



# ZTT Fittings and Insulators

Honorary Quality, Customer Oriented and Strivers Founded

2022

- 1 General Introduction
- 2 Products & Services
- 3 Quality Management
- 4 Facilities & Capacities
- 5 Typical References





# General Introduction



1992

ESTABLISHED

80<sup>+</sup>

GLOBAL PLANTS

16,000<sup>+</sup>

EMPLOYEES

160

GLOBAL  
MARKETS

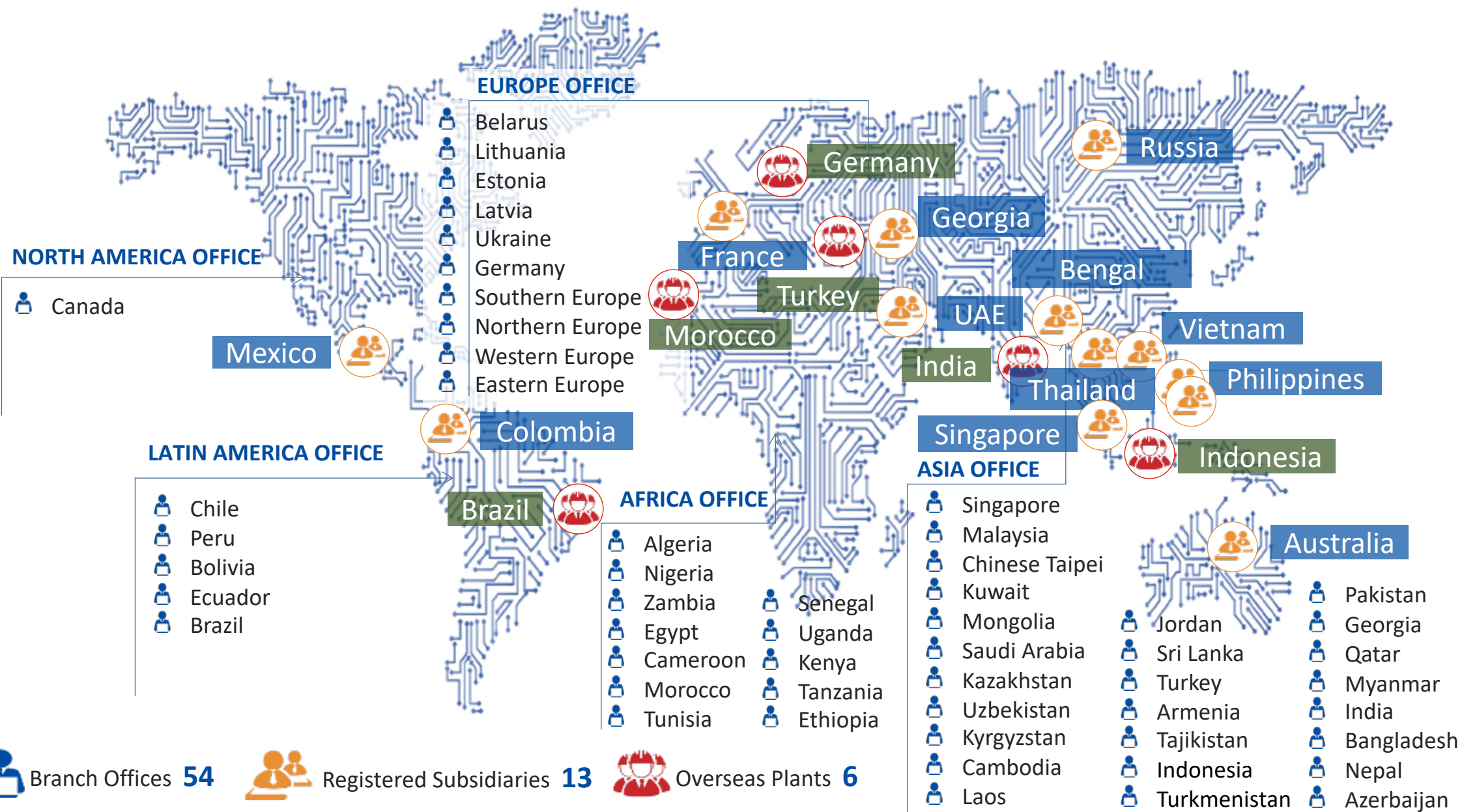
\$12.5

BILLION  
REVENUE.2021

2002

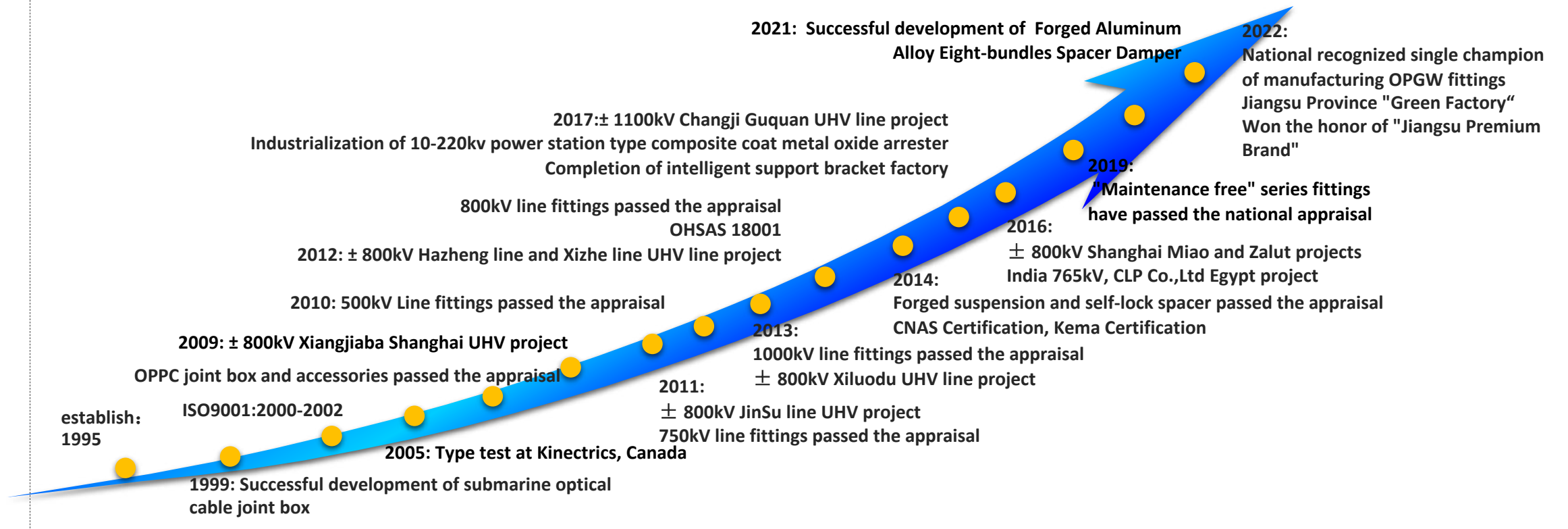
LISTED

# Branch Offices & Registered Subsidiaries





- Establishment time: 1995
- Total floor area: 146000 m<sup>2</sup>
- Plant area: 118000 m<sup>2</sup>
- Testing Center: 2376 m<sup>2</sup>
- Location: Nantong City, Jiangsu Province



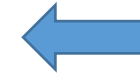
**Mao Xinguo**  
CEO



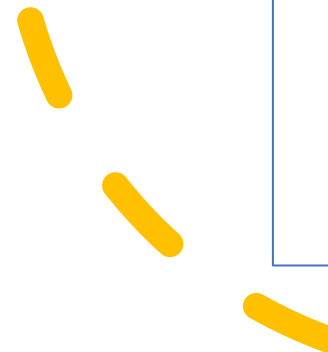
- Rich experience more than 20 years in hardware industry;
- Has a number of hardware patents;
- Achieved National Senior Engineer Certificate;
- Achieved Master's degree Certificate.

- 
- Former CTO of DULMISON Group based in UK
  - Former CEO of DULHUNTY in Australia
  - Former Managing Director of MACLEAN in Australia
  - Chief Scientist of APAC
  - Committee Member of AS, IEEE, CIGRE
  - Over 35 years of research on anti-vibration fittings for T&D lines

Experience



**John Christopher  
(Jack) ROUGHAN**  
(AUSTRALIA)  
Chief Technical  
Officer



## Products & Services



# WHAT WE CAN DO...

## Hardware/Fittings

LV/HV/EHV/UHV

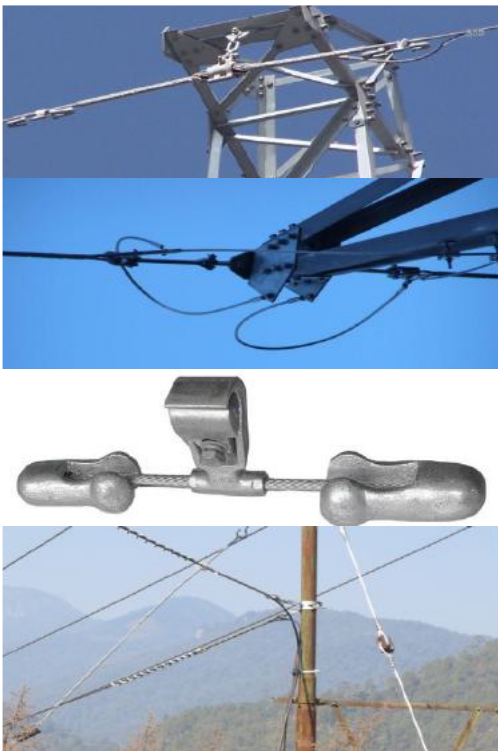
Aerial Optic Fiber  
Cables

Communication  
accessories

Rural power  
grid

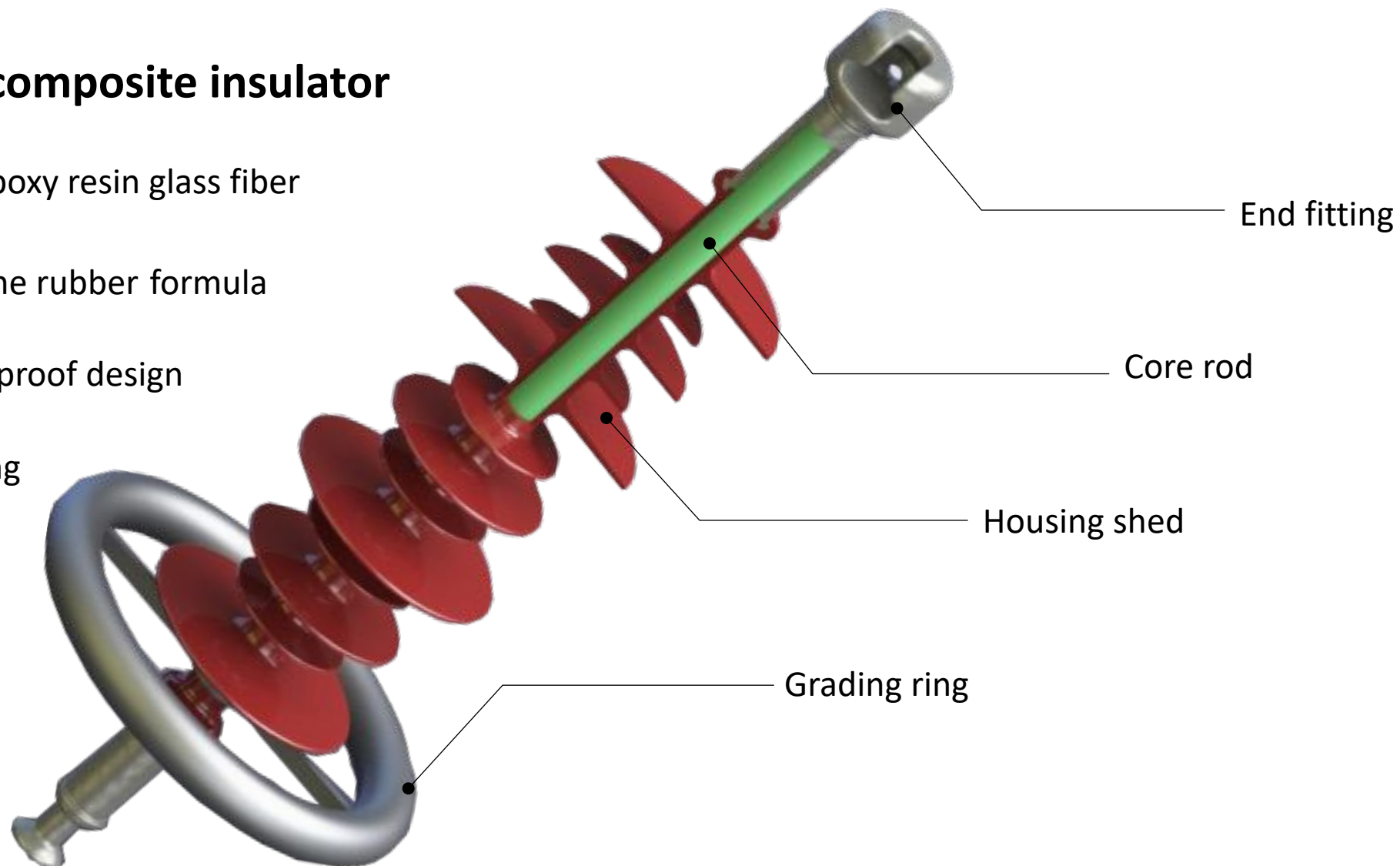
Lightnig  
arrester

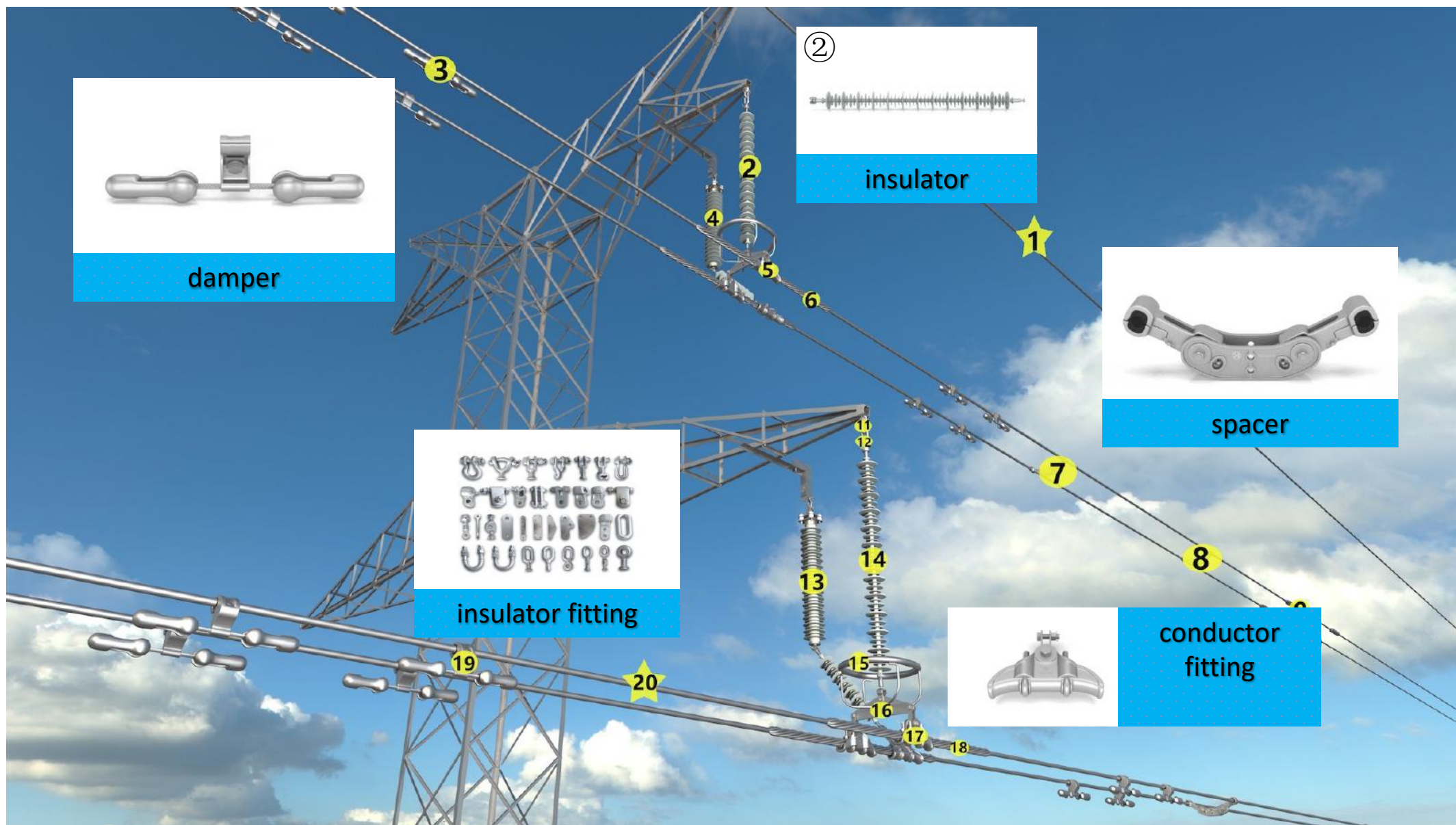
Composite  
Insulators



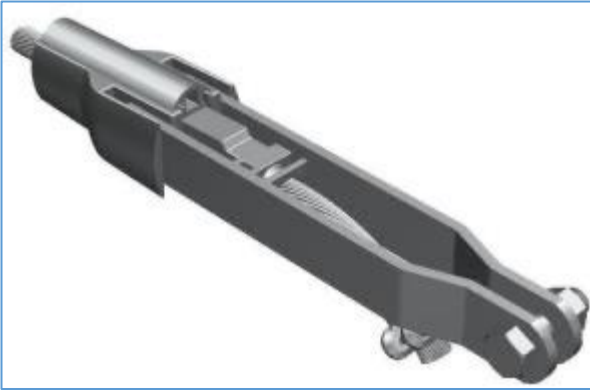
## Structure of composite insulator

- 💡 High strength epoxy resin glass fiber
- 💡 Advanced silicone rubber formula
- 💡 Labyrinth waterproof design
- 💡 Ultrasonic testing





## ZTT Wedge Clamp



### Characteristics:

- Non-compression clamp
- No need cutting off the conductor
- Energy-saving clamp
- Enough mechanical strength
- Wedge type clamp
- Without contact resistance increase

## Forged Suspension Clamp



### Characteristics:

- Half weight, double strength
- Energy-saving
- Environment-friendly
- Emissions of carbon is much lower
- Resource-saving
- Own intellectual property rights
- Wear-resistant
- Forged

## Self-locking Spacer



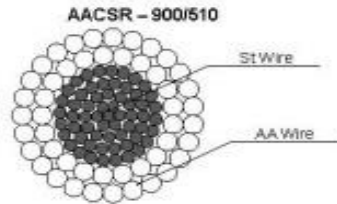
### Characteristics:

- Quickly installation
- Dual defensive function

# High Strength Compression Tension clamp

## 4. Construction and Specification for AACSR

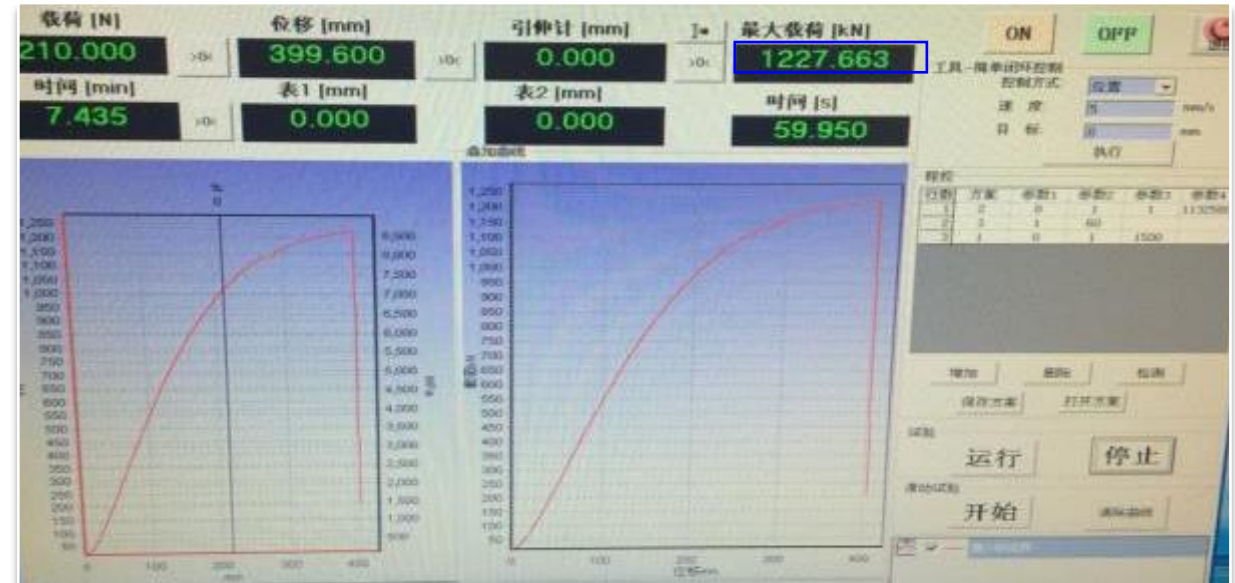
### 4.1. Conductor Structure



#### 4.1.1. Conductor Technical Structure

| Parameter                       |                                    | Unit                | Value                                                                                       |
|---------------------------------|------------------------------------|---------------------|---------------------------------------------------------------------------------------------|
| Structure                       | Center: Steel wire                 | pcs/mm              | 1/3.26                                                                                      |
|                                 | Layer 1: Steel wire                |                     | 6/3.26                                                                                      |
|                                 | Layer 2: Steel wire                |                     | 12/3.26                                                                                     |
|                                 | Layer 3: Steel wire                |                     | 18/3.26                                                                                     |
|                                 | Layer 4: Steel wire                |                     | 24/3.26                                                                                     |
|                                 | Layer 5: Aluminum alloy wire       |                     | 21/4.89                                                                                     |
| Lay ratio                       | Layer 6: Aluminum alloy wire       | /                   | 27/4.89                                                                                     |
|                                 | Stranding direction of outer layer |                     | direction                                                                                   |
|                                 | Conductor diameter                 |                     | mm                                                                                          |
|                                 | Cross section                      |                     | mm <sup>2</sup>                                                                             |
|                                 | Conductor weight                   |                     | kg/km                                                                                       |
|                                 | Rated tensile strength             |                     | kN                                                                                          |
| Modulus of Elasticity           |                                    | GPa                 | 103.73                                                                                      |
| Coefficient of linear expansion |                                    | 10 <sup>-6</sup> /℃ | 15.40                                                                                       |
| Max. DC Resistance at 20℃       |                                    | Ω/km                | 0.03732                                                                                     |
| Lay ratio                       | Aluminum alloy wire layer          | /                   | 21 wire layer: 10-16<br>27 wire layer: 10-14                                                |
|                                 | Steel wire layer                   |                     | 6 wire layer: 16-26<br>12 wire layer: 16-24<br>18 wire layer: 16-22<br>24 wire layer: 16-20 |

Note: There will be no any joints in the finished wire (Al alloy or steel).



## Conductor:

- Type: AACSR-900/510;
- OD.: 48.9mm,
- **RTS=1192.19kN**

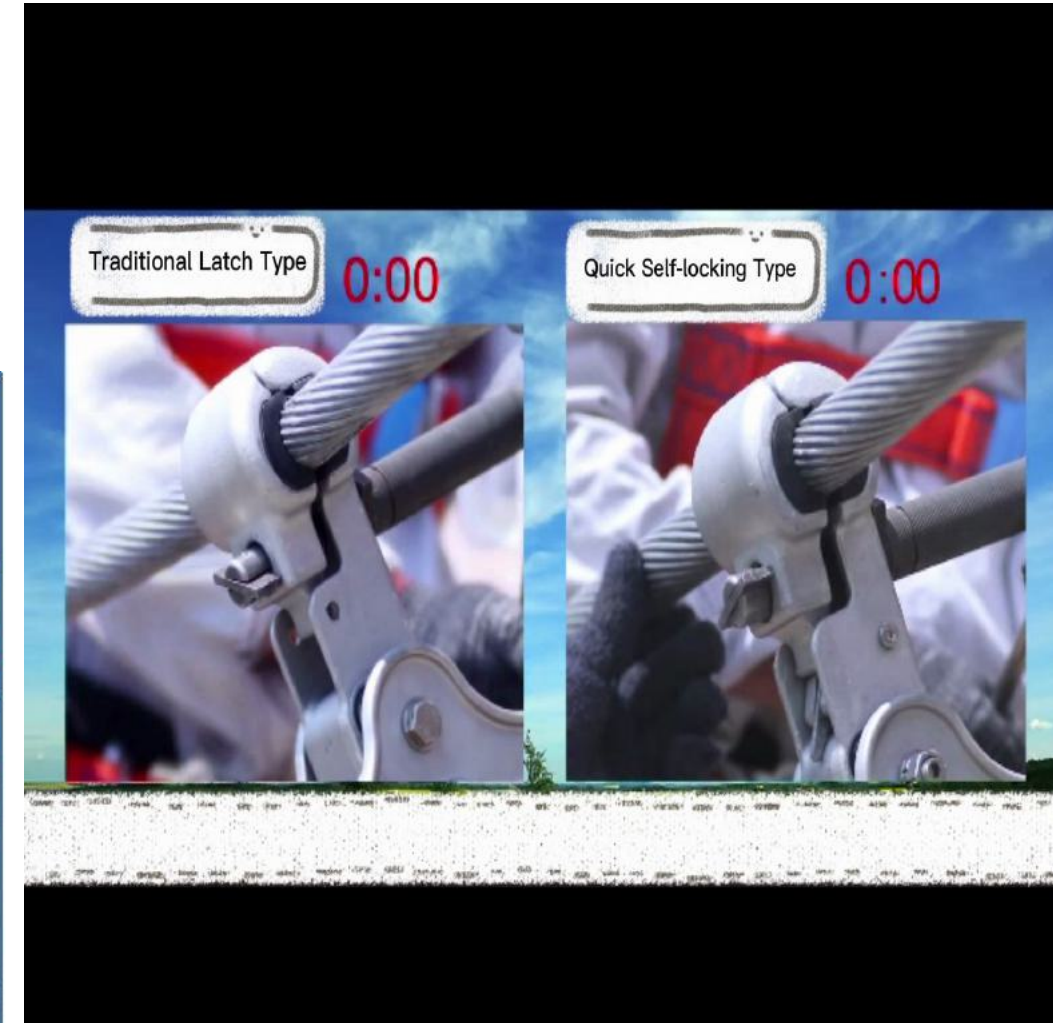
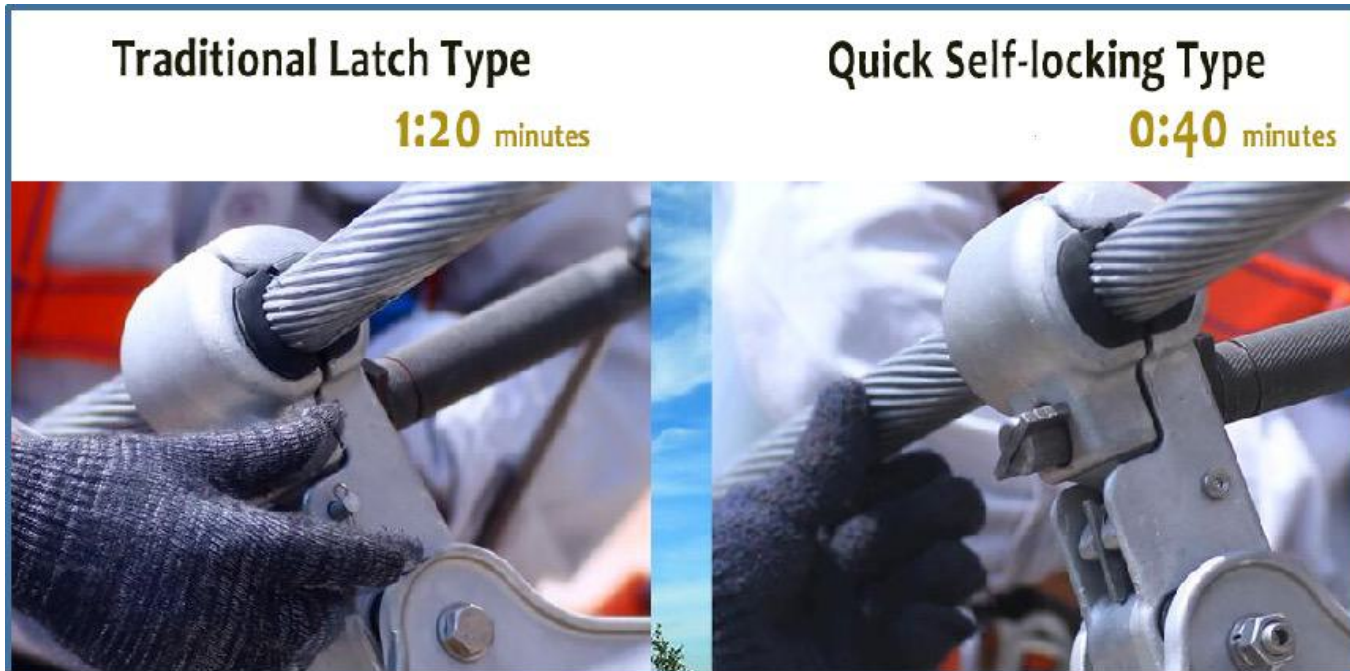
## Tension clamp:

- Tensile test result: **1227.663kN (102.98% RTS of con.)**

# Reliable products - maintenance free

## Self-locking Spacer

- ◆ Save over 50% time for installing.
- ◆ For traditional spacer, clamps will fall off causing conductor being frayed, while self-locking type is maintenance free.

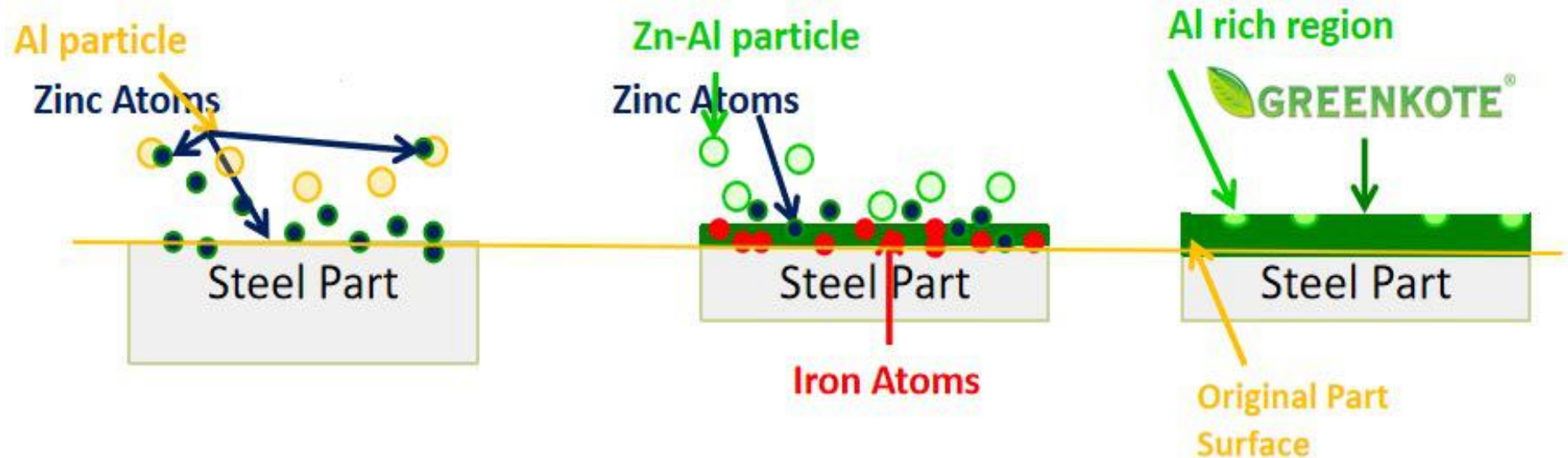




## Solutions For Severely Corroded Areas

### *Thermal Diffusion Coating Technology*

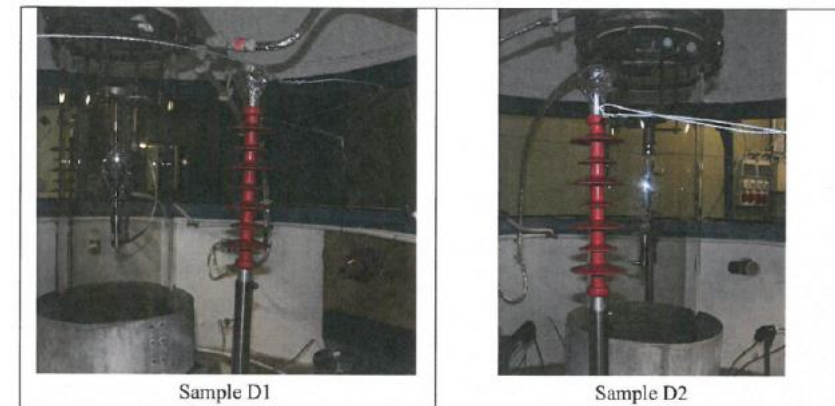
- ❑ *Strong corrosion resistance, withstand the salt spray test up to 4000 hours.*
- ❑ *The tolerance of coating thickness can reach  $\pm 5\mu\text{m}$ .*
- ❑ *No risk of hydrogen embrittlement.*
- ❑ *Super adhesion, with super anti-wear ability.*



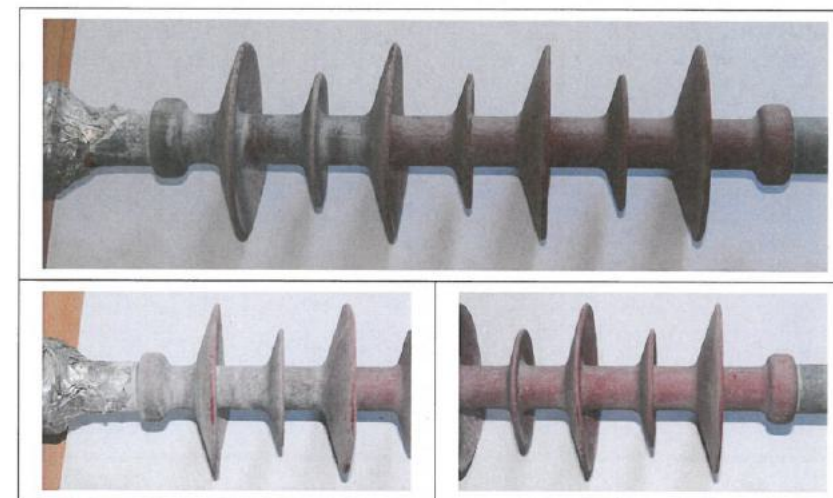
# Highlight type test of composite insulator

The composite insulator developed by **JiangDong Group** is the only one in China that has passed the **Tracking and erosion test (5000h multiple stress)** in the Hungarian VEIKI-VNL Electric Large Laboratories Ltd. a DEKRA company according to the **IEC62730-2012** standard.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                        |                                                                     |                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                        | VEIKI-VNL<br>ELECTRIC LARGE LABORATORIES Ltd.<br>TESTING LABORATORY | No. 10942/VNL<br>Page 1 of 10      |
| <b>TEST REPORT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                        |                                                                     |                                    |
| Test object:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Composite insulator                                                                                                                                                                                    |                                                                     |                                    |
| Designation:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Composite insulator FXBW-33/70                                                                                                                                                                         |                                                                     |                                    |
| <b>Tracking and erosion test<br/>(5000h multiple stress)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                        |                                                                     |                                    |
| Order/Contract:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NFL-05/2018-02, 19 <sup>th</sup> July, 2018                                                                                                                                                            |                                                                     |                                    |
| Test specification:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IEC/TR 62730:2012 Clauses 6, 7.2                                                                                                                                                                       |                                                                     |                                    |
| Tests performed:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The test object, constructed in accordance with the description, drawings and photographs incorporated in this report has been subjected to <b>Tracking and erosion test (5000h multiple stress)</b> . |                                                                     |                                    |
| Test results:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>The test object fulfilled the relevant requirements of the standard and Client's specification.</b>                                                                                                 |                                                                     |                                    |
| <small>This Test Report has been issued by VEIKI-VNL Electric Large Laboratories Ltd. Testing Laboratory in accordance with above mentioned specification.<br/>The Report applies only to the test object. The responsibility for conformity of any product having the same designations with that tested rests with the Manufacturer.<br/>This Report comprises 16 sheets in total (10 numbered pages, 1 drawing and 5 pages of Test Plan/Program).</small>                                                                                               |                                                                                                                                                                                                        |                                                                     |                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                        |                                                                     |                                    |
| Budapest,<br>28 <sup>th</sup> June, 2019                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                        | Péter Szél<br>responsible for the test                              | Csaba Homok<br>supervised by       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                        |                                                                     | Balázs Varga<br>Head of Laboratory |
| <small>Laboratory accredited by NAH under No. NAH-1-1251/2019.<br/>VEIKI-VNL Ltd. is an independent company, member of Short-circuit Testing Liaison (STL).<br/>Copyright: Only integral reproduction of this Report is permitted without written permission of VEIKI-VNL Ltd.<br/>Electronic copies of this Report may be available and have status of "for information only". The sealed and bound version of the Report is the only valid version.<br/>1158 Budapest, Vasgolyó u. 2-4., HUNGARY<br/>E-mail: VEIKI-info@dekra.com<br/>www.vnl.hu</small> |                                                                                                                                                                                                        |                                                                     |                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                        | Phone: +36-1-417 3157<br>Fax: +36-1-417 3163                        |                                    |



Photos 1-2  
Tracking and erosion test with 5000h multiple stress



Photos 3-5  
Insulator sample D1 after 5000 h

## TIII TecnoSoft



Copyright: Tecnodin S.R.L.  
by Tecnodin S.R.L.

Created by R. Claren, TECNODIN, S.R.L.  
Modified by O. Quintard - P. Michaluszko, FCI

Win 95-98-NT-2000-XP  
Version: 2004



## SPACER DISTRIBUTION TecnoSoft

Win 95-98-NT-2000-XP  
Version: 2004

Created by R. Claren, TECNODIN, S.R.L.  
Modified by O. Quintard - P. Michaluszko, FCI

Copyright: Tecnodin S.R.L.  
by Tecnodin S.R.L.



## Single TecnoSoft

Win 95-98-NT-2000-XP  
Version: 2004

Created by R. Claren, TECNODIN, S.R.L.  
Modified by O. Quintard - P. Michaluszko, FCI

Copyright: Tecnodin S.R.L.  
by Tecnodin S.R.L.

ZTT can supply the full solution for vibration study and products.

# Quality Management



# Quality Certificates



Quality policy:

Quality matters  
to survive

Win with high  
quality.



Jiangsu Province "Green Factory" 2023



Specialized & Refined Enterprises 2022



# Golden Certifications

## EUROPE



## NORTH AMERICA



## ASIA



## OTHER CERTIFICATIONS



ISO9001



ISO14001



OHSAS 18001



CSR (WCA)



CNAS Certificate (ISO 17025)



TÜV Rheinland



DEKRA



Physical and Chemical Test



3000 kN tensile test machine

Testing  
Equipemnts

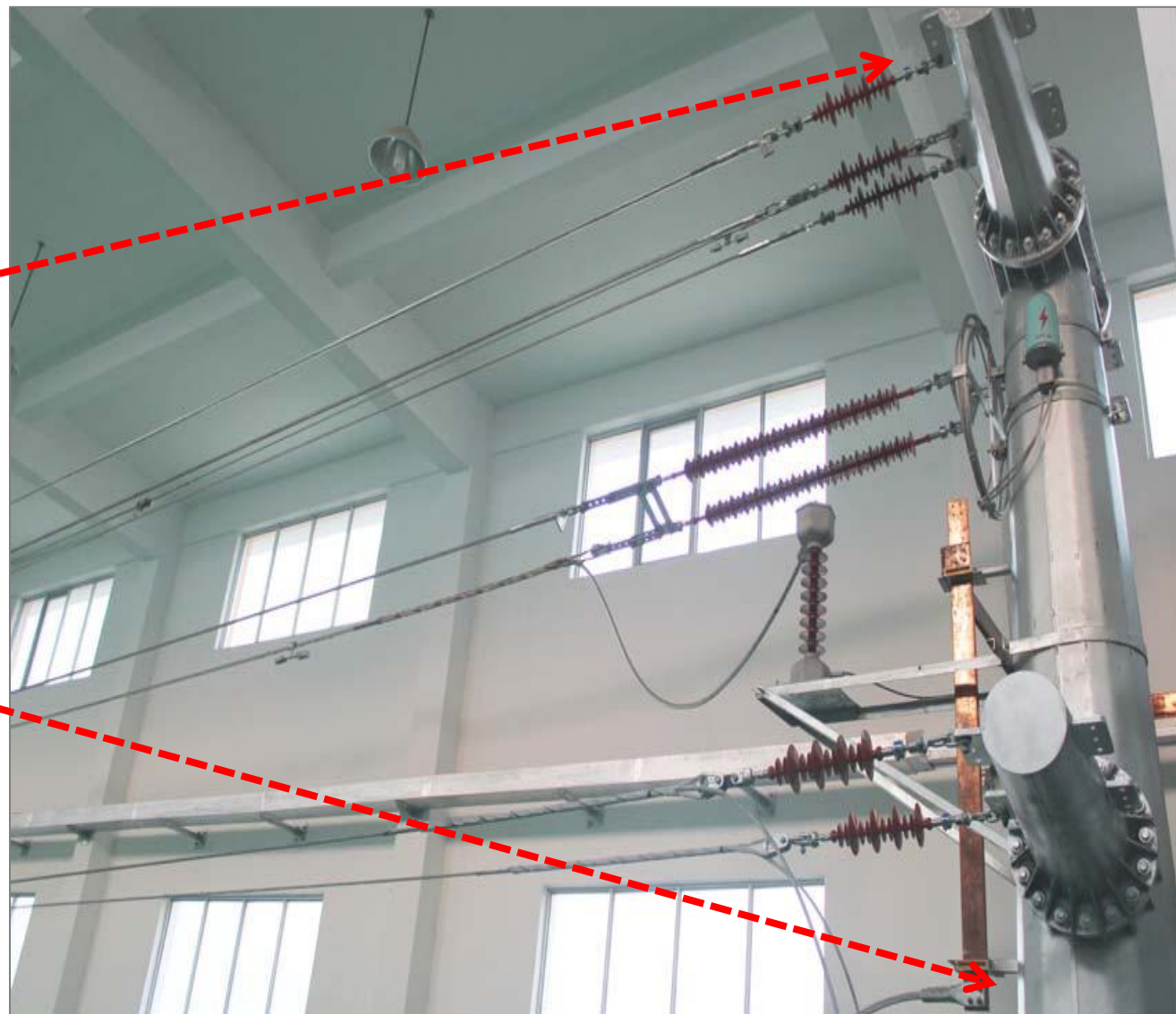


2000kN mechanical test machine



scanning electron microscope

## Simulate Transmission Line(100M)



- ❑ Temperature Rise
- ❑ Melting Ice Test
- ❑ Sag and Tension



## The damping test line

- Span length of 170m
- Damping test for conductor & OPGW of Large Span or River Crossing project.



## Current capacity test instrument

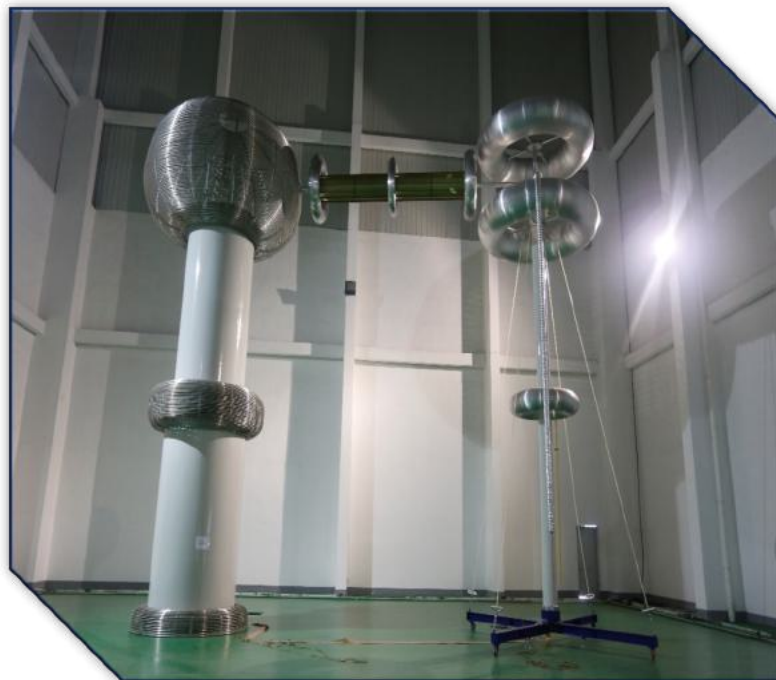
- Ampacity
- Resistance
- Heat cycle test
- Temperature Rise



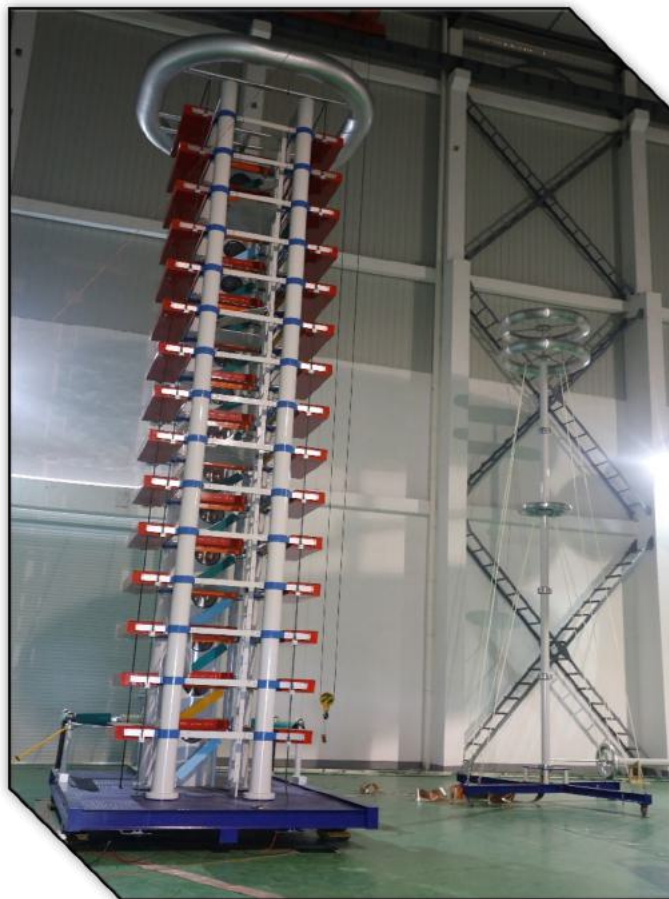
## Sheave test instrument

- For conductor
- For OPGW/OPPC

**1000kV Power frequency test transformer**



**3000kV impact equipment generator**



## Electrical test

- Dry lightning impulse withstand voltage test
- Wet power-frequency test
- Wet switching impulse withstand voltage test
- IEC 60383, IEC61109, IEC 62217

## Raw material inspection

### Aluminum alloy:

- ISO 209, ISO 3522, ASTM B211,

### Steel, Iron:

- ISO 630, ISO 683, ISO 9328,  
ISO 3755, ISO 4990, ISO 185

### Zinc ingots, Zinc Coating:

- ISO 752, ISO 1461, ASTM A90,  
ASTM A153

## Hardware fittings & accessories.

### Fittings:

- BS/EN/IEC 61284, BS 3288, IS 2486

### Spacer:

- BS/EN/IEC 61854, IS 10162

### Damper:

- BS/EN/IEC 61897, IS 9708

## Factory acceptance test

### Fittings:

- BS/EN/IEC 61284, BS 3288, IS 2486

### Spacer:

- BS/EN/IEC 61854, IS 10162

### Damper:

- BS/EN/IEC 61897, IS 9708

## Raw material inspection

### **silicone rubber:**

- ISO 37, ISO 34, ISO 7619 IEC 60587

### **Core Rod:**

- ISO 1183-1, ISO 62, ASTM D 2583,  
IEC 60167, ASTM D 3916

### **Zinc Coating:**

- IEC 60383, ISO 1461, ASTM A90,  
ASTM A153

## Insulators

- IEC 61109-2008
- IEC 62217-2012
- IEC 60383
- IEC 61952-2008
- IEC 60060

| Products                                                                            | Item                                                         | Test standard             |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------|
| The common test items of most products                                              | Visual Examination                                           | BS/EN/IEC 61284           |
|                                                                                     | Dimensional and material verification                        | BS/EN/IEC 61284, ISO 1101 |
|                                                                                     | Hot dip galvanizing                                          | ISO 1461, ASTM A153       |
| Suspension clamp                                                                    | Vertical damage load and failure load test                   | BS/EN/IEC 61284           |
|                                                                                     | Slip test                                                    |                           |
|                                                                                     | Clamp bolt tightening test                                   |                           |
| Tension clamp<br>Dead-end tension joint<br>Mid-span tension joints<br>Repair sleeve | Tensile test                                                 | BS/EN/IEC 61284           |
|                                                                                     | Mechanical damage and failure load test (Bolt tension clamp) |                           |
|                                                                                     | Clamp bolt tightening test                                   |                           |

| Products              | Item                                                                |                                                                      | Standard        |
|-----------------------|---------------------------------------------------------------------|----------------------------------------------------------------------|-----------------|
| T connector           | Tensile tests with mechanical tension between joint and T conductor |                                                                      | BS/EN/IEC 61284 |
|                       | Tensile tests with mechanical tension on the main conductor         |                                                                      |                 |
| Link fittings         | Mechanical damage load and failure load test                        |                                                                      | BS/EN/IEC 61284 |
| Vibration damper      | Clamp slip test                                                     |                                                                      | BS/EN/IEC 61897 |
|                       | Clamp bolt tightening test                                          |                                                                      |                 |
|                       | Attachment of weights to messenger cable                            |                                                                      |                 |
|                       | Attachment of clamp to messenger cable                              |                                                                      |                 |
| Spacer/ Spacer damper | Corrosion protection tests                                          |                                                                      | BS/EN/IEC 61854 |
|                       | Mechanical tests                                                    | clamp slip tests                                                     |                 |
|                       |                                                                     | clamp bolt tightening test                                           |                 |
|                       |                                                                     | simulated short-circuit current test and compression & tension tests |                 |
|                       |                                                                     | flexibility tests                                                    |                 |
| Joint box             | Seal test                                                           |                                                                      | YD/T 814.2      |

| Item                      |                          | Acceptance criteria                                                                                                                                              |
|---------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test during manufacturing | Silicone rubber          | Hardness test: 65±5 Shore A<br>Tensile strength: ≥4.0Mpa<br>Elongation at break: ≥200%<br>Relative density: 1.5±0.1 g/cm <sup>3</sup><br>Hydrophobicity: HC1~HC2 |
|                           | Pretreatment of core rod | The size of the core rod is well matched with the end fittings                                                                                                   |
|                           | Injection                | No defectiveness, No plastic deformation<br>The thickness of a single sheath is not less than the specified value                                                |
|                           | Appearance check         | No hard, brittle phenomenon<br>After trimming, the arc is natural and smooth                                                                                     |
|                           | Laser Marking            | Printed with company logo, product specifications, production date                                                                                               |
|                           | Final crimping           | Indentation and crimp waveforms                                                                                                                                  |

| Item       |                                                                                       | Test standard |
|------------|---------------------------------------------------------------------------------------|---------------|
| Insulators | Verification of dimensions                                                            | IEC61109-2008 |
|            | Verification of the end fittings                                                      | IEC61109-2008 |
|            | Verification of tightness of the interface between end fittings and insulator housing | IEC61109-2008 |
|            | Specified mechanical load, SML                                                        | IEC61109-2008 |
|            | Galvanizing test                                                                      | IEC61109-2008 |

# TYPE TEST REPORT for Fitting



## ■ KINETRICS

**KEMA**

■ **BV**

**■ CESI**

■ **CEPRI**

**■ SECRI**

■ **PLAIC**



**CESI**



国家电网  
STATE GRID

中国电力科学研究院  
CHINA ELECTRIC POWER RESEARCH INSTITUTE



# PLAIC

| <p><b>KINETRICS</b></p> <p>To: Mr. Gu Zhi<br/>Jiangsu Zhongtian Technologies Co., Ltd.<br/>No. 8, Zhongtian Road,<br/>Nantong Economic and Technical Development Zone,<br/>Jiangsu Province<br/>P.R. China</p> <p align="center"><b>KINETRICS INTERNATIONAL INC. TEST REPORT<br/>FOR JIANGSU ZHONGTIAN TECHNOLOGIES CO., LTD.</b><br/>(Ref. Test on Fittings for OPGW Cable)</p> <p>Kinetricks International Inc. Report No.: K-422172-RC-0003-R00</p> <p align="center">February 22, 2006</p> <p>M. Cobert<br/>Transmission and Distribution Technologies Business</p> <p>Two tests were performed on suspension and dead-end hardware accessories for an OPGW Cable. The cable and hardware were manufactured by Jiangsu Zhongtian Technologies Co., Ltd. This document is a compilation of the tests and is assembled in the following order:</p> <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>ACCESSORY TESTS</th> <th>TEST DATE</th> <th>STANDARD</th> </tr> </thead> <tbody> <tr> <td>1. Slip Test on Dead-End Clamp</td> <td>November 20, 2005</td> <td>IEC 61264, Par 11.5.1</td> </tr> <tr> <td>2. Slip Test on Suspension Clamp</td> <td>November 17, 2005</td> <td>IEC 61264, Par 11.4.2</td> </tr> </tbody> </table> <p align="center"><b>PRIVATE INFORMATION</b></p> <p>Contents of this report shall not be disclosed without authority of the client.</p> | ACCESSORY TESTS         | TEST DATE                                                                     | STANDARD | 1. Slip Test on Dead-End Clamp | November 20, 2005 | IEC 61264, Par 11.5.1 | 2. Slip Test on Suspension Clamp | November 17, 2005 | IEC 61264, Par 11.4.2 | <p align="center"><b>KEMA</b></p> <h2 align="center">Report</h2> <p>TIC 3087-14</p> <p>Type tests on 500 kV transmission line conductor fittings</p> <p>Client:<br/><b>Jiangsu Zhongtian Technology Co., Ltd. (ZTT)</b><br/>Nantong, Jiangsu, China</p> <p>Manufacturer:<br/><b>Jiangdong Fittings Equipment Co., Ltd. (A ZTT Company)</b><br/>Nantong, Jiangsu, China</p> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Industry &amp; Fair Share Division</td> <td>Page 1/3</td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>INSPECTION REPORT N°</b><br/>CNPE-16-038-002</td> <td> <input type="checkbox"/> Interim<br/> <input checked="" type="checkbox"/> Final         </td> </tr> <tr> <td colspan="3">BY Job no.: CNPE-3888</td> </tr> <tr> <td>PROJECT: 200kV Transmission Line</td> <td colspan="2">REF: CNPE-3888</td> </tr> <tr> <td>PO Client: Jiangsu Zhongtian Technology Co., Ltd. (ZTT)</td> <td colspan="2">PO for: Client's order</td> </tr> <tr> <td>Product Name: Jiangsu Zhongtian Technology Co., Ltd. (ZTT)</td> <td colspan="2">Project to Manufacture:</td> </tr> <tr> <td colspan="3">Inspection requested by: Jiangsu Zhongtian Technology Co., Ltd. (ZTT)</td> </tr> <tr> <td>SUPPLY / SUBJECT OF INSPECTION</td> <td>ITEM / SIZE</td> <td>QTY</td> </tr> <tr> <td>Item name: 500kV Tension Clamp</td> <td></td> <td></td> </tr> <tr> <td colspan="3">DOCUMENTS OF REFERENCE: See combination sheet for additional documents (if Ref. #) or</td> </tr> <tr> <td>Test procedure: IEC 61264-2</td> <td>Rev: 1</td> <td>Approved By: [Signature]</td> </tr> <tr> <td>Test procedure: IEC 61264-2</td> <td>Rev: 1</td> <td>Date: 10/10/05</td> </tr> <tr> <td>Test procedure: IEC 61264-2</td> <td>Rev: 1</td> <td>Date: 10/10/05</td> </tr> <tr> <td>Test procedure: IEC 61264-2</td> <td>Rev: 1</td> <td>Date: 10/10/05</td> </tr> <tr> <td>Test procedure: IEC 61264-2</td> <td>Rev: 1</td> <td>Date: 10/10/05</td> </tr> <tr> <td>Test procedure: IEC 61264-2</td> <td>Rev: 1</td> <td>Date: 10/10/05</td> </tr> <tr> <td colspan="3"> <b>INSPECTIONS:</b><br/>           Inspection single &amp; Double Phase<br/>           Main Sample: 10 pieces, 100% inspection<br/>           Co., LTD.<br/>           Date: 17th - 19th Oct. 2005<br/> <b>Scope of inspection:</b><br/> <input checked="" type="checkbox"/> Before manufacturing<br/> <input checked="" type="checkbox"/> During manufacturing<br/> <input checked="" type="checkbox"/> Final<br/> <input checked="" type="checkbox"/> Packing<br/> <b>Final inspection:</b><br/> <input checked="" type="checkbox"/> Dimensional checking<br/> <input checked="" type="checkbox"/> Document and QC record review<br/> <input checked="" type="checkbox"/> Visual examination, check<br/> <input checked="" type="checkbox"/> Witnessing tools<br/> <input checked="" type="checkbox"/> Manufacturing progress status<br/> <input checked="" type="checkbox"/> Vendor assessment<br/> <input checked="" type="checkbox"/> Final inspection<br/> <input checked="" type="checkbox"/> Packing<br/>           (For details see combination sheet)<br/> <b>Risk level:</b><br/>           High <input type="checkbox"/> Medium <input type="checkbox"/> Low <input checked="" type="checkbox"/> </td> </tr> <tr> <td colspan="3"> <b>Details of inspection:</b> <input checked="" type="checkbox"/> Laboratory <input type="checkbox"/> On-site<br/> <b>Main Characteristics &amp; Remarks:</b><br/>           All the tests according to approved test procedure were found to be acceptable for Tension clamp, Suspension clamp, Vibration Damper, Link Fittings, and Repair Sleeve.<br/>           But final cycle test were not finished for Tension clamp and Repair sleeve.<br/>           For more details please refer to the following inspection report.<br/> <b>Next risk scheduled:</b><br/>           Risk         </td> </tr> </table> | Industry & Fair Share Division |  | Page 1/3 | <b>INSPECTION REPORT N°</b><br>CNPE-16-038-002 |  | <input type="checkbox"/> Interim<br><input checked="" type="checkbox"/> Final | BY Job no.: CNPE-3888 |  |  | PROJECT: 200kV Transmission Line | REF: CNPE-3888 |  | PO Client: Jiangsu Zhongtian Technology Co., Ltd. (ZTT) | PO for: Client's order |  | Product Name: Jiangsu Zhongtian Technology Co., Ltd. (ZTT) | Project to Manufacture: |  | Inspection requested by: Jiangsu Zhongtian Technology Co., Ltd. (ZTT) |  |  | SUPPLY / SUBJECT OF INSPECTION | ITEM / SIZE | QTY | Item name: 500kV Tension Clamp |  |  | DOCUMENTS OF REFERENCE: See combination sheet for additional documents (if Ref. #) or |  |  | Test procedure: IEC 61264-2 | Rev: 1 | Approved By: [Signature] | Test procedure: IEC 61264-2 | Rev: 1 | Date: 10/10/05 | Test procedure: IEC 61264-2 | Rev: 1 | Date: 10/10/05 | Test procedure: IEC 61264-2 | Rev: 1 | Date: 10/10/05 | Test procedure: IEC 61264-2 | Rev: 1 | Date: 10/10/05 | Test procedure: IEC 61264-2 | Rev: 1 | Date: 10/10/05 | <b>INSPECTIONS:</b><br>Inspection single & Double Phase<br>Main Sample: 10 pieces, 100% inspection<br>Co., LTD.<br>Date: 17th - 19th Oct. 2005<br><b>Scope of inspection:</b><br><input checked="" type="checkbox"/> Before manufacturing<br><input checked="" type="checkbox"/> During manufacturing<br><input checked="" type="checkbox"/> Final<br><input checked="" type="checkbox"/> Packing<br><b>Final inspection:</b><br><input checked="" type="checkbox"/> Dimensional checking<br><input checked="" type="checkbox"/> Document and QC record review<br><input checked="" type="checkbox"/> Visual examination, check<br><input checked="" type="checkbox"/> Witnessing tools<br><input checked="" type="checkbox"/> Manufacturing progress status<br><input checked="" type="checkbox"/> Vendor assessment<br><input checked="" type="checkbox"/> Final inspection<br><input checked="" type="checkbox"/> Packing<br>(For details see combination sheet)<br><b>Risk level:</b><br>High <input type="checkbox"/> Medium <input type="checkbox"/> Low <input checked="" type="checkbox"/> |  |  | <b>Details of inspection:</b> <input checked="" type="checkbox"/> Laboratory <input type="checkbox"/> On-site<br><b>Main Characteristics &amp; Remarks:</b><br>All the tests according to approved test procedure were found to be acceptable for Tension clamp, Suspension clamp, Vibration Damper, Link Fittings, and Repair Sleeve.<br>But final cycle test were not finished for Tension clamp and Repair sleeve.<br>For more details please refer to the following inspection report.<br><b>Next risk scheduled:</b><br>Risk |  |  | <div style="text-align: right;"> <br/>       检验编号: M2005-HAT-A<br/>       Release No.:     </div> <div style="text-align: center; margin: 20px 0;"> <br/>       中国合格评定国家认可委员会<br/>       CNAS L2208     </div> <h2 align="center">检 验 报 告</h2> <h3 align="center">Test Report</h3> <p>试样名称: 预绞式悬垂线夹</p> <p>Name of products: Aramid grip suspension clamp</p> <p>型号规格: CL-763/50</p> <p>Type and size:</p> <p>委托单位: 江苏中天科技股份有限公司</p> <p>Client: Jiangsu Zhongtian Technology Co., Ltd.</p> <p>检测方法: 委托检测</p> <p>Kind of Test: Customer ordered test</p> <div align="center" style="margin-top: 20px;"> <br/>       上海电研研究所电工材料特种物理性能中心<br/>       QUALITY SUPERVISOR AND TEST CENTER FOR ELECTRICAL MATERIALS AND SPECIAL PHYSICAL PROPERTY CENTER OF ELECTRIC CABLE RESEARCH INSTITUTE     </div> | <div style="text-align: right;"> <br/>       检验编号: M2005-HAT-A<br/>       Release No.:     </div> <div style="text-align: center; margin: 20px 0;"> <br/>       中国合格评定国家认可委员会<br/>       CNAS L2208     </div> <h2 align="center">TEST REPORT</h2> <p>Test Kind: Client Test</p> <p>Sample Name: Strain Clamp (Bolt Type)</p> <p>(Category): NLL-S</p> <p>Client: Jiangsu Zhongtian Technology Co., Ltd.</p> <div align="center" style="margin-top: 20px;"> <br/>       CENTRE SEAL     </div> <p align="right">Issuing Date of Report: June 30, 2006</p> |
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| ACCESSORY TESTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| 1. Slip Test on Dead-End Clamp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| Industry & Fair Share Division                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| PROJECT: 200kV Transmission Line                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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| Product Name: Jiangsu Zhongtian Technology Co., Ltd. (ZTT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| Inspection requested by: Jiangsu Zhongtian Technology Co., Ltd. (ZTT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| Item name: 500kV Tension Clamp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| DOCUMENTS OF REFERENCE: See combination sheet for additional documents (if Ref. #) or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| Test procedure: IEC 61264-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| Test procedure: IEC 61264-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| <b>INSPECTIONS:</b><br>Inspection single & Double Phase<br>Main Sample: 10 pieces, 100% inspection<br>Co., LTD.<br>Date: 17th - 19th Oct. 2005<br><b>Scope of inspection:</b><br><input checked="" type="checkbox"/> Before manufacturing<br><input checked="" type="checkbox"/> During manufacturing<br><input checked="" type="checkbox"/> Final<br><input checked="" type="checkbox"/> Packing<br><b>Final inspection:</b><br><input checked="" type="checkbox"/> Dimensional checking<br><input checked="" type="checkbox"/> Document and QC record review<br><input checked="" type="checkbox"/> Visual examination, check<br><input checked="" type="checkbox"/> Witnessing tools<br><input checked="" type="checkbox"/> Manufacturing progress status<br><input checked="" type="checkbox"/> Vendor assessment<br><input checked="" type="checkbox"/> Final inspection<br><input checked="" type="checkbox"/> Packing<br>(For details see combination sheet)<br><b>Risk level:</b><br>High <input type="checkbox"/> Medium <input type="checkbox"/> Low <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                                                     |                         |                                                                               |          |                                |                   |                       |                                  |                   |                       |                                                                                                                                                                                                                                                                                                                                                                            |     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| <b>Details of inspection:</b> <input checked="" type="checkbox"/> Laboratory <input type="checkbox"/> On-site<br><b>Main Characteristics &amp; Remarks:</b><br>All the tests according to approved test procedure were found to be acceptable for Tension clamp, Suspension clamp, Vibration Damper, Link Fittings, and Repair Sleeve.<br>But final cycle test were not finished for Tension clamp and Repair sleeve.<br>For more details please refer to the following inspection report.<br><b>Next risk scheduled:</b><br>Risk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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# TYPE TEST REPORT for Composite Insulator

## ■ CEPRI (China)



Type test for 10kV-1000kV AC  
Type test for 10kV-1100kV DC

## ■ CESI (Italy)

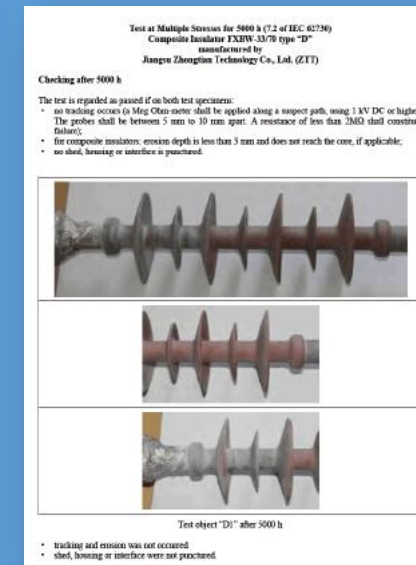
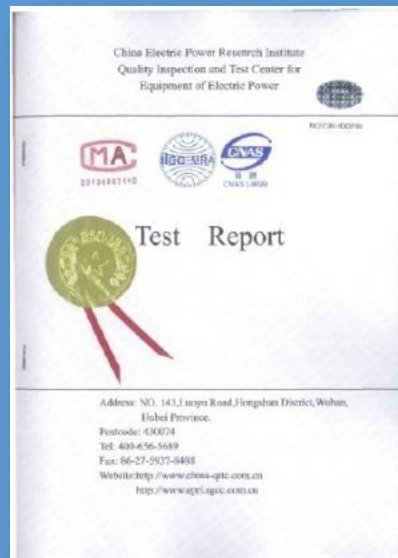


Type test for 132kV  
Type test for 400kV

## ■ Veiki (Hungary)



5000h multiple stress test(5000h ageing test),  
132kV/400kV Type test



## Facilities & Capacities



## Factory Landscape



## Main insulator manufacture equipment



### Mixer(5 sets)

- Uniform mixing and high kneading efficiency.



### Mill(6 sets)

- High production efficiency and low manufacturing cost.



### Injection Molding Machine (18 sets)

- Automatic injection machine with upper cylinder.
- Automatic positioning to ensure insulation level.



### Crimping Machine(4 sets)

- Fast crimping speed, saving production time.
- Finland special crimping machine is used, with good tensile strength stability.
- Real time monitoring of crimping status to ensure structural reliability.

## Main Fitting manufacture equipment



### High Pressure Die Casting Machine(6 sets)

- Accurate operation and high casting efficiency.
- The largest machine can achieve 2000Ton pressure.

### Computerized Numerical Control(9 sets)

- Digital control system, high production efficiency.
- Easy to operate and observe the processing .

### Forging machine (4 sets)

- High precision, reliable performance and convenient operation.

### Laser Cutting Machine (2 sets)

- An interactive workbench to realize automatic nesting programming of products and remote program distribution.
- 4 times more efficient than flame cutting.

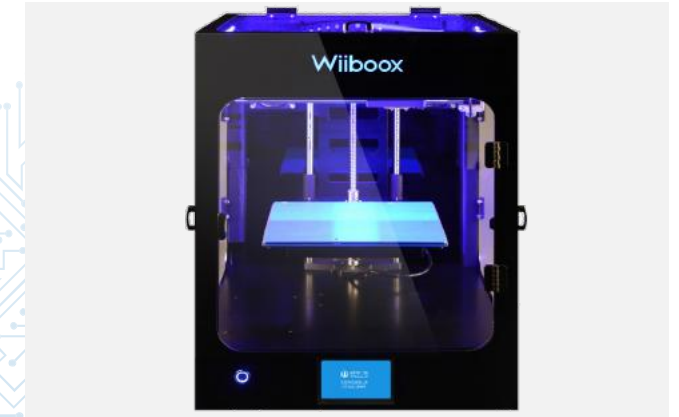


**Intelligent Casting Production Line** (The robot is used to realize automatic casting for clamps.)

- ✓ Reduce labor intensity and safety risks;
- ✓ Improve product stability;
- ✓ Improve production efficiency ;
- ✓ Improve utilization rate of raw material.



**Laser Cutting Automation**(Numerical control laser cutting for plates)



**3D Proofing** (conduct 3D proofing for newly developed fitting products.)



**Machining automation**

# Manufacturing capacity

| No | Product name               | Annual output(pcs) |
|----|----------------------------|--------------------|
| 1  | 35kV composite insulator   | 850,000            |
| 2  | 66kV composite insulator   | 440,000            |
| 3  | 110kV composite insulator  | 140,000            |
| 4  | 220kV composite insulator  | 70,500             |
| 5  | 330kV composite insulator  | 43,500             |
| 6  | 500kV composite insulator  | 35,000             |
| 7  | 750kV composite insulator  | 13,600             |
| 8  | 1000kV composite insulator | 10,200             |

| No | Product name                | Annual output |
|----|-----------------------------|---------------|
| 1  | tension clamp               | 180,000 sets  |
| 2  | Suspension clamp            | 360,000 sets  |
| 3  | Vibration damper            | 720,000 sets  |
| 4  | Spacers                     | 288,000 sets  |
| 5  | Arcing horn                 | 180,000 sets  |
| 6  | Grading and Shielding Rings | 144,000 sets  |
| 7  | Joint box                   | 72,000 sets   |
| 8  | Galvanizing hardware        | 5,400 ton     |

# Packing and Transportation for Fittings

- All fittings are packed with wooden box, carton, or as per requirements of customers.
- Design and manufacture of box according to customer's requirements.
- Close logistics coordination and various transportation mode to meet the customers' delivery time.



## Typical References











ELTEL



elecnor



ABB



VATTENFALL



ENGie  
Ineo



SIEMENS



LARSEN & TOUBRO  
It's all about Imagineering



KEC  
KEC INTERNATIONAL LIMITED



GAMMON  
Builders to the Nation



ISOLUX CORSA  
PROJETOS E INSTALAÇÕES



EMC<sup>®</sup>  
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JYOTI STRUCTURES LIMITED  
Lighting up the future

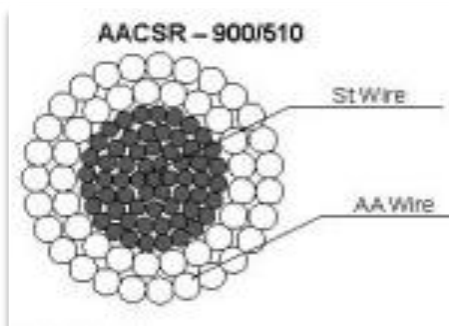


LIGHT  
TECHNOLOGY

Largest span  
**1967.48m**



TEMPERATURE  
**-60°C**



TENSILE  
STRENGTH OF  
TENSION CLAMP:  
**1,227.663 KN**



HEAVY ICE  
**60mm HEAVY ICE**



1000KV  
UHV AC



$\pm 1100KV$   
UHV DC



HIGH ALTITUDE  
HIGHEST  
ALTITUDE 5300 m



## *Changji-Guquan $\pm 1100\text{kV}$ UHVDC*

### Project information:

- **Voltage: DC  $\pm 1100\text{kV}$**
- Length: 3304.7 km
- Rated capacity of 12,000,000 kW
- Finished time: shall be Dec. 2018

### Supply products:

- Conductor
- OPGW
- Fittings



## *Huainan-Nanjing 1000kV UHVAC*

### Project information:

- **Voltage: AC 1000kV**
- Length: 740.3 km
- Rated capacity of 7,000,000 kW
- Finished time: 2015
- Delivery time: 2014

### Supply products:

- Conductor
- OPGW
- Fittings



## *$\pm 800$ kV HVDC Bipole Champa – Kurukshetra Transmission System in Indian*

### Project information:

- Voltage: DC  $\pm 800$  KV
- Length: 1407 km
- Finished time: Jan . 2015
- Delivery time: July 2014

### Supply products:

- OPGW ■ Fittings

## *Xiluodu-Zhexi $\pm 800$ kV UHVDC*

### Project information:

- Voltage: DC  $\pm 800$  KV
- Length: 2192 km
- Rated capacity of 7,500,000 kW
- Finished time: Jan . 2014
- Delivery time: July 2013

### Supply products:

- Conductor ■ OPGW ■ Fittings

## *Xiangjiaba-Shanghai $\pm 800$ kV UHVDC*

### Project information:

- Voltage:  $\pm 800$  KV
- Length: 1907 km
- No. of Towers: 3939
- Finished time: July 2010

### Supply products:

- Conductor ■ OPGW ■ Fittings



# TYPICAL PROJECT- RIVER CROSSING-L<sup>4</sup> Fittings



## *400 KV D/C River Crossing (Haldia-Subhasgram) (in India)*

### Project information:

- **The max span: 1572m**
- OPGW RTS: 441.2kN
- OPGW Dia: 25.98mm

### Supply products:

- OPGW ■ Fittings



## *132kV Meghna River Crossing at Tetia-Kanainagar (in Bangladesh)*

### Project information:

- **The max span: 1600m**
- OPGW RTS: 239.3kN
- OPGW Dia: 18.3mm

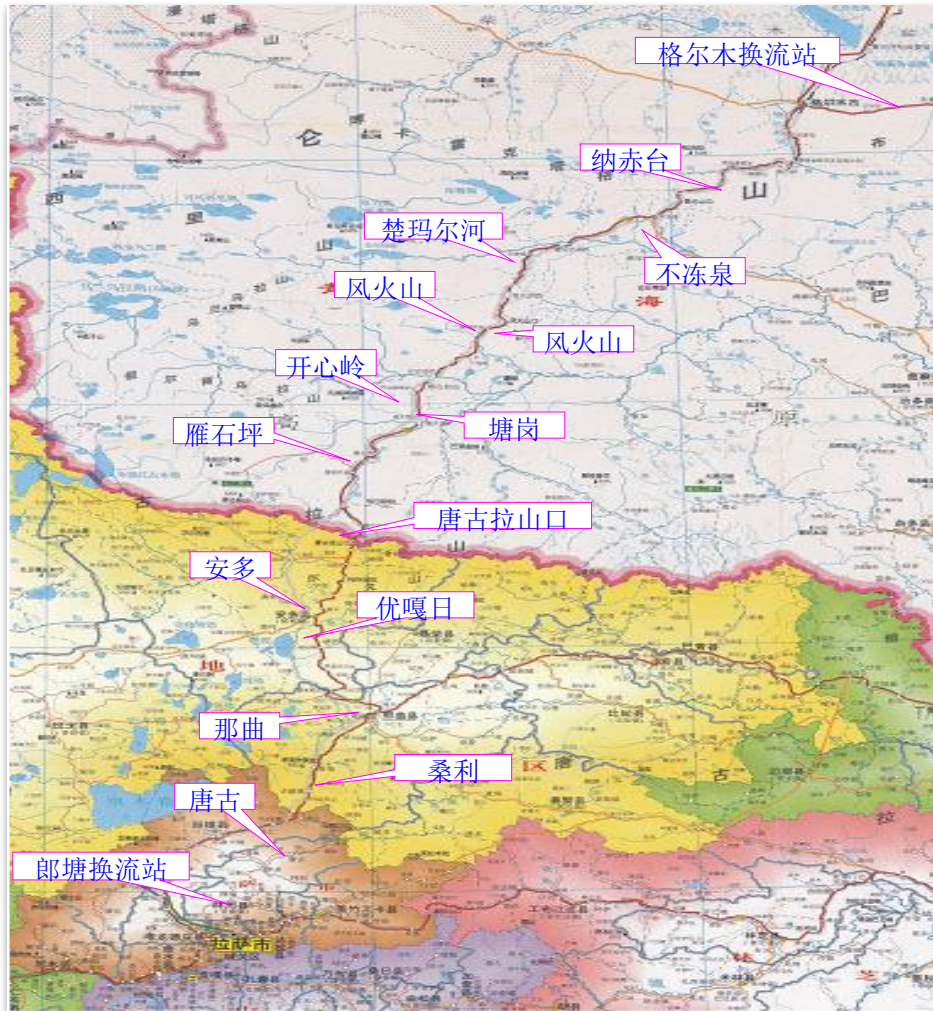
### Supply products:

- OPGW ■ Fittings

## L<sup>4</sup> Fittings

- L- Large span
- L- Large strength
- L- Less wear
- L- Longer service life

## Qinghai Golmud to Tibet Lhasa $\pm 400\text{kV}$ DC networking project



### Project information:

- Voltage: DC  $\pm 400\text{kV}$
- Length: 1308 km
- **Ultra-low temperature:  $-60^\circ\text{C}$**
- **The highest altitude: 5300m**
- Finished time: Dec. 2011

### Supply products:

- Conductor
- OPGW
- Fittings

### SMILE Fittings

S- Special Material

M-Mechanical strength is high

I- Impact test

L- Low temperature resistance

E- Environmentally friendly



# TYPICAL PROJECT- HEAVY ICE LOAD

*500kV Kangding to Chongzhou Project in China & 220kV S/C Khalasti- Leh T/L in India*

■ Ice Thickness 25,50, 60mm

Supply products:

■ OPGW    ■ Fittings



# TYPICAL REFERENCE –IN HEAVY CORROSION AREA

## *220KV Chiclayo Oeste (In Peru)*

Project information:

- Zinc Coating weight: 915g/m<sup>2</sup>

Supply products:

- Fittings



## *220KV OHL Double Circuit From Kcr – Lalazar (In Pakistan)*

## *132KV TP1000 project(In Pakistan)*

Project information:

- Zinc Coating thickness: 150μm

Supply products:

- Fittings
- Invar conductor
- Delivery time: 2017

## ***EETC 500kV transmission line project (in EGYPT)*** ***Biggest OHL project in EGYPT***

### **Project information:**

- Length: 1236km
- Delivery time: from Mar. 2016

### **Supply products:**

- Conductor: ACSR-490/65, AAAC-506
- OPGW
- Fittings

## ***GDHA 400kV/500kV Transmission Line Project (in Ethiopia)***

### **Project information:**

- Length: 500kV:  $2 \times 620\text{km}$ , 400kV: 98km
- Conductor: ACSR 402/52 mm<sup>2</sup>, 240/32 mm<sup>2</sup>
- Delivery time: 2014

### **Supply products:**

- Fittings

## ***400kV Kenya to Tanzania transmission line project (in Kenya)***

### **Project information:**

- Conductor: ACSR Bluejay, ACSR 95/55
- Delivery time: 2018

### **Supply products:**

- Conductor: ACSR Bluejay, ACSR 95/55
- OPGW
- Fittings

## ***330kV Overhead Transmission Line MFEZ (in Zambia)***

### **Project information:**

- Conductor: ACSR 380/50 mm<sup>2</sup>
- Delivery time: 2016

### **Supply products:**

- Fittings

## ***Bobcat Bluff Wind Farm project (in USA)***

### **Project information:**

- Voltage: 110kV
- Conductor: ACS 251mm<sup>2</sup>
- Delivery time: Aug., 2012

### **Supply products:**

- Fittings

## ***110kV Jablonowo-Bronica unwald (in Poland)***

### **Project information:**

- Voltage: 110kV
- Conductor: ACSR 242/39 mm<sup>2</sup>
- Delivery time: Dec, 2011

### **Supply products:**

- Fittings

## ***220kV Transmission Line project (in Iceland)***

### **Project information:**

- Voltage: 220kV
- Conductor: AAAC 1143.5 mm<sup>2</sup>
- Delivery time: May., 2015

### **Supply products:**

- Fittings ■ Conductor

## ***Transmission Line Project (in Albania)***

### **Project information:**

- Voltage: 35/110/220/400kV
- Conductor: ACSR, GSW
- Delivery time: Jan.2012, Apr.2016

### **Supply products:**

- Fittings

## ***220KV Chaglla transmission Line (in Peru)***

### **Project information:**

- Altitude: 1900m~4454.71mm, 3000m-4000m takes up 60%.
- The longest span length is **1967.48m**

### **Supply products:**

- Fittings for OPGW and conductor
- Delivery date: May, 2014



## ***Línea 2 x 500 kV Alto Jahuel – Lo Aguirre Línea 2 x 500 kV Lo Aguirre - Polpaico (in Chile)***

### **Project information:**

- ACAR 700MCM, ACSR Gull, EHS 3/8
- Temperature: -5~35°C
- Max. Wind pressure: 40kg/m<sup>2</sup>

### **Supply products:**

- Fittings ■ conductor ■ Aircraft Warning Sphere
- Damping solution
- Delivery date: December, 2013

## ***500kV LEAT Rincon Santa Maria – Resistencia (in Argentina)***

### **Project information:**

- Delivery time: Dec., 2015

### **Supply products:**

- Fittings for conductor, earth wire
- Special fittings for Cross Rope tower

## ***Qatrana-Amman West 400kV OHTL, Samra- Amman West 400kV OHTL (in Jordan)***

### **Project information:**

- ACSR/ACS 560/50

### **Supply products:**

- Fittings for conductor & Composite insulator
- Delivery date: December, 2017

## ***132 kV OHTL's to Connect the Following Substations: LOT(1): Amman West / Sweima - Sarrow LOT(2): New Tafila (in Jordan)***

### **Project information:**

- AAAC Yew

### **Supply products:**

- Fittings for conductor & Composite insulator
- Delivery date: May, 2017

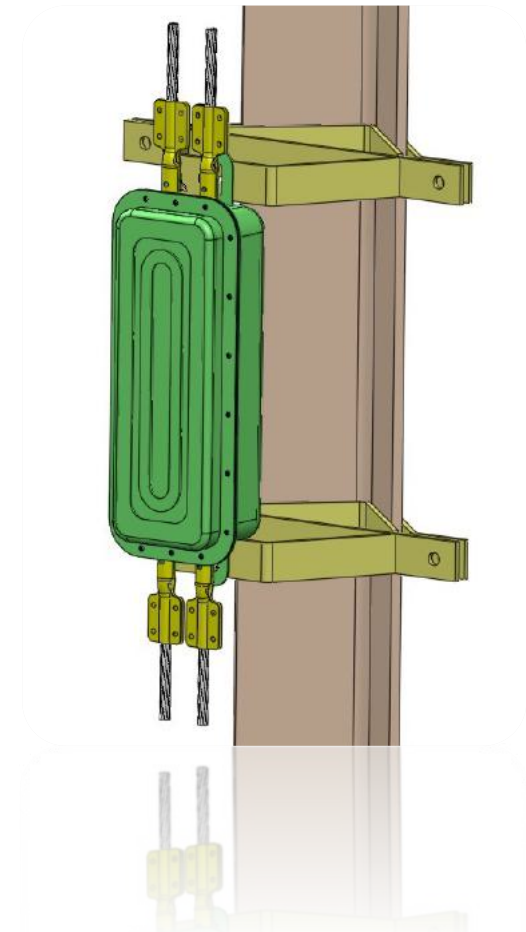
## ***Yanbu-3(YNB) SWCC S/S To Madinah East BSP 380KV OHTL (in Saudi Arabia)***

### **Project information:**

- OPGW

### **Supply products:**

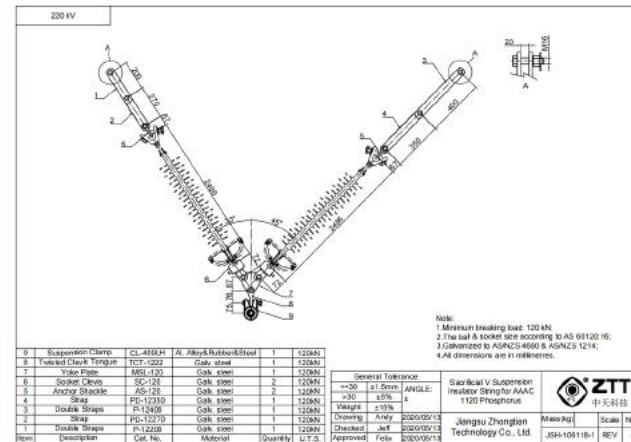
- Joint Box for OPGW
- Delivery date: April, 2015



## Typical projects(India, PGCIL)



## Typical projects(Australia, FMG)



- User: FMG
- Insulator type: 120kN,160kN *Long Rod and 12.5kN Post*
- Voltage: 220kV
- Project: FMG Pilbara Transmission Project
- Total Quantity: 9714pcs
- Year: 2020



# One Belt One Road Economic Corridor major project



- This key grid project -  $\pm 660\text{kV}$  HVDC Transmission Project from MATIARI to LAHORE in Pakistan, which was shortlisted in the “One Belt One Road” and “**China-Pakistan Economic Corridor**”.
- The total length is **878km** and transmission capacity is **4 million kilowatts**.
- This project offered a maximum of **7,000 job vacancies** for the local area.

“



**JiangDong** supplied 1354km OPGW cable and accessories in “ESTABLISHMENT OF FIBER OPTIC COMMUNICATION SYSTEM IN LIEU OF EXISTING ULDC MW LINKS IN EASTERN REGION” project for our client power grid corporation of India Ltd.(PGCIL)

The performance of the products **meets the technical specifications.**The **excellet after sales services** exhibited and proactive approach by JiangDong met demanding delivery schedules to support our installation.

“



**JiangDong** has been manufacturing and supplying 132KV overhead transmission line optical ground wire(OPGW) and fittings for our project Aqaba industrial Estate Spur OHTL.

The equipment supplied was **in full compliance with technical specification and to our full satisfaction.**



**JiangDong** has supplied OPGW, OPGW fittings, conductor fittings. GSW fittings to us in the project of ALAOJI-CALABAR 330 double circuit transmission line.

**The quality of products is reliable, and technology is advance. We satisfied with your on-time delivery, perfect service after sales.**

We anticipate JiangDong's continuous excellent quality and service in future to our long-term cooperation.



All materials from **JiangDong** were received **on time and defect free** contributing to the successful commissioning of the project for our client AusNet services.

**We thank you for your support and look forward to work with you on future major transmission line projects.**



# THANK YOU!



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