

ICS 87.020
CCS G 50



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

GB/T 31415-2015

**Paints and varnishes -- Performance requirements for
protective paint systems for offshore and related structures
(English Translation)**

Issued on: May 15, 2015

Implemented on: October 1, 2015

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Foreword...	3
1 Scope...	5
2 Normative references...	6
3 Terms and definitions...	8
4 Field of application...	11
5 Paints...	13
6 Protective paint systems...	16
7 Application testing of paints...	19
8 Performance testing of the paint system...	19
9 Test report...	24
Annex A (normative) Ageing procedure...	26
Annex B (normative) Fingerprint...	27
Annex C (informative) Examples of test reports...	28
Bibliography...	32

Foreword

This Standard is drafted according to the rules given in GB/T 1.1-2009.

This Standard uses translation method to equivalently adopt the International Standard ISO 20340.2009 "Paints and varnishes - Performance requirements for protective paint systems for offshore and related structures".

China's documents that are identical to the International documents normatively referenced in this Standard are as follows.

- GB/T 1725-2007 Paints varnishes and plastics - Determination of non-volatile-matter content(ISO 3251.2003, IDT)
- GB/T 1747.2-2008 Paints and varnishes - Determination of pigment content - Part

2 Ashing method (ISO 14680-2.2000, IDT)

- GB/T 5208-2008 Determination of flash point - Rapid equilibrium closed cup method (ISO 3679.2004, IDT)

- GB/T 5210-2006 Paints and varnishes - Pull-off test for adhesion (ISO 4624.2002, IDT)
- GB/T 6750-2007 Paints and varnishes - Determination of density - Pyknometer method (ISO 2811-1.1997, IDT)
- GB/T 6753.2-1986 Paints and varnishes - Surface-drying test - Ballotini method (eqv ISO 1517.1973)
- GB/T 7790-2008 Paints and varnishes - Determination of resistance to cathodic disbonding of coatings exposed to sea water (ISO 15711.2003, MOD)
- GB/T 8923.1-2011 Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 1. Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous (ISO 8501-1.2007, IDT)
- GB/T 9271-2008 Paints and varnishes standard panels for testing (ISO 1514.2004, MOD)
- GB/T 9272-2007 Paints and varnishes - Determination of percentage volume of non-volatile matter by measuring the density of a dried coating (ISO 3233.1988, MOD)
- GB/T 9278-2008 Temperatures and humidities for conditioning and testing of paint specimens (ISO 3270.1984, IDT)
- GB/T 10125-2012 Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227.2006, IDT)
- GB/T 13288.1-2008 Preparation of steel substrates before application of paints and related products - Surface roughness characteristics of blast-cleaned substrates - Part 1. Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast (ISO 8503-1.1988, IDT)
- GB/T 13288.2-2011 Preparation of steel substrates before application of paints and related products - Surface roughness characteristics of blast-cleaned steel substrates - Part 2. Method for the grading of surface profile of abrasive blast-

cleaned steel - Comparator procedure (ISO 8503-2.1988, IDT)

- GB/T 13912-2002 Metallic coatings - Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461.1999, MOD)

- GB/T 21862.2-2008 Paints and varnishes - Determination of density - Part 2. Immersed body (plummet) method (ISO 2811-2.1997, IDT)

- GB/T 21862.3-2008 Paints and varnishes - Determination of density - Part 3. Oscillation method (ISO 2811-3.1977, IDT)

- GB/T 21862.4-2008 Paints and varnishes - Determination of density - Part 4. Pressure cup method (ISO 2811-4.1977, IDT)

This Standard is proposed by the China Petroleum and Chemical Industry Federation.

This Standard shall be under the jurisdiction of the National Technical Committee on Coatings and Pigments of Standardization Administration of China (SAC/TC 5).

Drafting organizations of this Standard. CNOOC Changzhou Paint and Chemical Research Institute Co., Ltd., Beijing Bihaizhou Corrosion Protection Industrial Co., Ltd., Zhejiang Yutong Materials Co., Ltd., Xinhe New Material Co., Ltd., Offshore Oil Engineering Co., Ltd., Hempel Elderly Coatings (China) Co., Ltd., Zhong Tu Chemical Industry (Shanghai) Co., Ltd., Akzo Nobel Protective Coatings (Jiangsu) Co., Ltd., Jordan Coatings (Zhangjiagang) Co., Ltd., Wing Kee Coating Industry (Kunshan) Co., Ltd., COSCO Kansai Paint Chemical Co., Ltd., 11th Research Institute of China Shipbuilding Industry Corporation, Ocean Chemical Research Institute Co., Ltd., Daikin Fluorine Chemical (China) Co., Ltd., Shanghai Paint Research Institute, Shenzhen Guang Tian Decoration Group Co., Ltd., Jiangsu Shuangle Chemical Pigment Co., Ltd.

Main drafters of this Standard. Chen Feng, Liu Xiaoping, Yang Yaliang, Hu Jianlin, Zhang Guoqing, Li Huagang, Zhang Yinan, Zhang Yanbin, Liu Xin, Wang Haiyang, Liu Huicheng, Fu Jianhua, Qian Yemiao, Mi Lin, Shi Youliang, Yan Jie, Ding Shibo, Wei Xuefeng, Xu Lili, Li Shaoqiang, Mao Mingshun.

Paints and varnishes - Performance requirements for

protective paint systems for offshore and related structures

1 Scope

This Standard deals with performance requirements for protective paint systems for offshore and related structures (i.e. those exposed to the marine atmosphere, as well as those immersed in sea or brackish water). Such structures are exposed to environments of corrosivity category C5-M and immersion category Im2 as defined in ISO 12944-2, with special stresses as given in Subclause 4.3 and Annex B of ISO 12944-2:1998. This Standard can also be used for other structures, provided that the paints or protective paint systems selected comply with this Standard.

This Standard places emphasis on high-durability paint systems, with the aim of minimizing maintenance and hence reducing safety considerations and environmental impact. It specifies additional test requirements over and above those specified for corrosivity category C5-M in ISO 12944-6. Hence, a system fulfilling the requirements for C5-M high durability in ISO 12944-6 will not necessarily fulfil the requirements of this Standard and might thus need further testing to do so.

The temperature range applicable for these paint systems is normally between - 20 °C and + 80 °C, and the performance testing is aimed at verifying suitability of the paint systems for this temperature range. The use of paint systems outside this temperature range shall be subject to agreement by the end user. Such agreement may include testing at the applicable temperatures.

The paint systems for submerged service (Im2) are aimed at ambient operating temperatures up to a maximum of 50 °C. For higher operating temperatures, specific evaluation and performance documentation is needed. The selection of performance requirements should be considered in conjunction with the cathodic protection design parameters.

This Standard includes.

- the test methods to be used to determine the composition of the separate