



# Technical Specification

Cable Type: HSUC-5 SA- C1N4

DS  
RLEO

DS  
SRK

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LS

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AMENDMENT RECORD

| Rev. | Change description | Date       | Prepared | Checked      | Approved    | Format checked |
|------|--------------------|------------|----------|--------------|-------------|----------------|
| V1.0 | First edition      | 2024-04-02 | Wang Yue | Kang Huiling | Xu Guoxiang | Zhai Yaxing    |
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# Contents

AMENDMENT RECORD ..... 1

1. Instruction ..... 3

2. Scope ..... 3

3. References ..... 3

4. Abbreviations and definitions ..... 4

5. Description ..... 4

6. Cable Design and Physical Characteristics ..... 6

    6.1. Cross-Sectional Drawing ..... 6

    6.2. Cable Design ..... 6

7. Optical Characteristics ..... 8



1. INSTRUCTION

Hengtong HSUC-5 cable has been designed, manufactured and qualified for use in cable systems. The design and manufacture of the cable follow industry standard quality, process and safety standards and provide the following key requirements.

2. SCOPE

Applicable to outgoing documents for various projects of the company.

3. REFERENCES

| Document No.  | Document Title                                                                                           |
|---------------|----------------------------------------------------------------------------------------------------------|
| ISO 9001      | Quality management systems - requirements                                                                |
| ISO 14001     | Environmental management systems                                                                         |
| ISO 45001     | Occupational health and safety management systems                                                        |
| ITU-T G.652   | Characteristics of a single-mode optical fiber and cable                                                 |
| ITU-T G.978   | Characteristics of optical fibre submarine cable                                                         |
| IEC 60793     | Optical fibers                                                                                           |
| IEC 60794-3   | Optical fibre cable-Part3: Outdoor cables - Sectional specification                                      |
| EIA/TIA 598   | Optical fiber cable color coding                                                                         |
| ASTM E29 - 13 | Standard practice for using significant digits in test data to determine conformance with specifications |



4. ABBREVIATIONS AND DEFINITIONS

| No. | Abbr. | Document Type                        |
|-----|-------|--------------------------------------|
| 1   | FIMT  | Fiber in Metal Tube                  |
| 2   | HSUC  | Hengtong Special Unrepeated Cable    |
| 3   | HDPE  | High Density Polyethylene            |
| 4   | NOTS  | Nominal Operational Tensile Strength |
| 5   | NPTS  | Nominal Permanent Tensile Strength   |
| 6   | NTTS  | Nominal Transient Tensile Strength   |
| 7   | O.D.  | Outer Diameter                       |
| 8   | PE    | Polyethylene                         |
| 9   | PP    | Polypropylene                        |
| 10  | SA    | Single Armoured                      |
| 11  | UTS   | Ultimate Tensile Strength            |

5. DESCRIPTION

The cable has excellent optical transmission and physical performance, to meet customer requirements. HSUC-5 SA-C1N4 of unrepeated submarine cables are designed to provide a high level of mechanical protection to the optical fibers at the center of the cable construction.

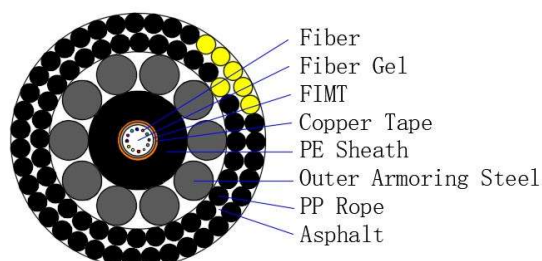
The optical fibers will be spliced and spooled on the lengths arranged from 25~50km which is depending on the fiber type. The stainless-steel tube with optical fibers will be manufactured and spliced sometimes in order to meet the required delivery length. Tube joint done before the extrusion process will not be visible on the cable surface and also improves productivity.

The outer armour wires are flooded with a bituminous compound to enhance corrosion protection, before being wrapped in polypropylene (PP) yarn to assist in handling and storing



the armour cables. Due to the PP yarn spool length limitation, the yarns will be joined in order to create a long span of submarine cable, and that causes the cable to have PP yarn knots along the cable. During handling it is possible for the yarns to be damaged and come loose for armoured cables, these areas of loose yarns can be cut back and taped off with PVC tape with no detrimental effect on the cable.

### 6.1. Cross-Sectional Drawing



| Item                    | Physical Characteristics           | Unit | Nominal Value |
|-------------------------|------------------------------------|------|---------------|
| Structure&<br>Parameter | Fiber                              | No.  | Up to 48      |
|                         | Cable Core O.D                     | mm   | Φ10.5         |
|                         | Cable O.D.                         | mm   | Φ25.3         |
|                         | Weight in air, approximately.      | kg/m | 1.40          |
|                         | Weight in seawater, approximately. | kg/m | 0.85          |

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| Item                  | Physical Characteristics               | Unit  | Nominal Value |
|-----------------------|----------------------------------------|-------|---------------|
| Nominal Specification | Water Depth                            | m     | 1000          |
|                       | Minimum Breaking Load, (UTS)           | kN    | 200           |
|                       | Nominal Transient Tensile Load, (NTTS) | kN    | 162           |
|                       | Nominal Operating Tensile Load, (NOTS) | kN    | 120           |
|                       | Nominal Permanent Tensile Load, (NPTS) | kN    | 76            |
|                       | Minimum Bending Radius. (<NPTS)        | m     | 1.0           |
|                       | Minimum Bending Radius. (>NPTS)        | m     | 1.5           |
|                       | Operating Temperature Range            | °C    | -10 to +50    |
|                       | Storage Temperature Range              | °C    | -20 to +70    |
|                       | Handling Temperature Range             | °C    | -20 to +70    |
|                       | DC Resistance@23°C*                    | Ω/km  | ≤ 8           |
|                       | Insulation Resistance                  | GΩ.km | 10            |
|                       | Operating Voltage (DC)                 | V     | 500           |
|                       | Operating voltage AC, @60Hz, RMS       | V     | 200           |

\*Temperature coefficient of DC resistance is 0.004/°C



## 7. OPTICAL CHARACTERISTICS

| ITU-T G.652D                         | Unit                   | Nominal value | ±   |
|--------------------------------------|------------------------|---------------|-----|
| Cladding Diameter                    | μm                     | 125           | 1   |
| Cladding-Core Concentricity Error    | μm                     | ≤0.6          | -   |
| Cladding Non-circularity             | %                      | ≤ 1           | -   |
| Coating Diameter (uncolored)         | μm                     | 245           | 10  |
| Coating-Cladding Concentricity Error | μm                     | ≤ 12.5        | -   |
| Mode Field Diameter, MFD @ 1310 nm   | μm                     | 9.2           | 0.4 |
| Mode Field Diameter, MFD @ 1550 nm   | μm                     | 10.4          | 0.5 |
| Attenuation @ 1310 nm                | dB/km                  | ≤ 0.36        | -   |
| *Attenuation @ 1550 nm               | dB/km                  | ≤0.19         | -   |
| Zero Dispersion Wavelength           | nm                     | 1300~1324     | -   |
| Zero Dispersion Slope                | ps/nm <sup>2</sup> ·km | ≤ 0.092       | -   |
| Chromatic Dispersion @ 1310 nm       | ps/nm·km               | ≤ 3.5         | -   |
| Chromatic Dispersion @ 1550 nm       | ps/nm·km               | ≤ 18          | -   |
| Polarization Mode Dispersion, PMD    | ps/√km                 | ≤ 0.2         | -   |
| Cable Cut-off Wavelength             | nm                     | ≤ 1260        | -   |
| Refractive Index @1550nm             | -                      | 1.4683        |     |
| Proof Test Level                     | kpsi                   | 200           | -   |

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