KEI - THE WIRES AND CABLES SPECIALIST

KEI is one of the leading players in electrical cable industry that provides one-stop-shop solutions to its domestic and international customers. At KEI, our goal is to create values for our stakeholder by meeting the stated and implied needs of our customers, employees and the communities where we exist and do business.

KEI FACT FILE
Registered Office: New Delhi, India
Organizational Strength: More than 2000
Listed On: NSE, BSE, CSE & Luxembourg Stock Exchange
Through GDR & FCCB

FACTORY AREA
Bhiwadi: 65,943 sq. mtrs
Chopanki: 41,356.26 sq. mtrs
Silvassa: 23,195 sq. mtrs

AWARDS AND ACCREDITATIONS

PROFILE
KEI has been at the forefront of India’s wire and cable industry for the last forty years. We manufacture a range of specialized cables and are a crucial player in the domestic and retail segment. Since inception, we have firmly believed in the philosophy of constant growth and innovation. Customer satisfaction has always been our priority. A highly qualified, committed and experienced group of professionals strives to meet international standards and cater to the needs of a changing market. Our unblemished track record has earned us the patronage of leading industrial houses, project consultants and architects. In order to provide reliable and expedient services to our customers, we have created manufacturing facilities at Bhiwadi, Silvassa and Chopanki. We employ state-of-the-art equipment and adhere to international safety and environmental norms.

KEI was established in 1968 as a partnership company in the domestic wire segment. In the early seventies we started manufacturing switchboard cables and control, instrumentation and thermocouple extension cables including special application cables like fire retardant and low halogen cables. In 1993 we added power cables with PVC & XLPE insulation in our product line. During 2010 we added EHV cables up to 220 kV with technical collaborations with Brugg Kabel AG, Switzerland and diversified into EPC business. Today KEI is a one-stop shop when it comes to meeting cabling requirements for the domestic, power and industrial sectors.
MARINE & OFFSHORE CABLES

KEI is proud to supply Marine and offshore cables to important projects of Indian defense shipyards and private shipyards in India and abroad. Cables have been supplied to renowned shipyards like Mazagon Docks, Garden Reach Shipyard, Naval Dockyards, Goa Shipyard, Cochin Shipyard, Hindustan Shipyard, Larsen & Toubro, Gunsun, ONGC in India & also exported to Sime-Dorby Malaysia, ZADCO UAE, NPCC UAE, etc.

KEI offers Marine Cables complete range in categories Power, control Instrumentation, Fire Resistant, Mud resistant, High temperature cables.

CONSTRUCTION

Conductor
- Tinned or untinned copper with stranded class 2 or class 5 from 0.5 to 1000 sq mm. or 22-19 AWG to 2000Kcmil
- Solid single strand for communication cables as required.
- Standards IEC 60228, BS 6360 or UL.

For Thermocouple Cables
- KX, IX, EX, TX, KX/VX, SX/RX

Insulations
- EPDM, XLPE, Halogen free EVA based, Silicon rubber glass braided and varnished, PE, PVC
- Dual layer EPDM + HF or PVC + Polyamide(Nylon)
- Fibreglass tape Insulation as per NES standard

Fire resistant cable
- Heat barrier of glass micro tape lapped in double layer shall be provided over the conductor, before the Insulation

Sheath
- Thermoplastic Halogen free Type SHF1, Cross Linked thermo set Type SHF2 or EVA, Silicon, FR PVC, HDPE, MUD RESISTANT SHF2
- PCP, CPE or CSP sheaths for EPDM or Silicon insulated cables
- TPR Sheath
- Oil resistant sheath also available in SHF2 or SW4 grade

Braiding/ Armour
- ATC wire, plain copper, bronze, stainless steel, Aluminium alloy wire
- Copper braid of desired conductivity can be designed as required to meet installation specific requirement or to serve as Earth continuity conductor

Instrumentation Cables
- Cores twisted in pairs, Triads or Quad to form an element
- Screen provision:
  - Each element can have individual screen or shielding of Aluminium Mylar backed tape or copper Mylar backed tape.

- Each unit has ATC drain wire
- Multi element cable can have overall screen or shielding of Aluminium Mylar backed tape or copper Mylar backed tape with an ATC drain wire.
- ATC wire braiding can be offered as alternative to tape type screen for an individual element or overall screen.

Special Protection
- Cables can be supplied with special sheath like Lead alloy sheath or Polyamide(Nylon) sheath as a proven moisture barrier in highly contaminated areas

Core Identification & Sheath Color
- Standard color coding as per CENELEC for cores and Black or Grey for the sheath.
- However, we can provide any customized color coding as per project requirement.

Current Ratings
- Cables meet the respective Current rating requirements as specified by the specifications under different installation and operating conditions.
- In general Commercial ships and offshore cables rating are as per IEC 6092-552.
- Ratings of Cables as per Naval Standards are as specified in these standards.

Packing
- On wooden drums or reels as per Indian Standard.
- For overseas supply seaworthy wooden drum treated with fumigation shall be supplied.
- Plastic or Steel reels can be offered on request.
- Packing Lengths: 250/500/1000m.
- Wires In 100m reel

Testing & Inspection
- Our factory provides Routine TC for each drum. Type TC can be provided on prior request.
- Cost of Inspection at our works in India by customer or by any appointed Inspection / certification agency shall be to the buyers account.

Warranty
- Cables shall have standard warranty of 12 months from the date of installation or 18 months from the date of shipment whichever is earlier.

Datasheet
- For each order KEI shall furnish standard datasheet for each size of cable.

ROHS
- Cables not having a lead sheath are ROHS compliant
SPECIFICATION COMPLIANCE

SPECIFICATION

IEC 60092-350, 353
POWER & CONTROL Cables 0.6/1.0KV EPDM, HEPR or XLPE or Silicon rubber or PVC Insulated

NEK 606
POWER & CONTROL Cables 0.6/1.0KV EPDM insulated RFOU, RFCU, BFROU, BFRCU

NEK 606
Instrumentation Cables 250V EPDM insulated RFOU(o), RFOU(i), RFCU(o), RFCU(i), BFROU(o), BFROU(i), BFRCU(o), BFRCU(i)

IEC 60092-350, 354
POWER Cables 3, 6, 10, 15KV EPDM or XLPE Insulated

IEC 60092-350, 376
INSTRUMENTATION & CONTROL Cables 250V EPDM or XLPE or PE or Silicon rubber or PVC Insulated

BS 6883
POWER, CONTROL & Instrumentation Cables EPDM insulated up to 11KV

IEEE 1580, UL 1309
XLPE/ EPR/ EVA/ LSZH/ PVC NYLON/ POLYOLEFINE, Types E, X, T, S, T/N, LSE, LSK, LSS, P

NAVAL STANDARDS

NES 525
SMALL WIRES

NES 526 & DEFSTAN 512 P3
DUAL EXTRUDED INSULATION EPR + LFH, LFH SHEATHED POWER & CONTROL CABLES

NES 527 & DEFSTAN 512 P2
SILICON RUBBER INSULATED, GLASS FIBRE BRAIDED AND LFH SHEATHED POWER AND CONTROL CABLES

DEFSTAN 61-12
ZIFR INSULATED WIRES, CORES

VG 95218 P 60, 62 & 63
POLYOLEFINE INSULATED SCREENED INSTRUMENTATION, TYPES MGSGO, FMGSGO, FMGSGSGO

VG 95218 P 61
EPR INSULATED, SCREENED INSTRUMENTATION, TYPES LMGSGO

ONGC OFFSHORE

FS 4011
Power, Control & Instrumentation cables for Offshore Installations

FS 3508
Instrumentation cables for Offshore Installations

FIRE TESTS REFERENCE

IEC 60332-1-2 -test
Flame-retardant test for single insulated wire and cable

IEC 60332-3-22 -test
Flame-retardant (FR)-test for bunched wires and cables, category A

IEC 60754 -1.2
Halogen-evolution from insulation or sheath material

IEC 61034 series
Smoke emission test

IEC 60331-21
Fire-resistant test for the FIRE RESISTANT CABLES

NES 713, 718
Measurement of toxicity of gases evolved, where applicable
<table>
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<tr>
<th>SL No.</th>
<th>Certification Authority</th>
<th>Cable Types</th>
<th>Certificate No.</th>
<th>Manufacturing Standard Specifications</th>
<th>Types</th>
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<th>Conductor Temperature Class</th>
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<tr>
<td>1</td>
<td>DET NORSKE VERITAS (D N V) TYPE APPROVAL</td>
<td>Instrumentation and Communication Cables MUD RESISTANT &amp; FIRE RESISTANT, Flame Retardant Cat A, Halogen Free, Low Smoke</td>
<td>E - 10486</td>
<td>NEK : 606 (2009-05) (S-Types); IEC : 60092 - 376 (2003-05)</td>
<td>BFOU (I) S3 / S7 250 V; BFOU (C) S4 / S8 250 V; BFCU (I) &amp; (C) 250 V</td>
<td>250 V</td>
<td>90°C</td>
</tr>
<tr>
<td>2</td>
<td>DET NORSKE VERITAS (D N V) TYPE APPROVAL</td>
<td>Instrumentation and Communication Cables MUD RESISTANT, Flame Retardant Cat A, Halogen Free, Low Smoke</td>
<td>E - 10487</td>
<td>NEK : 606 (2009-05) (S-Types); IEC : 60092 - 376 (2003-05)</td>
<td>RFOU (I) S1 / S5 250 V; RFUO (C) S2 / S6 250 V; RFUO (I) &amp; (C) 250 V</td>
<td>250 V</td>
<td>90°C</td>
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<td>3</td>
<td>DET NORSKE VERITAS (D N V) TYPE APPROVAL</td>
<td>General Power and Lightning, MUD RESISTANT &amp; FIRE RESISTANT, Flame Retardant Cat A, Halogen Free, Low Smoke</td>
<td>E - 10488</td>
<td>NEK : 606 (2009-05) (P-Types); IEC : 60092 - 353 (2001-04)</td>
<td>BFOU P5 / P12 0.6/1 KV; BFCU 0.6/1 KV; BFOU YFD 0.6/1 KV</td>
<td>0.6/1 KV</td>
<td>90°C</td>
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<td>4</td>
<td>DET NORSKE VERITAS (D N V) TYPE APPROVAL</td>
<td>General Power and Lightning, MUD RESISTANT, Flame Retardant Cat A, Halogen Free, Low Smoke</td>
<td>E - 10489</td>
<td>NEK : 606 (2009-05) (P-Types); IEC : 60092 - 353 (2001-04)</td>
<td>RFOU P1 / P8 0.6/1 KV; BFCU 0.6/1 KV; RFOU YFD 0.6/1 KV</td>
<td>0.6/1 KV</td>
<td>90°C</td>
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<td>5</td>
<td>INDIAN REGISTER OF SHIPPING (I R S)</td>
<td>Power, Control and Instrumentation Cables, Flame Retardant Cat A, FIRE RESISTANT, Halogen Free, Low Smoke</td>
<td>2012WAC022</td>
<td>IEC : 60092 - 350, 351, 359, 60092 - 353</td>
<td>XLPE / EPR / PVC / LFH; Power &amp; Control Cables</td>
<td>0.6/1 KV</td>
<td>90°C</td>
</tr>
</tbody>
</table>

| 6     | Directorate of Quality Assurance (DOQA), Govt. Of India, Ministry Of Defence | Registration No.: DOQA/464/2008; Control No.: N0803905A |                  | IEC : 60092 - 376 Instrumentation Cables Fire Resistant 250 V |                  | 250 V | 90°C | Instrumentation Cables Fire Resistant 250 V |
|       |                                                                                |                                                             |                  | DGS 211 / NES 527 Silicon Rubber Insulated LFH Cables 440 V 105°C |                  | 440 V | 85°C | Silicon Rubber Insulated LFH Cables 440 V 105°C |
|       |                                                                                |                                                             |                  | DGS 212 / NES 526 Cable Electrical LFH type 440 V 85°C |                  | 440 V | 85°C | Cable Electrical LFH type 440 V 85°C |
|       |                                                                                |                                                             |                  | NES-09, Def Stan 63-12 Part-18, Pt-25 & Pt-51 Cable Electrical and miniature Type 0.6/1.0 KV 85°C |                  | 0.6/1.0 KV | 85°C | Cable Electrical and miniature Type 0.6/1.0 KV 85°C |
|       |                                                                                |                                                             |                  | DIN 89158 Power Cables with copper braid MCGC 250 V 85°C |                  | 250 V | 85°C | Power Cables with copper braid MCGC 250 V 85°C |
|       |                                                                                |                                                             |                  | DIN 89159 Communication cables 250 V 85°C |                  | 250 V | 85°C | Communication cables 250 V 85°C |
|       |                                                                                |                                                             |                  | DIN (V.G) 95218 Degaussing Cable 550 V 85°C |                  | 550 V | 85°C | Degaussing Cable 550 V 85°C |
|       |                                                                                |                                                             |                  | Cost, MIL C037, NES-326, 527, 518, 525, Def Stan 63-12 Part-18, Pt-25, Pt-31, and related specification LFH Cables 440 V / 250 V 90°C |                  | 440 V / 250 V | 90°C | LFH Cables 440 V / 250 V 90°C |
|       |                                                                                |                                                             |                  | IS : 7098 Part-I XLPE Insulated Cables Upto 1.1 KV 1.1 KV 90°C |                  | 1.1 KV | 90°C | XLPE Insulated Cables Upto 1.1 KV 1.1 KV 90°C |
|       |                                                                                |                                                             |                  | IS : 7098 Part-II XLPE Insulated Cables Upto 33 KV 33 KV 90°C |                  | 33 KV | 90°C | XLPE Insulated Cables Upto 33 KV 33 KV 90°C |
|       |                                                                                |                                                             |                  | IS : 9968 Part-1 and Part -II Elastomer Insulated Cables 1.1, 3.3 6.6 KV 90°C |                  | 1.1, 3.3 | 6.6 KV | Elastomer Insulated Cables 1.1, 3.3 6.6 KV 90°C |

*KEI Marine & Offshore cables have been type tested by all above authorities.*
SPECIALITY CABLES

- MINING Cables: Rubber flexible trailing cables, Landline cables, PVC and XLPE cables.
- Elastomeric cables: for Material handling, reeling duty, Pump and other applications. H07RN-F and H05RR-F VDE certified cables available.
- High Temperature Cable: Silicon and other special polymer cables.
- Cables for Sub Zero temperature Installations offshore or onshore and underground systems suitable up to -60°C.
- Solar Cables: TUV approved.
- Control Cables: In various designs and sizes.
- Instrumentation cables: As per international standards and industry specific requirements.
- Thermocouple Extension and compensating cables.
- Halogen Free cables, Non toxic cables.
- FIRE SURVIVAL cables meeting C W 2 and other international categories.
- Cables with Lead Alloy sheath as per IEC and EEMUA.
- Field Bus cables.
- Composite cables having combinations of different types.
- Motor coil leads, Power and control cables for machines and Industry.

TESTING FACILITIES

TEST LABORATORY Certified: ISO / IEC 17025 Bhimwadi factory.

Inspection Authorities visiting: ABS, BS, BSI, BYQI, Crown, CSA, DASEIN, DNV, EIL, ERDA, Intertek, IRS, JACOBS, KAYNER, LRS, RITES, SGS, Tata Projects, TOYO, TUV & VDE etc.

EHV cables tested at CPRI, KEMA, 220KV Type Test at FGH Engineering & Test GmbH Lab (CESI) at the Mannheim Germany.
INSTALLATION RECOMMENDATIONS

The minimum recommended installing bending radius shall be in accordance with IEC 60092-352.

Reel-to-Reel Rewinding

Setup for overhead, into tray

20 ft.