ISO 19642-2:2019 (E)

Road vehicles — Automotive cables — Part 2: Test methods

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Specifications

4.1 General test conditions
4.2 Safety concerns
4.3 Ovens

5 Test methods for single core cables

5.1 Dimensional tests
5.1.1 General
5.1.2 Cable outside diameter
5.1.2.1 Purpose
5.1.2.2 Test specimen
5.1.2.3 Test
5.1.3 Insulation thickness
5.1.3.1 Purpose
5.1.3.2 Test specimens
5.1.3.3 Test
5.1.4 Conductor diameter
5.1.4.1 Purpose
5.1.4.2 Test specimens
5.1.4.3 Test
5.1.5 Cross-sectional area (CSA)
5.1.5.1 Purpose
5.1.5.2 Test of cross-sectional area, A
5.1.6 In-process cable outside diameter
5.1.6.1 Purpose
5.1.6.2 Test specimens
5.1.6.3 Test
5.2 Electrical tests
5.2.1 Conductor resistance
5.2.1.1 Purpose
5.2.1.2 Test specimens
5.2.1.3 Preparation of conductor ends
5.2.1.4 Test
5.2.2 Determination of temperature coefficients
5.2.2.1 Purpose
5.2.2.2 Test specimen
5.2.2.3 Calibration graph
5.2.2.4 4-point measurement method
5.2.2.5 Procedure
5.2.2.6 Analysis of test results, linear approximation
5.2.3 Withstand voltage
5.2.3.1 Purpose
5.2.3.2 Test specimen
5.2.3.3 Test
5.2.4 Withstand voltage after environmental testing

5.2.4.1 Purpose
5.2.4.2 Test
5.2.5 Insulation faults
5.2.5.1 Purpose
5.2.5.2 Test specimen
5.2.5.3 Test
5.2.6 Insulation volume resistivity
5.2.6.1 Purpose
5.2.6.2 Test specimen
5.2.6.3 Test
5.3 Mechanical tests
5.3.1 Strip force
5.3.1.1 General
5.3.1.2 Purpose
5.3.1.3 Test specimens
5.3.1.4 Test
5.3.2 Abrasion
5.3.2.1 General
5.3.2.2 Purpose
5.3.2.3 Test specimen
5.3.2.4 Sandpaper abrasion test
5.3.2.5 Scrape abrasion test
5.3.3 Breaking force of the finished cable
5.3.3.1 Purpose
5.3.3.2 Test specimens
5.3.3.3 Test
5.3.4 Cyclic bending
5.3.4.1 Purpose
5.3.4.2 Test specimens
5.3.4.3 Test
5.3.5 Flexibility
5.3.5.1 General
5.3.5.2 Purpose
5.3.5.3 Test specimen
5.3.5.4 Test
5.4 Environmental tests
5.4.1 Test specimen preparation and winding tests
5.4.1.1 Purpose
5.4.1.2 Test specimens
5.4.1.3 Test
5.4.1.4 Rotatable mandrel
5.4.1.5 Stationary mandrel
5.4.2 Long term heat ageing, 3 000 h at temperature class rating
5.4.2.1 Purpose
5.4.2.2 Test specimens
5.4.2.3 Apparatus
5.4.2.4 Test
5.4.3 Short term heat ageing, 240 h at temperature class rating +25 °C
5.4.3.1 Purpose
5.4.3.2 Test specimens
5.4.3.3 Apparatus
5.4.3.4 Test
5.4.4 Thermal overload, 6 h at temperature class rating +50 °C
5.4.4.1 Purpose
5.4.4.2 Test specimens
5.4.4.3 Apparatus
5.4.4.4 Test
5.4.5 Pressure test at high temperature
5.4.5.1 Purpose
5.4.5.2 Test specimens
5.4.5.3 Test
5.4.6 Shrinkage by heat
5.4.6.1 Purpose
5.4.6.2 Test specimens

5.4.6.3 Test
5.4.7 Low temperature winding
5.4.7.1 Purpose
5.4.7.2 Test specimens
5.4.7.3 Test
5.4.8 Cold impact
5.4.8.1 Purpose
5.4.8.2 Test specimens
5.4.8.3 Test
5.4.9 Temperature and humidity cycling
5.4.9.1 Purpose
5.4.9.2 Test specimens
5.4.9.3 Test
5.4.10 Resistance to hot water
5.4.10.1 Purpose
5.4.10.2 Test specimens
5.4.10.3 Test
5.4.11 Resistance to liquid chemicals
5.4.11.1 General
5.4.11.2 Purpose
5.4.11.3 Test setup
5.4.11.4 Test specimens
5.4.11.5 Apparatus
5.4.11.6 Test performance
5.4.12 Durability of cable marking
5.4.12.1 Purpose
5.4.12.2 Test specimens
5.4.12.3 Apparatus
5.4.12.4 Test
5.4.13 Stress cracking resistance
5.4.13.1 General
5.4.13.2 Purpose
5.4.13.3 Test specimen preparation
5.4.13.4 First temperature exposure
5.4.13.5 Cooling down and wrapping
5.4.13.6 Second temperature exposure
5.4.13.7 Cooling down and removing of mandrel
5.4.14 Resistance to ozone
5.4.14.1 Purpose
5.4.14.2 Test specimens
5.4.14.3 Apparatus
5.4.14.4 Test
5.4.15 Resistance to flame propagation
5.4.15.1 General
5.4.15.2 Purpose
5.4.15.3 Test specimen
5.4.15.4 Test

6 Test methods for sheathed cables

6.1 Dimensional tests
6.1.1 Cable outside diameter
6.1.1.1 Purpose
6.1.1.2 Test
6.1.2 Ovality of sheath
6.1.2.1 Purpose
6.1.2.2 Test
6.1.3 Thickness of sheath
6.1.3.1 Purpose
6.1.3.2 Test
6.1.4 In-process cable outside diameter
6.1.4.1 Purpose
6.1.4.2 Test specimens
6.1.4.3 Test
6.2 Electrical tests

6.2.1 Electrical continuity
6.2.1.1 Purpose
6.2.1.2 Test specimen
6.2.1.3 Test
6.2.2 Withstand voltage at final inspection
6.2.2.1 Purpose
6.2.2.2 Test specimen
6.2.2.3 Test
6.2.3 Screening effectiveness
6.2.3.1 Purpose
6.2.3.2 d.c. resistance of the screen
6.2.3.2.1 Purpose
6.2.3.2.2 Test specimen
6.2.3.2.3 Test
6.2.3.3 Surface transfer impedance — Tri-axial method
6.2.3.3.1 Purpose
6.2.3.3.2 General
6.2.3.3.3 Test specimen
6.2.3.3.4 Test
6.2.3.4 Screening attenuation — Absorbing clamp method
6.2.3.4.1 Purpose
6.2.3.4.2 General
6.2.3.4.3 Test specimen
6.2.3.4.4 Test
6.2.3.5 Screening attenuation — Tri-axial method
6.2.3.5.1 Purpose
6.2.3.5.2 General
6.2.3.5.3 Test specimen
6.2.3.5.4 Test
6.2.4 Sheath fault on screened cables
6.2.4.1 Purpose
6.2.4.2 Test specimen
6.2.4.3 Test
6.3 Mechanical tests
6.3.1 Strip force of sheath
6.3.1.1 Purpose
6.3.1.2 Test specimen
6.3.1.3 Test
6.3.2 Cyclic bending
6.3.2.1 Purpose
6.3.2.2 Test specimens
6.3.2.3 Test
6.3.3 Flexibility
6.3.3.1 General
6.3.3.2 Purpose
6.3.3.3 Test specimen
6.3.3.4 Test
6.4 Environmental tests
6.4.1 Test specimen preparation and winding tests
6.4.1.1 Purpose
6.4.1.2 Test specimens
6.4.1.3 Test
6.4.1.4 Rotatable mandrel
6.4.1.5 Stationary mandrel
6.4.2 Long-term heat ageing, 3 000 h at temperature class rating
6.4.2.1 Purpose
6.4.2.2 Test specimens
6.4.2.3 Test
6.4.3 Short term heat ageing, 240 h at temperature class rating +25 °C
6.4.3.1 Purpose
6.4.3.2 Test specimens
6.4.3.3 Test
6.4.4 Thermal overload, 6 h at temperature class rating +50 °C
6.4.4.1 Purpose

6.4.4.2 Test specimens
6.4.4.3 Test
6.4.5 Pressure test at high temperature
6.4.5.1 Purpose
6.4.5.2 Test specimens
6.4.5.3 Test
6.4.6 Shrinkage by heat of sheath
6.4.6.1 Purpose
6.4.6.2 Test specimen
6.4.6.3 Test
6.4.7 Low temperature winding
6.4.7.1 Purpose
6.4.7.2 Test
6.4.8 Cold impact
6.4.8.1 Purpose
6.4.8.2 Test specimens
6.4.8.3 Test
6.4.9 Temperature and humidity cycling
6.4.9.1 Purpose
6.4.9.2 General
6.4.9.3 Test specimens
6.4.9.4 Test
6.4.10 Resistance to liquid chemicals
6.4.10.1 Purpose
6.4.10.2 General
6.4.10.3 Test specimens
6.4.10.4 Test
6.4.11 Durability of sheath marking
6.4.11.1 Purpose
6.4.11.2 Test specimens
6.4.11.3 Apparatus
6.4.11.4 Test
6.4.12 Resistance to ozone
6.4.12.1 Purpose
6.4.12.2 Test specimens
6.4.12.3 Apparatus
6.4.12.4 Test
6.4.13 Artificial weathering
6.4.13.1 Purpose
6.4.13.2 Test specimen
6.4.13.3 Test
6.4.14 Resistance to flame propagation
6.4.14.1 Purpose
6.4.14.2 Test specimen
6.4.14.3 Test

Annex A (informative) Examples of materials and sources suppliers

Annex B (informative) Flexibility apparatus

Annex C (normative) Flame test apparatus

C.1 Test apparatus
C.2 Chamber

Page count: 58