缆慧检测 ISTCW

中国认可
国际互认
检测
TESTING
CNAS L9930

Contract No.: ISTCW24-1057

Test Report

Consigner	CALEDONIAN CABLES LIMITED
Sample Name	Railway Cable
Type and Size	ZPFU 21PR1.0mm^2 Solid CU/PE/PE bedding/DSTA /PE
Kind of test	Commission test
Sample Received Date	April 22, 2024
Test Duration	April 22, 2024 – June 4, 2024
Test Conclusion	The item of "Weathering/UV-resistance of sheath" complies with the requirements of UL 1581-2021, "Acid and alkali resistance of sheath" complies with the requirements of EN 50264-3-2:2008, the other items tested for the sample comply with the technical requirements of consigner.

Authorized by
Shanghai Intelligent Service and Technology Co., Ltd.

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ZPFU 21PR1.0mm² Solid CU/PE/PE bedding/DSTA /PE

1 Sample Description

Manufacturer	CALEDONIAN CABLES LIMITED
Type and Size	ZPFU 21PR1.0mm² Solid CU/PE/PE bedding/DSTA /PE
Quantity	20m
Marking	/
Color	Black
Source	Sent by the consigner
Status	Normal appearance

2 Testing and Verdict Standards

2.1 Testing Standards

IEC 60811-401:2012+ADM1:2017 CSV Electric and optical fibre cables - Test methods for non-metallic materials - Part 401: Miscellaneous tests - Thermal ageing methods - Ageing in an air oven

IEC 60811-404:2012 Electric and optical fibre cables - Test methods for non-metallic materials - Part 404: Miscellaneous tests - Mineral oil immersion tests for sheaths

IEC 60811-501:2012+A1:2018 Electric and optical fibre cables - Test methods for non-metallic materials - Part 501: Mechanical tests - Tests for determining the mechanical properties of insulating and sheathing compounds

EN 50264-3-2:2008 Railway applications. Railway rolling stock power and control cables having special fire performance-Cables with crosslinked elastomeric insulation with reduced dimensions. Multicore cables

UL 1581-2021 Reference Standard for Electrical Wires, Cables, and Flexible Cords

2.2 Verdict Standards

Technical requirements of consigner.

EN 50264-3-2:2008 Railway applications. Railway rolling stock power and control cables having special fire performance-Cables with crosslinked elastomeric insulation with reduced dimensions. Multicore cables

UL 1581-2021 Reference Standard for Electrical Wires, Cables, and Flexible Cords

3 Other Information

3.1 Information from the test laboratory

- The sample's name, type and size are provided by the consigner.
- This test report replaces the test report numbered TN24-3275E.

3.2 Symbol Definition

Requirement: / = no requirement in standards

Verdict: P = complying with requirement / Pass

F = not complying with requirement / Fail

N = not required

4 Mechanical properties of sheath before and after ageing

Test method: IEC 60811-501:2012+A1:2018, IEC 60811-401:2012+ADM1:2017 CSV.

Test parameters:

Ageing temperature	100	℃
Duration	240	h
Tensile speed	350	mm/min

Test Item	Unit	Requirement	Test Result	Verdict
Before ageing				
- Tensile strength	N/mm²	≥12.5	22.0	P
- Elongation at break	%	≥300	730	P
After ageing				
- Tensile strength	N/mm²	≥12.5	18.9	P
- Elongation at break	%	≥300	700	P

5 Mineral oil resistance of sheath

Test method: IEC 60811-404:2012, IEC 60811-501:2012+A1:2018.

Test parameters:

Type of oil		IRM902
Temperature	70	℃
Duration	4	h

Test Item	Unit	Requirement	Test Result	Verdict
After mineral oil resistance test				
- Tensile strength	N/mm²	≥12.5	20.9	P
- Variation of tensile strength	%	≤±30	-5	P
- Elongation at break	%	≥300	670	P
- Variation of elongation at break	%	≤±40	-8	P

6 Acid and alkali resistance of sheath

According to EN 50264-3-2:2008 Table 10.

Test method: EN 60811-404:2012, EN 60811-501:2012+A1:2018.

Test parameters:

Type of acid		N-oxalic acid solution
Type of alkali		N-sodium hydroxide solution
Temperature	23	℃
Duration	168	h

ZPFU 21PR1.0mm² Solid CU/PE/PE bedding/DSTA /PE

Test Item	Unit	Requirement	Test Result	Verdict
After acid resistance test				
- Variation of tensile strength	%	≤±30	-5	P
- Elongation at break	%	≥100	720	P
After alkali resistance test				
- Variation of tensile strength	%	≤±30	-2	P
- Elongation at break	%	≥100	720	P

7 Weathering/UV-resistance of sheath

Test method: UL 1581-2021.

Test parameters:

Irradiance	0.35	W/(m²·nm) at 340 nm (xenon-arc exposure)
Every cycle		102 min light (Black Panel Temperature 63℃) +18 min light and water spray
Duration of treatment	720	h
Tensile speed	500	mm/min

Test Item	Unit	Requirement	Test Result	Verdict
Weathering/UV-resistance				
- Retention of the tensile strength		≥0.80	0.93	P
- Retention of the elongation at break		≥0.80	0.97	P

- The End. -