## Application

ÖLFLEX® ROBOT F1 UL / CSA is especially designed to withstand torsion and bending stress in once, e.g. for connecting handling tools to assembling- or welding robotics, to manipulators, for connecting to rotating or tilting tables. Usable for transmission of control- and monitoring signals or as supply cables. They are for use in dry, damp or wet locations as well as outdoors. Usage on motor drum guidance or under a strain of more then 15 N/mm² is not allowed. ÖLFLEX® ROBOT F1 UL / CSA cables are increased oil-resistant and at room temperature generally resistant against acids and caustics solutions. The outer sheath of Polyurethane is resistant against high mechanical stress, particularly to abrasion cuts, microbe proof and hydrolysis resistant. ÖLFLEX® ROBOT F1 cables, marked with ( C ) or ( D ) are screened against electromagnetic interfering effects (EMC). UL AWM approvals for USA and Canada covers the usage in factory wired equipment; field-wiring or outdoor usage is not covered.

## Design

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| Certification | UL rec. AWM 20940, cUL rec. for Canada: AWM I/II A/B 80° 600V or 1000V |
| Conductor | extra fine copper wires in acc. To IEC 60228 / VDE 0295<br>0,14mm² up to 0,5mm³ tinned copper wires, above bare copper wires. |
| Insulation | TPE compound (Thermoplastic elastomer) |
| Core identification code | up to and incl. 0,34mm² colour coded according DIN 47100.<br>up from 0,5mm²: white cores with black numbers, version “G” with protective conductor GNYE.<br>Version “X” = without protective conductor (GNYE). |
| Stranding | Cores arranged in layers, versions up from 12 cores and more: cores arranged in groups of bundles of cores with adhesive-free slip tape wrapping. |
| Screen | Screened version: Braiding (C) or helix (D) of tinned copper wires over slip-tape wrapping |
| Outer sheath | Polyurethane compound TMPU acc. HD 22.10 S1 and UL AWM Style 20940, colour: black, matt. |

## Electrical properties at 20°C

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| Peak operating voltage | Sizes up to and incl. 0,34mm²: 350V (not for power applications) |
| Rated voltage | IEC: up to sizes 0,5mm² $U_0/U$: 300/500 V,<br>UL & CSA: sizes ≤ 1,5mm²: 600V,<br>sizes ≥ 2,5mm²: 1000V |
| Test voltage | up to 0,34mm²: 1500 V AC<br>up from 0,5mm²: 2000 V AC |

## Mechanical and thermal properties

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| Minimum bending radius | occasional flexing: 10 x outer diameter<br>fixed installation: 4 x outer diameter |
| Temperature range | for flex. applications -40 °C up to +80 °C max. conductor temperature<br>fixed installation -50 °C up to +80 °C max. conductor temperature |
| Torsional stress | max. torsion angle:<br>± 360°/m (unshielded version)<br>± 180°/m (shielded version) |
| Flammability | flame retardant acc. to IEC 60332-1-2 resp. VDE 0482-332-1-2 |
| Oil resistance | according to VDE 0472 part 803 test methode B |
| Tests | acc. UL & CSA, VDE 0472 & IEC 60 811 resp. VDE 0473 |
| General requirements | with up to 0.34 mm²: These cables are conform to the EU-Directive 2011/65/EU (RoHS, Restriction of the use of certain hazardous substances).<br>more than 0.5 mm²: These cables are conform to the EU-Directive 2014/35/EU (Low Voltage Directive) |