 132 NPS [3353 MM] | As per ISO<br>As per API<br>As per AWWA |
| • Note: Pipes can be supplied as per Customer Specification also. | | |

**Application Industry: Oil & Gas Pipelines & Water Pipelines**

### Internal Cement Mortar Lining

Internal Cement Mortar Lining plant is designed to apply a suitable Cement Mortar Lining on the internal pipe surface, as per AWWA coating specifications. Typically used for transportation of water or sewage.

Internal cement mortar lining is performed by use of a spinning machine, which rotates the pipe causing centrifugal pressure on cement mortar which helps in equalizing the mortar thickness and forming a smooth, dense protective lining. Once completed, water is sprayed and ends are capped as per the curing procedure and customer specification for guaranteed strength and protection.

# INDUCTION PIPE BENDS / SPOOLS

RATNAMANI has diversified its activities with fabrication and coating of Induction Bends / Spools. RATNAMANI has 2 State of art automatic bending machines operating to cater the requirements of Induction bends for the pipe sizes 3" to 48" Dia.

The bends fabricated by RATNAMANI meets the requirement of ASME, ASTM, API, DIN, BS, PFI, GAIL, EIL, ONGC, IOCL and other National/International Technical Specifications.

**Induction bending uses the principal of induction to locally heat a pipe. This results in a narrow heat band of the pipe.**

The heated material is shaped into a bend in a narrow zone as the pipe is pushed by a precise drive system in a heavy frame. The bend part is then cooled by water/air to make the bend shape. The bending process is continuous and automated.

## ADVANTAGE OF INDUCTION BENDING

**Improved Quality**
- Induction bends have precise dimensional controls and accuracy (radius, angle, ovality & wall thinning)
- Uniform hardness
- Better surface finish (no pipe wrinkles)

**Processing Flexibility**
- A wide range of material like carbon steel/alloy steel/stainless steel can be bend
- Multiple bends can be produced
- Precise customized pipe bends can be made

**Time Saving**
- Induction bending does not require any sand filling or insertion of inner mandrels. Bending time is considerably lesser

**Integrity of pipe work**
- Induction bends are piggable and reduces the need of welding for many applications

**Application:** The products manufactured finds a wide range of applications in Oil and Gas Exploration, Petrochemical & Refineries, LNG, Fertilizer Plants, Thermal, Nuclear and Solar Power Plants, Desalination Plants, Chemical Industries, Pharmaceutical, Food and Dairy, Automobile and Marine.

# TECHNICAL SPECIFICATION OF BENDING MACHINE

| Attributes | Machine No. 1 | Machine No. 2 |
|---|---|---|
| Pipe Diameter | 4''-24'' (101.6 mm-610 mm) | 16" – 48" (406.4 – 1219 mm) |
| Pipe Thickness | Up to 1.18'' (30 mm) | Up to 1.57" (40 mm) |
| Bending Radius | 2D – 8D | 2D – 8D |
| Bending Angle | 0° – 90° | 0° – 90° |
| Angle Tolerance | ± 0.5° | ± 0.5° |
| Radius Tolerance | ± 1% | ± 1% |
| Ovality At Ends | ± 1% | ± 1% |
| Ovality on Body | 4D & above to 2-2.5% | 4D & above to |
| Wall Thinning | 4D & above ≤ 8% | 4D & above ≤ 8% |

## Induction Bends from different materials

- Carbon Steel Pipes (API 5L Gr.B/ASTM A106 Gr.B)
- High Strength Steel Pipes (API 5L X42 to X80)
- Low Temperature Alloy Steel (ASTM A333 Gr.6)
- Stainless Steel Pipes (ASTM A312, 304L, 316L, etc.)
- Duplex & Super duplex Steel, including 22% Cr(UNS S31803) & 25% Cr(UNS S32750/60)
- High Chrome Steel Pipes (ASTM A335, P11, P22, P91 etc.)
- High Nickel High Chrome Steel Pipes (Inconel, Hastealloy etc.)
- Cladded Pipes
- Tubes & Pipes (Seamless/ERW/LSAW/HSAW)

**RATNAMANI has a full fledged in-house facility for the following Tests:**

- Mechanical Testing
  a) Universal Testing Machine
  b) Charpy Testing
- Hardness Tester
- Hydro Testing
- Bevelling machine
- Thickness gauge
- Non-destructive Testing ( X-ray/UTI/MPI )
- Microscope for metallographic analysis
- Spectrometer for chemical analysis
- Corrosion Testing
  a) Hydrogen-induced cracking (HIC)
  b) Sulfide stress corrosion cracking (SSCC)

In addition to the above, Ratnamani has an arrangement for Heat Treatment Facility.

# INSPECTION AND TESTING

**Each of Ratnamani's products undergoes a series of comprehensive mandatory and customer-specified supplementary tests at in-house testing facilities by qualified personnel in accordance with various International Standards / Specifications.**

The list of Third Party Inspection Agencies [TPIA], with whom Ratnamani have had privilege to carry out detailed stage-wise inspection & testing, reads like Who's Who' Directory of TPIA's. Inspection by customer's own survey can also be offered.

## Inspection & Testing Facilities at Ratnamani are as follows:

- Mechanical Testing & Chemical Testing
- Fully equipped laboratory for Corrosion Testing, Chloride Contamination Testing & Residual Stress Measurement
- Micro Structure Examination / Analysis
- Laboratory Spectrometer & Portable Spectrometer
- Positive Material Identification (PMI) Tester
- Elevated Temperature Tensile Testing
- Hydro Testing for Straight as well as U-Tubes
- Air Under Water Testing for Straight Tubes up to the length of 27 meters
- Ferrite Content and Surface Finish
- Fibroscope - Inside Surface checking of tubes having outside diameter 4.7 mm and above
- Non Destructive Testing offered:
  - Eddy Current Testing
  - Ultrasonic Testing with full body thickness measurement
  - Real Time Radioscopy
- Nace Corrosion Laboratory
  - Hydrogen Induced Cracking(96 hrs)
  - Sulfide Stress Cracking - Tensile (720hrs)
  - Sulfide Stress Cracking - 4 Point Bend (96/720hrs)

# Integrated Management System Policy

**RATNAMANI METALS AND TUBES LIMITED aspires to be world leader in supplying pipes and tubes to industries such as Oil and Gas, Refineries & Petrochemicals, Thermals/Solar/Nuclear Power, Aerospace, Defence, Automotive, Chemicals and Fertilizers, Pharmaceuticals, Food & Dairy, Cross Country Fuel Supply, Water supply, etc. We are committed to meet customer requirements and exceed customer expectations, focusing upon sustained approach with respect to Quality, Environment, Occupational Health and Safety aspects, while providing consistent supply of :**

- Carbon steel and alloy steel welded pipes.
- Stainless steel and Nickel alloy seamless pipes & tubes.
- Stainless steel and Titanium welded pipes and tubes.
- Coated pipes.
- Hot induction pipe bends.

**We are committed to,**

- Continually improve processes and practices.
- Use energy efficient products and services.
- Ensure availability of information and resources for continual improvement in effectiveness of integrated management system.
- Comply with statutory and regulatory obligations.
- Work in environmentally sustainable way and conservation of natural resources such as water, energy, materials & protection of environment including prevention of pollution.
- Eliminate hazards and reduce OH&S risks, provide safe and healthy working condition by prevention of work related injury and ill health.
- Establish, monitor and review IMS strategies, initiatives and objectives in consultation and participation of employees and relevant interested parties.
- Displaying and communicating this policy to all our customers, employees and other interested parties.

We shall strive to continually improve the effectiveness of integrated management system and we are committed to using this policy as a guideline in our activities.

# CERTIFICATIONS AND APPROVALS

**Ratnamani Metals & Tubes Limited holds several approvals as a manufacturer of seamless tube and pipe, and can deliver tubular products in accordance with most international standards.**

**ISO 9001 : 2015**

**ISO 14001 : 2015**

**IATF 16949 : 2016**

**DIN EN ISO 3834-2**

**ISO 45001 : 2018**

**API 5L, API 5CT & API 2B**

**PED & ADW0**

**NADCAP**

**EN 9100 : 2018 (AS9100D)**

**Marine**

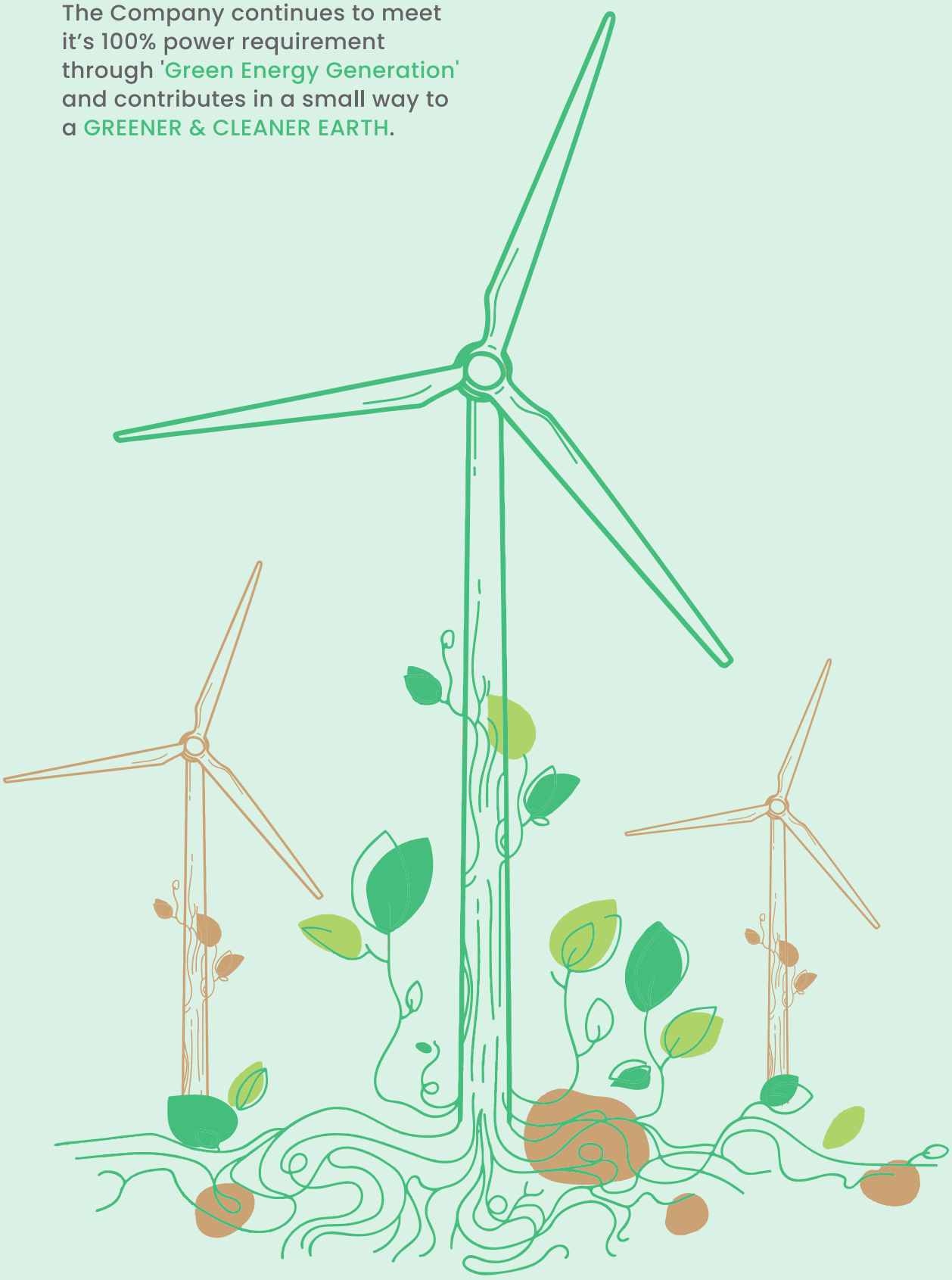
**TRCU**

**NORSOK**

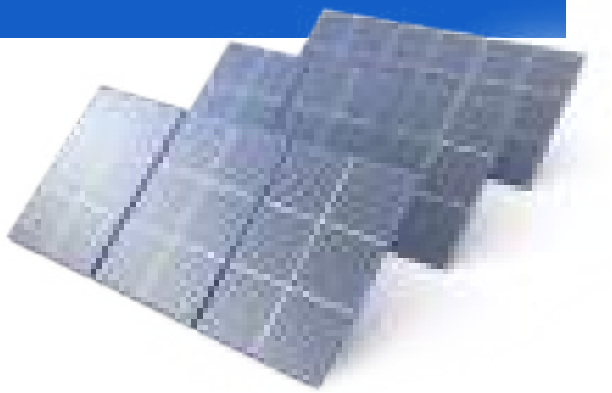
**"WELL KNOWN PIPE / TUBE MAKER" STATUS BY CENTRAL BOILERS BOARD - INDIA**

# We work with GREEN POWER

The Company continues to meet it's 100% power requirement through 'Green Energy Generation' and contributes in a small way to a GREENER & CLEANER EARTH.



Being a leading environment-friendly corporation is of paramount importance to us. Therefore, we have invested heavily in renewable energies with the aim to contribute towards environmental sustainability and adopting greener technologies. The sustainable approaches we incorporated comprises of Solar Power, Wind Energy & Natural Gas & More.



## A RELIABLE SOURCE OF SUBSTANTIAL POWER (SOLAR PLANT)

In an attempt to reduce our carbon footprint, we installed a 15 MW captive solar plant in the Patan District of Gujarat. Equipped with an array of 44772 solar panels spanning about 57 acres of land, the unit will generate 22.5 million units of energy per year.

## ZERO DISCHARGE FACILITY AND ADOPTION OF NATURAL GAS

At our zero-discharge facilities, after removing all liquids and chemicals, the water is used for gardening purpose. In addition, we rely on Natural Gas for heating to conserve our non-renewable resources.

# HEALTH CARE AND EDUCATION

## We constantly engage in activities that play a major role in shaping the future of our society.

Healthcare and Education are two major areas where we aim to make a huge impact. To educate children with little to no access to resources we have built a school in rural area to help children take their first step towards a bright future. Furthermore, we have built a sizeable campus in the Mehsana district where students can pursue their studies from schooling to graduation. Whenever the need arises we take initiatives in the healthcare sector to ensure the health and wellbeing of people.

# CONTRIBUTION TOWARDS NATURE CONSERVATION

At Ratnamani, we believe that alleviating environmental issues is crucial but not enough to create a sustainable environment. Therefore, we engage in practices that help preserve the environment. **In our ''Save The Sparrow'' initiative we distributed 1,82, 000 sparrow nests to help prevent the extinction of House Sparrows.**

Social afforestation and rainwater harvesting are some other activities we take part in for conserving nature.

# INTERNATIONAL PRESENCE


RUSSIA
LITHUANIA
NDS
ANY
POLAND
CZECH REPUBLIC
ERLAND
ALY
KAZAKHSTAN
IRAN
KUWAIT
ABU DHABI
SAUDI ARABIA
QATAR
KINGDOM OF BAHRAIN
EGYPT
UAE
OMAN
A
CHINA
JAPAN
SOUTH KOREA
NEPAL
INDIA
BANGLADESH
THAILAND
VIETNAM
PHILIPPINES
MALAYSIA
INDONESIA
TANZANIA
AUSTRALIA
NEW ZEALAND

RATNAMANI®
METALS & TUBES LTD.

## Registered Office

17, Rajmugat Society,
Naranpura Cross Raod, Ankur Road,
Naranpura, Ahmedabad-380 013,
Gujarat (India).

Phone: +91-79-2741 5501/2/3/4
Fax: +91-79-2748 0999.

## Corporate Office

"The First", A&B Wing, 9th Floor,
Behind Keshav Baug Party Plot,
Off 132 Feet Ring Road,
Vastrapur, Ahmedabad-380 015.

Phone: +91 79 2960 1200/1/2
Fax: +91-79-2960 1210

## Regional Office

**Mumbai Office**
Panchsheel Plaza, B-Wing,
2nd Floor, 55- Gamdevi Road,
Near Dharam Palace, Mumbai 400 007,
Maharashtra (India).

Phone: +91-22-3520 9900/33

**Delhi Office**
402, Bhikaji Cama Bhawan,
4th Floor, Bhikaji Cama Place,
New Delhi - 110066.

Phone: +91-11-4615 2724

## Branch Office

**USA Office**
5326, Heath River Lane,
Sugar Land, Texas - 77479
United States of America

Phone: +1 832 871 9244

## Manufacturing Units

**Unit 1:**
Survey No. 423,
Ahmedabad-Mehsana Highway,
P.O. Chhatral - 382715, Tal. Kadi,
Dist. Mehsana,
Gujarat (India).

Phone: +91-2764-232254, 232263, 233766

**Unit 2:**
Survey No. 3306 to 3309,
G.I.D.C. Estate Chhatral,
Phase-IV, A'bad-Mehsana Highway,
P.O. Chhatral - 382 729, Tal. Kalol,
Dist. Gandhinagar - Gujarat (India).

Phone: +91-2764-232234, 233919, 232409

**Unit 3:**
Survey No. 474,
Village: Bhimasar,
Tal. Anjar, Nr. Gandhidham,
Dist. Kutch-370 210,
Gujarat (India).

Phone: +91-2836-285538, 285539
Fax: +91-2836-285540

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