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National Standard of the People's Republic of China

GB/T 6892 —2023
Replace GB/T 6892-2015

Wrought aluminium and aluminium alloys
extruded profiles for general
engineering
一般工业用铝及铝合金挤压型材

(English Translation)

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Foreword

This standard is drafted in accordance with the regulations in GB/T 1.1-2020 Guidelines for Standardization Conduct—Part 1: Structure and Drafting Rules of Standardized Documents.

本文件按照 GB/T 1.1-2020《标准化工作导则 第1部分：标准化文件的结构和起草规则》的规定起草。

This standard supersedes GB/T 6892-2015 Aluminum and Aluminum Alloy Extruded Profiles for General Industrial Application. Comparing with GB/T 6892-2015, the main technical revision in this standard, except for structural adjustments and editorial changes, are as follows :

本文件代替 GB/T 6892-2015《一般工业用铝及铝合金挤压型材》。本文件与 GB/T 6892-2015 相比，除结构调整和编辑性改动外，主要技术变化如下：

a) Added “ Type I 6105, 6013, 6A66 alloys, Type II 5383, 7004, 7A21 and 7A41 alloys” (see 4.1) ;

a) 增加了 “ I类 6105、6013、6A66 合金，II类 5383、7004、7A21、7A41 合金” (见 4.1) ;
b) Added “ alloy designation, temper and dimension size of the profiles” (see 4.2) ;

b) 增加了 “型材的牌号、状态及尺寸规格” (见 4.2) ;
c) Revised “ relevent requirement for surface treatment profiles” (see 4.3 and also see 3.12 of 2015 edition) ;

c) 更改了 “经表面处理型材的相关要求” (见 4.3, 2015 年版的 3.12) ;
d) Revised “specified non-proportional extension strength of 6005-T5 profiles” (see Chapter 5 and also see 3.4 of 2015 edition);

d) 更改了 6005T5 型材的规定非比例延伸强度 (见第 5 章, 2015 年版的 3.4) ;
e) Canceled the chemical compositions of 5051A, 6008, 6360, 6261, 6081 and 7178 alloys; canceled the corresponding tempers of the following alloys: 1050A-H112, 1100-O, 1100-H112, 1200-H112, 2A11-O, 2014-O, 2014-H111, 2014-T4, 2014-T4510, 2014-T4511, 2014-T6510, 2014-T6511, 2014A-O, 2014A-H111, 2014A-T4, 2014A-T6, 2014A-T4510, 2014A-T4511, 2014A-T6510, 2014A-T6511, 2024-O, 2024-H111, 2024-T3510, 2024-T3511, 2024-T8, 2024-T8510, 2024-T8511, 2017-O, 2017-T4, 2017A-T4, 2017A-T4510, 2017A-T4511, 5A02-O, 5A03-O, 5A03-H112, 5005-O, 5005-H111, 5005-H112, 5005A-O, 5005A-H111, 5005A-H112, 5019-H112, 5051A-H112, 5251-H112, 5154A-H112, 5454-H112, 5754-H112, 5086-H112, 6A02-T4, 6101A-T6, 6005-T1, 6008T4, 6008T6, 6351-O, 6351-T4, 6351-T5, 6360-T4, 6360-T5, 6360-T6, 6360-T66, 6261-O, 6261-T4, 6261-T5, 6261-T6, 6063A-T4, 6463A-T1, 6463A-T5, 6463A-T6, 6081-T6, 6082-O, 6082-H111, 7A04-O, 7003-T5, 7021-T6, 7022-T6510, 7049A-T6, 7049A-T6510, 7049A-T6511, 7075-T76, 7075-T76510, 7075-T76511, 7178-T6, 7178-T6510, 7178-T6511, 7178-T76, 7178-T76510, 7178-T76511; canceled the T76, T76510, T76511 tempers of 7075 alloy; canceled the requirements for electrical conductivity

of 7178 alloy (see 3.2, 3.4 and 3.7 of 2015 edition);

删除了 5051A、6008、6360、6261、6081、7178 合金的化学成分；删除了 1050AH112、11000、1100H112、1200H112、2A110、20140、2014H111、2014T4、2014T4510、2014T4511、2014T6510、2014T6511、2014A0、2014AH111、2014AT4、2014AT6、2014AT4510、2014AT4511、2014AT6510、2014AT6511、20240、2024H111、2024T3510、2024T3511、2024T8、2024T8510、2024T8511、20170、2017T4、2017AT4、2017AT4510、2017AT4511、5A020、5A030、5A03H112、50050、5005H111、5005H112、5005A0、5005AH111、5005AH112、5019H112、5051AH112、5251H112、5154AH112、5454H112、5754H112、5086H112、6A02T4、6101AT6、6005T1、6008T4、6008T6、63510、6351T4、6351T5、6360T4、6360T5、6360T6、6360T66、62610、6261T4、6261T5、6261T6、6063AT4、6463AT1、6463AT5、6463AT6、6081T6、60820、6082H111、7A040、7003T5、7021T6、7022T6510、7049AT6、7049AT6510、7049AT6511、7075T76、7075T76510、7075T76511、7178T6、7178T6510、7178T6511、7178T76、7178T76510、7178T76511 牌号状态；删除了 7075 牌号 T76、T76510、T76511 状态；删除了 7178 牌号电导率的要求（见 2015 年版的 3.2、3.4、3.7）；

f) Added the chemical compositions of 6A66, 7A21 and 7A41 alloys; added the corresponding tempers of the alloy 5052-0, 5383-H112, 6A66-T5, 6A66-T6, 6013-T6, 6105-T5, 7A21-T5 and 7A41-T6; added the requirements for electrical conductivity of the alloy 6063, 6061, 6101B, 6005, 6005A and 6082; added the requirements for inter-granular corrosion property, salt mist corrosion resistance, bending property, shear property, compression property, fatigue property, fatigue crack propagation rate, plane strain fracture toughness, pin-type support, tensile modulus of elasticity, welding property, and bonding property of welds; added the requirements for the depth of coarse grain ring in 6061, 6063, 6082 and 6005A alloys; revised the requirements for electrical conductivity (see Chapter 5, and also see 3.7 of 2015 edition);

e) 增加了 6A66、7A21、7A41 合金的化学成分；增加了 50520、5383H112、6A66T5、6A66T6、6013T6、6105T5、7A21T5、7A41T6 牌号状态；增加了 6063、6061、6101B、6005、6005A、6082 合金电导率要求；增加了晶间腐蚀性能、耐盐雾腐蚀性能、弯曲性能、剪切性能、压缩性能、疲劳性能、疲劳裂纹扩展速率、平面应变断裂韧度、销型支承、拉伸弹性模量、焊接性能、焊缝焊合性能要求；增加了 6061、6063、6082、6005A 合金粗晶环深度的要求；更改了电导率要求（见第 5 章，2015 年版的 3.7）；

g) Added the test methods for inter-granular corrosion property, salt mist corrosion resistance, bending property, shear property, compression property, fatigue property, fatigue crack propagation rate, plane strain fracture toughness, pin-type support, tensile modulus of elasticity, welding property, and bonding property of welds; revised the test method for film performance (see Chapter 6 and also see 4.11 of 2015 edition);

f) 增加了晶间腐蚀性能、耐盐雾腐蚀性能、弯曲性能、剪切性能、压缩性能、疲劳性能、疲劳裂纹扩展速率、平面应变断裂韧度、销型支承、拉伸弹性模量、焊接性能、焊缝焊合性能的试验方法；更改了膜层性能的试验方法（见第 6 章，2015 版的 4.11）；

h) Change the “inspection items” to “inspection items and process assurance items”. (see 7.4 and also see 5.4 of 2015 edition);

将“检验项目”更改为“检验项目和工艺保证项目”（见 7.4，2015 年版的 5.4）；

i) Revised the requirements for “sampling” (see 7.5 and also see 5.5 of 2015 edition)；

更改了“取样”的要求（见 7.5，2015 年版的 5.5）；

j) Revised the “judgement of test results” (see 7.6 and also see 5.6 of 2015 edition)；

更改了“检验结果的判定”（见 7.6，2015 版的 5.6）；

k) Revised the requirement for “marking of products” (see 8.1.1 and also see 6.1.1 of 2015 edition)；

更改了“产品标志的要求”（见 8.1.1，2015 版的 6.1.1）；

l) Added “Test Method for Pin-Type Support” (see Annex C)

增加了“销型支承试验方法”（见附录 C）；

Please note that some of contents in this standard may involve patent rights. The issuing organization of this standard does not assume responsibility for identifying any patents.

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This document is proposed by the China Non-ferrous Metals Industry Association.

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本文件由全国有色金属标准化技术委员会 (SAC/TC 243) 归口。

The previous version of this standard and the document it replaces are as follows:

本文件及其所代替文件的历次版本发布情况为：

——Firstly published in 1986 as GB/T 6892-1986, firstly revised in 2000;

——1986 年首次发布为 GB/T 6892-1986，2000 年第一次修订；

——Secondly revised in 2006, during the revision, GB/T 19347-2003 "Aluminum Alloy Extruded Profiles for Railway Vehicle Structures" (firstly published in 2003 as GB/T 19347-2003) and GB/T 19347.2-2005 "Aluminum Alloy Extruded Profiles for Railway Vehicle Structures under Special Environmental Conditions" were incorporated (firstly published in 2005 as GB/T 19347.2-2005)；

——2006 年第二次修订，修订时并入了 GB/T 19347-2003《轨道车辆结构用铝合金挤压型材》（2003 年首次发布为 GB/T 19347-2003）及 GB/T 19347.2-2005《特殊环境条件 轨道车辆结构用铝合金挤压型材》（2005 年首次发布为 GB/T 19347.2-2005）；

——Thirdly revised in 2015;

——2015年第三次修订；

——This is the fourth revision.

——本次为第四次修订。

Wrought aluminium and aluminium alloys extruded profiles for general engineering

一般工业用铝及铝合金挤压型材

1 Scope 范围

This standard specifies the product classification, technical requirements, test methods, inspection rules, marking, packaging, transportation, storage, quality certificate and the contents included in purchase order (or contract) for extruded profiles of aluminum and its alloys used for general industry.

本文件规定了一般工业用铝及铝合金挤压型材的产品分类、技术要求、试验方法、检验规则、标志、包装、运输、贮存及质量证明书与订货单（或合同）内容。

This standard is applicable to extruded profiles of aluminum and its alloys used for general industrial application (hereafter referred to “Profiles”).

本文件适用于一般工业用铝及铝合金型材（以下简称型材）。

2 Normative References 规范性引用文件

The contents in the following documents constitute essential clauses of this standard through normative references in the text. For dated references, only the edition corresponding to that date is applicable to this standard. For undated references, the latest edition of the referenced document (including any amendments) is applicable to this standard.

下列文件中的内容通过文中的规范性引用而构成本文件必不可少的条款。其中，注日期的引用文件，仅该日期对应的版本适用于本文件；不注日期的引用文件，其最新版本（包括所有的修改单）适用于本文件。

GB/T 231.1 Metallic Materials — Brinell Hardness Test—Part 1: Test Method

金属材料 布氏硬度试验 第1部分：试验方法

GB/T 232 Metallic Materials — Method for Bending Test

金属材料 弯曲试验方法

GB/T 3190 Wrought Aluminum and its Alloys —Chemical Composition

变形铝及铝合金化学成分

GB/T 3199 Products of Aluminum and its Alloy —Packaging, Marking, Transportation and Storage

铝及铝合金加工产品包装、标志、运输、贮存

GB/T 3246.1 Inspection Method for Structure of Wrought Aluminum and its Alloy Products —Part 1: Inspection Method for Microstructure

变形铝及铝合金制品组织检验方法 第1部分：显微组织检验方法

GB/T 3246.2 Inspection Method for Structure of Wrought Aluminum and its Alloy Products
—Part 2: Inspection Method for Macrostructure
变形铝及铝合金制品组织检验方法 第2部分：低倍组织检验方法

GB/T 3251 Compression Test Method for Aluminum and its Alloy Products
铝及铝合金产品压缩试验方法

GB/T 5237.2 Architectural Profiles of Aluminum Alloys —Part 2: Anodized Profiles
铝合金建筑型材 第2部分：阳极氧化型材

GB/T 5237.3 Architectural Profiles of Aluminum Alloys —Part 3: Electrophoretic Painted Profiles
铝合金建筑型材 第3部分：电泳涂漆型材

GB/T 5237.4 Architectural Profiles of Aluminum Alloys —Part 4: Powder Sprayed Profiles
铝合金建筑型材 第4部分：喷粉型材

GB/T 5237.5 Architectural Profiles of Aluminum Alloys —Part 5: Paint Sprayed Profiles
铝合金建筑型材 第5部分：喷漆型材

GB/T 6398 Metallic Materials —Fatigue Test—Method for Fatigue Crack Propagation
金属材料 疲劳试验 疲劳裂纹扩展方法

GB/T 6519 Method of Ultrasonic Inspection for Wrought Aluminum and Magnesium Alloy Products
变形铝、镁合金产品超声波检验方法

GB/T 7998-2023 Evaluation Method for Inter-granular Corrosion Susceptibility of Aluminum Alloys
铝合金晶间腐蚀敏感性评价方法

GB/T 7999 Analytical Method of the Photoelectric Direct Reading Emission Spectrum for Aluminum and its Alloys
铝及铝合金光电直读发射光谱分析方法

GB/T 8005.1 Terminology of Aluminum and its Alloys—Part 1: Products, Fabrication and Processing Technology
铝及铝合金术语 第1部分：产品及加工处理工艺

GB/T 8013 (All Parts) Anodized Film and Organic Polymer Film on Aluminum and its Alloys
铝及铝合金阳极氧化膜与有机聚合物膜

GB/T 8170 Rounding off Rules for Numerical Values & Expression and Judgement of Limit Values
数值修约规则与极限数值的表示和判定

GB/T 12966 Eddy Current Test Method for Aluminum Alloy Conductivity
铝及铝合金电导率涡流测试方法

GB/T 12967.3 Inspection Method for Anodized Film and Organic Polymer Film on Aluminum and its Alloys—Part 3: Salt Spray Test
铝及铝合金阳极氧化膜及有机聚合物膜检测方法 第3部分：盐雾试验

GB/T 14846 Extruded Profiles of Aluminum and its Alloys— Dimensional Tolerance
铝及铝合金挤压型材尺寸偏差

GB/T 16865 Tensile Test Specimens and Test Method for Wrought Aluminum and Magnesium and Their Alloy Products
变形铝、镁及其合金加工制品拉伸试验用试样及方法

GB/T 17432 Sampling Method for Chemical Composition Analysis of Wrought Aluminum and its Alloys

变形铝及铝合金化学成分分析取样方法

GB/T 20975 (All parts) Chemical Analysis Method of Aluminum and its Alloys

铝及铝合金化学分析方法

GB/T 22639 Test Method for Exfoliation Corrosion of Aluminum and its Alloy Products

铝合金产品的剥落腐蚀试验方法

GB/T 22640 Test Method for Evaluating the Stress Corrosion Susceptibility of Aluminum Alloys

铝合金加工产品的环形试样应力腐蚀试验方法

GB/T 26492.5 Defects in Ingots and Their Fabricated Products of Aluminum and its Alloys

—Part 5: Defects in Tubes and Pipes, Rods and Bars, Profiles, Wires

变形铝及铝合金铸锭及加工产品缺陷 第5部分：管材、棒材、型材、线材缺陷

GB/T 32790 Test Method for Bonding Performance of Aluminum and its Alloy Extrusion Welds

铝及铝合金挤压焊缝焊接性能检验方法

GB/T 34487 Shear Test Method for Aluminum Alloy Products Used for Structures

结构件用铝合金产品剪切试验方法

GB/T 37616 Fatigue Test Method for Axial Force Control of Aluminum Alloy Extruded Profiles

铝合金挤压型材轴向力控制疲劳试验方法

GB/T 42914 Test Method for Fracture Toughness of Aluminum Alloy Products

铝及铝合金产品标识

GB/T 42916 Identification of Aluminum and its Alloy Products

铝合金产品断裂韧度试验方法

JJG 475 Electronic Universal Testing Machine

电子式万能试验机

YS/T 1630.1-2023 Aluminum Alloy Sheets and Plates for Aviation Use—Part 1: Sheets and Plates of 7050 Alloy

航空用铝合金管、棒、型材 第1部分：7050 铝合金型材

ISO 15614-2 Specification and qualification of welding procedures for metallic materials—Welding procedure test—Part 2: Arc welding of aluminium and its alloys

ISO 25239-4 Friction Stir Welding—Aluminum—Part 4: Evaluation for Welding Procedure

3 Terminology and Definitions 术语和定义

The terminology and definitions defined in GB/T 8005.1 and GB/T 26492.5 are applicable to this standard.

GB/T 8005.1、GB/T 26492.5界定的术语和定义适用于本文件。

4 Product Classification 产品分类

4.1 Composition Classification 成分类别

Profiles are classified into Type I and Type II based on composition, as shown in Table 1.

型材按成分划分为 I 类和 II 类，见表1。

Table 1 Composition Classification 成分类别

Type 类型	Type Description 类型说明	Typical Alloy Designation 典型牌号
Type I	Profiles of 1XXX, 3XXX and 6XXX series alloys, and 5XXX series alloy with an average magnesium limit of less than 4% 1XXX系、3XXX系、6XXX系及镁限量平均值小于4%的5XXX系合金型材	1060, 1350, 3003, 3103, 3A21, 5052, 5A02, 6101B, 6005, 6005A, 6105, 6106, 6013, 6351, 6060, 6061, 6063, 6063A, 6463, 6082, 6A02, 6A66,
Type II	Profiles of 2XXX and 7XXX series alloys, and 5XXX series alloy with an average magnesium limit of not less than 4% 2XXX系、7XXX系及镁限量平均值不小于4%的5XXX系合金型材	2014, 2024, 2A11, 2A12, 5083, 5383, 5A05, 5A06, 7003, 7005, 7020, 7022, 7075 7A04, 7A21, 7A41

4.2 Designation, Temper and Dimension 牌号、状态及尺寸规格

The alloy designation, temper and dimension of profiles shall be as specified in Table 2. When purchaser needs other alloy designation, temper and dimension, it shall be agreed upon by supplier and purchaser with reference to "Registration Form for Temper and Properties of Wrought Aluminum and its Alloy Products", and indicated in the purchase order (or the contract).

型材的牌号、状态及尺寸规格应符合表2的规定。需方需要其他牌号、状态、尺寸规格时，由供需双方参照《变形铝及铝合金产品状态与性能登记表》协商确定，并在订货单（或合同）中注明。

Table 2 Grade, Temper and size of the profile 型材的牌号、状态及尺寸规格

Alloy 牌号	Temper 状态	dimensions 尺寸规格 mm	
		Section size 截面尺寸	Length 长度
1060	0, H112	Meet the drawing requirements agreed by both sides of the manufacturer and purchaser. 符合供需双方商定的图样要求	1000~14000
1350	H112		
2014	T6		
2024	T3		
2A11	T4		

Alloy 牌号	Temper 状态	dimensions 尺寸规格 mm	
		Section size 截面尺寸	Length 长度
2A12	0、T4		
3003	H112		
3103	H112		
3A21	0、H112		
5052	0、H112		
5083	H112		
5383	H112		
5A02	H112		
5A05	0、H112		
5A06	0、H112		
6101B	T6		
6005	T4、T5、T6		
6005A	T5、T6		
6105	T5		
6106	T6	Meet the drawing requirements agreed by both sides of the manufacturer and purchaser. 符合供需双方商定的图样要求	1000~14000
6013	T6		
6351	T6		
6060	T4、T5、T6、T66		
6061	T4、T5、T6		
6063	T4、T5、T6、T66		
6063A	T5、T6		
6463	T4、T5、T6		
6082	T4、T5、T6		
6A02	T6		
6A66	T5、T6		
7003	T6		
7005	T5、T6		
7020	T6		
7022	T6、T6511		
7075	T6、T6510、T6511、T73、 T73510、T73511		
7A04	T6		
7A21	T5		
7A41	T6		

4.3 Surface Type 表面类型

Profiles are classified into non-surface finishing and surface finishing profiles based on surface types. The film type, film gloss, powder and paint used for film formation ,

film-forming technology, and film functions of the surface finishing profiles are as shown in Table 3.

型材按表面类型分为经表面处理的型材和未经表面处理的型材，经表面处理的型材的膜层类别、膜层光泽、成膜用粉和漆、成膜工艺及膜层功能见表3。

Table 3 Film Type, Film Gloss, Powder and Paint Used for Film Formation, Film-Forming Technology and film Functions

膜层类别、膜层光泽、成膜用粉和漆、成膜工艺及膜层功能

Film Type ^a 膜层类别			膜层光泽Film gloss ^b					Powder and paint used for film formation 成膜用粉和漆	Film-forming Technology 成膜工艺	Film functions膜层功能	
			Mat t 无光	Low Ligh t 低光	Flat Ligh t 平光	High Ligh t 高光	Mirror gloss 镜面			Main function 主要功能	Special function 特殊功能
Anodized film 阳极氧化 膜	Plane film 平面 膜	Mono-color Plane 单色平面	-	-	-	-	-	Anodizing, 阳极氧化 anodizing+electrolytic coloring, 阳极氧化+电 解着色、 anodizing+dyeing阳极 氧化+染色	Having decorativ e and general protectiv e functions 具有装饰 性与一般 保护性功 能	Having anti bacterial/anti fungal, hydrophilic/hydrophobi c, non stick/anti stick/anti graffiti, insulation, high temperature resistance, heavy anti-corrosion, reflective insulation, light absorption, anti slip, high abrasion resistance, heat dissipation, and anti-static, reflective, fluorescent afterglow emitting, peelable and other functions	
		Multi-colo r plane texture ^d 多色平面纹 理									
	Stere o film 立体 膜	Mono-color stereo texture ^d 单色立体纹 理									
	Multi-colo										

		<p>r stereo texture^d 多色立体纹理</p>					
<p>Anodized composite Film 阳极氧化复合膜</p>	<p>Plane film 平面膜</p>	<p>Mono-color plane 单色平面</p>	<p>Light or extinction 有光或消光</p>	<p>Clear paint, color paint 透明漆、有色漆</p>	<p>Anodizing+electrophoretic painting (clear paint or colored paint) 阳极氧化+电泳涂漆(透明漆或有色漆)</p>	<p>具有抗细菌/抗霉菌、亲/疏水、不沾/抗粘贴/防涂鸦、绝缘、耐高温、重防腐、反射隔热、光吸收、防滑、高耐磨、散热、防静电、反光、荧光余辉发光、可剥离等功能</p>	
		<p>Multi-color plane texture^d 多色平面纹理^d</p>		<p>Clear paint, color paint 透明漆、有色漆</p>	<p>Anodizing+multiple dyeing+clear paint electrophoretic coating, or anodizing+color paint electrophoretic coating+ink transfer printing 阳极氧化+多次染色+透明漆电泳涂装或阳极氧化+色漆电泳涂装+油墨转印</p>		
		<p>Mono-color stereo texture^d 单色立体纹理^d</p>		<p>Clear paint 透明漆</p>	<p>Electrochemical corrosion+anodizing+electrolytic coloring+clear paint electrophoretic coating 电化学腐蚀+阳极氧化+</p>		
		<p>Multi-color</p>					

		stereo texture ^d 多色立体纹理			电解着色+透明漆电泳涂装		
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Table 3 Film Type, Film Gloss, Powder and Paint Used for Film Formation, Film-Forming Technology and film Functions (cont.)

膜层类别、光泽、成膜用粉和漆、成膜工艺及膜层功能（续）

Film Type ^a 膜层类别		Film gloss ^b 膜层光泽					Powder and paint used for film formation ^c 成膜用粉和漆	Film-forming Technology 成膜工艺	Film functions 膜层功能			
		Matt 无光	Low Light 低光	Flat Light 平光	High Light 高光	Mirror gloss 镜面			Main Function 主要功能	Special function 特殊功能		
Powder sprayed film 喷粉膜	Plane film 平面膜	Mono-color Plane 单色平面		√	√	√	√	-	Ordinary powder 普通粉	Powder single-layer spraying 粉末单层喷涂	Having decorative and general protective functions 具有装饰性与一般保护性功能	Having antibacterial/antifungal, hydrophilic/hydrophobic, nonstick/antistick/antigraffiti, insulat
				√	√	√	√	-	Thin coating powder ^e 薄涂粉 ^e			
	Multi color plane texture ^d 多色平面纹理	Metal effect 金属效果	√	√	√	√	√	Metal effect powder ^f 金属效果粉 ^f	Powder single-layer spraying+ink heat transfer printing 粉末单层喷涂+油墨热转印			
			√	√	√	-	-	Metal effect transfer printing powder ^f 金属效果转印粉 ^f				
		Other effect 其他效果	√	√	√	√	-	Heat transfer printing powder 热转印粉	Powder single-layer spraying+ink heat transfer 粉末单层喷涂+油墨热转移			
			√	√	√	-	-	Heat transfer powder 热转移粉				

										粉末单层喷涂+油墨热转移		ion, high temperature resistance, heavy anti-corrosion, reflective insulation, light absorption, anti-slip, high abrasion resistance, heat dissipation, and anti-static, reflect
Stereo Film 立体膜层	Mono-color stereoscopic texture ^d 单色立体纹理 ^d		√	√	-	-	-	Sand-print powder 砂纹粉	Powder single-layer spraying 粉末单层喷涂			
			-	-	-	-	-	Orange patterned powder 桔纹粉				
			-	-	-	-	-	Pattern powder 花纹粉				
			-	-	-	-	-	Wrinkle powder 皱纹粉				
	Multi color Stereo texture film ^d 多色立体纹理膜		Metal effect 金属效果	√	√	-	-	-				Sand-print metal effect powder ^f 砂纹金属效果粉 ^f
				-	-	-	-	-				Orange patterned metal effect powder ^f 桔纹金属效果粉 ^f
				-	-	-	-	-				Wrinkle metal effect powder ^f 皱纹金属效果粉 ^f
				-	-	-	-	-				Hammer pattern powder 锤纹粉

												<p>ive, fluorescent afterglow emitting, peelable and other functions 具有抗 细菌/抗 霉菌、亲 /疏水、 不沾/抗 粘贴/防 涂鸦、绝 缘、耐高 温、重防 腐、反射 隔热、光 吸收、防 滑、高耐 磨、散 热、防静电、反 光、荧光 余辉发 光、可剥</p>
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													离等功能
				-	-	-	-	-	Hammer heat transfer printing powder 锤纹热转印粉	Powder single-layer spraying+ heat transfer printing 粉末单层喷涂+热转印			
			Other effect 其他效果	-	-	-	-	-	Sprinkle coating Powder 洒涂面粉	Spray pre-curing +sprinkle powder for pattern making 喷涂预固化+洒粉制纹			
				-	-	-	-	-	Sprinkle coating heat transfer powder 洒涂热转移粉	Spray pre-curing +sprinkle powder for pattern making+ink heat transfer 喷涂预固化+洒粉制纹+油墨热转移			
				-	-	-	-	-	Sprinkle coating heat transfer printing Powder 洒涂热转印粉	Spray pre-curing +sprinkle powder for pattern making+ink heat transfer printing 喷涂预固化+洒粉制纹+油墨热转印			
				-	-	-	-	-	Orange patterned heat transfer printing powder 桔纹热转印粉	Powder single-layer spraying+ heat transfer printing 粉末单层喷涂+热转印			

				√	√	-	-	-	Sand-print heat transfer printing powder 砂纹热转印粉			
				-	-	-	-	-	Pattern heat transfer printing powder 花纹热转印粉			
				-	-	-	-	-	Wrinkle heat transfer printing powder 皱纹热转印粉			
Powder sprayed film (cont.)				√	√	-	-	-	Sand-print heat transfer powder 砂纹热转移粉	Powder single-layer spraying+ heat transfer 粉末单层喷涂+热转移		
				-	-	-	-	-	Wrinkle heat transfer powder 皱纹热转移粉			
				-	-	-	-	-	Multi-layer powder 多层粉	One-time spray pre-curing +secondary spraying+roller pressing for pattern making 一次喷涂预固化+二次喷涂+辊压制纹		
				-	-	-	-	-	Multi-layer heat transfer printing 多层热转印	One-time spray pre-curing +secondary		

									Powder 多层热转印粉	spraying+roller pressing for pattern making+ink heat transfer printing 一次喷涂预固化+二次 喷涂+辊压制纹+油墨 热转印		
				-	-	-	-	-	Multi-layer heat transfer powder 多层热转移粉	One-time spray pre- curing +secondary spraying+roller pressing for pattern making+ink heat transfer 一次喷涂预固化+二次 喷涂+辊压制纹+油墨 热转移		

Table 3 Film Type, Film Gloss, Powder and Paint Used for Film Formation , Film-Forming Technology and film Functions (cont.)

Film Type ^a 膜层类别			Film gloss ^b 膜层光泽					Powder and paint used for film formation ^c 成膜用粉和漆	Film- forming Technology 成膜工艺	Film functions 膜层功能	
			Matt	Low light	Flat light	High light	Mirror gloss			Main Function 主要功能	Special function 特殊功能
Paint sprayed film 喷漆膜	Plane film 平面膜 层	Mono-color Plane 单色平面	√	√	√	-	-	PVDF paint PVDF漆	Primer+mono-color topcoat spraying Primer+mono-color topcoat+varnish		
			√	√	√	√	-	FEVE paint FEVE漆			

									spraying Primer+barrier paint+ Mono-color topcoat +varnish spraying 底漆+单色面漆喷涂 底漆+单色面漆+清漆 喷涂底漆+阻挡漆+单 色面漆+清漆喷涂			
				√	√	√	-	-	Epoxy paint 环氧漆	Primer+mono-color topcoat spraying 底漆+单色面漆喷涂		
				√	√	√	-	-	Polyester paint 聚酯漆	Mono-color topcoat spraying Primer+mono-color topcoat spraying 单色面漆喷涂底漆+单 色面漆喷涂		
				-	√	√	-	-	Acrylic paint 丙烯酸漆	Primer+mono-color topcoat spraying 底漆+单色面漆喷涂		
				-	√	√	-	-	Polyurethane paint 聚氨酯漆	Primer+mono-color topcoat spraying 底漆+单色面漆喷涂		
		Mult i- colo	Met al Eff	-	√	√	-	-	PVDF paint PVDF漆	Primer+metal effect pigment topcoat ^f		
				-	√	√	√	-	FEVE paint	spraying,		

		r plan e text ure ^d 多色 平面 纹理	ect 金属 效果						FEVE漆	Primer+metal effect pigment topcoat ^f +varnish spraying, Primer+barrier paint+metal effect pigment topcoat ^f +varnish spraying 底漆+金属效果颜料面漆喷涂、底漆+金属效果颜料面漆+清漆喷涂、底漆+阻挡漆+金属效果颜料面漆+清漆喷涂		
				-	√	√	-	-	Epoxy paint 环氧漆	Primer+metal effect pigment topcoat ^f spraying 底漆+金属效果颜料面漆		
				-	√	√	-	-	Polyester paint 聚酯漆	Metal effect pigment topcoat ^f spraying, Primer+metal effect pigment topcoat ^f spraying 金属效果颜料面漆喷涂、底漆+金属效果颜料面漆喷涂		
				-	√	√	-	-	Acrylic paint	Primer+metal effect		

								丙烯酸漆	pigment topcoat ^f spraying 底漆+金属效果颜料面 漆喷涂		
			-	√	√	-	-	Polyurethane paint 聚氨酯漆	Primer+mono-color topcoat spraying 底漆+单色面漆喷涂		
		Other Effect 其他 效果	-	√	√	-	-	Polyurethane paint 聚氨酯漆	Mono-color topcoat spraying+ink heat transfer printing		
			-	√	√	-	-	Acrylic paint 丙烯酸漆	单色面漆喷涂+油墨热 转印		

Note: “√” denotes this type of film exists on the products and gloss test is needed. “-” means no film type with this gloss range exist on the products or it is unnecessary to test the gloss of this type of film.

注：“√”表示产品中存在该类型的膜层并有测试光泽的需求，“-”表示产品中不存在该光泽范围的膜层类型或者该类型的膜层没有测试光泽的需求。

^a Refer to Annex A to select the type and code of the film on the profiles. For the color of the powder sprayed film and paint sprayed film, refer to YS/T 680;

可参照附录A选择型材的膜层类别及膜层代号，喷粉膜、喷漆膜颜色参见YS/T 680；

^b It is unnecessary to test the gloss of anodized film and anodized composite film. It is necessary to test the gloss of powder and paint sprayed plane films. It is unnecessary to test the gloss of stereoscopic film (except for sand-print powder sprayed film). The film gloss is classified based on matt, low light, flat light, high light and mirror gloss:

阳极氧化膜和阳极氧化复合膜没有测试光泽需求，喷粉和喷漆平面膜层有测试光泽需求，立体膜（砂纹粉喷涂膜除外）没有测试光泽的需求。膜层光泽按无光、低光、平光、高光、镜面分类：

a) —matt: 60° gloss value $\leq 10\text{GU}$;

b) —low light: $10\text{GU} < 60^\circ$ gloss value $\leq 30\text{GU}$;

c) —flat light: $30\text{GU} < 60^\circ$ gloss value $\leq 70\text{GU}$;

d) —high light: $70\text{GU} < 60^\circ$ gloss value $\leq 100\text{GU}$;

e) —mirror gloss: 60° gloss value $> 100\text{GU}$, the film has a metallic effect;

——无光： 60° 光泽值 $\leq 10\text{GU}$ ；

——低光： $10\text{GU} < 60^\circ$ 光泽值 $\leq 30\text{GU}$ ；

——平光： $30\text{GU} < 60^\circ$ 光泽值 $\leq 70\text{GU}$ ；

——高光： $70\text{GU} < 60^\circ$ 光泽值 $\leq 100\text{GU}$ ；

——镜面： 60° 光泽值 $> 100\text{GU}$ ，膜层呈金属效果；

^c For the requirements of the paint used for forming anodized composite films, refer to GB/T 5237.3. The requirements of the powder used for forming powder sprayed films, refer to YS/T 680. The requirements of the paint used for forming paint sprayed films, refer to GB/T 5237.5; 阳极氧化复合膜成膜用漆的要求见GB/T 5237.3，喷粉膜成膜用粉的要求见YS/T 680，喷漆膜成膜用漆的要求见GB/T 5237.5；

^d For texture type, refer to GB/T 8013.4;

纹理类型见GB/T 8013.4；

^e The film-forming thickness is $40\ \mu\text{m} \sim 60\ \mu\text{m}$ plane powder;

成膜厚度为 $40\ \mu\text{m} \sim 60\ \mu\text{m}$ 的平面粉末；

^f Including the metal effect pigments such as aluminum pigments, copper gold powder, and pearlescent pigments, etc.

含铝颜料、铜金粉、珠光颜料等金属效果颜料。

4.4 Marking and Examples 标记及示例

4.4.1 The marking of non-surface finishing profiles shall be expressed in sequence of product name, number of this standard, alloy designation, temper, section code and cut lengths. The example of marking is as follows:

未经表面处理的型材标记按产品名称、本文件编号、牌号、状态、截面代号及定尺长度的顺序表示。标记示例如下：

Example: 示例

The profile which alloy designation stand for 6063, with temper T5, section code YST01100001 and length of 4000mm is marked as:

6063牌号、T5状态、截面代号为YST01100001、长度为4000mm的型材，标记为：
型材 Profile GB/T 6892-6063T5- YST01100001×4000

4.4.2 The marking of surface finishing profiles shall be expressed in sequence of product name and color (or color code), film code, number of this standard, alloy designation, temper, section code and cut lengths. The examples of marking are as follows:

经表面处理的型材标记按产品名称和颜色（或色号）、膜层代号、本文件编号、牌号、状态、截面代号及定尺长度的顺序表示。标记示例如下：

Example 1: 示例 1

The profile whose color is silver white, film code is AA20, alloy designation is 6063, temper is T5, section code is YST01100001 and length is 4000mm shall be marked as:

银白色、膜层代号为AA20、6063 牌号、T5 状态、截面代号为 YST01100001、长度为 4000mm 的型材，标记为：

Profile silver white 型材银白色 AA20 GB/T 6892-6063T5- YST01100001×4000

Example 2 : 示例 2

The profile whose color is black, film code is EA21, alloy designation is 6063, temper is T5, section code is YST00010004 and length is 4000mm shall be marked as:

黑色、膜层代号为EA21、6063 牌号、T5 状态、截面代号为 YST00010004、长度为 4000mm 的型材，标记为：

Profile black 型材黑色 EA21 GB/T 6892-6063T5- YST00010004 ×4000

Example 3: 示例 3

The profile whose color is yellow, film code is GA40, alloy designation is 6063, temper is T5, section code is YST00010004 and length is 4000mm shall be marked as:

黄色、膜层代号为GA40、6063 牌号、T5 状态、截面代号为 YST00010004、长度为 4000mm 的型材，标记为：

Profile yellow 型材黄色 GA40 GB/T 6892-6063T5- YST00010004×4000

Example 4: 示例 4

The profile whose color is green, film code is LF4-65, alloy designation is 6063, temper is T5, section code is YST00010004 and length is 4000mm shall be marked as:

绿色、膜厚代号为LF4-65、6063 牌号、T5 状态、截面代号为 YST00010004、长度为 4000mm 的型材，标记为：

Profile green 型材绿色 LF4-65 GB/T 6892-6063T5- YST00010004×4000

5 Technical Requirements 技术要求

The technical requirements for profiles shall be as specified in Table 4. If purchaser has special requirements, it shall be agreed upon by supplier and purchaser with reference to "Registration Form for Temper and Properties of Wrought Aluminum and Aluminum Alloy Products", and indicated in the profile drawing, purchase order (or contract).

型材的技术要求应符合表 4 的规定，需方有特殊要求时，由供需双方参照《变形铝及铝合金产品状

态与性能登记表》协商确定，并在型材图样、订货单（或合同）中注明。

Table 4 Technical Requirements技术要求

Items 项目	Technical Requirements 技术要求
Chemical composition 化学成分	Chemical composition of alloy 6A66, 7A21 and 7A41 shall be as shown in Table 5. Chemical composition of other alloys shall be as specified in GB/T 3190. 6A66、7A21、7A41 牌号化学成分应符合表 5 规定，其他牌号化学成分应符合 GB/T 3190 的规定
Dimensional tolerance 尺寸偏差	Dimensional tolerance shall be as specified in GB/T 14846. If the class is not specified, it is considered as ordinary class. If purchaser requires high-precision or ultra high precision, or has special requirements for dimensional tolerance, it shall be agreed upon by supplier and purchaser and indicated in the profile drawing, purchase order (or contract). For surface finishing profiles, the dimension change resulting from surface finishing should not affect their assembly and use. 尺寸偏差应符合 GB/T 14846 的规定，未注明等级时，为普通级。需方要求高精级、超高精级或对尺寸偏差有特殊要求时，由供需双方协商确定，并在型材图样、订货单（或合同）中注明。对于表面处理的型材，因表面处理引起的尺寸变化应不影响其装配和使用
Tensile mechanical properties at room temperature 室温拉伸力学性能	Tensile mechanical properties at room temperature shall be as specified in Table 6. If the purchaser has requirements for tensile modulus of elasticity, it shall be agreed upon by the supplier and purchaser and indicated in the profile drawing, purchase order (or contract). 室温拉伸力学性能应符合表 6 规定。需方对拉伸弹性模量有要求时，由供需双方协商确定，并在型材图样、订货单（或合同）中注明
Brinell hardness 布氏硬度	If requested by the purchaser, Brinell hardness shall be indicated in the purchase order (or contract). Brinell hardness (see Table 6) is for reference only and not used as a basis for judgement. 需方有要求时，应在订货单（或合同）中注明。布氏硬度（见表 6）仅供参考，不作为判定依据
Compression performance 压缩性能	If requested by the purchaser, these shall be agreed upon by supplier and purchaser and indicated in the profile drawing, purchase order (or contract). 需方有要求时，由供需双方协商确定，并在型材图样、订货单（或合同）中注明
Bending performance 弯曲性能	
Shear performance 剪切性能	
Fatigue performance 疲劳性能	
Fatigue life 疲劳寿命	
Fatigue crack propagation rate 疲劳裂纹扩展速率	
Plane strain fracture toughness 平面应变断裂韧度	
pin-type support 销型支承	
Electrical conductivity 电导率	If requested by the purchaser, the electrical

	<p>conductivity shall be indicated in the profile drawing, purchase order (or contract). The electrical conductivity of alloy 6063, 6061, 6101B, 6005, 6005A and 6082 shall be as shown in Table 7.</p> <p>需方要求电导率时,应在型材图样、订货单(或合同)中注明。6101B、6005、6005A、6061、6063、6082 合金型材电导率应符合表 7 规定</p>
<p>The matching relationship between electrical conductivity and mechanical properties</p> <p>电导率与力学性能的匹配关系</p>	<p>If requested by the purchaser, it shall be indicated in the profile drawing, purchase order (or contract). For the profiles of 7075 alloy, the matching relationship between electrical conductivity and mechanical properties shall be as shown in Table 8.</p> <p>需方有要求时,应在型材图样、订货单(或合同)中注明。7075 合金型材电导率与力学性能的匹配关系应符合表 8 规定</p>
<p>Stress corrosion resistance</p> <p>抗应力腐蚀性能</p>	<p>If the purchaser has requirements for stress corrosion resistance of T73, T73510 and T73511 tempers of 7075 alloy profiles, their stress corrosion resistance shall be as shown in Table 9.</p> <p>需方对 7075 合金 T73、T73510、T73511 状态型材抗应力腐蚀性能有要求时,其抗应力腐蚀性能应符合表 9 的规定</p>
<p>Exfoliation corrosion resistance</p> <p>抗剥落腐蚀性能</p>	<p>If the purchaser has requirements for exfoliation corrosion resistance of 2XXX, 5XXX, 6XXX and 7XXX series alloy profiles, the test result class of exfoliation corrosion resistance shall be agreed upon by the supplier and purchaser and indicated in purchase order (or contract).</p> <p>需方对 2XXX 系、5XXX 系、6XXX 系及 7XXX 系合金型材抗剥落腐蚀性能有要求时,由供需双方协商确定抗剥落腐蚀性能试验结果等级,并在订货单(或合同)中注明</p>
<p>Inter-granular corrosion susceptibility</p> <p>晶间腐蚀敏感性</p>	<p>If the purchaser has requirements for inter-granular corrosion susceptibility of 2XXX, 6XXX and 7XXX series alloy profiles, the class of inter-granular corrosion shall be agreed upon by the supplier and purchaser and indicated in purchase order (or contract). If the purchaser has requirements for inter-granular corrosion performance of 5XXX series alloy profiles, the the class of inter-granular corrosion (when corrosion depth method is used) or mass loss per unit area (when mass loss method is used) shall be agreed upon by supplier and purchaser, and indicated in purchase order (or contract).</p> <p>需方对 2XXX 系、6XXX 系及 7XXX 系合金型材晶间腐蚀敏感性有要求时,由供需双方协商确定晶间腐蚀级别,并在订货单(或合同)中注明;需方对 5XXX 系合金型材晶间腐蚀性能有要求时,由供需双方协商确定晶间腐蚀级别(采用腐蚀深度法时)或单位面积质量损失(采用质量损失法时),并在订货单(或合同)中注明</p>
<p>Salt mist corrosion resistance</p> <p>耐盐雾腐蚀性能</p>	<p>If requested by the purchaser, these shall be agreed upon by supplier and purchaser, and indicated in the profile drawing, purchase order (or contract).</p>
<p>Welding performance</p> <p>焊接性能</p>	

Acceptance class of ultrasonic flaw detection 超声波探伤验收等级		需方有要求时,由供需双方协商确定,并在型材图样、订货单(或合同)中注明
Bonding performance of welds 焊缝焊合性能		If requested by the purchaser, the bonding performance of welds on profiles shall be agreed upon by the supplier and purchaser, and indicated in purchase order (or contract). Poor bonding is not allowed in the welds of profiles, but bonding marks are allowed. 需方对型材焊缝焊合性能有要求时,由供需双方协商确定,并在型材图样、订货单(或合同)中注明。型材的焊缝不准许存在焊合不良,但允许存在焊合痕迹
Macrostructure 低倍组织	Fracture structure 断口组织	There shall be no non-metallic inclusions or metal inclusions on the fractures of profiles with a thickness of not less than 25mm. It is not allowed to exist oxide films with a length more than 2.0mm per point. There shall not be more than 4 oxide films with a length more than 0.3mm and not more than 2.0mm per point. It is allowed to exist oxide films with a length not more than 0.3mm per point. The inspected area shall not be less than 80cm ² . 厚度不小于 25mm 的型材断口不准许存在非金属夹杂、金属夹杂。每点长度大于 2.0mm 的氧化膜不准许存在;每点长度大于 0.3mm、不大于 2.0mm 的氧化膜不应多于 4 个;每点长度不大于 0.3mm 的氧化膜允许存在。受检面积宜不小于 80cm ²
	Depth of coarse grain 粗晶环深度	For 6061, 6063, 6082 and 6005A alloy profiles, the ordinary class of coarse grain ring shall not be more than 8mm, not more than 5mm for high precision class. If the class is not specified, it shall be considered as ordinary class. If the purchaser has requirements for coarse grain ring in other alloy profiles, it shall be agreed upon by the supplier and purchaser, and indicated the requirement for depth of coarse grain ring in the purchase order (or the contract). 6061、6063、6082、6005A 合金型材粗晶环普通级不大于 8mm, 高精级不大于 5mm, 未注明等级时,为普通级。需方对其他牌号型材粗晶环有要求时,由供需双方协商确定,并在订货单(或合同)中注明粗晶环深度要求
	Others 其他	There shall be no cracks and tail-shrinkage. It is allowable to exist point-like defects such as bright grains, non-metallic inclusions, metal inclusions, white spots, primary crystals with a diameter of no more than 0.5mm and no more than two points, as well as lamination with a depth of no more than 0.5mm. 不准许有裂纹、缩尾存在;允许有不超两点、且直径不大于 0.5mm 的光亮晶粒、非金属夹杂物、金属夹杂和白斑、初晶等点状缺陷以及深度不超过 0.5mm 的成层
Microstructure 显微组织		Over heat in microstructure of solution treated profiles is not allowed. 经固溶处理的型材显微组织不准许过烧
Film	Anodized film ^b	Conform to GB/T 5237.2 or agreed upon by Supplier and

performance ^a 膜层性能 ^a	阳极氧化膜	purchaser according to GB/T 8013.1. 符合 GB/T 5237.2 或供需双方按照 GB/T 8013.1 商定
	Anodized composite film ^b 阳极氧化复合膜 ^b	Conform to GB/T 5237.3 or agreed upon by Supplier and purchaser according to GB/T 8013.2. 符合 GB/T 5237.3 或供需双方按照 GB/T 8013.2 商定
	powder sprayed film ^b 喷粉膜 ^b	Conform to GB/T 5237.4 or agreed upon by Supplier and purchaser according to GB/T 8013.3. 符合 GB/T 5237.4 或供需双方按照 GB/T 8013.3 商定
	paint sprayed film ^b 喷漆膜 ^b	Conform to GB/T 5237.5 or agreed upon by Supplier and purchaser according to GB/T 8013.3. 符合 GB/T 5237.5 或供需双方按照 GB/T 8013.3 商定
Appearance quality 外观质量		<p>The surfaces of non-surface finishing profiles shall be clean, and there shall be free from cracks and corrosion spots. The depth of defects such as peeling, bubbles, dents, bruises, abrasions, scratches, rough surfaces, and localized mechanical damage, etc on profile surfaces shall not exceed 8% of the nominal wall thickness of the defect location, and not exceed 0.2mm on decorative surfaces and 0.5mm on non-decorative surfaces. The total area of defects on decorative surfaces shall not exceed 2% of the surface area of the profile, and on non-decorative surfaces shall not exceed 5% of the surface area of the profile. The surface defect depth of the location needed to be machined on the profile shall not exceed the machining allowance. It is allowable for the supplier to polish the surfaces of the profiles longitudinally to smooth finish.</p> <p>未经表面处理的型材表面应清洁, 不允许有裂纹和腐蚀斑点存在。表面上的起皮、气泡、压坑、碰伤、擦伤、划伤、表面粗糙、局部机械损伤等缺陷的深度不允许超过所在部位壁厚公称尺寸的 8%, 且在装饰面上不应超过 0.2mm, 在非装饰面上不应超过 0.5mm。其缺陷的总面积在装饰面上不应超过型材表面积的 2%, 在非装饰面上不应超过型材表面积的 5%。型材上需要加工的部位, 其表面缺陷深度不应超过加工余量。型材的表面允许供方沿型材纵向打磨至光滑</p>
<p>^a When the purchaser has requirements for film texture, it shall be agreed upon by the supplier and purchaser according to GB/T8013.4. When the purchaser has requirements for special functions of films, it shall be agreed upon by the supplier and purchaser according to GB/T8013.5. 需方对膜层纹理有要求时, 供需双方按照 GB/T8013.4 商定, 需方对膜层特殊功能有要求时, 供需双方按照 GB/T8013.5 商定。</p> <p>^b The specific implementation standard shall be specified in purchase order (or the contract), and film performance requirements shall be specified in the profile drawing, purchase order (or contract) according to the said standard. 应在订货单(或合同)中注明具体执行标准, 并根据该标准的规定, 在型材图样、订货单(或合同)中注明膜层性能要求。</p>		

Table 5 Chemical composition 化学成分

Alloy 牌号	Chemical composition (mass fraction) 化学成分 (质量分数)												
	%											Other Elements ^a 其他 ^a	Al
	Si	Fe	Cu	Mn	Mg	Cr	Zn	V	Ti	Zr	Each 单个		
6A66	1.2~ 1.8	0.50	0.50	0.40~ 1.2	0.8~1.6	0.25	0.6	—	0.10	—	≤ 0.05	≤ 0.15	Remainder 余量
7A21	0.50	0.50	0.20	0.20	1.0~2.0	—	4.0~ 6.0	—	0.10	0.2 0	≤ 0.05	≤ 0.15	Remainder 余量
7A41	0.50	0.50	0.10~ 0.50	0.50	1.2~2.0	0.30	5.5~ 7.0	—	0.10	0.2 0	≤ 0.05	≤ 0.15	Remainder 余量

^a "Other" means a metal element whose value is not listed or specified in the table
^a "其他" 指表中未列出或未规定数值的金属元素。
^b "Total" means the sum of the "other" metallic elements which are not less than 0.0010%.
^b "合计" 表示不小于 0.0010% 的 "其他" 金属元素之和。

Table 6 Tensile properties and Brinell hardness at room temperature

室温拉伸力学性能和布氏硬度

Alloy 牌号	Temper 状态	Wall thickness mm 厚度	Tensile test results at room temperature 室温拉伸试验结果				Brinell hardness reference value 布氏硬 度参考 值 HBW
			Tensile Strength 抗拉强度 R_m MPa	Yield Strength 规 定非比例延 伸强度 $R_{p0.2}$ MPa	断后伸长率 Elongation after fracture ^a %		
					A	A_{50mm}	
不小于 min ^b							
1060	0	—	60~95	15	22	20	—
	H112	—	60	15	22	20	—
1350	H112	—	60	—	25	23	20
2014	T6	>25.00~75.00	460	415	7	—	140
2024	T3	≤15.00	395	290	8	6	120
		>15.00~50.00	420	290	8	—	120
2A11	T4	≤10.00	335	190	—	10	—
		>10.00~20.00	335	200	10	8	—

Alloy 牌号	Temper 状态	Wall thickness mm 厚度		Tensile test results at room temperature 室温拉伸试验结果				Brinell hardness reference value 布氏硬度参考 值 HBW
				Tensile Strength 抗拉强度 R_m MPa	Yield Strength规 定非比例延 伸强度 $R_{p0.2}$ MPa	断后伸长率 Elongation after fracture ^a %		
						A	A_{50mm}	
				不小于 min ^b				
2A12	0	—		≤245	—	12	10	—
	T4	≤5.00		390	295	—	8	—
		>5.00~10.00		410	295	—	8	—
		>10.00~20.00		420	305	10	8	—
		>20.00~50.00		440	315	10	—	—
3003	H112	—		95	35	25	20	30
3103	H112	—		95	35	25	20	28
3A21	0、H112	—		≤185	—	16	14	—
5052	H112	—		170	70	15	13	47
	0	—		≤245	—	12	10	—
5083	H112	—		270	125	12	10	70
5383	H112	—		310	190	—	13	—
5A02	H112	—		≤245	—	12	10	—
5A05	0、H112	—		≤255	130	15	13	—
5A06	0、H112	—		≤315	160	15	13	—
6101B	T6	≤15.00		215	160	8	6	70
6005	T4	≤25.00		180	90	15	13	50
	T5	≤6.30		250	220	—	7	—
6005	T6	Solid section 实心型 材	> 10.00~ 25.00	250	200	8	6	85
			Hollow section 空心型 材	≤5.00	255	215	—	6
		Hollow section 空心型 材	>5.00~ 15.00	250	200	8	6	85
6005A	T5	≤6.30		250	200	—	7	—
	T6	Solid section 实心型 材	≤5.00	270	225	—	6	90
			>5.00~ 10.00	260	215	—	6	85
		Hollow section 空心型 材	> 10.00~ 25.00	250	200	8	6	85
			≤5.00	255	215	—	6	85

Alloy 牌号	Temper 状态	Wall thickness mm 厚度		Tensile test results at room temperature 室温拉伸试验结果				Brinell hardness reference value 布氏硬度参考 值 HBW
				Tensile Strength 抗拉强度 R_m MPa	Yield Strength 规定非比例延 伸强度 $R_{p0.2}$ MPa	断后伸长率 Elongation after fracture ^a %		
						A	A_{50mm}	
不小于 min ^b								
		section 空心型 材	>5.00~ 15.00	250	200	8	6	85
6105	T5	—		250	240	—	8	—
6106	T6	≤10.00		250	200	—	6	75
6013	T6	—		340	310	—	8	—
6351	T6	≤5.00		290	250	—	6	95
		>5.00~25.00		300	255	10	8	95
6060	T4	≤25.00		120	60	16	14	50
	T5	≤5.00		160	120	—	6	60
	T6	≤3.00		190	150	—	6	70
		>3.00~25.00		170	140	8	6	70
	T66	≤3.00		215	160	—	6	75
		>3.00~25.00		195	150	8	6	75
6061	T4	≤25.00		180	110	15	13	65
	T5	≤16.00		240	205	9	7	—
	T6	≤5.00		260	240	—	7	95
		>5.00~25.00		260	240	10	8	95
6063	T4	≤25.00		130	65	14	12	50
	T5	≤3.00		175	130	—	6	65
		>3.00~25.00		160	110	7	5	65
	T6	≤10.00		215	170	—	6	75
		>10.00~25.00		195	160	8	6	75
	T66	≤10.00		245	200	—	6	80
6063A	T5	≤10.00		200	160	—	5	75
	T6	≤10.00		230	190	—	5	80
6463	T4	≤50.00		125	75	14	12	46
	T5	≤50.00		150	110	8	6	60
	T6	≤50.00		195	160	10	8	74
6082	T4	≤25.00		205	110	14	12	70
	T5	≤5.00		270	230	—	6	90
	T6	≤5.00		290	250	—	6	95
		>5.00~25.00		310	260	10	8	95
6A02	T6	—		295	230	10	8	—
6A66	T5	—		320	280	—	8	—

Table 6 Tensile properties and Brinell hardness at room temperature (To be continued)

Alloy	Temper	Wall thickness mm	Tensile test results at room temperature				Brinell hardness reference value HBW
			Tensile Strength R_m MPa	Yield Strength $R_{p0.2}$ MPa	Elongation after fracture ^a %		
					A	A_{50mm}	
min ^b							
	T6	—	350	310	—	8	
7003	T6	≤10.00	350	290	—	8	110
7005	T5	≤25.00	345	305	10	8	—
	T6	≤40.00	350	290	10	8	110
7020	T6	≤40.00	350	290	10	8	110
7022	T6、 T6511	≤30.00	490	420	7	5	133
7075	T6、 T6510、 T6511	≤25.00	530	460	6	4	150
		>25.00~60.00	540	470	6	—	150
	T73、 T73510、 T73511	≤25.00	485	420	7	5	135
7A04	T6	≤10.00	500	430	—	4	—
		>10.00~20.00	530	440	6	4	—
		>20.00~50.00	560	460	6	—	—
7A21	T5	—	390	360	—	8	—
7A41	T6	—	460	420	—	8	—

^a Not applicable to profiles with wall thickness less than 1.6mm.
不适用于壁厚不大于1.6mm的型材。

^b The tensile strength of the “0” temper and the specified non-proportional extension strength (yield strength) do not apply.
0态的抗拉强度和规定非比例延伸强度不适用。

Table 7 Electrical Conductivity Requirements 电导率要求

Alloy 牌号	Temper 状态	Conductivity index ^a 电导率指标 MS/m
6101B	T6	≥28.0
6005	T4	≥25.0
	T5、T6	≥27.0
6005A	T6	≥25.0
6061	T4	≥22.0
	T6	≥23.0
6063	T4	≥25.0
	T5、T6	≥28.0
6082	T4	≥22.0
	T6	≥26.5

^a When the demander requires the international annealed copper percentage (%IACS) as the conductivity unit, the conversion shall be carried out according to $1\text{MS/m}=1.724\times\%IACS$, and the calculation result shall be retained after one decimal place.
需方要求以国际退火铜百分比(%IACS)为电导率单位时,按 $1\text{MS/m}=1.724\times\%IACS$ 进行换算,计算结果保留小数点后一位。

Table 8 Matching relationship between electrical conductivity and mechanical properties of 7075 alloy profiles^a

7075 合金型材电导率与力学性能的匹配关系

Alloy 牌号	As-supplied 供应状态	Electric conductivity 电导率 MS/m	Mechanical property 力学性能
7075	T73、T73510、T73511	22.0~23.1	Comply with the provisions of this document and specify the non-proportional elongation strength (Rp0.2) as 420 MPa~502 MPa 符合本文件规定,且规定非比例延伸强度 (Rp0.2) 为 420 MPa~502 MPa
		>23.1	Comply with the provisions of this document 符合本文件规定

^a When the stress corrosion resistance meets the requirements in Table 9, the matching relationship between electrical conductivity and mechanical properties is for reference only.

抗应力腐蚀性能符合表 9 规定时,电导率与力学性能的匹配关系仅供参考。

Table 9 Stress Corrosion Property

应力腐蚀性能

Alloy 牌号	Temper 状态	Wall thickness of the profile sampling area 型材取样区域的壁厚 a ^a mm	Sample class 试样类别		Loading direction 加载方向	Test method 试验方法	Loading stress 加载应力 MPa	Test time 加载应力 d	Test result 试验结果
			Ratio of width b to wall thickness a of the section sampling area 型材取样区域的宽度b与壁厚a之比 b/a						
7075	T73、T73510、T73511	≥ 17.78	>2	Circular specimen 圆形试样	High direction 高向	Constant strain 恒应变	0.75×Rp0.2	≥ 20	The sample has no crack or fracture. 试样无裂纹、未断裂
			≤2	C-ring sample C型环试样					

^a When the wall thickness of the profile sampling area is less than 17.78mm, the stress corrosion resistance is determined by the supply and demand parties through negotiation, and indicated in the purchase order (or the contract).

^a 型材取样区域的壁厚小于17.78mm时, 抗应力腐蚀性能由供需双方协商确定, 并在订货单(或合同)中注明。

6 Test Methods 试验方法

The test methods of profiles shall be as specified in Table 10. When purchaser has special requirements for test methods, it shall be agreed upon by supplier and purchaser and indicated in the purchase order (or the contract).

型材的试验方法应符合表 10 的规定, 需方对试验方法有特殊要求时, 由供需双方协商确定, 并在订货单(或合同)中注明。

Table 10 Test Method 试验方法

Items 项目	Test Methods 试验方法
Chemical composition 化学成分	<p>Chemical analysis shall be carried out according to the method specified in GB/T 20975 (all parts) or GB/T 7999. The method specified in GB/T 20975 (all parts) shall be used in case of arbitration. The rounding comparison method is used for judgement of numerical analysis, and the rounding rules of numerical values are implemented in accordance with the relevant provisions in GB/T 8170. The rounding digits shall be consistent with the limit digits specified in Table 5 of this document or in GB/T 3190.</p> <p>按 GB/T 20975 (所有部分) 或 GB/T 7999 规定的方法进行, 仲裁时采用 GB/T 20975 (所有部分) 规定的方法; 分析数值的判定采用修约比较法, 数值修约规则按 GB/T 8170 的有关规定进行, 修约数位应与本文件的表 5 或 GB/T 3190 规定的极限数位一致</p>
Dimensional tolerance 尺寸偏差	<p>The dimensional measurement methods for non-surface finishing profiles, anodized profiles and electrophoretic painted profiles shall be as specified in GB/T 14846. When measuring the cross section dimension of powder sprayed and paint sprayed profiles, the film thickness shall be deducted. When purchaser requests to use a three coordinate measuring instrument to measure the dimensional tolerance of the profiles, it shall be agreed upon by supplier and purchaser with reference to Annex B and indicated in purchase order (or contract).</p> <p>未经表面处理的型材、阳极氧化型材及电泳涂漆型材尺寸的测量方法按 GB/T 14846 规定的方法进行。测定喷粉型材和喷漆型材横截面尺寸时, 应扣除膜层厚度。需方要求采用三坐标测量仪测量型材尺寸偏差时, 应由供需双方参照附录 B 商定, 并在订货单(或合同)中注明</p>
Tensile mechanical properties at room temperature 室温拉伸力学性能	<p>As per the method in GB/T 16865</p> <p>按 GB/T 16865 规定的方法进行</p>
Brinell hardness 布氏硬度	<p>As per the method in GB/T 231.1</p> <p>按 GB/T 231.1 规定的方法进行</p>
Compression performance 压缩性能	<p>As per the method in GB/T 3251. The type of test specimens and tested items shall be agreed upon by supplier and purchaser and indicated in purchase order (or contract).</p> <p>按 GB/T 3251 规定的方法进行, 试样类型及其检验项目由供需双方协</p>

	商确定, 并在订货单(或合同)中注明	
Bending performance 弯曲性能	As per the method in GB/T 232. The diameter of pressure head shall be agreed upon by supplier and purchaser and indicated in purchase order (or contract). 按 GB/T 232 规定的方法进行, 压头直径由供需双方协商确定, 并在订货单(或合同)中注明	
Shear performance 剪切性能	As per the method in GB/T 34487 按 GB/T 34487 规定的方法进行	
Fatigue performance 疲劳性能	Fatigue life 疲劳寿命	As per the method in GB/T 37616 按 GB/T 37616 规定的方法进行
	Fatigue crack propagation rate 疲劳裂纹扩展速率	As per the method in GB/T 6398 按 GB/T 6398 规定的方法进行
Plane strain fracture toughness 平面应变断裂韧度	As per GB/T 42914 Test Method for Fracture Toughness of Aluminum Products” 按 GB/T 42961 规定的方法进行	
Pin-type support 销型支承	According to the method in Annex C 按附录 C 规定的方法进行	
Electrical conductivity 电导率	Electrical conductivity is measured on the surfaces of profiles according to GB/T 12966. When the dimension or surface of the profile cannot meet the testing requirements, the test method shall be agreed upon by supplier and purchaser with reference to GB/T 12966 and indicated in purchase order (or contract). 按 GB/T 12966 的规定在型材表面测试电导率。当型材尺寸或表面无法满足测试要求时, 由供需双方参照 GB/T 12966 协商确定试验方法, 并在订货单(或合同)中注明	
The matching relationship between electrical conductivity and mechanical properties 电导率与力学性能的匹配关系	Electrical conductivity is measured on the billet of tensile mechanical specimens of profiles according to GB/T 12966. The positions to be measured shall be as specified in Table 11. Based on the measured results of the conductivity of the specimen billet and the specified non-proportional extension strength ($R_{p0.2}$), evaluate whether the matching relationship between conductivity and mechanical properties meets the requirements 按 GB/T 12966 的规定在型材拉伸力学试样的样坯上测试电导率, 测试部位应符合表 11 规定, 再根据试样样坯电导率和规定非比例延伸强度 ($R_{p0.2}$) 的测定结果, 评判电导率与力学性能的匹配关系是否符合要求	
Stress corrosion resistance 抗应力腐蚀性能	As per the provisions of 6.5 in YS/T 1630.1-2023. Or the determination method shall be confirmed through agreement by the supplier and the purchaser according to GB/T 22640 and indicate it in the purchase order (or the contract). 按 YS/T 1630.1-2023 中 6.5 的规定进行。或供需双方按 GB/T 22640 协商确定测定方法, 并在订货单(或合同)中注明	
Exfoliation corrosion resistance 抗剥落腐蚀性能	As per the method in GB/T 22639. For class evaluation, refer to T/CNIA 0180 "Exfoliation Corrosion Morphology Pictures of Aluminum Alloy Products" . 按 GB/T 22639 规定的方法进行, 参照 T/CNIA 0180 进行等级评定	
Inter-granular corrosion susceptibility 晶间腐蚀敏感性	2XXX, 6XXX and 7XXX series 2XXX 系、6XXX 系、7XXX 系	As per the corrosion depth method in GB/T 7998-2023 按 GB/T 7998-2023 规定的腐蚀深度法进行
	5XXX series	As per the mass loss method in GB/T

	5XXX 系	7998-2023 按 GB/T 7998-2023 规定的质量损失法进行
Salt mist corrosion resistance 耐盐雾腐蚀性能		Test method and result expression shall be agreed upon by supplier and purchaser as per GB/T 12967.3 and indicated in purchase order (or contract). 由供需双方按 GB/T 12967.3 协商确定试验方法及其结果表示形式, 并在订货单 (或合同) 中注明
Welding performance 焊接性能		As per the method in ISO 15614-2 or ISO 25239-4 按 ISO 15614 或 ISO 25239 规定的方法进行
Acceptance class of ultrasonic flaw detection 超声波探伤验收等级		As per GB/T 6519. The ultrasonic inspection method shall be agreed upon by supplier and purchaser and indicated in purchase order (or contract). If not specified, the contact method is used. 按 GB/T 6519 的规定进行, 超声波检验方式由供需双方协商确定, 并在订货单 (或合同) 中注明。未注明时, 采用接触法
Bonding performance of welds 焊缝焊合性能		As per GB/T 32790. The inspection method shall be agreed upon by supplier and purchaser and indicated in the purchase order (or the contract). 按 GB/T 32790 的规定进行, 检验方法由供需双方协商确定, 并在订货单 (或合同) 中注明
Macrostructure 低倍组织		As per the method in GB/T 3246.2. 按 GB/T 3246.2 规定的方法进行
Microstructure 显微组织		As per the method in GB/T 3246.1. 按 GB/T 3246.1 规定的方法进行
Film performance 膜层性能		As per the method in GB/T 5237.2~GB/T 5237.5 or it shall be agreed upon by supplier and purchaser according to GB/T 8013.1~GB/T 8013.5, and indicated in the purchase order (or the contract) 按 GB/T 5237.2~GB/T 5237.5 规定的方法进行或由供需双方按 GB/T 8013.1~GB/T 8013.5 协商确定, 并在订货单 (或合同) 中注明
Appearance quality 外观质量		Visually inspect the appearance quality of non-surface finishing profiles. If necessary, use corresponding tools and measuring instruments for measurement. If the depth of the defect is difficult to determine, measurement is allowed after polishing. 未经表面处理的型材外观质量以目视检验, 必要时采用相应的工具、量具测量。当缺陷深度难以确定时, 允许打磨后测量

Table 11 Conductivity Measurement Position Used for Evaluating the Matching Relationship Between Conductivity and Mechanical Properties

电导率与力学性能的匹配关系评判用电导率测试部位

Wall thickness of profile 型材壁厚 mm	Conductivity Measurement Position 电导率测试部位
≤ 2.50	Profile surface 型材的表面
>2.50~12.50	Surface after removing 10% wall thickness of the profile through machining 加工掉型材 10%壁厚后的表面
>12.50~40.00	A plane which is close to the center of the profile section thickness and parallel to the extrusion direction. 接近型材断面厚度中心且与挤压方向平行的平面
>40.00	A plane which is approximately 10mm apart from the center of the profile section thickness and parallel to the extrusion direction. 距型材断面厚度中心约 10mm 且与挤压方向平行的平面

7 Inspection Rules 检验规则

7.1 Inspection and Acceptance 检查和验收

7.1.1 Supplier is responsible for inspecting the products, ensuring that product quality meets the provisions in this standard and purchase order (or contract) and filling in the quality certificates.

产品应由供方进行检验，保证产品质量符合本文件及订货单（或合同）的规定，并填写质量证明书。

7.1.2 Purchaser shall inspect the received products according to provisions in this standard. If inscription results do not conform to provisions of this standard and purchase order (or contract), they shall be submitted in written to supplier and resolved through consultation by purchaser and supplier. Objection in respect of surface quality and dimensional tolerance shall be put forward within one month from the date of receiving the products. Objection in other properties shall be put forward within three months from the date of receiving the products. If arbitration is necessary, it can be proceeded by the entrusted unit recognized by purchaser and supplier and test specimens shall be taken jointly at purchaser site.

需方应对收到的产品按本文件的规定进行检验。检验结果与本文件及订货单（或合同）的规定不符时，应以书面形式向供方提出，由供需双方协商解决。属于表面质量及尺寸偏差的异议，应在收到产品之日起一个月内提出，属于其他性能的异议，应在收到产品之日起三个月内提出。如需仲裁，可委托供需双方认可的单位进行，并在需方共同取样。

7.2 Combined Lots 组批

The products shall be submitted for acceptance in lots. Each lot is composed of product with same alloy designation, same temper, same dimension, same film code and same surface treatment technology. If purchaser requests to combine lots according to melt number and heat treatment furnace number, it shall be indicated in purchase order (or contract).

产品应成批提交验收，每批应由同一牌号、状态、尺寸规格、膜层代号和表面处理工艺的产品组成。需方要求按熔次、热处理炉次组批时，应在订货单（或合同）中注明。

7.3 Weighing 计重

The weight of products shall be weighed. 产品应检斤计重。

7.4 Inspection Items and Technology Assurance Items 检验项目和工艺保证项目

If special requirements are not specified in purchase order (or contract), the ex-factory inspection items, periodic inspection items and technology assurance items of products shall conform to the provisions in Table 12.

订货单(或合同)中未注明特殊要求时, 产品出厂检验项目、定期检验项目、工艺保证项目应符合表12的规定。

Table 12 Product Inspection Items and Technology Assurance Items

产品检验项目和工艺保证项目

Items项目	Ex-factory Inspection 出厂检验	Periodic Inspection 定期检验	Technology Assurance 工艺保证
Chemical composition 化学成分	√	-	-
Dimensional tolerance 尺寸偏差	√	-	-
Tensile mechanical properties at room temperature 室温拉伸力学性能	√	-	-
Others 其他	<p>If the requirements are indicated in purchase order (or contract), but the type of inspection item is not indicated, nor is it indicated as a technology assurance item, the item shall be listed as an ex-factory inspection item, otherwise it shall comply with the provisions in purchase order (or contract). When it is indicated as a periodic inspection item, its periodic inspection cycle shall also be indicated. The periodic inspection shall be carried out for the first batch or when forming technology changes.</p> <p>订货单(或合同)中注明有要求, 但未注明检验项目类型, 也未注明其为工艺保证项目时, 该项目应列为出厂检验项目, 否则应符合订货单(或合同)规定; 注明为定期检验项目时, 应同时注明其定期检验周期, 首批或成形工艺更改时应进行定期检验</p>		
Brinell hardness 布氏硬度			
Compression performance 压缩性能			
Bending performance 弯曲性能			
Shear performance 剪切性能			
Fatigue performance 疲劳性能			
Plane strain fracture toughness 平面应变断裂韧度			
Pin-type support 销型支承			
Electrical conductivity 电导率			
The matching relationship between electrical conductivity and mechanical properties 电导率与力学性能的匹配关系			
Stress corrosion resistance 抗应力腐蚀性能			
Exfoliation corrosion resistance 抗剥落腐蚀性能			
Inter-granular corrosion susceptibility 晶间腐蚀敏感性			
Salt mist corrosion resistance 耐盐雾腐蚀性能			
Welding performance 焊接性能			
Acceptance class of ultrasonic flaw detection 超声波探伤验收等级			
Bonding performance of welds 焊缝焊合性能			

Macrostructure 低倍组织	Fracture structure 断口组织	-	-	√	
	Others其他	√		-	
Microstructure 显微组织	Offline quenched profiles离线淬火型 材	√		-	-
	Online quenched profiles在线淬火型 材	-		√	
Film performance膜层性能		Conform to GB/T 5237.2 ~ GB/T 5237.5 or GB/T 8013.1~GB/T 8013.3. 符合GB/T 5237.2~GB/T 5237.5或GB/T 8013.1~GB/T 8013.3的规定			
Appearance quality外观质量		√	-	-	
Note: “√” stands for inspection items. “-” stands for non-inspection items or non-technology assurance items, if purchaser needs them, they will become inspection items or technology assurance items. 注：“√”表示检验项目，“-”表示非检验项目或非工艺保证项目，若需方需要时，为检验项目或工艺保证项目。					

7.5 Sampling 取样

Sampling on profiles shall be as specified in Table 13. 型材的取样应符合表13的规定。

Table 13 Sampling Specifications on Profiles

型材的取样规定

Inspection Items检验项目		Sampling Specifications取样规定
Chemical composition化学成分		As per GB/T 17432. 按GB/T 17432的规定进行
Dimensional tolerance尺寸偏差		Sampling 10% of each batch, not less than 5 pieces 每批抽检10%，不少于5根
Tensile mechanical properties at room temperature ^a 室温拉伸力学性能	Tensile strength, specified non-proportional extension strength, elongation after fracture 抗拉强度、规定非比例延伸强度、断后伸长率	Sampling quantity is as shown in Table 14. One test specimen is taken at extruded front end of extracted profile, other requirements as per GB/T 16865. 取样数量按表14规定。在抽取的型材挤压前端切取1个试样，其他要求应符合GB/T 16865的规定
	Others其他	
Brinell hardness布氏硬度		Sampling quantity is as shown in Table 14. One test specimen is taken at extruded front end of extracted profile. 取样数量按表14规定。在抽取的型材挤压前端切取1个试样
Compression performance ^a 压缩性能 ^a		One profile is taken from each batch (or heat

		<p>number of heat treatment). One test specimen is cut at head and tail ends of this profile respectively. Other requirements as per GB/T 3251.</p> <p>每批（或热处理炉次）抽取1根型材，在型材上头、尾各切取1个试样，其他要求应符合GB/T 3251的规定</p>
Bending performance °弯曲性能°		<p>Sampling quantity is as shown in Table 14. One test specimen is taken at extruded front end of extracted profile, other requirements as per GB/T 232.</p> <p>取样数量按表14规定。在抽取的型材挤压前端切取1个试样，其他要求应符合GB/T 232的规定</p>
Shear performance °剪切性能°		<p>One profile is taken from each batch (or heat number of heat treatment). One test specimen is cut at head and tail ends of this profile respectively. Other requirements as per GB/T 34487.</p> <p>每批（或热处理炉次）抽取1根型材，在型材上头、尾各切取1个试样，其他要求应符合GB/T 34487的规定</p>
Fatigue performance °疲劳性能	Fatigue life 疲劳寿命	<p>Three profiles are taken from each batch (or heat number of heat treatment). One test specimen is cut at head end or tail end of each profile. Other requirements as per GB/T 37616.</p> <p>每批（或热处理炉次）抽取3根型材，在每根型材上头端或尾端切取1个试样，其他要求应符合GB/T 37616的规定</p>
	Fatigue crack propagation rate 疲劳裂纹扩展速率	<p>One profile is taken from each batch (or heat number of heat treatment). One test specimen is cut at head and tail ends of this profile respectively. Other requirements as per GB/T 6398.</p> <p>每批（或热处理炉次）抽取1根型材，在型材上头、尾各切取1个试样，其他要求应符合GB/T 6398的规定</p>
Plane strain fracture toughness °平面应变断裂韧度°		<p>Two profiles are taken from each batch (or heat number of heat treatment). One test specimen is cut at head and tail ends of each profile respectively. Other requirements as per the regulation of GB/T 42914.</p> <p>每批（或热处理炉次）抽取2根型材，在每根型材上头、尾各切取1个试样，其他要求应符合GB/T 42914的规定</p>
		One profile is taken from each batch (or heat

Pin-type support ^a 销型支承 ^a	number of heat treatment). One test specimen is cut at head and tail ends of this profile respectively. Other requirements as per Annex C. 每批（或热处理炉次）抽取1根型材，在型材上头、尾各切取1个试样，其他要求应符合附录C的规定
Electrical conductivity ^a 电导率 ^a	Sampling quantity is as shown in Table 14. One test specimen (or sample blank) is taken at extruded front end of extracted profile, other requirements as per GB/T 12966. 取样数量按表14规定。在抽取的型材挤压前端切取1个试样（或试样样坯），其他要求应符合GB/T 12966的规定
The matching relationship between electrical conductivity and mechanical properties 电导率与力学性能的匹配关系	Profile tensile test specimens or sample blanks are taken according to sampling specifications for tensile mechanical properties at room temperature. 按室温拉伸力学性能的取样规定，取型材拉伸试样或试样样坯
Stress corrosion resistance ^a 抗应力腐蚀性能 ^a	One profile is taken from each batch (or heat number of heat treatment) and one sample is cut on this profile. Cut three parallel test specimens with consistent directions on this sample. Other requirements shall conform to the provisions in 9.1.2 of YS/T 1630.1-2023. 每批（或热处理炉次）抽取1根型材，在抽取的型材上切取1个样品。在样品上切取3个方向一致的平行试样，其他要求符合YS/T 1630.1-2023中9.1.2的规定
Exfoliation corrosion resistance ^a 抗剥落腐蚀性能 ^a	One profile is taken from each batch (or heat number of heat treatment) and three test specimens are cut continuously at the extruded front end of this profile. Other requirements as per GB/T 22639. 每批（或热处理炉次）抽取1根型材，在抽取的型材挤压前端连续切取3个试样，其他要求应符合GB/T 22639的规定
Inter-granular corrosion susceptibility ^a 晶间腐蚀敏感性 ^a	One profile is taken from each batch (or heat number of heat treatment) and three test specimens are cut continuously at the extruded front end of this profile. Other requirements as per GB/T 7998-2023. 每批（或热处理炉次）抽取1根型材，在抽取的型材挤压前端连续切取3个试样，其他要求应符合GB/T 7998-2023的规定
Salt mist corrosion resistance ^a 耐盐雾腐蚀性能 ^a	One profile is taken from each batch (or heat number of heat treatment) and one test specimen

	is cut at head end or tail end of this profile. Other requirements as per GB/T 12967.3. 每批（或热处理炉次）抽取1根型材，在型材上头端或尾端切取1个试样，其他要求应符合GB/T 12967.3的规定
Welding performance ^a 焊接性能 ^a	One profile is taken from each batch (or heat number of heat treatment) and one test specimen is cut at head and tail ends of this profile respectively. 每批（或热处理炉次）抽取1根型材，在型材上头、尾各切取1个试样
Acceptance class of ultrasonic flaw detection 超声波探伤验收等级	Inspection piece by piece. 逐根检验
Bonding performance of welds 焊缝焊合性能	Sampling quantity is as shown in Table 14. One test specimen is taken at extruded front end of each extracted profile. Other requirements as per GB/T 32790. 取样数量按表14规定。在每根抽取型材的挤压前端切取1个试样，其他要求应符合GB/T 32790的规定
Macrostructure 低倍组织	Sampling quantity is as shown in Table 14. One test specimen is cut on extruded tail end of each extracted profile. Other requirements as per GB/T 3246.2. 取样数量按表14规定。在每根抽取型材的挤压尾端切取1个试样，其他要求应符合GB/T 3246.2的规定
Microstructure ^a 显微组织 ^a	Two profiles are taken from each batch (or heat number of heat treatment) and one test specimen is cut on each extracted profile. Other requirements as per GB/T 3246.1. 每批（或热处理炉次）抽取2根型材，在抽取的每根型材上切取1个试样，其他要求应符合GB/T 3246.1的规定
Film performance 膜层性能	As per the selected implementation standard in Table 10. If not specified, implement as per GB/T 8013 (all parts). 按表10选定的执行标准进行，未注明时，按GB/T 8013（所有部分）的规定进行
Appearance quality 外观质量	Inspection piece by piece. 逐根检验
^a For solution treated profiles, the manufacturing plant takes test specimens according to heat number of heat treatment, and test specimens are taken according to batches in case of arbitration. ^a 经固溶处理的型材，生产厂按热处理炉次取样，仲裁时按批取样。	

Table 14 Table for Sampling Quantity 取样数量表

Unit: piece单位为根

Quantity of Each Lot (or Heat Treatment Furnace) 每批（或热处理炉次）数量	Sampling Quantity取样数量
≤50	2
>50~90	3
>90~150	5
>150~280	8
>280~500	13
>500~1200	20
>1200	40

7.6 Judgement of Test Results 检验结果的判定

7.6.1 Chemical Composition 化学成分

When chemical composition of any test specimen is unacceptable, if the melt number of profiles can be distinguished, the profiles from the melt number represented by the said specimen are judged as unacceptable, the profiles from other melt number shall be inspected sequentially, the profiles that pass the inspection will be delivered. If the melt number of profiles can not be distinguished, the profiles from this batch are judged as unacceptable.

任一试样的化学成分不合格时，型材能区分熔次的，判该试样代表的熔次型材不合格，其他熔次型材依次检验，合格者交货。不能区分熔次的判该批型材不合格。

7.6.2 Dimensional Tolerance 尺寸偏差

When dimensional tolerance of any test specimen is unacceptable, the profiles from this batch are judged as unacceptable. But it is allowable for supplier to inspect the said profiles piece by piece and the profiles that pass the inspection will be delivered.

任一试样的尺寸偏差不合格时，判该批型材不合格。但允许供方逐根检验，合格者交货。

7.6.3 Tensile Mechanical Properties at Room Temperature, Compression Performance, Bending Performance, Shear Performance, Fatigue Performance, Pin-Type Support, Stress Corrosion Resistance, Exfoliation Corrosion Resistance, Inter-granular Corrosion Susceptibility, Salt Mist Corrosion Resistance and Welding Performance

室温拉伸力学性能、压缩性能、弯曲性能、剪切性能、疲劳性能、销型支承、抗应力腐蚀性能、抗剥落腐蚀性能、晶间腐蚀敏感性、耐盐雾腐蚀性能、焊接性能

7.6.3.1 If any test specimen is unacceptable, the profiles from this batch (or heat number of heat treatment) shall be judged as unacceptable or implement according to 7.6.3.2.

任一试样不合格时，判该批（或热处理炉次）型材不合格或按7.6.3.2执行。

7.6.3.2 If the heat number of heat treatment of profiles can be distinguished, double the number of specimens shall be taken from the heat number of heat treatment represented by the said specimen for repeated testing of the non-conforming item. If the heat number of

heat treatment of profiles cannot be distinguished, double the number of specimens shall be taken from this batch of profiles for repeated testing of the non-conforming item (including the profile represented by the non-conforming specimen taken for the first time). If all of the retested results are acceptable, the profiles from this batch (or heat number of heat treatment) are judged as acceptable. If some specimens in retested results are still unacceptable, the profiles from this batch (or the heat number of heat treatment) are judged as unacceptable. It is allowable for the supplier to inspect the said profiles piece by piece through consultation between purchaser and supplier, the profiles that pass the inspection will be delivered or implement as per 7.6.3.3.

型材能区分热处理炉次的，应从该试样代表的热处理炉次中另取双倍数量的试样对该不合格项目进行重复试验，不能区分热处理炉次的，应从该批型材中另取双倍数量的试样对该不合格项目进行重复试验（包含首次取样不合格试样代表的型材）。重复试验结果全部合格，则判该批（或热处理炉次）型材合格。重复试验结果中仍有试样不合格时，则判该批（或热处理炉次）型材不合格。经供需双方商定允许供方逐根检验，合格者交货或按7.6.3.3执行。

7.6.3.3 After repeated heat treatment by the supplier, all ex-factory inspection items in Table 12 shall be inspected according to the heat number of heat treatment except for chemical composition, dimensional tolerance, film performance, and appearance quality. Sampling quantity is as shown in Table 14. If all of the retested results are acceptable, the profiles from this batch are judged as acceptable, otherwise judged as unacceptable.

供方重复热处理后依炉次检验表12中除化学成分、尺寸偏差、膜层性能、外观质量外的所有出厂检验项目，取样数量按表14。所有检验结果均合格时，判该批型材合格，否则判该批型材不合格。

7.6.4 Plane Strain Fracture Toughness 平面应变断裂韧度

If the plane strain fracture toughness K_{Ic} value or "Batch Release K_0 " value of any test specimen is unacceptable, the profiles from this batch (or heat number of heat treatment) are judged as unacceptable or implement according to 7.6.3.2.

任一试样的平面应变断裂韧度 K_{Ic} 值或“批产放行 K_0 ”值不合格时，判该批（或热处理炉次）型材不合格或按7.6.3.2执行。

7.6.5 Electrical Conductivity 电导率

When electrical conductivity of any test specimen is unacceptable, implement as per 7.6.3.2. 任一试样的电导率不合格时按7.6.3.2执行。

7.6.6 The matching relationship between electrical conductivity and mechanical properties 电导率与力学性能的匹配关系

When the matching relationship between electrical conductivity and mechanical properties of any specimen is unacceptable, the supplier shall inspect the profiles piece by piece, the profiles that pass the inspection will be delivered, or judge according to the results of stress corrosion resistance test, or implement as per

任一试样电导率与力学性能的匹配关系不合格时，由供方逐件检验，合格者交货，或按抗应力腐蚀试验结果进行判定，或按7.6.3.2执行。

7.6.7 Acceptance class of ultrasonic flaw detection 超声波探伤验收等级

When the acceptance class of ultrasonic flaw detection of any specimen is unacceptable, this piece of profile is judged as unacceptable.

任一试样的超声波探伤验收等级不合格时，判该根型材不合格。

7.6.8 Bonding Performance of Welds 焊缝焊合性能

If the un-acceptance due to bonding performance of welds, it is allowed to cut a section of material from extruded front end of the hollow profile for repeated testing until acceptable. Other hollow profiles in this batch shall be head-cut or inspected one by one according to the maximum length of the defect distribution of the inspected profile, and the profiles that pass the inspection will be delivered.

因焊缝焊合性能不合格时，允许从空心型材的挤压前端切去一段重复试验，直至合格，则该批中的其他空心型材均应接受检型材缺陷分布的最大长度切头或逐根检验，合格者交货。

7.6.9 Macrostructure 低倍组织

When macrostructure of any test specimen is unacceptable, it is judged as follows:

任一试样的低倍组织不合格时，按如下判定：

a) If the un-acceptance is caused by metallurgical defects such as cracks, bright grains, non-metallic inclusions, foreign metallic inclusions and white spots, primary crystals and oxide films, etc., the profiles from this batch are judged as unacceptable. But through consultation between purchaser and supplier, the supplier can inspect the said profiles piece by piece and the profiles that pass the inspection will be delivered.

因裂纹、光亮晶粒、非金属夹杂物、外来金属夹杂及白斑、初晶及氧化膜等冶金缺陷不合格时，判该批型材不合格。但经供需双方商定，可由供方逐根检验，合格者交货。

b) If the un-acceptance is caused by defects such as lamination, tail-shrinkage and coarse grain ring, it is allowed to cut a section of material from extruded tail end of the profile for re-testing until acceptable. Other profiles in this batch shall be tail-cut or inspected one by one according to the maximum length of the above mentioned defect distribution of the inspected profile, and the profiles that pass the inspection will be delivered.

因成层、缩尾、粗晶环不合格时，允许从型材挤压尾端切去一段重复试验，直至合格，则该批中的其他型材均应接受检型材上述缺陷分布的最大长度切尾或逐根检验，合格者交货。

c) When the fracture structure of any test specimen is unacceptable, if the melt number of profiles can be distinguished, the profiles from the melt number represented by the said test specimen are judged as unacceptable, the profiles from other melt number shall be inspected sequentially and the profiles that pass the inspection will be delivered. If the melt number of profiles cannot be distinguished, this batch of profiles is judged as unacceptable.

任一试样的断口组织不合格时，能区分熔次的，判定该试样代表的熔次不合格，其他熔次型材依次检验，合格者交货。不能区分熔次的判该批型材不合格。

7.6.10 Microstructure 显微组织

If microstructure of any test specimen is unacceptable, the profiles from this batch (or heat number of heat treatment) are judged as unacceptable.

任一试样的显微组织不合格时，判该批（或热处理炉次）型材不合格。

7.6.11 Film Performance 膜层性能

If film performance of any profile is unacceptable, it shall be judged according to the selected implementation standard in Chapter 5.

任一型材的膜层性能不合格时，按第5章选定的执行标准判定。

7.6.12 Appearance Quality 外观质量

If appearance quality of any profile is unacceptable, this piece of profile is judged as unacceptable.

任一型材的外观质量不合格时,判该根型材不合格。

8 Marking, Packaging, Transportation, Storage and Quality Certificate

标志、包装、运输、贮存及质量证明书

8.1 Marking 标志

8.1.1 Marking of Products 产品标志

The marking of products shall be as specified in GB/T 42916

产品标志应符合GB/T 42916的规定。

8.1.2 Marking of Packaging Boxes 包装箱标志

Marking of packaging boxes for profiles shall be as specified in GB/T 3199.

型材的包装箱标志应符合 GB/T 3199 的规定。

8.2 Packaging, Transportation and Storage 包装、运输、贮存

Profiles are not oiled and not packed in boxes; other requirements shall be in accordance with GB/T 3199. If purchaser needs to apply oil, pack in boxes, or use packaging methods other than GB/T 3199, it shall be agreed upon by purchaser and supplier and indicated in purchase order (or contract). The transportation and storage of profiles shall be as specified in GB/T 3199.

型材不涂油,不装箱,其他应符合 GB/T 3199 的规定。需方需要涂油、装箱或与 GB/T 3199 不同的包装方式、方法时应由供需双方协商确定,并在订货单(或合同)中注明。型材的运输和贮存应符合 GB/T 3199 的规定。

8.3 Quality Certificate 质量证明书

Each lot of profiles shall be attached with Quality Certificate of product and the following information shall be indicated in the certificate:

每批型材应附有产品质量证明书,其上注明:

- a) Name of supplier;a) 供方名称;
- b) Name of product;b) 产品名称;
- c) Alloy designation, temper and dimension (or model) ;c) 牌号、状态、尺寸规格(或型号);
- d) Film code, color or color code of surface finishing profiles;d) 经表面处理的型材膜层代号、颜色或色号;
- e) Product lot No. or production date;e) 产品批号或生产日期;
- f) Net weight or quantity ; f) 净重或件数;
- g) Number of this standard;g) 本文件编号;
- h) Each analyzed and inspected results and inspection stamp of supplier' s Quality Inspection Department;h) 各项分析检验结果和供方质检部门的检印;
- i) Packaging date (or date of ex-factory). i) 包装日期(或出厂日期)。

9 Contents in Purchase Order (or the Contract) 订货单(或合同)内容

Contents in Annex D should be included in purchase order (or contract) which is used for purchasing the materials listed in this standard.

订购本文件所列材料的订货单（或合同）内宜包括附录D的内容。

Annex A 附录A
(Informative) (资料性)
Guide for Selection of Decorative and General Protective Films
装饰性与一般保护性膜层选用指南

A.1 General 概述

The main functions of paint films on surface finishing profiles are protective and decorative. The performance degradation of paint films in using environment shall not result in product corrosion and appearance influence. Therefore, before selecting the type of paint films, the environment type in using area shall be determined firstly. The film type selected for different environment type may be different. There are many classification methods for environment types in related domestic and international standards. For example, in Chinese national standard GB/T 15957, the atmospheric types are classified into four categories, i.e. industrial, urban, marine and rural atmospheres and classified into humid, general and dry environments based on humidity. In international standard ISO 9223, the environment types are classified into six categories of indoor and outdoor environments based on corrosive conditions. The specific classification is as shown in Table A.1.

表面处理型材膜层的主要功能是装饰性和保护性，膜层在使用环境中的性能衰退不应导致产品腐蚀以及影响产品的外观，因此，在选择膜层类型之前，应先确定使用区域的环境类型，不同环境类型所选择的膜层类型将可能不同，在国内外相关标准中对环境类型有多种分类方法，例如 GB/T 15957 按大气类型分为工业大气、城市大气、海洋大气和乡村大气等 4 大类，并按湿度分为潮湿型环境、普通型环境和干燥型环境等 3 类。ISO 9223 按腐蚀性条件分为 6 类室外环境和室内环境，具体分类见表 A.1。

Table A.1 Environment Type 环境类型

Corrosive Grade 腐蚀等级	Corrosive Extent 腐蚀程度	Environmental Conditions 环境条件	
		Outdoor 室外	Indoor 室内
C1	Very low 非常低	Cold or dry atmospheric environment with very low pollution and wetting time. e.g.: some deserts, Arctic and Antarctic Center. 非常低污染和润湿时间的寒冷或干燥大气环境，例如：某些沙漠、北极与南极中心	Space which can be warmed and has low pollution and low relative humidity, e.g.: office, shop, school, hotel and museum. 低污染低相对湿度可供暖的空间，如：办公室、商店、学校、宾馆、博物馆
C2	Low 低	Temperature zone environment with low pollution ($SO_2 < 5 \mu g/m^3$), e.g.: countryside, small town. 低污染 ($SO_2 < 5 \mu g/m^3$) 温带环境，如：农村、小城镇；短润湿时间的寒冷或干燥大气环境，如：沙漠、亚北极区域	Space which is not warmed and has more greatly changed temperature and relative humidity, low pollution and less condensation, e.g.: warehouse, gymnasium. 温度和相对湿度变化较大，低污染且较少发生冷凝的不供暖空间，如：仓库、体育馆

		Cold or dry atmospheric environment with short wetting time. e.g.: desert, sub-arctic area.	
C3	Medium 中等	The temperature zone environment with medium pollution (SO_2 : $5 \mu\text{g}/\text{m}^3 \sim 30 \text{g}/\text{m}^3$) or some areas slightly affected by chlorides, e.g.: urban area, coastal area with low chlorides deposition, tropical and subtropical areas with low pollution. 中等污染 (SO_2 : $5 \mu\text{g}/\text{m}^3 \sim 30 \text{g}/\text{m}^3$) 的温带环境或者某些受氯化物轻微影响的地域, 如: 城市地区、低氯化物沉积的海滨地区、低污染的热带及亚热带地区	Space with medium frequency condensation and medium pollution during production, e.g.: food processing plant, laundry, wine production plant and milk plant. 在生产过程中产生中等频次冷凝和中度的污染的空间, 如: 食品加工厂、洗衣店、酿酒厂、牛奶厂
C4	High 高	Temperature zone environment with precision pollution (SO_2 : $30 \mu\text{g}/\text{m}^3 \sim 90 \text{g}/\text{m}^3$) or some areas affected by chlorides, e.g.: polluted city, industrial area, coastal area without brine spray or melting and removing strong influence of cryohydrate, tropical and subtropical areas with medium pollution. 高污染的温带环境 (SO_2 : $30 \mu\text{g}/\text{m}^3 \sim 90 \text{g}/\text{m}^3$) 或者某些受氯化物影响的地域, 如: 被污染的城市、工业区域、没有盐水喷淋或者融除冰盐强影响的滨海地区、中度污染的热带和亚热带区域	Space with very frequent condensation and precision pollution during production, e.g.: chemical plant, swimming pool, ship and ship building factory. 在生产过程中产生的非常高冷凝频次和高度的污染的空间, 如: 化工厂、游泳池、海船、造船厂
C5	Very high 很高	The temperature zone and subtropical areas with very precision pollution (SO_2 : $90 \mu\text{g}/\text{m}^3 \sim 250 \text{g}/\text{m}^3$) or some areas affected by chlorides seriously, e.g.: industrial area, coastal area and coastline covered area. 非常高污染的温带或亚热带地区 (SO_2 : $90 \mu\text{g}/\text{m}^3 \sim 250 \text{g}/\text{m}^3$) 或者某些受氯化物严重影响的地域, 如: 工业区域、沿海地区、海岸线覆盖地域	Space with very frequent condensation and pollution during production, e.g.: mine, industrial cavern, airtight work shed in tropical and subtropical areas. 在生产过程中产生的非常高冷凝频次和污染的空间, 如: 矿山、工业用洞窟、热带和亚热带地区不透气的工棚
C6	Hostile	Tropical and subtropical (long	Space with continuous

	恶劣	<p>wetting time) environment with extreme pollution ($SO_2 > 250 \mu g/m^3$, including some associated factors and industrial required area or area seriously eroded by chlorides, e.g.: extreme industrial area, coastal and offshore areas and the area affected by salt mist occasionally .</p> <p>极其高污染的热带及亚热带(长时间润湿)环境 ($SO_2 > 250 \mu g/m^3$) 包括某些伴生因素及工业要求或受氯化物严重侵蚀地区, 如: 极端工业地区、海滨及近海地区、偶尔受盐雾影响地域</p>	<p>condensation or long time affection of precision humidity and pollution during production, e.g.: outdoor pollutants (including chlorides in air and acceleratively corroded material particles) can penetrate into indoor airtight work sheds in humid tropical area.</p> <p>在生产过程中冷凝持续发生或者很长时间内受高潮湿影响且高污染的空间。如: 室外污染物(包括空气中的氯化物及能加速腐蚀的物质颗粒)可渗入室内的潮湿热带地区的不通风的工棚</p>
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A.2 Selection of Paint Films in Various Using Environments

各种使用环境条件下膜层的选择

A.2.1 General Principles 总则

The anodized film, anodized composite film, powder sprayed film, fluorocarbon paint sprayed film and acrylic paint sprayed film have certain protective and decorative functions, they are applicable to architectural structure parts and vehicle parts, etc. of aluminum alloys. Because there are some differences in the performance of different films, the appropriate film shall be selected according to different using environment. Among them, the ultraviolet radiation is an important influencing factors and it shall be considered when selecting films. For silver white anodized film, the ultraviolet radiation has no obvious influence on it. But for color anodized film and other organic coatings, the ultraviolet radiation has different extent influence on them. In the area having strong ultraviolet radiation, it is recommended to select silver white anodized film, anodized composite films with high grade of weather resistance, powder sprayed and fluorocarbon paint sprayed films with high grade of weather resistance.

阳极氧化膜、阳极氧化复合膜、喷粉膜、氟碳漆喷涂膜和丙烯酸漆喷涂膜都具有一定的保护性和装饰性功能, 适用于铝合金建筑结构部件和车辆零部件等地方使用, 但由于不同膜层的性能有一定差异, 因此需根据不同的使用环境条件选择相适用的膜层。其中, 紫外光辐射是一个重要的影响因素, 在选择膜层时需加以考虑。对于银白阳极氧化膜来说, 紫外光辐射对其无明显影响, 而对于着色阳极氧化膜和其他有机涂层紫外光辐射对其将有不同程度的影响。在紫外光辐射强烈的区域, 建议选择银白阳极氧化膜、高耐候等级的阳极氧化复合膜、高耐候等级的喷粉膜和氟碳漆喷涂膜。

A.2.2 Industrial and Urban Environments 工业和城市环境

A.2.2.1 Anodized film 阳极氧化膜

When the surface of anodized film is wet, the phenomenon of performance degradation will occur easily because there exist acidic substances in air, the damage in seriously polluted

industrial areas is especially remarkable. The degradation of performance can be also accelerated in environment with high temperature and dry and wet alternation. Therefore, the anodized film having high grade of film thickness shall be selected for humid environment with serious industrial and urban pollution and larger temperature difference. Hot seal anodized film having high grade of film thickness shall be selected for dry environment with serious industrial and urban pollution and larger temperature difference.

阳极氧化膜表面湿润时由于空气中酸性物质的存在而容易出现性能衰退现象，污染严重的工业区域损害尤其突出，高温和干湿交替的气候环境也会加速其性能衰退。因此，工业和城市污染严重且温差较大的潮湿环境应选择高膜厚级别的阳极氧化膜，对于工业和城市污染严重且温差较大的干燥环境宜选择高膜厚级别的热封孔阳极氧化膜。

A. 2. 2. 2 Anodized Composite Film 阳极氧化复合膜

The anodized composite film is composed of anodized film and organic polymer film. Because aluminum anodized film exists, it is not easy to occur mechanical damage which damages the metal substrate and not easy to occur filiform corrosion under the film. The anodized composite film having high quality grade shall be selected for environment with serious industrial and urban pollution.

阳极氧化复合膜是由阳极氧化膜和有机聚合物膜组成的，由于铝阳极氧化膜的存在，不易受到伤及金属基体的机械损伤，且不容易产生膜下丝状腐蚀。工业和城市污染严重的环境宜选择高质量等级的阳极氧化复合膜。

A. 2. 2. 3 Sprayed film 喷涂膜

When the surface of sprayed film is wet, the phenomenon of performance degradation will occur easily because there exist acidic substances in air, the damage in seriously polluted industrial areas is especially remarkable. Penetration of water and harmful ions into the film will be accelerated in long-time wet and hot environment. Mechanical damage will also accelerate erosion of the film in industrial and urban environments. Therefore, sprayed films having high quality grade, e. g. powder sprayed film and fluorocarbon paint sprayed film having high weather resistance shall be selected for humid tropical environment with more serious industrial and urban pollution.

喷涂膜表面湿润时由于空气中酸性物质的存在而容易出现性能衰退现象，污染严重的工业区域损害尤其突出。长时间处于湿热的环境下会加速水和有害离子对膜层的渗透性。机械损伤也会加速膜层在工业和城市环境中的侵蚀。因此，工业和城市污染较为严重的潮湿热带环境宜选择高质量等级喷涂膜，如高耐候性粉末喷涂膜或氟碳漆喷涂膜。

A. 2. 3 Marine Environment 海洋环境

A. 2. 3. 1 Anodized film 阳极氧化膜

Anodized film has good salt-water resistance under environmental conditions without acidic pollution. However, if acidic environmental conditions result in local dissolution of film, the existence of chloride ions will accelerate the erosion of aluminum substrate. Anodized film having high grade of film thickness shall be selected for marine environmental area with large temperature difference.

在没有酸性污染的环境条件下，阳极氧化膜具有良好的耐盐水性能。然而，如果酸性环境条件导致膜层局部溶解，氯离子的存在将会加速铝基材的侵蚀。温差大的海洋环境地区宜选择高膜厚级别的阳极氧化膜。

A. 2. 3. 2 Anodized Composite Film 阳极氧化复合膜

The anodized composite film is composed of anodized film and organic polymer film. Since there exists aluminum anodized film, it is not easy to occur mechanical damage which damages the metal substrate and not easy to occur filiform corrosion under the film. The composite film having high quality grade shall be selected for environment with serious industrial and urban pollution.

阳极氧化复合膜是由阳极氧化膜和有机聚合物膜组成的，由于铝阳极氧化膜的存在，不易受到伤及金属基体的机械损伤，且不容易产生膜下丝状腐蚀。工业和城市污染严重的环境宜选择高质量等级的复合膜。

A. 2. 3. 3 Sprayed film 喷涂膜

There exist chloride ions in marine environment, these chloride ions will slowly penetrate into the surface of aluminum substrate and result in performance degradation of the film. Because the film is in wet and hot environment for a long time and existence of other ions, the penetration into the film will be increased. Mechanical damage will accelerate that the chloride ions erode the substrate. Therefore, the sprayed film having high quality grade, e. g. powder sprayed film and fluorocarbon paint sprayed film with high weather resistance shall be selected for humid tropical marine environment.

海洋环境中存在着氯离子，氯离子将会慢慢地渗透到铝基体表面导致膜层性能衰退。长时间处于湿热的环境下，以及其他离子的存在将会提高膜层的渗透性。机械损伤会加速氯离子对基材的侵蚀。因此，潮湿的热带海洋环境宜选择高质量等级喷涂膜，如高耐候性粉末膜喷涂膜或氟碳漆喷涂膜。

A. 2. 4 Rural Environment 乡村环境

Since there are good climate and environmental conditions in rural area, there is no erosion of chloride ions in marine environment and pollution influence in industrial and urban environments, various types of film can be selected normally. However, for dry rural environment with large temperature difference, it is not recommended to select medium or room temperature seal anodized film having high grade of film thickness. For rural environment with strong ultraviolet radiation, it is appropriate to select silver white anodized film, electrolytic colored anodized film, anodized composite film with high grade of weather resistance and sprayed film with high quality grade, e. g. powder sprayed film or fluorocarbon paint sprayed film with high weather resistance, it is not recommended to select dyed anodized film.

乡村环境由于气候环境条件好，不存在海洋环境中的氯离子侵蚀以及工业和城市环境污染的影响，因此各类膜层通常都可选用，然而，对于温差大且干燥的乡村环境不宜选用高膜厚等级的中温或常温封孔的阳极氧化膜，对于紫外光辐射强的乡村环境宜选用银白阳极氧化膜、电解着色阳极氧化膜、高耐候等级的阳极氧化复合膜、高质量等级喷涂膜，如高耐候性粉末膜喷涂膜或氟碳漆喷涂膜，不宜选用染色阳极氧化膜。

Annex B附录B
(Informative)资料性
Method for Dimensional Measurement—
Three Coordinate Measuring Instrument Method
尺寸测量方法——三坐标测量仪法

B.1 Method Overview 方法概述

By positioning the probe and workpiece, record the three-dimensional coordinates of the positioning points, calculate the difference in three-dimensional coordinates of different positioning points on the surface of the workpiece, and obtain the required dimensions such as length, height, volume, or area, etc.

通过探头与工件定位，记录定位点的三维坐标，计算工件表面不同定位点三维坐标的差值，得到所需长度、高度、体积或面积等尺寸。

B.2 Test Conditions 试验条件

B.2.1 Environmental temperature: $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$. 环境温度： $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 。

B.2.2 Relative humidity of the environment: $60\% \pm 5\%$. 环境相对湿度： $60\% \pm 5\%$ 。

B.2.3 Working air pressure: depending on equipment requirements, the flow rate of compressed air shall not be less than $0.0017\text{m}^3/\text{s}$, the air source pressure shall not be less than 0.6MPa , the temperature of the compressed air entering the host shall be $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, and the relative humidity shall not exceed 15%.

工作气压：根据设备要求而定，压缩空气的流量不低于 $0.0017\text{m}^3/\text{s}$ ，气源气压不低于 0.6MPa ，进入主机的压缩空气的温度为 $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ，相对湿度不大于 15%。

B.3 Instrument and Equipment 仪器设备

Three coordinate measuring instrument: mainly composed of the host (host support, guide rail, driving device, and workbench), pneumatic system (air bearing system, pneumatic control device, Z-axis pneumatic balance), electrical system, standard ball, probe and measurement software system. The grating resolution is not more than $0.1\mu\text{m}$, and the detection error is not more than $3\mu\text{m}$.

三坐标测量仪：主要由主机(主机支承、导轨、驱动装置和工作台)、气路系统(空气轴承系统、气动控制装置、Z轴气动平衡)、电气系统、标准球、测头、测量软件系统组成。光栅分辨力不大于 $0.1\mu\text{m}$ ，探测误差不大于 $3\mu\text{m}$ 。

B.4 Test Specimen 试样

The surfaces of the test specimens are clean and free from defects such as flash, burrs, and particles that may affect the measurement results.

试样表面洁净，无飞边、毛刺、颗粒物等可能影响测量结果的缺陷。

B.5 Test Steps 测试步骤

B.5.1 Before measurement, let the test specimen stand in the testing environment so that the difference between the specimen temperature and the ambient temperature is not more than 2°C .

测量前，将试样在测试环境下静置，使试样温度与环境温度差值不大于 2°C 。

B.5.2 Turn on the coordinate measuring instrument and stabilize it for 30 minutes.

开启三坐标测量仪，稳定 30min。

B.5.3 Select suitable probe and fixture according to measuring requirements.

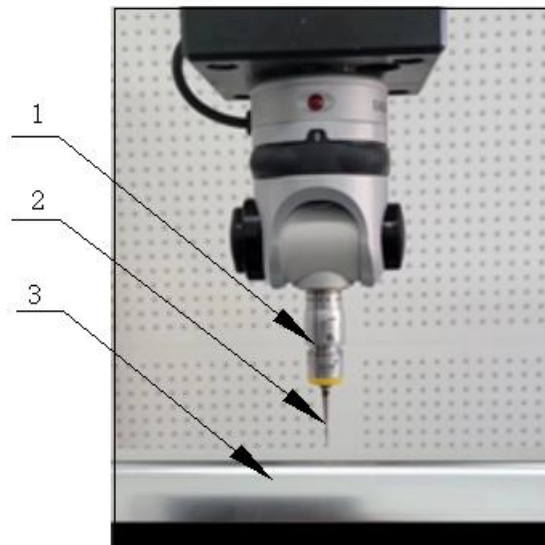
根据测量要求，选择适宜测头、工装夹具。

B.5.4 Install the standard ball on the workbench, measure the size of the standard ball and verify the probe. After verification, remove the standard ball and move the probe to the zero position.

将标准球安装在工作台上，对标准球尺寸进行测量校验测头。校验完毕后，取下标准球，将测头移动至零点位置。

B.5.5 Place the test specimen at the optimal measurement position on the workbench, refer to Figure B.1.

将试样摆放到工作台的最佳测量位置上，见图 B.1。



Description: 标引序号说明

1—measuring rod; 测杆

2—probe; 测头

3—test specimen. 试样

Figure B.1 Diagram of Dimensional Measurement

尺寸测量示意图

B.5.6 Set a measurement program in the measurement software system, enter the specimen information (including but not limited to: batch number, part number, process number/process name, operator, time, etc.), and start measuring.

在测量软件系统中设定测量程序，输入试样信息（包括但不限于：批次号、件号、工序号/工序名称、操作者、时间、等信息），开始测量。

B.5.7 After the measurement is finished, move the probe to the zero position, turn off the three coordinate measuring instrument and air circuit, remove the measuring rod and take off the specimen.

测量结束后，将测头移动至零点位置，关闭三坐标测量仪和气路，卸下测杆、取下试样。

B.6 Expression of Test Results 结果表示

The system will automatically give the test results such as length, height, area or volume, etc of the test specimen.

系统自动给出试样的长度、高度、面积或体积等试验结果。

Annex C 附录 C
(Normative) 规范性
Test Method for Pin-Type Support 销型支承试验方法

C.1 Method Overview 方法概述

Apply a load to the connecting hole through the pin until occurrence of rupture phenomenon, calculate the anti-rupture strength of the connecting hole, and observe the rupture morphology.

通过销钉对连接孔施加载荷，直至连接孔出现破裂现象，计算连接孔抗破裂强度，观察破裂形貌。

C.2 Instrument 仪器

C.2.1 Tensile Testing Machine 拉伸试验机

Accuracy meets or better than Level 1 requirements, and coaxiality meets the requirements of JJG 475.

准确度满足或优于 1 级要求，同轴度符合 JJG 475 的要求。

C.2.2 Extensometer 引伸计

Accuracy meets or better than Level 0.5 requirements. 准确度满足或优于 0.5 级要求。

C.2.3 Fixture 夹具

C.2.3.1 The fixture consists of an upper bracket (see Figure C.1), a lower bracket (see Figure C.2), a load-bearing pin and a loading pin.

夹具由上支架（见图 C.1）、下支架（见图 C.2）、承载销钉、加载销钉组成。

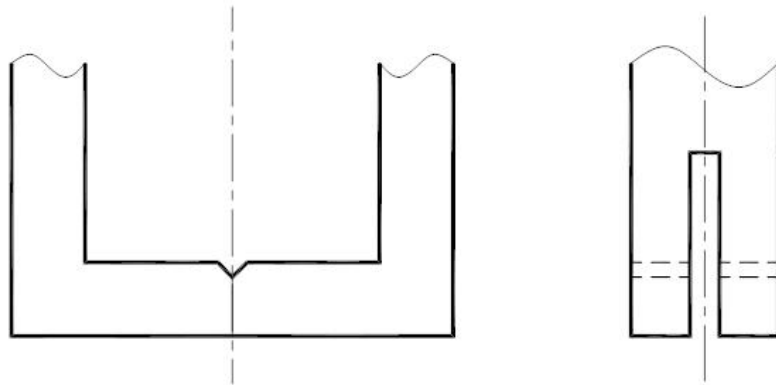


Figure C.1 Diagram of Upper Bracket for Fixture

夹具上支架示意图

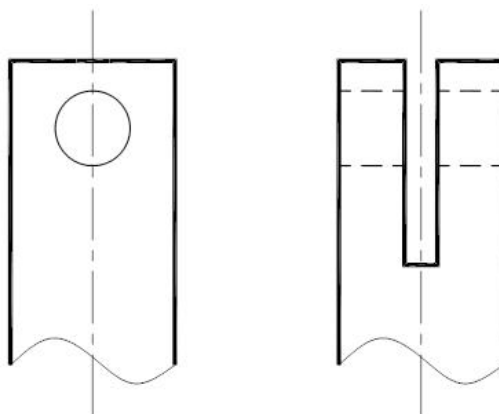


Figure C.2 Diagram of Lower Bracket for Fixture图C.2夹具下支架示意图

C.2.3.2 The material of the load-bearing pin is hardened steel with 60HRC~64HRC in hardness and $0.1\mu\text{m}\sim 0.2\mu\text{m}$ in surface roughness. The pin diameter is 6mm.

承载销钉材质为淬硬钢，硬度为 60HRC~64HRC，表面粗糙度为 $0.1\mu\text{m}\sim 0.2\mu\text{m}$ 。直径为 6mm。

C.2.3.3 The material of the loading pin is hardened steel with 60HRC~64HRC in hardness and $0.1\mu\text{m}\sim 0.2\mu\text{m}$ in surface roughness. The pin diameter is 10mm.

加载销钉材质为淬硬钢，硬度为 60HRC~64HRC，表面粗糙度为 $0.1\mu\text{m}\sim 0.2\mu\text{m}$ 。直径为 10mm。

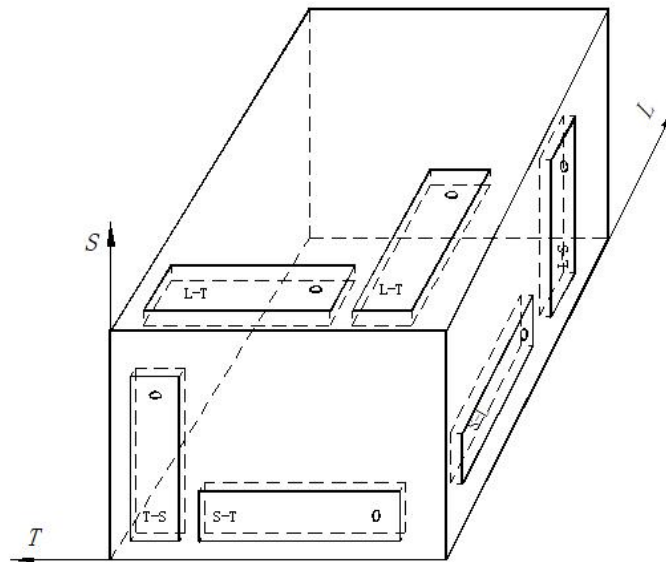
C.2.4 Vernier Caliper 游标卡尺

The resolution is 0.01mm. 分辨力为 0.01mm。

C.3 Test Specimen 试样

C.3.1 The sampling direction of the test specimen is as shown in Figure C.3.

试样取样方向符合图 C.3 规定。



Description: 标引序号说明

T—direction perpendicular to “S” and “L”; 垂直于“S”和“L”的方向;

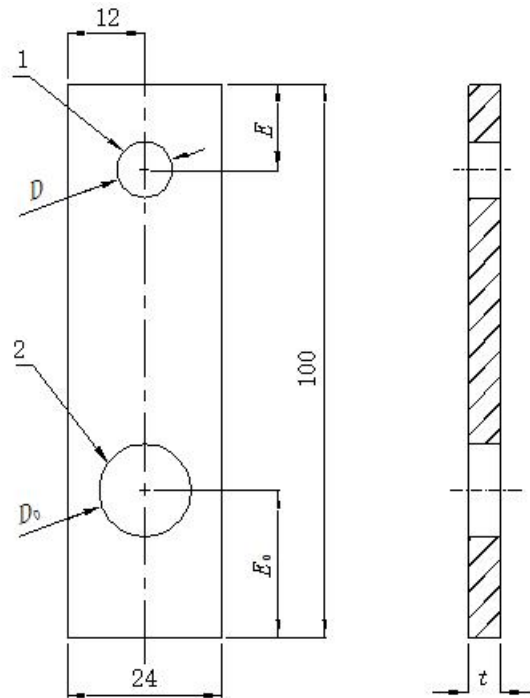
S—the direction of the short side (or cross-sectional height) of the product cross-section perpendicular to the metal flow line;

垂直于金属流线的产品横截面短边（或横截面高度）方向;

L—direction of the metal flow line. 金属流线方向。

Figure C.3 Sampling Direction on Profile型材取样方向

C.3.2 For the dimension of test specimen, refer to Figure C.4. 试样尺寸见图 C.4。



Unit: mm

D	E		D_0	E_0	t
	$E/D=1.5$	$E/D=2$			
6 ± 0.01	9 ± 0.02	12 ± 0.02	10 ± 0.01	20 ± 0.01	3

Description: 标引序号说明:

 D —diameter of the load-bearing hole; 承载孔直径; D_0 —diameter of the loading hole; 加载孔直径; E —distance between the center of the load-bearing hole and specimen edge;
承载孔中心与试样边缘的距离; E_0 —distance between the center of the loading hole and test specimen edge;
加载孔中心与试样边缘的距离; t —thickness of test specimen; 试样厚度;

1—load-bearing hole; 承载孔;

2—loading hole. 加载孔。

Figure C.4 Diagram of Test Specimen Dimension 试样尺寸示意图

C.4 Test Steps 试验步骤

C.4.1 Inspect the surface of the test specimen for defects such as scratches, bruises, corrosion, etc. affecting the inspected results. Only when the surface of the test specimen is acceptable can it enter in the next process. If the surface of the test specimen is unacceptable, the test specimen shall be prepared again.

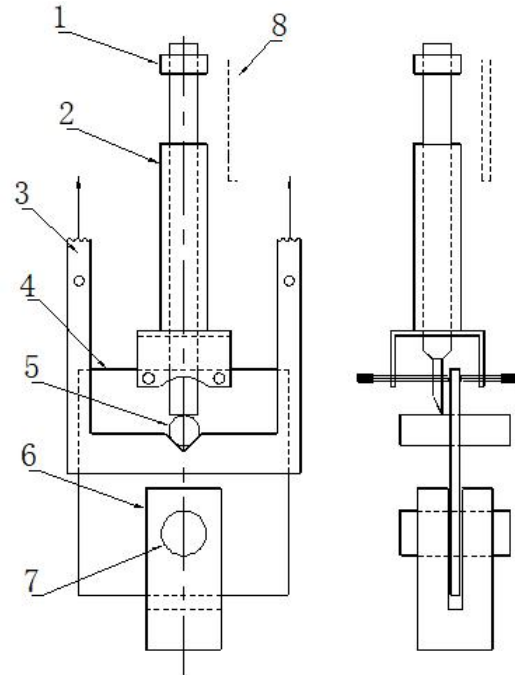
检查试样表面是否存在划伤、碰伤、腐蚀等影响检测结果的缺陷。试样表面合格方可转入下一道工序，试样表面不合格，需重新制备试样。

C.4.2 Use the vernier caliper to measure the diameter D of load-bearing hole, thickness t and record them.

用游标卡尺测量试样承载孔直径 D 、厚度 t ，并记录。

C.4.3 Install the fixture and test specimen on the testing machine, as shown in Figure C.5.

将夹具和试样安装在试验机上，如图 C.5 所示。



Description: 标引序号说明:

- 1—bolt pillar; 栓柱;
- 2—bolt pillar guide rail; 栓柱导轨;
- 3—upper bracket; 上支架;
- 4—test specimen; 试样;
- 5—load-bearing pin; 承载销钉;
- 6—lower bracket; 下支架;
- 7—loading pin; 加载销钉;
- 8—extensometer. 引伸计。

Figure C.5 Diagram of Test Specimen Installation 试样安装示意图

C.4.4 Install the extensometer and reset the force value of the testing machine to zero. 安装引伸计，将试验机力值清零。

C.4.5 Apply a load at a strain rate of 0.05min^{-1} until the connecting hole ruptures, record the load, and the system automatically draws the deformation curve of the connecting hole. 按照 0.05min^{-1} 的应变速率施加载荷，直至连接孔破裂，记录载荷，系统自动绘制连接孔变形曲线。

C.5 Test Data Processing 试验数据处理

C.5.1 The fracture strength δ_{bry} of the support is calculated according to formula (C.1), the value is expressed in newtons per square millimeter (N/mm^2). The calculated result shall be rounded to one decimal place as per GB/T 8170.

C.5.1 按公式 (C.1) 计算支承断裂强度 δ_{bry} ，数值以牛顿每平方米 (N/mm^2) 表示，计算结果表示到小数点后 1 位，按 GB/T 8170 的规定修约。

$$\delta_{\text{bry}} = \frac{F_{\text{max}}}{D \times t} \dots\dots\dots (\text{C.1})$$

where: 式中

F_{max} —maximum load, in newton (N);大载荷, 单位为牛顿 (N);
 D —diameter of load-bearing hole, in millimeter (mm); 承载孔直径, 单位为毫米 (mm);
 t —thickness of test specimen, in millimeter (mm). 试样厚度, 单位为毫米 (mm)。

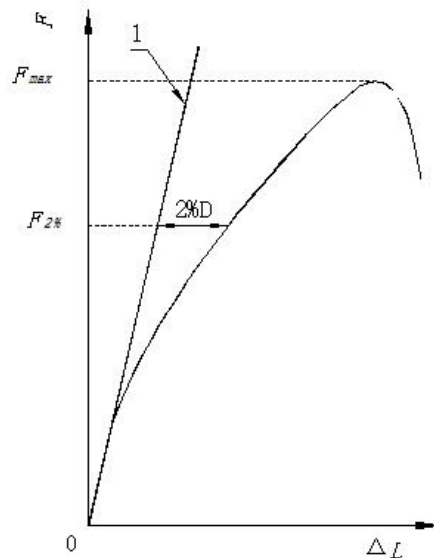
C. 5. 2 The bearing yield load $F_{2\%}$ is determined on the curve in Figure C. 6., and the yield strength δ_{bru} is calculated according to formula (C. 2), the value is expressed in newtons per square millimeter (N/mm²). The calculated result shall be rounded to one decimal place as per GB/T 8170.

C. 5. 2 在图 C. 6 的曲线上确定支承屈服载荷 $F_{2\%}$, 按公式 (C. 2) 计算屈服强度 δ_{bru} , 数值以牛顿每平方毫米 (N/mm²) 表示, 计算结果表示到小数点后 1 位, 按 GB/T 8170 的规定修约。

$$\delta_{bru} = \frac{F_{2\%}}{D \times t} \dots\dots\dots (C.2)$$

where: 式中

$F_{2\%}$ — bearing yield load, in newton (N). 支承屈服载荷, 单位为牛顿 (N)。



Description: 标引序号说

F — loading force; 加

ΔL —deformed amount of pin hole; 销孔变形量;

1—initial elastic load curve. 初始弹性载荷曲线。

明:

载力;

Figure C. 6 Deformation Curve of Load and Connecting Hole

载荷与连接孔变形曲线

C. 5. 3 Based on the characteristics of the fracture, the fracture mode is evaluated according to Table C. 1

根据断口特点, 按表 C. 1 评判断裂模式。

Table C. 1 Fracture Mode and Characteristics of Fracture 断裂模式与断口特点

Fracture Mode 断裂模式	Characteristics of Fracture 断口特点
Collapse 压溃	Pin hole of test specimen deformed, but not fractured, as shown in Figure C. 7. 试样销孔变形, 未断裂, 如图 C. 7

End crack 端裂	A single fracture occurred directly above the center of the specimen pin hole along the loading direction, as shown in Figure C.8. 试样销孔中心正上方，沿加载方向出现单个断裂，如图 C.8
Shear or multiple shears 剪切或多剪切	Fracture occurred at a 20° angle along the loading direction above the test pin hole, as shown in Figure C.9. 在测试销孔上方，沿加载方向 20° 出现的断裂，如图 C.9
Net tension 净拉伸	The fracture perpendicular to the loading direction and passing through the test specimen, as shown in Figure C.10. 垂直于加载方向，穿过试样的断裂，如图 C.10
Oblique tearing 斜向撕裂	Tear open and fracture towards the corner of the specimen (at an angle of $20^\circ \sim 70^\circ$ to the loading direction), as shown in Figure C.11. 向试样角部方向（与加载方向呈 $20^\circ \sim 70^\circ$ ）撕开断裂，如图 C.11
Multi-mode failure 多模失效	The specimen exhibits multiple failure modes, and it is not possible to determine which one is the primary failure mode. 试样表现出多种失效模式，且无法确定哪一个是主要失效模式

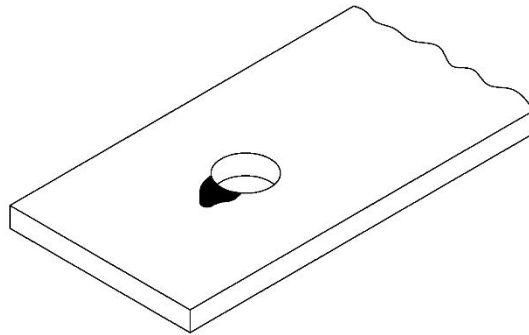
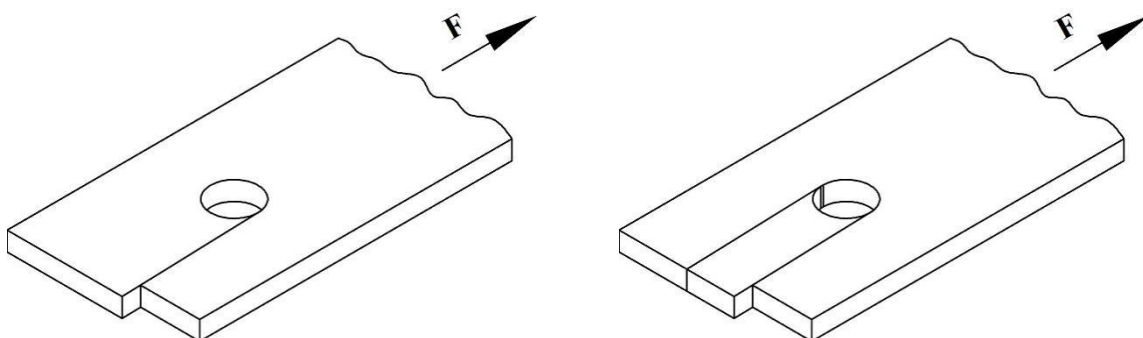


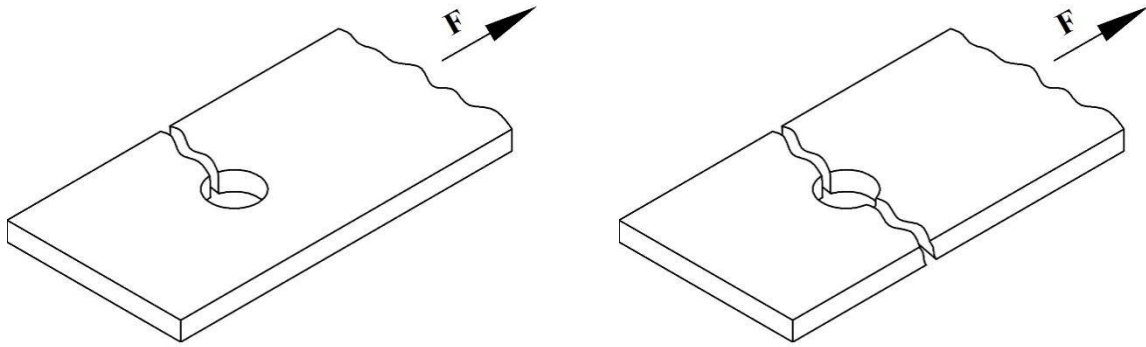
Figure C.7 Diagram of Collapse 压溃示意图



a) 单侧剪切 unilateral shear

b) 双侧剪切 bilateral shear

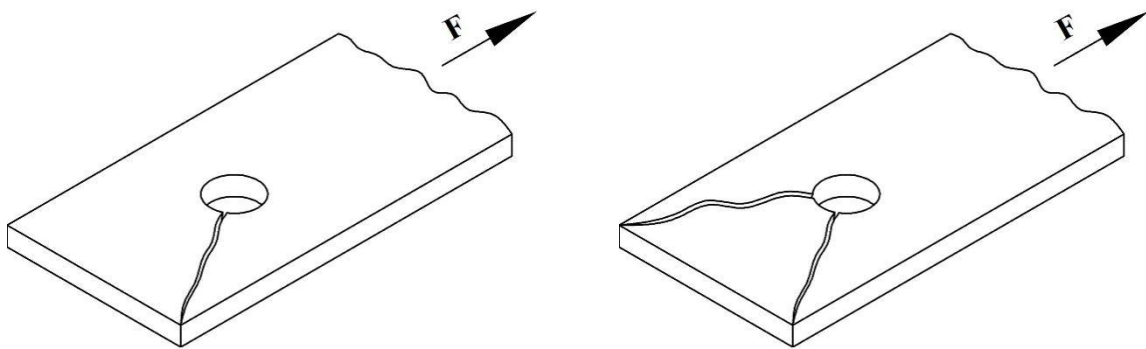
Figure C.8 Diagram of End Crack 剪切示意图



a) 单侧净拉伸 unilateral net tension

b) 双侧净拉伸 bilateral net tension

Figure C.9 Diagram of Shear 净拉伸示意图



a) 单侧斜向撕裂 unilateral oblique tearing

b) 双侧斜向撕裂 bilateral oblique tearing

Figure C.10 Diagram of Oblique Tearing 斜向撕裂示意图

C.6 Expression of Results 结果表示

The test results are expressed by the bearing fracture strength δ_{bry} , bearing yield load δ_{bru} , and fracture mode.

试验结果以支承断裂强度 δ_{bry} 、支承屈服载荷 δ_{bru} ，以及断裂模式表示。

C.7 Test Report 试验报告

The following contents shall be included in the test report:

试验报告中应包含以下内容：

a) Test equipment and model;

试验设备及型号；

b) Dimension of test specimen, including pin hole diameter, width, thickness and length;

试样的尺寸，包括销孔直径、宽度、厚度和长度；

c) Edge distance ratio of test specimen;

试样的边距比；

d) The bearing fracture strength and bearing yield load;

支承断裂强度和支承屈服载荷；

e) Fracture mode;

断裂模式；

f) Strain rate of test loading 试验加载的应变速率.

Annex D 附录 D
(Informative) 资料性

Contents in Purchase Order (or the Contract) 订货单 (或合同) 内容

D.1 The following contents shall be included in purchase order (or contract) for non-surface finishing profiles:

未经表面处理的型材订货单 (或合同) 宜包括以下内容:

- a) Name of product; a) 产品名称;
- b) Alloy designation; b) 牌号;
- c) Temper; c) 状态;
- d) Section code and length ; d) 截面代号及长度;
- e) Weight; e) 重量;
- f) Special requirements of purchaser; f) 需方的特殊要求:
 - Brinell hardness; 布氏硬度;
 - Performance of ultrasonic flaw detection; 超声波探伤性能;
 - Electrical conductivity; 电导率;
 - Stress corrosion resistance; 抗应力腐蚀性能;
 - Exfoliation corrosion resistance; 抗剥落腐蚀性能;
 - Inter-granular corrosion susceptibility; 晶间腐蚀敏感性;
 - Salt mist corrosion resistance; 耐盐雾腐蚀性;
 - Bending performance; 弯曲性能;
 - Shear performance; 剪切性能;
 - Compression performance; 压缩性能;
 - Fatigue performance; 疲劳性能;
 - Fatigue crack propagation rate; 疲劳裂纹扩展速率;
 - Plane strain fracture toughness; 平面应变断裂韧度;
 - pin-type support; 销型支承;
 - Elastic modulus; 弹性模量;
 - Welding performance; 焊接性能;
 - Bonding performance of welds; 焊缝焊合性能;
 - Requirements for packaging; 包装要求;
 - Other special requirements. 其他特殊要求;
- g) Number of this standard. g) 本文件编号。

D.2 The following contents shall be included in purchase order (or contract) for anodized profiles:

D.2 阳极氧化型材的订货单 (或合同) 宜包括以下内容:

- a) Application and type of films as well as surface finishing method ; 膜层用途、类型和处理方式;
- b) Texture type; b) 纹理类型;
- c) The environmental level of usage environment ; c) 使用环境的环境等级;
- d) Effective surface of product coating film; d) 产品涂膜有效面;
- e) Location and maximum dimension of contact area; e) 接触区域位置及最大尺寸;
- f) Sealing method; f) 封孔方式;
- g) Sampling requirements; g) 取样要求;
- h) Film code; h) 膜层代号;
- i) Color (or color code); i) 颜色 (或色号) ;
- j) Color difference; j) 色差;

- k) Film thickness;k) 膜厚;
- l) Sealing quality;l) 封孔质量;
- m) Appearance quality;m) 外观质量;
- n) Special requirements of purchaser:n) 需方的特殊要求:
- Gloss; 光泽;
 - Hardness;硬度;
 - Type of pre-treatment; 预处理类型;
 - Etching amount;刻蚀量;
 - Resistance to deformation and rupture;抗变形破裂性;
 - Resistance to crushed stone impact;耐碎石冲击性;
 - Sharp tool machining test;尖锐工具加工试验;
 - Surface density;表面密度;
 - Film continuity;膜层连续性;
 - Mirror reflectivity;镜面反射率;
 - Image clarity;影像清晰度;
 - Surface reflection characteristics;表面反射特性;
 - Abrasion resistance;耐磨性;
 - Salt mist corrosion resistance; 耐盐雾腐蚀性;
 - Corrosion resistance to sulfur dioxide in humid atmosphere;耐二氧化硫潮湿气氛腐蚀性;
 - Salt resistance, dry-wet cycle corrosion resistance;耐盐干湿循环腐蚀性;
 - Corrosion resistance to salt solution;耐盐溶液腐蚀性;
 - Corrosion resistance to flowing mixed gases; 耐流动混合气体腐蚀性;
 - Resistance to spray/dry cycle corrosion;耐喷雾/干燥循环腐蚀性;
 - Alkali resistance; 耐碱性;
 - Artificial sweat resistance; 耐人工汗性;
 - Alcohol resistance;耐酒精性;
 - Detergent resistance;耐清洁剂性;
 - Moisture and heat resistance;耐温湿性
 - Natural weather resistance;自然耐候性
 - Accelerated weather resistance;加速耐候性;
 - Requirements for packaging;包装要求;
 - Other special requirements. 其他特殊要求;

o) Number of this standard.o) 本文件编号。

D.3 The following contents shall be included in purchase order (or contract) for profiles with anodized composite films:

D.3 阳极氧化复合膜型材的订货单(或合同)宜包括以下内容:

- a) Application and type of films as well as surface finishing method ;a) 膜层用途、类型和处理方式;
- b) Texture type;b) 纹理类型;
- c) The environmental level of usage environment ;c) 使用环境的环境等级;
- d) Effective surface of product coating film;d) 产品涂膜有效面;
- e) Location and maximum dimension of contact area;e) 接触区域位置及最大尺寸;
- f) Sampling requirements;f) 取样要求;
- g) Film code;g) 膜层代号;
- h) Film performance classh) 膜层性能级别;

- i) Color (or color code); i) 颜色 (或色号) ;
- j) Color difference; j) 色差;
- k) Gloss; k) 光泽;
- l) Film thickness; 膜厚;
- m) Hardness 硬度;
- n) Dry adhesion; 干附着性;
- o) Wet adhesion 湿附着性;
- p) Boiling water adhesion 沸水附着性;
- q) Appearance quality; 外观质量
- r) Special requirements of purchaser: 需方的特殊要求:
 - Boiling water resistance; 耐沸水性;
 - Resistance to crushed stone impact; 耐碎石冲击性;
 - Sharp tool machining test; 尖锐工具加工试验;
 - Abrasion resistance; 耐磨性;
 - Salt mist corrosion resistance; 耐盐雾腐蚀性;
 - Resistance to UV salt spray combined corrosion; 耐紫外盐雾联合腐蚀性;
 - Corrosion resistance to sulfur dioxide in humid atmosphere; 耐二氧化硫潮湿气氛腐蚀性;
 - Salt resistance, dry-wet cycle corrosion resistance; 耐盐干湿循环腐蚀性;
 - Corrosion resistance to salt solution; 耐盐溶液腐蚀性;
 - Corrosion resistance to flowing mixed gases; 耐流动混合气体腐蚀性;
 - Resistance to spray/dry cycle corrosion; 耐喷雾/干燥循环腐蚀性;
 - Alkali resistance; 耐碱性;
 - Hydrochloric acid resistance; 耐盐酸性;
 - Nitric acid resistance; 耐硝酸性;
 - Solvent resistance; 耐溶剂性;
 - Mortar resistance; 耐砂浆性;
 - Artificial sweat resistance; 耐人工汗性;
 - Alcohol resistance; 耐酒精性;
 - Moisture and heat resistance; 耐温湿性;
 - Salt water resistance; 耐盐水性;
 - Natural weather resistance; 自然耐候性;
 - Accelerated weather resistance; 加速耐候性;
 - Requirements for packaging; 包装要求;
 - Other special requirements. 其他特殊要求;
- s) s) Number of this standard. s) 本文件编号。

D.4 The following contents shall be included in purchase order (or contract) for powder sprayed and paint sprayed profiles :

D.4 喷粉膜、喷漆膜型材的订货单 (或合同) 宜包括以下内容:

- a) Application and type of films as well as surface finishing method ; 膜层用途、类型和 处理方式;
- b) Texture type; 纹理类型;
- c) The environmental level of usage environment ; 使用环境的环境等级;
- d) Effective surface of product coating film; 产品涂膜有效面;
- e) Location and maximum dimension of contact area; e) 接触区域位置及最大尺寸;
- f) Sampling requirements; 取样要求;

- g) Film code;膜层代号;
- h) Film performance class;膜层性能级别;
- i) Color (or color code);颜色(或色号);
- j) Color difference;色差;
- k) Gloss;光泽;
- l) Film thickness;膜厚;
- m) Hardness;硬度;
- n) Dry adhesion;干附着性;
- o) Wet adhesion;湿附着性;
- p) Boiling water adhesion;沸水附着性;
- q) Impact resistance (except for the anodized pre-treatment film);
耐冲击性(除阳极氧化预处理膜以外);
- r) Appearance quality;外观质量;
- s) Special requirements of purchaser;需方的特殊要求:
- Pre-treatment type;预处理类型;
 - Etching amount;刻蚀量;
 - Quality of chemical conversion film or thickness of anodized film;
化学转化膜质量或阳极氧化膜厚度;
 - Boiling water resistance;耐沸水性;
 - Cupping resistance (except for the anodized pre-treatment film);
抗杯突性(除阳极氧化预处理膜以外);
 - Bending resistance (except for the anodized pre-treatment film);
抗弯曲性(除阳极氧化预处理膜以外);
 - Flexibility (except for the anodized pre-treatment film);柔韧性(除阳极氧化预处理膜以外);
 - Resistance to deformation and rupture;抗变形破裂性;
 - Resistance to crushed stone impact;耐碎石冲击性;
 - Sharp tool machining test;尖锐工具加工试验;
 - Surface density;表面密度;
 - Film continuity;膜层连续性;
 - Abrasion resistance;耐磨性;
 - Salt mist corrosion resistance;耐盐雾腐蚀性;
 - Resistance to UV salt spray combined corrosion;耐紫外盐雾联合腐蚀性;
 - Corrosion resistance to sulfur dioxide in humid atmosphere;耐二氧化硫潮湿气氛腐蚀性;
 - Salt resistance, dry-wet cycle corrosion resistance;耐盐干湿循环腐蚀性;
 - Corrosion resistance to salt solution;耐盐溶液腐蚀性;
 - Corrosion resistance to flowing mixed gases;耐流动混合气体腐蚀性;
 - Resistance to spray/dry cycle corrosion;耐喷雾/干燥循环腐蚀性;
 - Resistant to Machu corrosion;耐马丘腐蚀性;
 - Filiform corrosion resistance;耐丝状腐蚀性;
 - Alkali resistance;耐碱性;
 - Acetic acid resistance;耐乙酸性;
 - Citric acid resistance;耐柠檬酸性;
 - Hydrochloric acid resistance;耐盐酸性;
 - Nitric acid resistance;耐硝酸性;

- Sulphuric acid resistance; 耐硫酸性;
 - Solvent resistance; 耐溶剂性;
 - Mortar resistance; 耐砂浆性;
 - Artificial sweat resistance; 耐人工汗性;
 - Alcohol resistance; 耐酒精性;
 - Resistance to cleaning agents; 耐清洗剂性;
 - Detergent resistance; 耐洗涤剂性;
 - Moisture and heat resistance; 耐温湿性;
 - Water resistance; 耐水性;
 - Salt water resistance; 耐盐水性;
 - Gasoline resistance; 耐汽油性;
 - Stain Resistance; 耐沾污性;
 - Baking resistance; 耐烘烤性;
 - Thermal viscosity; 热黏性;
 - Ink penetration depth; 油墨渗透深度;
 - Natural weather resistance; 自然耐候性;
 - Accelerated weather resistance; 加速耐候性;
 - Requirements for packaging; 包装要求;
 - Other special requirements. 其他特殊要求;
- t) Number of this standard. t) 本文件编号。

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