- Stainless Steel &
Nickel Alloy Spring Wires

We Use 100% GREEN POWER

TÜV NORD TUV India Private Ltd. ISO 9001

# Raajratna® Metal Industries Limited

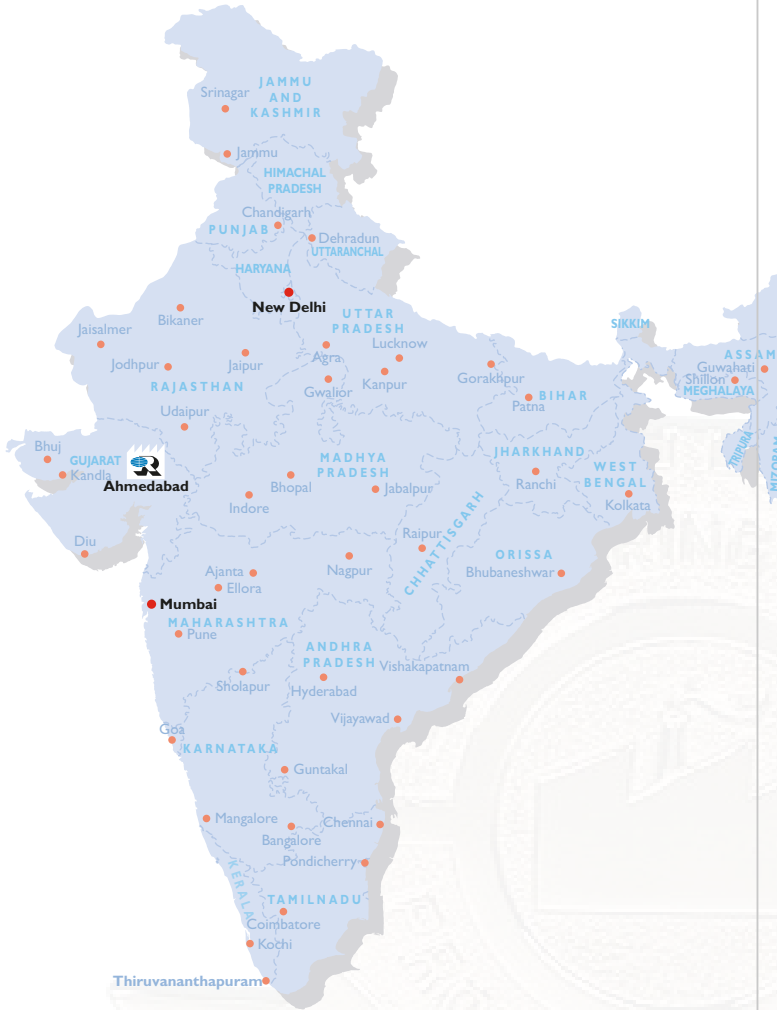
# Green Power


THE ONLY COMPANY

using 100% green power

for manufacturing stainless steel wires & bars

# Company Profile




Raajratna Metal Industries Limited an "ISO 9001-2008" accredited company, started production of stainless steel wires in 1990 and subsequently diversified to bright bars. Since it's beginning Raajratna has used state-of-the art technology with strong emphasis on product quality and customer satisfaction.

As a result of continuous improvement in every aspect of business, within a short span, today Raajratna has become one of the most reliable source of quality product both in domestic as well as in international market with annual production capacity of 30,000 tonnes. Because of its large manufacturing capacity and continuous product innovation with regular upgradation of production process. Raajratna has achieved economy of scale and is able to serve customers having highly diversified requirements.

Raajratna exports more than 80% of its production to 50 countries across the globe. Raajratna is being awarded every year since 1991 for excellence in exports. It has been possible due to Raajratna's ability to meet exact market requirements and strict adherence to delivery schedule with an individual attention to every customer.

# Product Range

## Stainless Steel Spring Wire

Raajratna manufactures high quality Stainless Steel Spring wire from 0.10 - 16.00 mm in bright as well as in stearate coated surface finish.

The Stainless Steel Spring wires are manufactured as per ASTM A 313, EN 10270-3, JIS G4314, BS 2056 & DIN 17224 and other equivalent international standards.

The Stainless Steel Spring wires can be supplied in ½ hard, ¾ hard & full hard conditions as well.

## Mechanical & Physical Properties

| Nominal Diameter | | Temper | Tensile Strength | Surface Finish | Tolerance | |
|---|---|---|---|---|---|---|
| in mm | in inch | | (N/mm²) | | in mm | in inch |
| 0.10 - 0.15 | 0.004 - 0.006 | Half Hard<br>¾ Hard<br>Full Hard | As per<br>ASTM A313<br>EN 10270-3<br>JIS G4314<br>BS 2056<br>DIN 17224 | Bright | ± 0.005 | ± 0.0002 |
| 0.15 < d ≤0.20 | 0.006 < d ≤0.008 | | | Bright | ± 0.005 | ± 0.0002 |
| 0.20 < d ≤ 0.30 | 0.008 < d ≤0.012 | | | Bright / Coated | ± 0.005 | ± 0.0002 |
| 0.30 < d ≤ 0.40 | 0.012 < d ≤0.016 | | | Bright / Coated | ± 0.008 | ± 0.0003 |
| 0.40 < d ≤ 0.50 | 0.016 < d ≤0.020 | | | Bright / Coated | ± 0.008 | ± 0.0003 |
| 0.50 < d ≤ 0.65 | 0.020 < d ≤0.026 | | | Bright / Coated | ± 0.008 | ± 0.0003 |
| 0.65 < d ≤ 0.80 | 0.026 < d ≤0.032 | | | Bright / Coated | ± 0.010 | ± 0.0004 |
| 0.80 < d ≤ 1.00 | 0.032 < d ≤0.040 | | | Coated | ± 0.010 | ± 0.0004 |
| 1.00 < d ≤ 1.25 | 0.040 < d ≤0.050 | | | Coated | ± 0.015 | ± 0.0006 |
| 1.25 < d ≤ 1.50 | 0.050 < d ≤0.060 | | | Coated | ± 0.015 | ± 0.0006 |
| 1.50 < d ≤ 1.75 | 0.060 < d ≤0.070 | | | Coated | ± 0.015 | ± 0.0006 |
| 1.75 < d ≤ 2.00 | 0.070 < d ≤0.080 | | | Coated | ± 0.015 | ± 0.0006 |
| 2.00 < d ≤ 2.50 | 0.080 < d ≤0.098 | | | Coated | ± 0.020 | ± 0.0008 |
| 2.50 < d ≤ 3.00 | 0.098 < d ≤0.120 | | | Coated | ± 0.020 | ± 0.0008 |
| 3.00 < d ≤ 3.50 | 0.120 < d ≤0.140 | | | Coated | ± 0.020 | ± 0.0008 |
| 3.50 < d ≤ 4.25 | 0.140 < d ≤0.170 | | | Coated | ± 0.020 | ± 0.0008 |
| 4.25 < d ≤ 5.00 | 0.170 < d ≤0.200 | | | Coated | ± 0.025 | ± 0.0010 |
| 5.00 < d ≤ 6.00 | 0.200 < d ≤0.240 | | | Coated | ± 0.025 | ± 0.0010 |
| 6.00 < d ≤ 7.00 | 0.240 < d ≤0.280 | | | Coated | ± 0.025 | ± 0.0010 |
| 7.00 < d ≤ 8.50 | 0.280 < d ≤0.330 | | | Coated | ± 0.030 | ± 0.0012 |
| 8.50 < d ≤ 10.00 | 0.330 < d ≤0.400 | | | Coated | ± 0.030 | ± 0.0012 |
| 10.00 < d ≤ 11.00 | 0.400 < d ≤0.430 | | | Coated | ± 0.030 | ± 0.0012 |
| 11.00 < d ≤ 13.00 | 0.430 < d ≤0.510 | | | Coated | ± 0.030 | ± 0.0012 |
| 13.00 < d ≤ 16.00 | 0.510 < d ≤0.630 | | | Coated | ± 0.030 | ± 0.0012 |

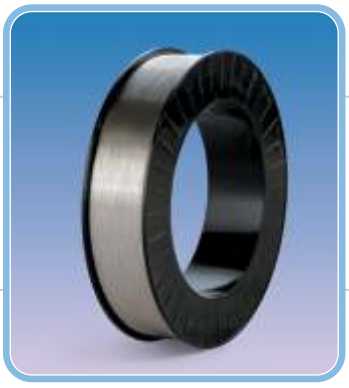
**Note :** We can aslo supply 3/4 hard in the above sizes.

# Packaging

## Stainless Steel Spring Wires can be supplied as under

**Plastic Spool**
Type : DIN 160, 200, 250, 300 & 355
Weight : 4 - 40 kgs

**Wooden Reel**
Type : 550 / 760K
Weight : 100 - 400 kgs



**Plastic Spool**
Type : SH460K
Weight : 18 - 40 kgs

**Coils on Pallet**
Type : As per Request
Weight : 30 - 100 kgs

**Compact Coil**
Type : Coil with Core
Weight : 400 - 1000 kgs

**Steel Reel**
Type : 550 / 760K
Weight : 100 - 400 kgs

* Customised packing available on request.

# Packaging & Spool Dimension

## Packing

| Diameter in mm | Diameter in inch | Packing | Approx. Weight | Remarks |
|---|---|---|---|---|
| 0.10 - 0.15 | 0.004 - 0.006 | DIN 125 | 2 - 3 Kgs | Bright |
| 0.15 - 0.20 | 0.006 - 0.008 | DIN 160 | 4 - 6 Kgs | Bright |
| 0.20 - 0.30 | 0.008 - 0.012 | Coil / DIN 200 | 10 - 12 Kgs | Bright / Coated |
| 0.30 - 0.60 | 0.012 - 0.024 | Coil / DIN 250 | 18 - 20 Kgs | Bright / Coated |
| 0.20 - 0.50 | 0.008 - 0.020 | SH 460 | 18 - 40 Kgs | Bright / Coated |
| 0.30 onwards | 0.012 onwards | Coil | - - - | 0.30 - 0.80 Bright / Coated<br>0.80 & above Coated |
| 0.50 - 4.00 | 0.020 - 0.160 | Wooden Spool<br>DIN 500 / 550 / 760 | 100 - 400 Kgs | Coated |
| 0.50 - 0.75 | 0.020 - 0.030 | Coil | 15 - 25 Kgs | Bright / Coated |
| 0.80 - 0.90 | 0.032 - 0.036 | Coil | 40 - 50 Kgs | Bright / Coated |
| 1.00 - 1.50 | 0.040 - 0.060 | Coil | 50 - 70 Kgs | Coated |
| 1.50 - 1.70 | 0.060 - 0.070 | Coil | 50 - 125 Kgs | Coated |
| 1.70 - 2.80 | 0.070 - 0.110 | Coil | 100 - 250 Kgs | Coated |
| 2.80 - 4.00 | 0.110 - 0.160 | Coil | 200 - 300 Kgs | Coated |
| 4.00 - 16.00 | 0.160 - 0.630 | Coil | 250 - 350 Kgs | Coated |
| 2.00 - 12.00 | 0.080 - 0.470 | Euro Coil | 400 - 1000 Kgs | Coated |
| 0.35 - 4.00 | 0.014 - 0.160 | Metal Spool<br>DIN 500 / 550 / 760 | 100 - 400 Kgs | Coated |

### Plastic Spool Dimension

| Spool Size in mm | Flange in mm | Width Including Flange in mm | Width Excluding Flange in mm | Barrel in mm | Arbor in mm |
|---|---|---|---|---|---|
| DIN 125 | 125 (±5) | 125 (±5) | 101 (±5) | 80 (±5) | 16 (±2) |
| DIN 160 | 160 (±5) | 160 (±5) | 128 (±5) | 100 (±5) | 22 (±2) |
| DIN 200 | 200 (±5) | 200 (±5) | 160 (±5) | 127 (±5) | 22 (±2) |
| DIN 250 | 250 (±5) | 200 (±5) | 160 (±5) | 160 (±5) | 22 (±2) |
| DIN 350 | 350 (±5) | 350 (±5) | 90 (±5) | 210 (±5) | 50 (±2) |

# Packaging & Spool Dimension

## Plastic Spool Dimension

| Spool Size in inch | Flange in inch | Width Including Flange in inch | Width Excluding Flange in inch | Barrel in inch | Arbor in inch |
|---|---|---|---|---|---|
| DIN 125 | 4.9 (±0.20) | 4.92 (±0.20) | 3.98 (±0.20) | 3.15 (±0.20) | 0.63 (±0.078) |
| DIN 160 | 6.3 (±0.20) | 6.30 (±0.20) | 5.04 (±0.20) | 3.94 (±0.20) | 0.87 (±0.078) |
| DIN 200 | 7.8 (±0.20) | 7.87 (±0.20) | 6.30 (±0.20) | 5.00 (±0.20) | 0.87 (±0.078) |
| DIN 250 | 9.8 (±0.20) | 9.84 (±0.20) | 6.30 (±0.20) | 6.30 (±0.20) | 0.87 (±0.078) |
| DIN 350 | 13.8 (±0.20) | 13.80 (±0.20) | 3.55 (±0.20) | 8.27 (±0.20) | 1.97 (±0.078) |

## Metal Spool Dimension

| Flange Dia | | Barrel Diameter | | Bore | | Traverse (Width) | |
|---|---|---|---|---|---|---|---|
| in mm | in inch | in mm | in inch | in mm | in inch | in mm | in inch |
| 500 | 20.00 | 210 / 250 | 8.00 / 10.00 | 40 | 1.57 | 240 | 9.50 |
| 550 | 21.00 | 300 | 12.00 | 40 | 1.57 | 280 | 11.00 |
| 760 | 30.00 | 430 | 17.00 | 40 | 1.57 | 290 / 360 | 11.40 / 14.20 |

## Wooden Spool Dimension

| Flange Dia | | Barrel Diameter | | Bore | | Traverse (Width) | |
|---|---|---|---|---|---|---|---|
| in mm | in inch | in mm | in inch | in mm | in inch | in mm | in inch |
| 550 | 22.00 | 300 | 12.00 | 32 | 1.25 | 230 | 9.00 |
| 760 | 30.00 | 430 | 17.00 | 32 | 1.25 | 230 | 9.00 |

## SH 460 Spool Dimension

| Flange Dia | | Barrel Diameter | | Bore | | Traverse (Width) | |
|---|---|---|---|---|---|---|---|
| in mm | in inch | in mm | in inch | in mm | in inch | in mm | in inch |
| 460 | 18.00 | 320 | 12.60 | 305 | 12.00 | 90 | 3.55 |

## Coating

We are using drawing lubricants from CONDAT, TRAXIT and also Japanese origin (There is no hazardous coating or lubricant used)

## Applications

Stainless Steel Spring Wires are used for producing various types of springs like Aerosol Spring, Compression Spring, Extension Spring, Torsion Spring as well as for Wire Form, Straight Pin etc.

These products are used for Irrigation (Sprinkler), Hardware (Lock, Faucet), Automobile, Aerospace, Medical, Electronic, Office Supply, etc.

# Chemical Composition

Chemical Composition

| TYPE | C | Mn | P | S | Si | Cr | Ni | Cu | Mo | N | Ti | Others | EQUIVALENT INTERNATIONAL STANDARDS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRADE | Max | Max | Max | Max | Max | | | | Max | Max | | | | | | | | | |
| | % | % | % | % | % | % | % | % | % | % | % | % | W. Nr. | JIS | BS | AFNOR | | UNI | |
| ***300 & 400 Series*** | | | | | | | | | | | | | | | | | | | |
| 301 | 0.12 | 2.00 | 0.045 | 0.030 | 1.00 | 16.0 / 18.0 | 6.0 / 8.0 | - - - | - - - | 0.10 | - - - | - - - | - - - | - - - | - - - | - - - | | - - - | |
| 302 | 0.12 | 2.00 | 0.045 | 0.030 | 1.00 | 17.0 / 19.0 | 8.0 / 10.0 | - - - | - - - | 0.10 | - - - | - - - | 1.4310 | SUS302 | 302S17 | Z 12CN | 17 - 07 | X 12CrNi | 1707 |
| 304 / 304H | 0.08 | 2.00 | 0.045 | 0.030 | 1.00 | 18.0 / 20.0 | 8.0 / 10.0 | - - - | - - - | - - - | - - - | - - - | 1.4301 | SUS304 | 304S15 | Z 6CN | 18 - 09 | X 5CrNi | 1810 |
| 316 | 0.08 | 2.00 | 0.040 | 0.030 | 1.00 | 16.0 / 18.0 | 10.0 / 14.0 | - - - | 2.00 / 3.00 | - - - | - - - | - - - | 1.4401 | SUS316 | 316S31 | Z 6CND | 17 - 11 | X 8CrNiMo | 1713 |
| 347 | 0.08 | 2.00 | 0.045 | 0.030 | 1.00 | 17.0 / 19.0 | 9.0 - 13.0 | - - - | - - - | - - - | - - - | Nb>=10X%C | 1.4550 | - - - | - - - | - - - | - - - | - - - | |
| 410 | 0.15 | 1.00 | 0.040 | 0.030 | 1.00 | 11.5 / 13.5 | - - - | - - - | - - - | - - - | - - - | - - - | 1.4006 | - - - | - - - | - - - | - - - | - - - | |
| 430 | 0.10 | 1.00 | 0.040 | 0.030 | 0.75 | 16.0 / 18.0 | 0.60 | - - - | - - - | - - - | - - - | - - - | 1.4016 | SUS430 | 430S17 | Z 8C17 | - - - | X 8Cr17 | |

| TYPE | C | Mn | P | S | Si | Cr | Ni | Cu | Mo | N | Ti | Others | Iron | Co | Al | W | V | Nb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AISI | Max | Max | Max | Max | Max | | | | Max | Max | | | | Max | | | | |
| | % | % | % | % | % | % | % | % | % | % | % | % | | | | | | |
| ***Nickel Alloy Grades*** | | | | | | | | | | | | | | | | | | |
| X 750 | 0.080 | 0.30 | - - - | 0.010 | 0.50 | 14.0 / 17.0 | Ni+Co 70 min. | 0.50 | - - - | - - - | 2.25 - 2.75 | - - - | 5.00 - 9.00 | - - - | 0.40 - 1.00 | - - - | - - - | 0.70 - 1.20 |
| Alloy 600 | 0.15 | 1.00 | - - - | 0.015 | 0.50 | 14.0 / 17.0 | 72 min. | 0.50 | - - - | - - - | 0.50 | - - - | 6.00 - 10.00 | 1.00 | 0.35 | - - - | - - - | 1.00 |
| Alloy 601 | 0.100 | 1.00 | - - - | 0.015 | 0.50 | 23.0 | 60.50 | 1.00 | - - - | - - - | - - - | - - - | 13.0 | - - - | 1.350 | - - - | - - - | - - - |
| Alloy 625 | 0.05 | 0.50 | - - - | - - - | 0.50 | 21.50 | 61.0 | - - - | 9.00 | - - - | 0.40 | - - - | 2.50 | - - - | 0.40 | - - - | - - - | Nb 3.65 |
| Alloy 718* | 0.045 | 0.35 | 0.010 | 0.010 | 0.35 | 17.0 / 21.0 | 50.0 - 55.0 | 0.230 | 2.80 - 3.30 | - - - | - - - | - - - | - - - | 1.00 | - - - | - - - | - - - | 4.87 - 5.20 |
| Alloy 800 | 0.06 - 0.10 | 0.60 | - - - | - - - | 0.60 | 19.0 / 23.0 | 30.0 - 35.0 | - - - | - - - | - - - | 0.15 - 0.60 | - - - | 45.0 | - - - | 0.15 - 0.60 | - - - | - - - | - - - |
| Alloy 825 | 0.050 | 1.00 | - - - | 0.030 | 0.50 | 19.5 - 23.50 | 38.0 - 46.0 | 1.50 - 3.0 | 2.50 - 3.50 | - - - | 0.60 - 1.20 | - - - | 22.0 min. | - - - | 0.20 max. | - - - | - - - | - - - |
| Hastelloy C-276 | 0.020 | 1.00 | - - - | - - - | 0.05 | 14.0 / 16.5 | Bal. | - - - | 15.0 - 17.0 | - - - | - - - | - - - | 4.0 - 7.0 | 2.50 | - - - | 3.0 - 4.5 | 0.35 | - - - |

*Age hardenable

| TYPE | C | Mn | P | S | Si | Cr | Ni | Cu | Mo | N | Ti | Others | Iron | Co | Al | W | V | Nb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AISI | Max | Max | Max | Max | Max | | | | Max | Max | | | | Max | | | | |
| | % | % | % | % | % | % | % | % | % | % | % | % | | | | | | |
| ***Others*** | | | | | | | | | | | | | | | | | | |
| 631 (17-7PH) | 0.09 | 1.00 | 0.040 | 0.030 | 1.00 | 16.0 / 18.0 | 6.50 - 7.80 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | 0.75 - 1.50 | - - - | - - - | - - - |
| 904L | 0.025 | 1.00 - 2.50 | 0.020 | 0.030 | 0.50 | 19.5 / 21.5 | 24.0 - 26.0 | 1.20 - 2.00 | 4.20 - 5.20 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| Nitronic 50 | 0.060 | 5.00 | 0.040 | 0.030 | 1.00 | 22.00 | 12.50 | - - - | 2.25 | 0.30 | - - - | - - - | Bal. | - - - | - - - | - - - | 0.20 | 0.20 |

## Tensile Strength Conversion Table

| | |
|---|---|
| 1 kg / mm² | = 1422.33 psi |
| 1 kg / mm² | = 1.422 ksi |

| | |
|---|---|
| 1 kg / mm² | = 0.635 tsi |
| 1 kg / mm² | = 9.81 N/mm² |

## Conversion Table

| | | |
|---|---|---|
| 1.0 Inch | = 2.54 cm | = 25.4 mm |
| 1.0 Metre | = 1.0936 Yards | = 3.2808 Feet |

| | |
|---|---|
| 1.0 M.T. | = 1000 kgs |
| 1.0 Kilogram | = 2.2046 Lbs (Pound Mass) |

# Quality Assurance System

## Quality Policy

*We at Raajratna are committed to satisfy the needs and expectation of the customers by manufacturing and supplying stainless steel wires, stainless steel bright bars and heat resistance wires of stated quality, timely delivery and reliable services at all times.*

*This is achieved by*

*Encouraging participation of employees.*

*Supplying reliable product assured by complying requirements and continuously improving the effectiveness of quality management system.*

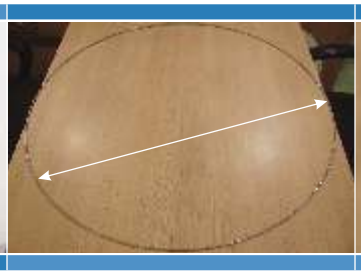
Tensile Testing

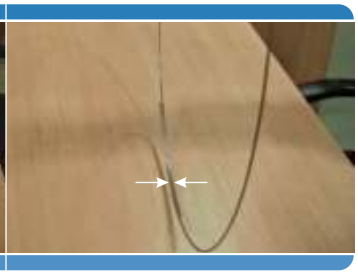

Spring wires are produced with stringent process controls to obtain homogeneous properties in wires. The cast and helix is controlled for uniform spring dimensions.

The quality is built into the product as a result of inspection and testing at various stages of production starting from raw material stage to finish product. We have also installed spectrometer for chemical analysis of incoming raw material.

Chemical Lab

Torsion Tester





Cast & Helix

# Research & Development

Upgradation of technology and continual research & developments helped us to meet critical standards of end users as per their requirements. Such infrastructure automatically leads to improved processes, world-class practices and recognised quality benchmarks enabling the company to achieve excellence in the product.



# Infrastructure & Logistics


# Raajratna's Global Presence

## Raajratna exports it's 80% of production to more than 50 countries across the globe

- Argentina
- Australia
- Austria
- Baharin
- Bangladesh
- Belgium
- Brazil
- Canada
- Chile
- China
- Colombia
- Cyprus
- Czech Republic
- Denmark
- Egypt
- Finland
- France
- Germany
- Greece
- Hong Kong
- Indonesia
- Iran
- Israel
- Italy
- Japan
- Kenya
- Kuwait
- Lithuania
- Malaysia
- Mexico
- Morocco
- Netherlands
- New Zealand
- Peru
- Phillippines
- Poland
- Portugal
- Romania
- Russia
- Saudi Arabia
- Singapore
- Slovenia
- South Africa
- South Korea
- Spain
- Sri Lanka
- Sweden
- Switzerland
- Syria
- Taiwan
- Thailand
- Turkey
- Ukraine
- U.A.E.
- U.K.
- U.S.A.
- Venezuela
- Vietnam

Exports | Office | Office & Warehouse

## *Enquiries & Orders*

**Please provide following information while forwarding your enquires and orders :**

- Size
- Grade (as per international standards) with any change from standard composition.
- Finish condition, tensile strength and surface finish
- End application
- Quantity for each size and each grade
- Delivery Schedule
- Packaging requirements - coil, spool etc. with specific dimensions
- Port of shipment / Destination

For more information please visit our **website : www.raajratna.com**

# "Raajratna" Quality so outstanding...
# ...we are proud it's Indian


## Raajratna® Metal Industries Limited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