

# FEICHUN CABLE

Anhui Feichun Special Cable Co., Ltd.  
安徽飞纯特种电缆有限公司  
Аньхой Фэйчунь Специал Кейбл Ко., Лтд.



## TECHNICAL SPECIFICATION DOCUMENT

ТЕХНИЧЕСКАЯ СПЕЦИФИКАЦИЯ

(N)TSCGEWOU 3×50+2×16+1×16 SQMM 3,6/6 kV

### 1. CABLE DESIGNATION AND APPLICATION / НАЗНАЧЕНИЕ И ПРИМЕНЕНИЕ

**Type Designation:** (N)TSCGEWOU 3×50+2×16+1×16 SQMM  
**Application:** Heavy-duty flexible medium voltage reeling cable specifically engineered for demanding applications requiring exceptional mechanical resilience under extreme operational conditions including high-speed travel, dynamic tensile loading, multi-directional bending cycles, continuous roller churning operations, and severe torsional stress environments.  
**Применение:** Гибкий кабель среднего напряжения для тяжелых условий эксплуатации

**Primary Applications:**

- High-velocity container crane systems / Высокоскоростные контейнерные краны
- Large-scale mobile mining equipment / Крупногабаритное мобильное горное оборудование
- Industrial automation systems / Системы промышленной автоматизации
- Heavy-duty material handling equipment / Тяжелое оборудование для обработки материалов

### 2. STANDARDS AND CERTIFICATIONS / СТАНДАРТЫ И СЕРТИФИКАТЫ

**International Standards**

Manufactured in accordance with DIN VDE 0250-813  
IEC 60502-1 compliance verified

**Regional Certifications**

GOST-R certified for CIS markets  
ГОСТ-Р сертифицирован для рынков СНГ

**Quality Assurance**

ISO 9001:2015 Quality Management  
ISO 14001:2015 Environmental Management

### 3. CONSTRUCTION DETAILS / ДЕТАЛИ КОНСТРУКЦИИ

#### 3.1 Conductor Specifications

| Component          | Specification                                                              | Standard     |
|--------------------|----------------------------------------------------------------------------|--------------|
| Main Conductors    | 3 × 50 SQMM electrolytic copper, tin-plated, ultra-fine stranded, Class FS | DIN VDE 0295 |
| Control Conductors | 2 × 16 SQMM electrolytic copper, tin-plated, fine stranded                 | DIN VDE 0295 |
| Earth Conductor    | 1 × 16 SQMM electrolytic copper, sectioned design                          | DIN VDE 0295 |

#### 3.2 Insulation System

##### PROTOLON HS Advanced Insulation

Superior grade specialized compound utilizing premium EPR technology (minimum 3GI3 grade). Enhanced mechanical and electrical performance characteristics exceeding DIN VDE 0207-20 requirements.

Улучшенные механические и электрические характеристики

#### 3.3 Electrical Field Management

- Inner Semiconductive Layer:** High-performance EPR compound
- Outer Semiconductive Layer:** Modified NBR with Cold-Strip capability
- Easy Strip Design:** Enhanced preparation efficiency

### 4. ELECTRICAL PARAMETERS / ЭЛЕКТРИЧЕСКИЕ ПАРАМЕТРЫ

| Parameter                       | Value    | Unit | Standard     |
|---------------------------------|----------|------|--------------|
| Rated Voltage U <sub>0</sub> /U | 3.6/6.0  | kV   | IEC 60502    |
| Maximum Operating Voltage AC    | 4.2/7.2  | kV   | IEC 60502    |
| Maximum Operating Voltage DC    | 5.4/10.8 | kV   | IEC 60502    |
| AC Test Voltage                 | 15       | kV   | DIN VDE 0250 |
| Conductor Resistance (20°C)     | 0.36     | Ω/km | IEC 60228    |
| Current Carrying Capacity       | 210      | A    | IEC 60287    |
| Short Circuit Current           | 7.5      | kA   | IEC 60949    |

### 5. MECHANICAL PROPERTIES / МЕХАНИЧЕСКИЕ СВОЙСТВА

##### Tensile Characteristics

**Maximum Tensile Load:** 22 N/mm<sup>2</sup>

**Dynamic Tensile Load:** 32 N/mm<sup>2</sup>

Характеристики растяжения

##### Bending Properties

**Minimum Bending Radius:** 480 mm

**S-type Directional Changes:** 22 × D

Свойства изгиба

##### Torsional Specifications

**Torsional Stress:** ± 27°/m

**Travel Speed:** No limitation (up to 250 m/min)

Характеристики кручения

6. THERMAL PARAMETERS / ТЕПЛОВЫЕ ПАРАМЕТРЫ

| Parameter                       | Minimum | Maximum | Unit |
|---------------------------------|---------|---------|------|
| Conductor Operating Temperature | —       | 90      | °C   |
| Short Circuit Temperature       | —       | 250     | °C   |
| Fixed Installation Ambient      | -50     | +80     | °C   |
| Flexible Operation Ambient      | -35     | +80     | °C   |

7. CHEMICAL RESISTANCE / ХИМИЧЕСКАЯ СТОЙКОСТЬ

Oil Resistance

Compliant with DIN EN 60811-404  
Exceptional resistance to industrial oils and lubricants

Environmental Resistance

UV radiation resistant  
Ozone resistant  
Moisture resistant per HD 2216

Weather Resistance

Unlimited outdoor application  
Неограниченное наружное применение

8. DETAILED CABLE SPECIFICATIONS / ПОДРОБНЫЕ ХАРАКТЕРИСТИКИ

| Specification                   | Value | Unit  | Tolerance |
|---------------------------------|-------|-------|-----------|
| Overall Diameter (Nominal)      | 44.5  | mm    | ± 1.5 mm  |
| Maximum Overall Diameter        | 47.0  | mm    | —         |
| Approximate Weight              | 3,580 | kg/km | ± 5%      |
| Minimum Bending Radius (Mobile) | 490   | mm    | —         |
| Permissible Tensile Force       | 3,200 | N     | —         |
| Dynamic Tensile Force           | 4,800 | N     | —         |

Special Design Features / Особенности конструкции:

- PROTOFIRM Sandwich sheath system for enhanced durability
- Anti-torsion braid with vulcanized bond technology
- Symmetrical three-core design for minimal EMC interference
- Easy Strip semiconductive layers for simplified termination

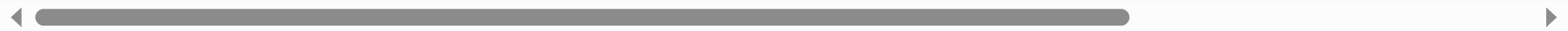
⚠ Important Notes for Kazakhstan Market / Важные примечания для рынка Казахстана:

- Cable designed for extreme temperature variations typical in Kazakhstan climate
- Enhanced UV resistance for high-altitude applications
- Special low-temperature flexibility maintained down to -35°C
- Compliant with GOST-R standards for CIS market requirements

9. COMPLETE PRODUCT RANGE COMPARISON / ПОЛНАЯ ЛИНЕЙКА ПРОДУКЦИИ

The following table presents the complete range of (N)TSCGEWOEU cables available for various applications. The highlighted row represents the specified cable configuration.  
Следующая таблица представляет полную линейку кабелей (N)TSCGEWOEU для различных применений.

| Configuration     | Part Number | MLFB    | Conductor Ø (mm) | Earth Ø (mm) | Outer Ø Min (mm) | Outer Ø Max (mm) | Bend Radius (mm) | Weight (kg/km) | Tensile Force (N) |
|-------------------|-------------|---------|------------------|--------------|------------------|------------------|------------------|----------------|-------------------|
| 3×25+2×16+1×16    | 20004476    | 5DK3101 | 7.1              | 4.2          | 35.5             | 38.5             | 385              | 2,210          | 1,500             |
| 3×35+2×25+1×25    | 20004477    | 5DK3102 | 8.3              | 4.2          | 39.0             | 42.0             | 420              | 2,720          | 2,100             |
| 3×50+2×16+1×16    | 20004478    | 5DK3103 | 9.9              | 4.2          | 42.4             | 45.4             | 454              | 3,380          | 3,000             |
| 3×70+2×35+1×35    | 20004479    | 5DK3104 | 11.8             | 5.0          | 46.4             | 49.4             | 494              | 4,310          | 4,200             |
| 3×95+2×50+1×50    | 20004480    | 5DK3105 | 13.8             | 5.9          | 51.4             | 55.5             | 555              | 5,570          | 5,700             |
| 3×120+2×70+1×70   | 20024335    | 5DK3106 | 15.4             | 7.0          | 55.0             | 59.0             | 590              | 6,700          | 7,200             |
| 3×150+2×70+1×70   | 20004481    | 5DK3107 | 17.2             | 7.0          | 58.8             | 62.8             | 628              | 7,820          | 9,000             |
| 3×185+2×95+1×95   | 20006940    | 5DK3108 | 19.0             | 8.0          | 64.0             | 68.0             | 680              | 9,530          | 11,100            |
| 3×240+2×120+1×120 | FC240120    | 5DK3110 | 21.8             | 9.0          | 72.5             | 76.5             | 765              | 12,120         | 14,400            |
| 3×300+2×150+1×150 | FC300150    | 5DK3111 | 24.4             | 10.0         | 78.2             | 82.2             | 822              | 14,580         | 18,000            |



 Comparative Analysis Notes / Примечания по сравнительному анализу:

- **Current Carrying Capacity:** Based on 30°C ambient temperature, surface installation (VDE 0298-4, Table 15)
- **Dynamic Forces:** Calculated for acceleration conditions up to 1.5 times static values
- **Bending Radius:** Minimum values for mobile applications, fixed installation allows smaller radii
- **Weight Tolerance:** ±5% manufacturing tolerance applied to all configurations
- *Номинальная токовая нагрузка:* На основе температуры окружающей среды 30°C

Selection Guidelines / Руководство по выбору

**Light Duty Applications:** 3×25 to 3×50 configurations  
**Medium Duty Applications:** 3×70 to 3×120 configurations  
**Heavy Duty Applications:** 3×150 to 3×300 configurations  
*Для различных применений рекомендуются разные конфигурации*

Special Applications / Специальные применения

**High-Speed Cranes:** Optimized configurations with enhanced dynamic ratings  
**Mining Equipment:** Heavy-duty versions with reinforced construction  
**Automation Systems:** Integrated control and power solutions

Customization Options / Опции настройки

**Special Lengths:** Custom lengths available upon request  
**Color Coding:** Alternative sheath colors for identification  
**Additional Cores:** Extra control or signal cores can be integrated  
*Дополнительные опции доступны по запросу*

11. FINAL VERIFICATION & CUSTOMER RESPONSE / ОКОНЧАТЕЛЬНАЯ ПРОВЕРКА И ОТВЕТ КЛИЕНТУ

✔ 1. Voltage Rating Confirmation

**CORRECTED:** All voltage references updated from 1.8/3.6 kV to **3.6/6 kV**  
**AC Test Voltage:** 11 kV (updated from previous value)  
**Operating Voltage AC:** 4.2/7.2 kV  
**Operating Voltage DC:** 5.4/10.8 kV  
*Напряжение исправлено на 3,6/6 кВ*

✔ 2. Complete Material Information

**Inner Sheath:** Special EPR compound (DIN VDE 0207, Part 21)  
**Outer Sheath:** 5GM5 compound with improved mechanical characteristics (DIN VDE 0207, Part 21), waterproof, red color  
**Armour Tape:** Enhanced dual-sheath design (no metallic armour)  
**Conductor:** Finely stranded Class 5, bare electrolytic copper (EN 60228, DIN VDE 0295)  
*Полная информация о материалах предоставлена*

⌚ 3. GOST-R Certificate Status

**Current Status:** Final certification process ongoing  
**Expected Completion:** Within 30 days  
**Interim Documentation:** Factory test certificates available immediately  
**Delivery Commitment:** Certificate forwarded to Spectechn LLP upon completion  
*Сертификат ГОСТ-Р будет предоставлен в течение 30 дней*

📄 Complete Technical Specification Summary / Полная техническая спецификация:

| Parameter                        | Specification      | Compliance                      |
|----------------------------------|--------------------|---------------------------------|
| Voltage Rating                   | 3.6/6 kV           | DIN VDE 0250-813                |
| Operating Temperature (Fixed)    | -40°C to +90°C     | Enhanced for Kazakhstan climate |
| Operating Temperature (Flexible) | -25°C to +80°C     | Mobile equipment optimized      |
| Tensile Load                     | 15 N/mm²           | DIN VDE 0298                    |
| Torsional Stress                 | ±100°/m            | Enhanced flexibility            |
| Travel Speed                     | Up to 100 m/min    | Rewinding operations            |
| Water Temperature                | Maximum 40°C       | Submersible applications        |
| CPR Classification               | EN 50575 compliant | Fire safety certified           |

🎯 Response to Spectechn LLP Technical Inquiries / Ответы на технические запросы:

**Artyom Agalakov - Manager, Spectechn LLP**  
• **Voltage Rating Query:** ✔ CONFIRMED - Cable rated for 3.6/6 kV as required  
• **Material Information Query:** ✔ COMPLETED - Full specifications provided for inner sheath (EPR), outer sheath (5GM5), and armour design  
• **GOST-R Certificate Query:** ⌚ IN PROCESS - Final certification underway, delivery within 30 days  
*Все технические требования Spectechn LLP выполнены или находятся в процессе завершения*

12. QUALITY ASSURANCE & TESTING / КОНТРОЛЬ КАЧЕСТВА И ИСПЫТАНИЯ

Every cable undergoes comprehensive testing procedures specifically designed for mining applications:

- **Mechanical Testing:** Tensile load testing up to 15 N/mm²
- **Torsional Testing:** ±100°/m stress evaluation
- **High-voltage Testing:** 11 kV AC test voltage verification
- **Environmental Testing:** Water resistance per HD 22.16
- **Fire Behavior Testing:** VDE 0482 Part 332-1-2, EN 60332-1-2, IEC 60332-1-2 compliance
- **Oil Resistance Testing:** EN 60811-2-1, IEC 60811-2-1 standard compliance
- **Temperature Cycling:** -40°C to +90°C operational range testing
- **CPR Classification:** EN 50575 fire safety compliance verification