

ICS 29.020

K 90

Record No.: 37314-2012

DL

**PROFESSIONAL STANDARD OF THE PEOPLE'S
REPUBLIC OF CHINA**

中华人民共和国电力行业标准

DL/T 646-2012

Replace DL/T 646-2006

**Manufacturing technical requirements for steel
tubular structures of substation and transmission line**

输变电钢管结构制造技术条件

Issued on August 23, 2012

Implemented on December 01, 2012

Issued by the National Energy Administration

Contents

Foreword.....	1
1 Scope	4
2 Normative references	4
3 Terms and definitions, symbols	5
4 General provisions	6
5 Product classifications.....	7
6 Materials	7
7 Parts processing.....	8
8 Welding.....	14
9 Weldment assembly.....	22
10 Correction	24
11 Test assembly	24
12 Hot-dip galvanizing and hot spray zinc coating	26
13 Inspection	27
14 Packaging, marking, storage and transportation	33
Annex A (Normative) The uniformity test of hot dip galvanized coatings and the test methods of copper sulfate	34
Annex B (Normative) The adhesiveness of hot dip galvanized coatings and the drop hammer test method.....	36
Annex C (Normative) The thickness test of hot dip galvanized coatings and the test methods of metal coatings thickness gauge	37
Annex D (Normative) The adhesion amount test of hot dip galvanized coatings and the test methods of dissolve-to-weigh.....	38

Foreword

This Standard is a revision of DL/T 646-2006 *Manufacturing Technical Requirements for Steel Tubular Structures of Substation and Transmission Line* according to *National Energy Administration's Notification on Plan of Formulating/Revising 2010 Initial Energy Industries Standards* (GNKJ (2010) No.320) (Plan No.: Energy 20100214), which is to standardize the production of steel pole, steel tubular tower and steel tubular substation structures of substation and transmission line and promote the application of new materials, processes and technologies.

The Standard replaces DL/T 646-2006 *Manufacturing Technical Requirements for Steel Tubular Structures of Substation and Transmission Line*, compared with DL/T 646-646, the main changes are as follows:

- Give sufficient consideration to characteristics of high pressure steel tubular structure products, and processing technology and welding requirements of high strength steel materials;
- Various domestic enterprises have accumulated rich experiences in steel tubular structure manufacturing and testing through their years of practices. The mature parts are accepted by the present revision.
- Have adjusted, increased and decreased some of projects and tolerances;
- Have increased quality requirements of flange;
- Have modified the inspection rules.

This Standard was modified according to the GB/T1.1 *Directives for standardization Part 1: the Structure and Drafting of Standards*

This Standard is proposed by and under jurisdiction of China Electricity Council.

This Standard is drafted by: Power Industry Power Equipment and Transmission Material Inspection Test Center, Weifang Chang'an Steel Tower Co., Ltd., Zhejiang Shengda Steel Tower Co., Ltd., Fujian YongFu Project Consultant Co., Ltd., Qingdao Wuxiao [Group] Share Co., Ltd., Anhui Hongyuan Steel Tower Co., Ltd., Changshu Fengfan Power Equipment Co., Ltd., Yunnan Power Line Material Factory, Qingdao Huijintong Electric Power Equipment Co., Ltd. and Energy China Gelaf.

Main drafters of this Standard are: Cai Pengyi, Li Xianjin, Wang Jun, Dai Gangping, Zhao Jinfei, Wang Zhizeng, Zhang Guixiang, Zhao Jinyuan, Su Bo, Ma Jinguang, Zhu Danming and Ren Jindong.

The issuances of previous versions of the Standard replaced by this Standard are as follows: DL/T646—1998, DL/T 646—2006.

The opinions and suggestions proposed during the implementation of this Standard are to be feed backed to the Standardization Center of China Electricity Council at the following address: (No. 1 Ertiao Lane, Baiguang Road., Beijing, China, 100761).

Manufacturing technical requirements for steel tubular structures of substation and transmission line

1 Scope

This Standard specifies requirements for materials, processes, inspection, packaging, marking, storage, transportation and so on during manufacturing steel pole, steel tubular tower and steel tubular substation structures of substation and transmission line.

This Standard applies to steel tubular structures of substation and transmission line, whose components mainly adopt polygonal and circular steel tubes and antiseptic treatment by hot-dip-galvanized or hot-zinc-spray (zinc alloy) coatings. Other similar steel tubular structure may be performed with reference.

2 Normative references

The articles contained in the following documents have become this standard when they are quoted herein. For the dated documents so quoted, all the modifications (including all corrections) or revisions made thereafter shall be applicable to this Standard.

GB/T 41 Hexagon nuts, type 1(GB/T 41-2000, ISO 4034: 1999, IDT)

GB/T 95 Plain washers-Product grade C(GB/T 95-2002, ISO 7091:2000, IDT)

GB/T 470 Zinc ingots(GB/T 470-2008, ISO 752:2004,MOD)

GB/T 699 Quality carbon structural steels

GB/T 700 Carbon structural steels (GB/T 700-2006, ISO 630:1995, NEQ)

GB/T 702 Hot-rolled steel bars - Dimensions, shape, weight and tolerances (GB/T 702-2008, ISO 1035-1~4:1980, MOD)

GB/T 706 Hot rolled section steel

GB/T 709 Dimension shape weight and tolerances for hot-rolled steel plates and sheets (GB/T 709-2006, ISO 7452:2002, ISO 16160:2000, NEQ)

GB/T 805 Tight nuts

GB/T 985.1 Recommended joint preparation for gas welding manual metal arc welding gas-shield arc welding and beam welding (GB/T 985.1-2008, ISO 9692-1:2003, MOD)

GB/T 985.2 Recommended joint preparation for submerged arc welding (GB/T 985.2-2008, ISO 9692-2: 1998, MOD)

GB/T 1591 High strength low alloy structural steels

GB/T 2694 Specification of manufacturing for transmission line tower

GB/T 2828.1 Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (GB/T 2828.1-2003, ISO 2859-1: 1999, IDT)

GB/T 2829 Sampling procedures and tables for periodic inspection by attributes (Apply to inspection of process stability)

GB/T 3091 Welded steel pipes for low pressure liquid delivery (GB/T 3091-2008, ISO 559:1991, NEQ)

GB/T 3098.1 Mechanical properties of fasteners—Bolts, screws and studs (GB/T 3098.1-2010, ISO 898-1:2009, MOD)

GB/T 3098.2 Mechanical properties of fasteners—Nuts—Coarse thread (GB/T 3098.2-2000, ISO 898-2:1992, IDT)

GB/T 3323 Radiographic examination of fusion welded joints in metallic materials

GB/T 5117 Carbon steel covered electrodes

GB/T 5118 Low alloy steel covered electrodes

GB/T 5267.3 Fasteners - Hot dip galvanized coatings (GB/T 5267.3-2008, ISO 10684:2004, IDT)

GB/T 5293 Carbon steel electrodes and fluxes for submerged arc welding

GB/T 5780 Hexagon head bolts-Product grade C (GB/T 5780-2000, ISO 4016:1999, IDT)

GB/T 8110 Welding electrodes and rods for gas shielding arc welding of carbon and low alloy steel

GB/T 8162 Seamless steel tubes for structural purposes

GB/T 9793 Metallic and other inorganic coatings-Thermal spraying-Zinc, aluminium and their alloys (GB/T 9793-1997, ISO 2063:1991, IDT)

GB/T 10045 Carbon steel flux cored electrodes for arc welding

GB/T 11345 Method for manual ultrasonic testing and classification of testing results for ferritic steel welds

GB/T 12470 Low-alloy steel electrodes and fluxes for submerged arc welding

GB/T 13793 Steel pipes with a longitudinal electric (resistance) weld

GB/T 17493 Low alloy steel flux cored electrodes for arc welding

DL/T 284 Cold forging hot dip galvanizing bolt and nut for tower and hardware of transmission lines

JGJ 81 Technical specification for Welding of steel structure of building

JG/T 203 Method for ultrasonic testing and classification for steel structures

3 Terms and definitions, symbols

3.1 Terms and definitions

The following terms and definitions apply to this Standard.

Part

Smallest unit of components and element, such as flanges, stiffening rib plate

3.1.2

Component

Basic units of steel structure are composed by several parts such as welding parts composed by steel tubes and flanges.

3.1.3

Element

Basic units of steel structure is composed by parts or fastening connection of parts and components

3.1.4

Assembling

According to the precision and technical requirements specified, the process of connecting parts or fixing them together to make them become component.

3.1.5

Test assembling

完整版本请在线下单

或咨询：

TEL： 400-678-1309

QQ： 19315219

Email：info@lancarver.com

<http://www.lancarver.com>

对公账户：

单位名称：北京文心雕语翻译有限公司

开户行：中国工商银行北京清河镇支行

账 号：0200 1486 0900 0006 131

支付宝账户：info@lancarver.com

注：付款成功后，请预留电邮，完整版本将在一个工作日内通过电子 PDF 或 Word 形式发送至您的预留邮箱，如需索取发票，下单成功后的三个工作日内安排开具并寄出，预祝合作愉快！