



API 17E / NACE MR0175 downhole TEC

TEC / Tubing Encapsulated Cable

1/4" Alloy 825 / 316L tubing-encapsulated downhole gauge cable (15,000–25,000 psi)



API 17E & NACE MR0175

1/4" (6.35 mm) Alloy 825 / 316L

15,000–25,000 psi · Up to +230 °C

Application

High-pressure, sour-service Tubing Encapsulated Cable (TEC) engineered to API 17E and NACE MR0175 (ISO 15156) with 18/16 AWG copper cores, FEP/PEEK-PFA dielectric, cold-drawn 1/4" (6.35 mm) Alloy 825 or 316L tube and 11×11 mm PVDF/PP encapsulation.

Typical uses: Onshore & Offshore Oil & Gas Well Completions, Permanent Downhole Pressure/Temperature Gauges (PDHG), Intelligent Completions & Interval Control Valves (ICV), ESP Downhole Monitoring & Carbon Capture (CCUS) Wells, Geothermal & Deep HPHT Sour-Gas Wells

Construction



Cross-section, not to scale

- 1 High-conductivity copper downhole conductor
- 2 High-temperature fluoropolymer dielectric & filler matrix
- 3 Seamless / orbital-welded & cold-drawn 1/4" metallic tube
- 4 11 × 11 mm square (0.433" × 0.433") polymeric encapsulation

Technical data

Typical values

Operating voltage rating	600 V rms (1000 V DC continuous downhole gauge excitation)	Max. conductor DC resistance @ 20 °C	≤ 21.4 Ω/km (18 AWG / 0.82 mm ²) · ≤ 13.5 Ω/km (16 AWG / 1.31 mm ²)
Metallic tube return resistance @ 20 °C	≈ 68 Ω/km (825 0.035") · 51 Ω/km (825 0.049") · 44 Ω/km (316L)	Insulation resistance @ 20 °C	≥ 5,000 MΩ·km (5 GΩ·km) at 1,000 V DC
Mutual capacitance (1C to tube)	≈ 125 to 145 pF/m (nF/km) depending on dielectric	Operating temperature by polymer grade	+150 °C (FEP/PP) · +175 °C (PVDF) · +200 °C (FEP) · +230 °C (PEEK/PFA)
Sour service metallurgy	Hardness ≤ 22 HRC (316L) / ≤ 35 HRC (Alloy 825) per NACE MR0175 / ISO 15156	Tube outer diameter & wall thickness	1/4" (6.35 mm) OD × 0.035" (0.89), 0.049" (1.24) or 0.065" (1.65 mm)
Working / collapse pressure rating	15,000 psi / 103 MPa (0.035") · 20,000–25,000 psi / 138–172 MPa (0.049")	Core-to-tube slippage holding force	≥ 150 N/m (swaged tube grips internal filler to prevent vertical slump)
Encapsulation profile	11.0 × 11.0 mm (0.433" × 0.433") square (or custom flatpack with HCL)	Standards	API Spec 17E (ISO 13628-5), NACE MR0175 / ISO 15156, ASTM B423 & ASTM A269

Sizes

10 standard constructions

Tick the sizes you need and send this page to info@tebaoflex.com or WhatsApp +86 185 9591 3361.

Order designation	Internal core	1/4" Tube alloy & wall	Dielectric / Encapsulation	Tube OD mm	Total weight kg/km ≈	Max. downhole temp.
Single-Conductor (1×18 AWG & 1×16 AWG) Coaxial-Return Downhole Gauge TEC 7 sizes						
☐ TEC-1C18-316L-035-PP	1×18 AWG (0.82 mm ²) Solid Cu	AISI 316L · 0.035" (0.89 mm)	FEP / PP (11×11 mm)	6.35	215	+150 °C
☐ TEC-1C18-A825-035-PVDF	1×18 AWG (0.82 mm ²) Solid Cu	Alloy 825 · 0.035" (0.89 mm)	FEP / PVDF (11×11 mm)	6.35	238	+175 °C
☐ TEC-1C18-A825-049-PVDF	1×18 AWG (0.82 mm ²) Solid Cu	Alloy 825 · 0.049" (1.24 mm)	FEP / PVDF (11×11 mm)	6.35	282	+175 °C
☐ TEC-1C18-A825-049-PFA	1×18 AWG (0.96 mm ²) NPC/SPC	Alloy 825 · 0.049" (1.24 mm)	PEEK-PFA / FEP (11×11)	6.35	295	+230 °C
☐ TEC-1C16-A825-035-PVDF	1×16 AWG (1.31 mm ²) Solid Cu	Alloy 825 · 0.035" (0.89 mm)	FEP / PVDF (11×11 mm)	6.35	244	+175 °C
☐ TEC-1C16-A825-049-PVDF	1×16 AWG (1.31 mm ²) Solid Cu	Alloy 825 · 0.049" (1.24 mm)	FEP / PVDF (11×11 mm)	6.35	288	+175 °C
☐ TEC-1C16-SD2507-049-PVDF	1×16 AWG (1.31 mm ²) Solid Cu	Super Duplex 2507 · 0.049"	FEP / PVDF (11×11 mm)	6.35	280	+175 °C
Two-Conductor (2×18 AWG Twisted Pair) Isolated-Return Downhole TEC 2 sizes						
☐ TEC-2C18-A825-035-PVDF	2×18 AWG (0.82 mm ²) Twisted Pair	Alloy 825 · 0.035" (0.89 mm)	FEP / PVDF (11×11 mm)	6.35	248	+175 °C
☐ TEC-2C18-A825-049-PVDF	2×18 AWG (0.82 mm ²) Twisted Pair	Alloy 825 · 0.049" (1.24 mm)	FEP / PVDF (11×11 mm)	6.35	292	+175 °C
Hybrid Electro-Optical (1×18 AWG + 2×Single-Mode Fibre) DTS/DAS + PDHG TEC 1 sizes						
☐ TEC-1C18+2SMF-A825-049	1×18 AWG Cu + 2×SM Fibre (FIMT)	Alloy 825 · 0.049" (1.24 mm)	PFA / PVDF (11×11 mm)	6.35	290	+200 °C

– All standard configurations have a 6.35 mm (1/4") metallic tube OD and an 11.0 × 11.0 mm (0.433" × 0.433") square outer encapsulation.

Mechanical & hydraulic ratings by 1/4" tube alloy and wall

4 sizes

1/4" (6.35 mm) Tube specification	Tube ID mm	Min. yield MPa (ksi)	Working pressure psi (MPa)	Tube breaking load kN ≈
AISI 316L × 0.035" (0.89 mm) wall	4.57	205 MPa (30 ksi)	12,500 psi (86 MPa)	8.4
Alloy 825 × 0.035" (0.89 mm) wall	4.57	240 MPa (35 ksi)	15,000 psi (103 MPa)	10.2
Alloy 825 × 0.049" (1.24 mm) wall	3.87	240 MPa (35 ksi)	20,000 psi (138 MPa)	13.4
Super Duplex 2507 × 0.049" (1.24 mm) wall	3.87	550 MPa (80 ksi)	25,000 psi (172 MPa)	16.8

– Tube breaking loads exclude the additional tensile strength contributed by optional 2 × Ø 1.6 mm galvanised steel bumper wires inside the 11×11 mm encapsulation.

Standards and approvals

- ✓ API Spec 17E / ISO 13628-5 Compliant
- ✓ NACE MR0175 / ISO 15156 Sour-Gas Certified
- ✓ EN 10204 3.1 Mill & Hydrostatic Test Cert.

Certifications



Management systems: ISO 9001, ISO 14001, ISO 45001

Request a quotation

Send the size, length and destination. An application engineer replies within 2 business hours.

WhatsApp / phone

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Email

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Web

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Typical values for this cable type, based on API 17E (ISO 13628-5) / NACE MR0175 (ISO 15156) / ASTM A269 / B423. Values for your order are confirmed in the quotation. Subject to change without notice. Jiangsu Tebaoflex Special Cable Co., Ltd., Taicang, Jiangsu, China.