KEI

Wires & Cables

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**KEI Industries Limited**

REGISTERED AND CORPORATE OFFICE:
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E-MAIL: info@kei-ind.com WEBSITE: www.kei-ind.com CIN NO: L74899DL1992PLC051527

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AWARDED Superbrands INDIA Consumer Validated 2023

KEI

Stainless Steel Wires

# Stainless Steel Wires

# Contents

# Introduction

KEI Industries Limited an ISO 9001:2015, ISO 14001:2015, OHSAS: 18001:2007 accredited company, started production of Stainless Steel Wires in 1994. Since its beginning KEI 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 of time, KEI has become one of the leading manufacturers & exporters of Stainless Steel Wires in Northern India. Continuous product innovation with regular upgradation of product process has earned KEI a reputed name in the domestic and international market. KEI exports its products to various countries like United Kingdom, USA, Mexico, European Countries, Africa, Australia and the far east.

KEI's Stainless Steel Wire division has a manufacturing capacity of 7200 Mt per year ranging from wire diameter 6.00 mm to 0.10 mm in various grades like AISI 304, 304L, 316, 316L, 302, 321, 304HQ, 302CHQ, 430, 434 and Electrodes grades AWS 308L, 309L, 316L, 310, 312, 430L. These wires are available with different properties such as soft, quarter hard, half hard, ¾ hard, full hard, depending upon its final application, and surface finishes such as bright, matt, coated, decoated and as per customer's specification.

# Quality Policy

- Manufacture & deliver products consistently complying with the customer requirement.
- Focusing on continual improvements & technological up-gradation in various activities aimed at achieving objectives
- Active employee participation by creating a suitable environment towards achieving total customer satisfaction.

DNV

## MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 10000375626-MSC-UKAS-IND | Initial certification date: 12 December 2000 | Valid: 30 June 2023 – 29 June 2026

This is to certify that the management system of

**KEI Industries Limited**

SP 919, 920, 922, RIICO Industrial Area, Phase- III, Bhiwadi, District: Alwar - 301019, Rajasthan, 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:

**Design, development, manufacture, marketing and services of cables, wires & conductors (HT/EHV/LT, power, control, instrumentation), thermocouples, elastomeric cables, winding & flexible wires and stainless-steel wires for wide range of applications**

Place and date: **Chennai, 26 June 2023**

For the issuing office: **DNV - Business Assurance ROMA, No. 10, GST Road, Alandur,Chennai - 600 016, India**

**Sivadasan Madiyath**
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV Business Assurance UK Limited, 4th Floor, Vivo Building, 30 Stamford Street, London, SE1 9LQ, United Kingdom - TEL: +44(0) 203 816 4000. www.dnv.co.uk

DNV

## MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 10000375627-MSC-UKAS-IND | Initial certification date: 30 June 2011 | Valid: 30 June 2023 – 29 June 2026

This is to certify that the management system of

**KEI Industries Limited**

SP 919, 920, 922, RIICO Industrial Area, Phase- III, Bhiwadi, District: Alwar - 301019, Rajasthan, India

and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard:

**ISO 14001:2015**

This certificate is valid for the following scope:

**Design, development, manufacture, marketing and services of cables, wires & conductors (HT/EHV/LT, power, control, instrumentation), thermocouples, elastomeric cables, winding & flexible wires and stainless steel wires for wide range of applications**

Place and date: **London, 26 June 2023**

For the issuing office: **DNV - Business Assurance 4th Floor, Vivo Building, 30 Stamford Street, London, SE1 9LQ, United Kingdom**

**Doug Milne**
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV Business Assurance UK Limited, 4th Floor, Vivo Building, 30 Stamford Street, London, SE1 9LQ, United Kingdom - TEL: +44(0) 203 816 4000. www.dnv.co.uk



CISQ AUTOMOTIVE
Consorzio di Ingegneria di Certificazione Italiani dei sistemi di gestione aziendale accreditato IATF
www.cisqautomotive.it

*CISQ AUTOMOTIVE is a IATF accredited Consortium of Italian Certification Bodies for company management systems*

***CERTIFICATE No.*** **TS/44622/23**

IT IS HEREBY CERTIFIED THAT THE QUALITY MANAGEMENT SYSTEM OF

**KEI INDUSTRIES LIMITED**

PHASE III, SP - 920 KEI INDUSTRIES LIMITED, RIICO INDUSTRIAL AREA, BHIWADI ALWAR 301019 INDIA

IN THE FOLLOWING OPERATIONAL UNITS

USI: 69G2KL - PHASE III, SP - 920 KEI INDUSTRIES LIMITED, RIICO INDUSTRIAL AREA, BHIWADI ALWAR 301019 INDIA

IS IN COMPLIANCE WITH THE STANDARD AND THE SCHEME REQUIREMENTS

**IATF 16949:2016**

FOR THE FOLLOWING FIELD(S) OF ACTIVITIES

IAF:17

MANUFACTURING OF STAINLESS STEEL ROUND WIRE

*For information concerning validity of the certificate, you can visit the site www.rina.org*

*Having been assessed in accordance with "IATF 16949 certification scheme rules - 5th Edition November 2016"*
*The validity of this certificate is dependent on an annual/six monthly audit and on a complete review, every three years, of the management system*

Issue date 17.11.2023

Expiry date 16.11.2026

Paolo Teramo
Certification Compliance & Technical Support, Senior Director

**Consorzio CISQ Automotive** *Via Vallera 2 - c/o Istituto Italiano dei Plastici Srl 20900 Monza – MB*

**RINA Services S.p.A.** Via Corsica 12 - 16128 Genova Italy

THIS CERTIFICATE IS ISSUED IN CONFORMITY WITH THE IATF RULES

NOT APPLICABLE REQUIREMENTS: 8.3 - PRODUCT DESIGN

*For information concerning the validity of the certificate, you can visit site www.iatfglobaloversight.org*

IATF Certificate n. **0488577**

DNV

## MATERIAL MANUFACTURE CERTIFICATE

Certificate No.: 6663-2015-CE-IND | Inital date: 17 July, 2015 | Validity: 05 July, 2024 – 04 July, 2027

This certificate consists of 3 pages

This is to verify that:

**KEI Industries Ltd.**
SP-919, 920 & 922, Phase III, RIICO Industrial Area, Bhiwadi, Alwar - 301019, Rajasthan, India.

for

**Austenitic Stainless-Steel Wires**

has implemented and is maintaining a certified quality assurance system which has undergone a specific assessment for materials for applications covered by Directive 2014/68/EU on pressure equipment, and is found to comply with Annex I, section 4.3, for acceptance of type 3.1 material certificates according to EN 10204:2004

Further details are given in the following pages

Place and date: **Vimercate, 05 July, 2024**

**Check Validity**

For the issuing office: **DNV Business Assurance Italy S.r.l.**

**Maurizio Bellina**
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid. DMSP-5-PA-PED-05-A15 rev.0

Issuing Office: DNV Business Assurance Italy S.r.l. Via Energy Park, 14, 20871 Vimercate (MB), Italy. Tel: 039 68 99 905., www.dnv.com

# Stainless Steel Wire

### STAINLESS STEEL WIRES FOR WEAVING, HOSES, BRAIDING, FILTERS, FENCING, KNITTING, CONVEYOR BELT, REDRAWING WIRE, etc.

KEI has the ability to manufacture wire in various applications and achieve mechanical properties, to customer's application. The grades suitable for these applications are 304, 304L, 316, 316L. The surface finish of wires can be bright or matt finished and high resistance to corrosion. Having regular winding pitch and tension, they are manufactured under strict process control.

### STAINLESS STEEL WIRES FOR KNITTING

KEI's Stainless Steel Wire for knitting application is equipped with the mechanical properties (elongation, tensile strength, yield strength) and good lubrication for high productivity.

### MECHANICAL PROPERTIES

| Dia (mm) | AISI 304, 316, 304L, 316L | |
|---|---|---|
| | Tensile Strength N/mm2 (Kgf/mm2) | Elongation (%) |
| 0.10 - 0.16 | 900 max (92 max) | 30 min |
| 0.17 - 0.22 | 875 max (89 max) | 30 min |
| 0.23 - 0.40 | 850 max (87 max) | 35 min |
| 0.41 - 0.70 | 825 max (85 max) | 40 min |
| 0.71 - 1.60 | 800 max (82 max) | 40 min |
| 1.61 - 5.25 | 800 max (82 max) | 45 min |





### STAINLESS STEEL WIRES FOR WALL TIE/TYING WIRES/ RE-INFORCEMENT BARS

KEI's Stainless Steel Wire find application in construction industry. KEI manufactures Stainless Steel Wires in grades of 302, 304, 316, 316Ti, in bright as well as annealed condition, suitable to manufacture wall tie, tying wires as well as re-inforcement bars for building and construction. The sizes offered are 0.9mm to 0.8mm.

### DIAMETER TOLERANCES

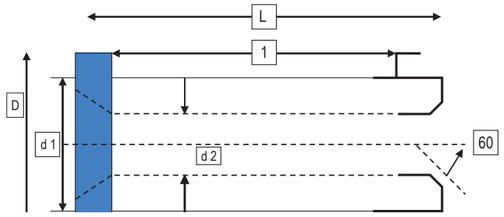
| Dia (mm) | Tolerance (mm) | Ovality (mm) |
|---|---|---|
| 0.10 - 0.11 | +/- 0.003 | 0.003 |
| 0.12 - 0.16 | +/- 0.005 | 0.005 |
| 0.17 - 0.28 | +/- 0.007 | 0.007 |
| 0.29 - 0.50 | +/- 0.010 | 0.010 |
| 0.51 - 0.90 | +/- 0.013 | 0.013 |
| 0.91 - 0.60 | +/- 0.020 | 0.020 |
| 1.61 - 2.80 | +/- 0.030 | 0.030 |
| 2.81 - 5.5 | +/- 0.030 | 0.030 |

### STAINLESS STEEL - EPQ QUALITY WIRE

| Dia (mm) | Tolerance (mm) | Mechanical properties | Coil weight (kg) |
|---|---|---|---|
| 0.60 - 1.40 | +/- 0.01 | 1/8 & 1/4 hard | 80 kgs max |
| 1.50 - 6.00 | +/- 0.025 | 1/8 & 1/4 hard | 300 kgs max |

# Packaging

## PLASTIC SPOOLS AS PER DIN SPECIFICATIONS WITH THE DIMENSIONS




## MECHANICAL PROPERTIES

| DIN | Nominal Wt. | Barrel Dia (mm) | Bore Dia (mm) | Overall Width (mm) | Traverse Length | Coil weight (kg) | Wire Weight | Wire Range |
|---|---|---|---|---|---|---|---|---|
| | (gms) | D | D1 | D2 | L | L | (kgs) | (mm) |
| 125 | 200 | 125 | 80 | 16 | 125 | 100 | 2 | 0.10-0.25 |
| 160 | 350 | 160 | 100 | 22 | 160 | 128 | 6 | 0.12-0.50 |
| 200 | 600 | 200 | 125 | 22 | 200 | 160 | 12 | 0.20-0.70 |
| 250 | 1050 | 250 | 160 | 22 | 200 | 160 | 20 | 0.30-0.80 |
| 355 | 1850 | 355 | 224 | 36 | 200 | 160 | 45 | 0.70-1.20 |

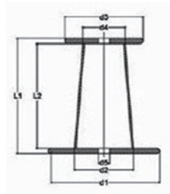
## SPECIFICATIONS FOR SOFT ANNEALED WIRES IN COILS

| Wire Dia Range (mm) | Coil Diameter in inches | | Coil Wt. (Kgs.) | | Surface Finish | Total Ht Formers+ Pallets (inches) | Total Wt. on Formers (Kgs.) |
|---|---|---|---|---|---|---|---|
| | ID | OD | Min | Max | | | |
| 5.50-2.50 | 18-22 | 25-30 | 100 | 500 | MATTE | 65 | 1000 |
| 2.49-1.60 | 18-22 | 25-30 | 100 | 500 | MATTE | 65 | 1000 |
| 1.59-1.00 | 12-14 | 20-24 | 50 | 100 | MATTE | 65 | 500 |





| Spool | Flange Dia. mm | Barrel Dia mm | Bore Dia | Over all length | Traverse mm | Wire Weight (Kg) | Wire Range (mm) |
|---|---|---|---|---|---|---|---|
| PT-25 | 225/210 | 128/108 | 32 | 278 | 248 | 25 | 0.15-0.30 |

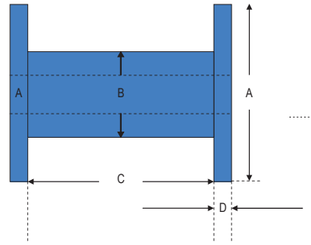


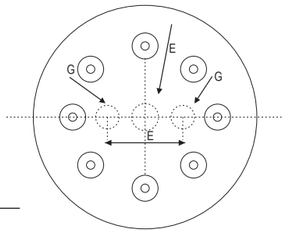
## FIBRE BOARD DRUM

| Size ranges (mm) | Drum Dimensions Inches | Weight of wire (Kg) |
|---|---|---|
| 0.80 – 1.60 | OD 20" Core 12" HT 36" | 250 Kg max. |

## WOODEN SPOOL - FOR 1/4, 1/2, 3/4 AND FULL HARD-WIRES

| Flange Dia | Barrel Dia | Traverse | Flange Flick | Centre Bore | PCD | Dughole Dia | Net Wt. |
|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | H |
| 560 | 350 | 300 | 24 | 45 | 220 | 20 | 200 kg. |
| 760 | 430 | 280 | 40 | 40 | 220 | 20 | 300 kg. |
| +/-5 | +/-3 | +/-3 | +/-1 | +/-2 | +/-2 | +/-1 | |




Full Hard 3/4, 1/2,1/4 hard wire.
Diameter ranges: 0.60 - 6.00mm.

# Welding Wire

### WIRES FOR WELDING ELECTRODES

KEI's Stainless Steel Wire for Welding Electrodes is manufactured having excellent mechanical properties, under strict guidance of technocrats. The diameter ranges from 1.60mm to 5.00mm in matt & bright finish and can supply in coil as well as in cut length. The commonly manufactured grades are AWS ER308, ER308L, ER310, ER312, ER316, ER316L.

### FILLER WIRE (TIG AND MIG)

KEI's Stainless Steel Wires for TIG in straight length and MIG Wires on spools, layer wound, TIG & MIG Wires are supplied in clean bright and matt finish. In grades are AWS ER308, ER308L, ER309, ER309L, ER310, ER312, ER316 and ER316L.

TIG Wire diameter ranges from 1.60mm to 5.00mm and in length upto 1000mm.

MIG Wire diameter ranges from 0.800mm to 1.600mm and in weight spools upto 12.50kg. apx.

### WHEN SHOULD I USE 308L, 309L OR 316L, 430L FILLER METAL?

308L (including ER308LSi) is predominately used on austenitic stainless steels, such as types 301, 302, 304, 305 and cast alloys CF-8 and CF-3. For high temperature applications such as in the electrical power industry, the high carbon 308H electrode provides better creep resistance than 308L.

316L (including ER316LSi) filler metal should be used with 316L and 316 base metals. CF-8M and CF-3M are the cast equivalents of 316 and 316L, respectively.

Use 309L (including ER309LSi) when joining mild steel or low alloy steel to stainless steels, for joining dissimilar stainless steels such as 409 to itself or to 304L stainless, as well as for joining 309 base metal. CG-12 is the cast equivalent of 309. Some 308L applications may be substituted with 309L filler metal, but 316L or 316 applications generally require Molybdenum and 309L contains no Molybdenum.

Type 430 stainless steel filler metal is ideal for 430 base materials because it matches these stabilized grades. CF-8C is the cast equivalent of 430. Type 430 filler metal is also suitable for most 308L filler metal applications.



# Cold Heading Wire

### WIRE FOR COLD HEADING

KEI's Stainless Steel Wire for Cold Heading is made by special heat treatment. Copper-bearing austenitic steel 302CHQ, 304HQ, normal 304 and 430 are also used for cold heading fasteners.

### SPECIAL CHARACTERISTICS

With excellent corrosion resistance and mechanical strength, it is the most suitable material for bolts, screws and other fasteners and has marked work hardening characteristics.

### SUPPLY CONDITIONS

KEI wires are coated to ensure smooth heading operation conditions. Cold drawn and Annealed, Cold drawn, Annealed and skin pass or as per customer's requirement with very fine tolerance.

### MECHANICAL PROPERTIES

| | | Annealed finish | | Light drawn | |
|---|---|---|---|---|---|
| Type | Grade | Tensile Strength N/mm2 (Kgf/mm2) | Elongation (%) | Tensile Strength N/mm² (Kgf/mm²) | Elongation (%) |
| Austenite | AISI 304/316 | 590-740 (60-75) | 40 over | 650-800 (66-81) | 20 |
| | AISI 302HQ | 440-590 (45-60) | 40 over | 460-640 (47-65) | 20 |
| Ferrite | AISI 430 | 390-540 (40-55) | 20 over | 460-640 (47-65) | 5 |

### MECHANICAL PROPERTIES

| Dia (mm) | Tolerance (mm) | Ovality (mm) |
|---|---|---|
| 0.80-1.90 | +0.00 - 0.02 | 0.010 |
| 2.00-3.50 | +0.00 - 0.03 | 0.015 |
| 3.51- 5.25 | +0.00 - 0.04 | 0.020 |

### MECHANICAL PROPERTIES

| Type | Grade | Diameter | Surface Finish |
|---|---|---|---|
| Austenite | AISI 304 AISI 302HQ | 1.50 & Above | De-coated wire or stearate coated |
| | AISI 316 | 1.50 & Above | |
| Ferrite | AISI 430 | 0.80- 1.60 | Bright finish |
| | | 1.70 & Above | Matt finish |

# Spring Hard Quality Wire

## SPRING WIRES

KEI's Stainless Steel Wire for Springs are manufactured having excellent mechanical properties (surface, cast & helix) manufactured under strict guidance of technical personnel. The diameter ranges from 0.19 mm to 1.20 mm in bright finish and 0.50 mm to 6.0mm in matt finish (coated) in grade of AISI 302, 304 & 316, 321, Standard ASTM A313 and others.

## ROPE WIRES

KEI's Stainless Steel Wire for Rope Wires are manufactured having excellent mechanical properties, under strict guidance of technical personnel. The diameter ranges from 0.19 mm to 1.20mm in bright finish and 0.50 mm to 6.00 mm in matt finish (de-coated) in grade of AISI 304, 316, 321 rope specs.

## STAINLESS STEEL WIRE FOR SPRINGS HAS FOLLOWING CHARACTERISTICS

- Excellent Surface Finish
- High Corrosion Resistance
- Superior Coiling Efficiency
- High Fatigue Strength

Stainless Steel Wire for Spring is made from the selected steel. In particular to provide optimum spring efficiency, this type of wire is meticulously finished to eliminate flaws.

## OVALITY OF THE WIRE

The arithmetic difference between the two measurements of the diameter shall be not more than half the tolerance specified in table 1.

## TENSILE GRADES

The tensile grades of wires are:

- 1570 N/mm2 for wires of all qualities
- 1770 N/mm2 for bright wires quality B
- 1960 N/mm2 for bright wires quality B

These nominal values are lower limits of strength. The upper limits are equal to the lower limits in addition to the tolerance specified in table 2.

**Table 1- Tolerances on diameter**

| Nominal Dia of wire *d* | Tolerance on diameter |
|---|---|
| mm | mm |
| 0.2 < *d* < 0.4 | ±0.01 |
| 0.4 < *d* < 0.6 | ±0.015 |
| 0.8 < *d* < 0.1 | ±0.02 |
| 1 < *d* < 6 | ±0.02 |
| 1.6 < *d* < 2.4 | ±0.03 |
| 2.4 < *d* < 3.7 | ±0.03 |
| 3.7 < *d* < 5.2 | ±0.04 |
| 5.2 < *d* < 6 | ±0.05 |

**Table 2 – Tolerances on tensile grade**

| Nominal Dia of wire d | Tolerance on tensile grade |
|---|---|
| mm | mm |
| 0.2 < d < 0.5 | 390 |
| 0.5 < *d* < 1 | 350 |
| 1 < *d* < 1.5 | 320 |
| 1.5 < *d* < 2 | 290 |
| 2 < *d* | 260 |

**Note:** Other tensile grades may be used on agreement between the manufacturer and the supplier.

## REVERSE BEND STRENGTH

This test applies only to wire of nominal diameter between 0.5 mm inclusive and 3.7 mm inclusive. For wires of nominal diameter less than 0.5 mm, the wire shall withstand without breaking the minimum number of reverse bends specified in table 3 for the appropriate diameter, tensile grade and finish. The radius of curvature for the supports for the various wire diameters is also given. If the tensile grade of a wire lies between two tensile grades given in Table 3, then the number of reverse bends for the next upper tensile grade shall be chosen.

**Note:** The reverse bend test is not mandatory for wires to correspond with this international standard.



Spring Hard Quality Wire

## MECHANICAL PROPERTIES

| DIN | Nominal Wt. | Barrel Dia (mm) | Bore Dia (mm) | Overall Width (mm) |
|---|---|---|---|---|
| CAST / PITCH OR HELIX | 0.40 – 0.85 | 300 | 300 – 450 | 90 under |
| | 0.90 – 1.40 | 400 | 400 – 600 | 100 under |
| | 1.50 – 6.00 | 600 | 600 – 900 | 100 under |

## CAST AND HELIX (PITCH)

| Nominal dia of wire d (mm) | Radius of Curvature of Supports (mm) | Minimum of reverse bends | | | |
|---|---|---|---|---|---|
| | | Quality B | | | Quality A |
| | | Tensile grade | | | |
| | 1570 | 1770 | 1960 | 1570 | |
| 0.5 < d < 0.55 | 1.75 | 15 | 14 | 13 | - |
| 0.55 < d < 0.6 | | 14 | 13 | 12 | - |
| 0.6 < d < 0.65 | | 12 | 11 | 10 | - |
| 0.65 < d < 0.7 | | 11 | 10 | 9 | - |
| 0.7 < d < 0.75 | 2.5 | 15 | 14 | 13 | 12 |
| 0.75 < d < 0.8 | | 14 | 13 | 12 | 11 |
| 0.8 < d < 0.85 | | 13 | 12 | 11 | 10 |
| 0.85 < d < 0.9 | | 11 | 10 | 9 | 8 |
| 0.9 < d < 0.95 | | 10 | 9 | 8 | 7 |
| 0.95 < d < 1 | | 10 | 9 | 8 | 7 |
| 1 < d < 1.1 | 3.75 | 15 | 14 | 13 | 12 |
| 1.1 < d < 1.2 | | 13 | 12 | 11 | 10 |
| 1.2 < d < 1.3 | | 12 | 11 | 10 | 9 |
| 1.3 < d < 1.4 | | 10 | 9 | 8 | 7 |
| 1.4 < d < 1.5 | | 9 | 8 | 7 | 6 |
| 1.5 < d < 1.6 | 5 | 12 | 11 | 10 | 9 |
| 1.6 < d < 1.7 | | 11 | 10 | 9 | 8 |
| 1.7 < d < 1.8 | | 10 | 9 | 8 | 7 |
| 1.8 < d < 1.9 | | 9 | 8 | 7 | 6 |
| 1.9 < d < 2 | | 8 | 7 | 6 | 5 |
| 2 < d < 2.1 | 7.5 | 13 | 12 | 11 | 10 |
| 2.1 < d < 2.2 | | 12 | 11 | 10 | 9 |
| 2.2 < d < 2.3 | | 11 | 10 | 9 | 8 |
| 2.4 < d < 2.5 | | 10 | 9 | 8 | 7 |
| 2.5 < d < 2.6 | | 9 | 8 | 7 | 6 |
| 2.6 < d < 2.7 | | 8 | 7 | 6 | 5 |
| 2.7 < d < 3 | | 7 | 6 | 5 | 4 |
| 3 < d < 3.1 | 10 | 11 | 10 | 9 | 8 |
| 3.1 < d < 3.2 | | 10 | 9 | 8 | 7 |
| 3.2 < d < 3.3 | | 9 | 8 | 7 | 6 |
| 3.3 < d < 3.4 | | 9 | 8 | 7 | 6 |
| 3.4 < d < 3.5 | | 8 | 7 | 6 | 5 |
| 3.5 < d < 3.6 | | 7 | 6 | 5 | 4 |
| 3.6 < d < 3.7 | | 7 | 6 | 5 | 4 |

## PACKING (COIL WT AND COIL DIA FOR HARD WIRES)

| Full Hard Kgs | | | | |
|---|---|---|---|---|
| *From* | *To* | *ID"* | *OD"* | *Coil* Wt Max |
| 0.40 | 0.85 | 8 | 16 | 30 |
| 0.90 | 1.40 | 14 | 22 | 60 |
| 1.50 | 6.00 | 18 | 30 | 250 |

# Wires for General Purpose

## PRODUCT RANGE

Stainless Steel Wires are used in Engineering, Chemical, Construction and many other industries besides various types of application in manufacturing of KITCHEN WARES, ORNAMENTS, UTENSILS, WALL TIE/TYING WIRES. Stainless Steel Wires at KEI are manufactured as per INTERNATIONAL STANDARDS as well as in accordance with customer's specifications.

## SPECIAL CHARACTERISTICS

- Produced from Wire Rods meeting International Standards
- Supplied in annealed, 1/8 hard, 1/4 hard & 1/2 hard, 3/4 hard, full hard conditions
- Drawn to very close tolerance limit
- Excellent surface finish
- Quality checked at each process stage

## CHEMICAL COMPOSITION

Available in complete range of Stainless Steel as per AISI, DIN, JIS and BS standards.

## WIRE FOR SCRUBBER

KEI's Stainless Steel Wire for Scrubber application has very bright smooth finish and its extra softness enables further cold working by the customers.

## SPECIFICATIONS FOR SCRUBBER APPLICATION IN SPOOL PACKAGING

| Diameter (mm) | Type of Spool | Unit Weight (kg) |
|---|---|---|
| 0.80 | DIN 355, DIN 250 | 40 - 45, 18 - 22 |
| 0.12 to 0.15 | DIN 160, DIN 125 | 3 - 6, 1.5 - 3 |
| 0.15 | DIN 200 | 8 - 12 |

## SPECIFICATIONS FOR SCRUBBER APPLICATION IN SPOOL PACKAGING

| Diameter | Grade | Tensile Strength N/mm2 (kgf/mm2) | Finish Method |
|---|---|---|---|
| 0.8 | AISI 304 | 640 - 830 (65 - 85) | Annealed |
| | AISI 430<br>AISI 434 | 490 - 640 (50 - 65) | |
| 0.12 to 0.15 | AISI 304 | Max 785 (Max 80) | Annealed |
| 0.12 to 0.15 | AISI 430<br>AISI 434 | Min 1170 (Min 120) | Wet Drawn |

## PACKING SPECIFICATION FOR SCRUBBER APPLICATION IN DRUM PACKING

| Size ranges (mm) | Drum | Dimensions | Inches | Weight of wire (kg) |
|---|---|---|---|---|
| 0.80-1.20 | OD 22'' | Core 12'' | HT 36'' | 200 |



Wires for General Purpose

## WIRE (EPQ) FOR KITCHENWARE AND BASKETS

KEI has the ability to manufacture Stainless Steel Wires in bright as well as in matt finish, suitable for kitchenware and basket, grade AISI 304, in various sizes. KEI is a major market player of wires in Electropolish quality, Balls, Pins, Nails and other general application.

## MECHANICAL PROPERTIES ALONG WITH PACKING DETAILS SPECIFICATION FOR 1/8, 1/4, 1/2, 3/4 HARD TEMPER WIRES

## MECHANICAL PROPERTIES

| Temper | Wire dia range | Coil dia | | Coil Weight | Surface Finish | Total Wt. on Former |
|---|---|---|---|---|---|---|
| 1/8 hard 130 | mm | ID | OD | kg | | kg |
| | KSI Max. | 18-22 | 25-30 | 250-400 | Bright / Matt | 1000 |
| | 4.50-6.00 | 18-22 | 25-30 | 100-200 | Stearate coated | 1000 |
| | 4.50-6.00 | 18-22 | 25-30 | 100-200 | Matt (clean) | 1000 |
| | 4.50-6.00 | 18-22 | 25-30 | 250-400 | Bright | 1000 |
| | 2.00-4.50 | 18-22 | 25-30 | 100-200 | Stearate Coated | 1000 |
| | 2.00-4.50 | 18-22 | 25-30 | 100-200 | Matt (clean) | 1000 |
| | 2.00-4.50 | 18-22 | 25-30 | 250-400 | Bright | 1000 |
| | 1.50-2.00 | 18-22 | 25-30 | 100-200 | Stearate Coated | 1000 |
| | 1.50-2.00 | 18-22 | 25-30 | 100-200 | Matt (clean) | 1000 |
| | 1.50-2.00 | 18-22 | 25-30 | 250-400 | Bright | 1000 |
| | 0.90-1.40 | 14-16 | 19-22 | 50-100 | Stearate Coated | 500 |
| | 0.90-1.25 | 14-16 | 19-22 | 50-100 | Matt (clean) | 500 |
| 1/4 hard 160 KSI Max. | 0.90-1.40 | 14-16 | 19-22 | 50-100 | Bright | 500 |
| | 4.50-6.00 | 18-22 | 25-30 | 100-200 | Stearate coated | 1000 |
| | 4.50-6.00 | 18-22 | 25-30 | 100-200 | Matt (clean) | 1000 |
| | 4.50-6.00 | 18-22 | 25-30 | 250-400 | Bright | 1000 |
| | 2.00-4.50 | 18-22 | 25-30 | 100-200 | Stearate Coated | 1000 |
| | 2.00-4.50 | 18-22 | 25-30 | 100-200 | Matt (clean) | 1000 |
| | 2.00-4.50 | 18-22 | 25-30 | 250-400 | Bright | 1000 |
| | 1.50-2.00 | 18-22 | 25-30 | 100-200 | Stearate Coated | 1000 |
| | 1.50-2.00 | 18-22 | 25-30 | 100-200 | Matt (clean) | 1000 |
| | 1.50-2.00 | 18-22 | 25-30 | 250-400 | Bright | 1000 |
| | 0.90-1.40 | 14-16 | 19-22 | 50-100 | Stearate Coated | 500 |
| | 0.90-1.25 | 14-16 | 19-22 | 50-100 | Matt (clean) | 500 |
| | 0.90-1.25 | 14-16 | 19-22 | 50-100 | Bright | 500 |

# Stainless Steel Wire-Grades Chemical Composition

## CHEMICAL COMPOSITION

For different applications and products, different grades of stainless steel is used. KEI Industries keeps a very strict check on the chemical composition of its raw materials to reassure its customer's needs. The standard chemical composition of some grades of Stainless Steel offered by KEI Industries is given below.

**Raw material testing is one of the important factors which determines the quality of the finished product. Since a slight change in the chemical composition and mechanical properties in the base rod can have a major impact on the properties of the finished wire. KEI has state-of-the-art equipment for testing these features accurately.**

| TYPE AISI | C Max | Mn Max | P Max | S Max | Si Max | Cr | Ni | Cu | Mo | N | Ti | Others | Equivalent International Standards | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | % | % | % | % | % | % | % | % | % | % | W.Nr. | JIS | BSI | AFNOR | | UNI | |
| 202 | 0.15 | 7.5-10.0 | 0.06 | 0.03 | 1.00 | 17-19 | 4-6 | — | — | 0.25 | — | — | 1.4373 | SUS 202 | — | — | | — | |
| 204Cu | 0.15 | 6.5-9.0 | 0.06 | 0.03 | 1.00 | 15.5-17.5 | 1.5-3.5 | 2-4 | 1.00 | 0.05-0.25 | — | — | 1.4597 | — | — | — | | — | |
| 302 | 012 | 2.00 | 0.045 | 0.030 | 1.00 | 17.0/19.0 | 8.0/10.0 | — | — | 0.10 | — | — | 1.4310 | SUS302 | 302S17 | Z12CN | 17-07 | X12CrNi | 1707 |
| 302HQ | 0.03 | 2.00 | 0.045 | 0.030 | 1.00 | 17.0/19.0 | 9.0/10.0 | 3.0/4.0 | — | — | — | — | 1.4567 | — | 394S17 | Z2CN4 | 18-10 | — | |
| 303 | 0.12 | 2.00 | 0.200 | 0.15/0.35 | 1.00 | 17.0/19.0 | 8.0/10.0 | — | — | — | — | — | 1.4305 | SUS303 | 303S31 | Z10CNF | 18-09 | X10CrNiS | 1809 |
| 304 | 0.08 | 2.00 | 0.045 | 0.030 | 1.00 | 18.0/20.0 | 8.0/10.0 | — | — | — | — | — | 1.4301 | SUS304 | 304S15 | Z6CN | 18-09 | X5CrNi | 1810 |
| 304Cu | 0.08 | 2.00 | 0.045 | 0.03 | 1.00 | 17-19 | 8-10 | 3-4 | — | — | — | — | 1.4567 | | | Z3CNU | 18-10 | — | |
| 304L | 0.03 | 2.00 | 0.045 | 0.030 | 1.00 | 18.0/20.0 | 8.0/12.0 | — | — | — | — | — | 1.4306 | SUS304L | 304S11 | Z2CN | 18-10 | X2CrNi | 1811 |
| 316 | 0.08 | 2.00 | 0.045 | 0.030 | 1.00 | 16.0/18.0 | 10.0/14.0 | — | 2.0/3.0 | — | — | — | 1.4401 | SUS316 | 316S31 | Z6CND | 17-11 | X8CrNiMo | 1713 |
| 316LN | 0.03 | 2.00 | 0.045 | 0.030 | 1.00 | 16.5/18.5 | 11.0/14.0 | — | 2.0/3.0 | — | — | — | 1.4429 | SUS316LN | 316S62 | Z2CND | 17-13Az | X2CrNiMoN | 1713 |
| 316L | 0.03 | 2.00 | 0.045 | 0.030 | 1.00 | 16.0/18.0 | 10.0/14.0 | — | 2.0/3.0 | — | — | — | 1.4404 | SUS316 | 316S11 | Z2CND | 17-12 | X2CrNiMo | 1712 |
| 316 | 0.08 | 2.00 | 0.045 | 0.030 | 1.00 | 16.5/18.5 | 10.0/13.0 | — | 2.50/3.00 | — | — | — | 1.4436 | — | 316S16 | Z6CND | 18-12 | X5CrNiMo | 1713 |
| 316Ti | 0.08 | 2.00 | 0.045 | 0.030 | 1.00 | 16.0/18.0 | 10.0/12.0 | — | 2.0/3.0 | — | 5x%C upto 0.8 | — | 1.4571 | SUS321 | 320S31/ 320S17 | Z6CNDT | 17-12 | X6CrNiMoTi | 1712 |
| 321 | 0.08 | 2.00 | 0.045 | 0.030 | 1.00 | 17.0/19.0 | 9.0/13.0 | — | — | — | 5X%C min. | — | 1.4541 | — | 321S31 | Z6CNT | 18-10 | X6CrNiRlTi | 1811 |
| ER308 | 0.08 | 2.00 | 0.025 | 0.020 | 0.50 | 19.0/21.0 | 9.5/11.0 | — | — | — | — | — | — | — | — | — | | — | |
| ER308L | 0.02 | 1.50/2.00 | 0.025 | 0.020 | 0.50 | 19.0/21.0 | 9.5/11.0 | — | — | — | — | — | 1.4331 | — | 308S92 | Z2CNS | 20-10 | — | |
| ER309 | 0.08 | 1.50/2.50 | 0.020 | 0.015 | 0.50 | 23.0/25.0 | 12.0/14.0 | — | — | — | — | — | — | — | — | — | | — | |
| ER309L | 0.03 | 1.50/2.50 | 0.020 | 0.015 | 0.50 | 23.0/25.0 | 12.0/14.0 | — | — | — | — | — | 1.4332 | — | 309S94 | — | | — | |
| ER310 | 0.08/ 0.15 | 1.50/2.50 | 0.025 | 0.025 | 0.60 | 23.0/28.0 | 20.0/22.0 | — | — | — | — | — | 1.4842 | — | 310S94 | Z12CN | 25-20 | — | |
| ER312 | 0.15 | 2.00 | 0.025 | 0.025 | 0.50 | 29.0/32.0 | 8.5/10.0 | — | — | — | — | — | 1.4337 | — | — | — | | — | |
| ER316 | 0.08 | 2.00 | 0.020 | 0.020 | 0.50 | 18.0/20.0 | 12.0/14.0 | — | 2.20/2.75 | — | — | — | — | — | 316S92 | — | | — | |
| ER316L | 0.02 | 1.50/2.00 | 0.020 | 0.020 | 0.50 | 18.0/20.0 | 12.0/14.0 | — | 2.20/2.75 | — | — | — | 1.4430 | — | — | Z2CND | 19-13 | — | |
| 430 | 0.10 | 1.00 | 0.040 | 0.030 | 0.75 | 14.0/18.0 | 0.60 | — | — | — | — | — | 1.4016 | SUS430 | 430S17 | Z8C17 | | X8Cr17 | |
| 430F | 0.12 | 1.25 | 0.060 | 0.15/ 0.35 | 1.00 | 15.5/17.5 | — | — | — | — | — | — | 1.4104 | SUS430F | — | Z10CRF17 | | X10CrS17 | |

## TENSILE STRENGTH CONVERSION TABLE

1. $Kgf/mm^2$ x 9.81 = $N/mm^2$ = MPa
2. psi x 0.0007 = $Kgf/mm^2$
3. 1.574 x $Kgf/mm^2$ = Tsi
4. Ksi x 1000 = psi
5. Kgf/mm2 = Ksi

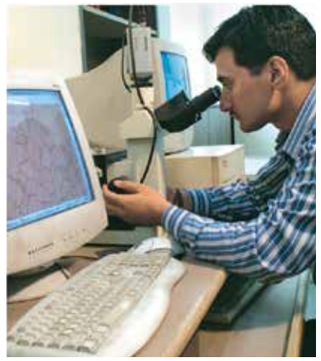
## CONVERSION TABLE

1. 1.0 Inch = 2.54 cm = 25.4 mm
2. 1.0 Meter = 1.0936 Yards = 3.2808 Feet
3. 1.0 Yard = 3.0 Feet
4. 1.0 Kilogram = 2.2046 Lbm (Pound Mass)

# Testing Equipments

### HILGER ANALYTICAL (POLYVAC 200), UK

This atomic absorption emission spectrometer is used for chemical testing of raw material (wire rod) in 22 elements. It provides the accurate element values in the raw material, ensures the re-verification of the material being used in process.



### TIRA MASCHINENBAU GMBH

An ultimate tensile testing machine providing accurate mechanical results of wire within seconds. The ultimate tensile strength, elongation, yield strength and any other parameter (as required) are reflected immediately for analyzing.

### VEB WERKZUGMASCHINENKOMBINANT, GERMANY

This is a harmless testing used for checking the hardness level in thick wire and the critical machine part, which indirectly contributes to the quality of finished product and efficiency of machines.

### DEWINTER OPTICAL INC. (METALLURGICAL MICROSCOPE)

This machine enables to look deeper into the quality of raw material and finished wires. It checks the grain size, structure, porosity and other metallurgical studies, ensures right raw material along with finished product.

### SETERO MICROSCOPE

For studying the wire surface and various levels (raw material, intermediate and finished wire).

### 10 TON ULTIMATE TENSILE TESTING MACHINE

Used for testing physical properties of raw material and thicker wires.

### 250 KGS ULTIMATE TENSILE TESTING MACHINE

Used for testing physical properties of intermediate wires (in-process material).

### 100 NEWTON ULTIMATE TENSILE TESTING MACHINE

This machine is also for testing physical properties on backup basis.

All these machines are complemented by well trained and qualified manpower to ensure the implementation of quality policy in product.



KEI
Stainless Steel Wires