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Ultrafine molybdenum powder

超细钼粉

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## Foreword

### 前 言

SAC/TC 243 is in charge of this English translation. In case of any doubt the contents of English translation, the Chinese original shall be considered authoritative.

This standard is drafted in accordance with the rules given in the GB/T 1.1-2009.

本标准按照 GB/T 1.1-2009 给出的规则起草。

This standard was proposed and prepared by SAC/TC 243 National Nonferrous Metals Standardization Technical Committees.

本标准由全国有色金属标准化技术委员会（SAC/TC 243）提出并归口。

本标准起草单位：金堆城钼业股份有限公司、西北有色金属研究院。

本标准主要起草人：杨秦莉、庄飞、赵虎、付静波、曹维成、冯鹏发

# Ultrafine molybdenum powder

## 超细钼粉

### 1 Scope 范围

This standard specifies the technical requirements, test methods, testing rules, marking, packaging, transportation, storage, quality certificate and purchase contract (or order) content of ultrafine molybdenum powder.

本标准规定了超细钼粉的技术要求、试验方法、检验规则、包装、标志、运输、贮存及质量证明书和合同（或订货单）内容等。

This standard is applicable to ultrafine molybdenum powder produced with hydrogen reduction method.

本标准适用于粉末冶金法生产的超细钼粉。

### 2 Normative references 规范性引用文件

The following referenced documents are indispensable for the application of this document. For dated references, only the editions cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是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 1479.2, Metal powder inspection of bulk density Part 2: Scott volumeter method*

GB/T 1479.2 金属粉末松装密度的测定第2部分：斯柯特容量计法

*GB/T 3249, Test method for fisher number of metal powders and related compounds*

GB/T 3249 难熔金属及其化合物粉末粒度的测定方法-费氏法

*GB/T 4325 (All parts), Methods for chemical analysis of molybdenum*

GB/T 4325（所有部分）钼化学分析方法

*GB/T 5314, Powders for powder metallurgical process—Sampling*

GB/T 5314 粉末冶金用粉末取样方法

*GB/T 8170, Rules of rounding off for numerical values & expression and judgement of limiting values*

GB/T 8170 数值修约规则与极限数值的表示和判定

### 3 Requirements 技术要求

#### 3.1 Product classification 产品牌号

Ultrafine molybdenum powders are classified into two designations as XFMo-1 and XFMo-2 according to the difference of Fisher particle sizes. XFMo-1 molybdenum powder is used to produce fine molybdenum products, and XFMo-2 molybdenum powder is used as active catalytic

additive.

根据费氏粒度的不同，产品划分为 XFMo-1、XFMo-2 两个牌号。XFMo-1 钼粉用于制备精细钼制品，XFMo-2 钼粉用于活性催化用添加剂。

### 3.2 Chemical composition

#### 3.2 化学成分

The chemical composition of products shall be in accordance with table 1

产品化学成分应符合表 1 规定。

Table 1 表 1 (质量分数, %) wt %

牌号 designation	XFMo-1	XFMo-2	
Mo, 不小于 Mo content / not less than	99.95	99.92	
Impurity Content, not more than 杂质含量, 不大于	Pb	0.0005	
	Bi	0.0005	
	Sn	0.0005	
	Sb	0.0010	
	Cd	0.0010	
	Ti	0.0010	-
	Mn	0.0005	-
	As	0.0010	-
	Cr	0.0030	-
	Fe	0.0050	0.0100
	Ni	0.0020	0.0020
	Cu	0.0010	0.0010
	Al	0.0015	0.0050
	Ca	0.0015	0.0040
	Mg	0.0020	0.0020
	W	0.0200	0.0200
	Si	0.0020	0.0100
P	0.0010	0.0050	
C	0.0050	0.0100	
O	0.2500	0.4000	
Note: Molybdenum content is calculated by the method of impurity reduction (exclusion of C, O and other gas elements). 注: 钼含量按杂质减量法计算 (C、O 等气体元素除外)。			

#### 3.3 Fisher particle size 费氏粒度

The fisher particle size of XFMo-1 shall be 1.0 $\mu$ m~2.5 $\mu$ m; The fisher particle size of

shall be  $0.5\mu\text{m}\sim 1.0\mu\text{m}$ .

XFMo-1 的费氏粒度为  $1.0\mu\text{m}\sim 2.5\mu\text{m}$ ；XFMo-2 的费氏粒度为  $0.5\mu\text{m}\sim 1.0\mu\text{m}$ 。

### 3.4 Bulk density 松装密度

The bulk density of the product shall be  $0.3\text{g}/\text{cm}^3\sim 1.2\text{g}/\text{cm}^3$ .

产品的松装密度为  $0.3\text{g}/\text{cm}^3\sim 1.2\text{g}/\text{cm}^3$ 。

### 3.5 Appearance quality 外观质量

The product shall be in dark gray or black gray loose powders, no caking, no visible impurities

产品呈深灰色或黑灰色粉末，松散无结块，无肉眼可见的杂质。

## 4 Test Methods 试验方法

4.1 The chemical analysis of the product shall be carried out in accordance with GB/T 4325 (all parts).

产品化学分析方法按 GB/T 4325（所有部分）的规定进行。

4.2 The fisher particle size range of the product shall be carried out in accordance with GB/T 3249.

产品的费氏粒度测定按 GB/T 3249 的规定进行。

4.3 The bulk density of the product shall be carried out in accordance with GB/T 1479.2.

产品的松装密度测定按 GB/T 1479.2 的规定进行。

4.4 The appearance quality of the product shall be carried out by visual inspection.

产品的外观质量用目视观测。

## 5 Inspection rules 检验规则

### 5.1 Inspection and acceptance 检查和验收

5.1.1 The quality inspection department from the supplier will inspect the products and fill in the quality certificate to ensure the quality of the product in accordance with this standard (or order contract).

产品应由供方质量检验部门进行检验，产品应符合本标准（或订货合同）规定，并填写质量证明书。

5.1.2 The purchasers should inspect the received products in accordance with this standard. If the testing results do not meet this document, notification of the discrepancies should be raised to supplier within 45 days from the date receiving the products or the time stipulated in the sales contract and be resolved through negotiation between the supplier and purchaser. If any arbitration is needed, the arbitrated material shall be less than 60% of this lot of product. The arbitrated sampling shall be conducted bilaterally on spot of goods deposited. Arbitration Institution shall be confirmed by mutual negotiation.

需方应对收到的产品按本标准的规定进行检验。如检验结果与本标准（或订货合同）的规定不符时，应在收到产品之日起 45 天内或销售合同规定的时间内向供方提出，由供需双方协商解决。如需仲裁，仲裁物料应不少于该批产品的 60%，仲裁取样在货物存放地由供需双方共同进行，仲裁机构由供需双方共同商定。

### 5.2 Lot 组批

Products shall be inspected in lot, and each lot shall be in the same designation, production

process and mixture. The weight of each lot shall be confirmed after supplier and purchaser negotiation

产品应成批提交验收。每批产品由同一工艺生产的、同一牌号混合料组成。每批重量由供需双方协商确定。

### 5.3 Inspection items and sampling 检验项目及取样

The inspection items and sampling shall be in accordance with Table 2.

产品的检查项目和取样应符合表 2 的规定。

Table 2 Inspection items and sampling  
表 2 检查项目及取样

Inspection items 检验项目	Rules of Sampling 取样规定	Clause of requirement 要求的章条号	Clause of test method 试验方法的章条号
Chemical composition 化学成分	GB/T 5314	3.2	4.1
Fisher particle size 费氏粒度		3.3	4.2
Bulk Density 松装密度		3.4	4.3
Appearance quality 外观质量		3.5	4.4

### 5.4 Judgment of inspection results 检验结果判定

5.4.1 Rounding off for numerical values and judgement of test results shall be carried out according to GB/T 8170.

检验结果的数值修约和判定按 GB/T 8170 的规定进行。

5.4.2 If chemical composition of product is unqualified, double amounts of samples should be taken for retest. If one result of the retest remains unqualified, this lot of products shall be judged as unqualified.

化学成分检验结果不符合本标准规定时,允许加倍取样重复试验,重复试验仍有一个结果不合格时,判该批不合格。

5.4.3 If fisher particle size or bulk density is unqualified, double amounts of samples should be taken for retest. If one result of the retest remains unqualified, this lot of products shall be judged as unqualified.

费氏粒度、松装密度检验结果不符合本标准规定时,允许加倍取样重复试验,重复试验仍有一个结果不合格时,判该批不合格。

5.4.4 If appearance quality is unqualified, this lot shall be judged as unqualified.

外观质量不符合本标准规定时,判该批不合格。

## 6 Marking, packaging, Transport, Storage and Quality certificate

标志、包装、贮存和运输、质量证明书

### 6.1 Marking 标志

The exterior package of products shall be stamped supplier name, product name, designation, lot number, net weight

产品外包装上应注明：供方名称、产品名称和牌号、批号、净重。

### 6.2 Packaging 包装

Product shall be packaged in vacuum bags. Each bag shall be not more than 5kg. Desiccant should be placed outside of the vacuum bag. The vacuum bags shall be placed in iron bucket lined with foam. The net weight shall be not more than 20kg for iron bucket. In case of special requirements, the package method shall be confirmed by mutual negotiation.

采用真空封装，每袋不超过 5kg，真空袋外放置干燥剂，放置在衬有泡沫的铁桶中。每桶净重不大于 20kg。如有特殊要求，可用供需双方协商的包装方式。

### 6.3 Transport 运输

Product shall be kept away from moisture and violent collision during transportation.

产品运输时，应防止潮湿，不得剧烈碰撞。

### 6.4 Storage 贮存

Product shall be stored in dry, ventilated and no acid or alkali and no oxidation atmosphere places. The storage period shall not exceed 3 months.

产品应存放于干燥、通风、无酸碱或氧化气氛之处。产品存放期不宜超过三个月。

### 6.4 Quality certificate 质量证明书

The quality certificate shall be attached for each lot products and shall include the following items:

每批产品应附有产品质量证明书，其上注明：

- a) Supplier name, address, telephone and telefax: 供方名称、地址、电话、传真；
- b) Product name 产品名称；
- c) Product designation: 牌号；
- d) Lot number 批号；
- e) Net weight and gross weight 净重和毛重；
- f) Various analysis test results and stamp of supplier quality inspection department:  
各项分析检验结果和质检部门印记
- g) A reference of this standard: 本标准编号
- h) Date of production (or packaging date). 出厂日期（或包装日期）

### 7 Order content (or contract) 订货单（或合同）内容

Order (or contract) shall include the following items:

订货单（或合同）应包括下列内容：

- a) Product name 产品名称；
- b) Product designation 产品牌号；
- c) Net weight 产品净重 ；
- d) Number of this standard 本标准编号；
- e) Other 其他。