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Aluminium-doped zinc oxide sputtering targets

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Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Categories

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by China Nonferrous Metals Industry Association. This document is under the jurisdiction of the National Technical Committee on Standardization of Nonferrous Metals (SAC/TC243). This document was drafted by: Pioneer Electronic Technology Co., Ltd., Shenzhen Zhongjin Lingnan Nonferrous Metals Co., Ltd., Zhuzhou Torch Antai New Materials Co., Ltd., Wuhu Yingri Technology Co., Ltd., Chengdu Zhongjiancai Optoelectronic Materials Co., Ltd., Shenzhen Zhongjin Lingnan Shaoguan Smelter of Nonferrous Metals Co., Ltd., Guangdong Oulai High-tech Materials Co., Ltd., Hebei Hengbo New Materials Technology Co., Ltd. Co., Ltd., Fujian Ashi Innovation Materials Co., Ltd., Zhongshan Zhilong New Materials Technology Co., Ltd., Shanghai University, Guangdong Pioneer Rare Materials Co., Ltd. company. The main drafters of this document are. Yu Fang, Tong Peiyun, Zhu Zhanfang, Yang Ping, Jiang Shaoying, Zeng Dunfeng, Zhou Yi, Cai Zhengming, Li Qingfeng, Chen Wenlin, Ge Chunqiao, Li Xifeng, Zhu Liu, Gao Minyi, Zuo Hongyi, Liu Huiming, Wang Zhiqiang, Li Jiaxuan, Li Peng, Luo Shenglei, Chen Qinzong, Li Qiang, Zhang Jianhua, Zhang Ke, Zeng Pingsheng, Shi Shilong, Wang Kaikai, and Zhu Yongfeng. Zinc Oxide Aluminum Sputtering Target

1 Scope

China's national standard for aluminium-doped zinc oxide sputtering targets. AZO is the transparent conducting oxide used where indium tin oxide is too expensive to justify - which is to say wherever the area is large. Thin film solar modules need a transparent front electrode over their whole area, and low-emissivity architectural glass needs a conducting coating over whole facades; at those areas the indium price dominates, and AZO made from abundant zinc and aluminium replaces it. The coating is deposited by sputtering from a

ceramic target, and the target is what governs the result: its density, its composition uniformity and its grain structure determine the film's resistivity and transparency, and a target with porosity arcs during sputtering and throws particles into the film. The standard covers targets made by mixing ZnO and Al₂O₃ powders and sintering at atmospheric pressure, specifying classification, technical requirements, test methods, inspection rules and the order contents.

This document specifies the classification, technical requirements, test methods, inspection rules, marking, Packaging, transportation, storage and accompanying documents and order contents. This document is applicable to the zinc oxide aluminum target produced by mixing ZnO and Al₂O₃ powder in a certain proportion and sintering by normal pressure. Used in thin-film solar cell coating and building energy-saving glass coating.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 1551 Determination of resistivity of silicon single crystals - In-line four-probe method and DC two-probe method

GB/T 3850 Density determination method for dense sintered metal materials and cemented carbides

GB/T 6569 Test method for bending strength of fine ceramics

GB/T 8170 Rules for rounding off values and expression and determination of limit values

GB/T 13298 Metal microstructure inspection methods SL499 Standard Test Method for Residual Stress Measurement by Hole Drilling Strain Method YS/T 837 Ultrasonic testing method for sputtering target-backing plate bonding quality

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 apparent density The mass of a substance per unit volume.

3.2 relative density The ratio of apparent density to theoretical density.

Note. When the mass ratio of AZO target is $m(\text{ZnO}):m(\text{Al}_2\text{O}_3)=98:2$, the theoretical density of AZO target is calculated as 5.57g/cm³.

4 Categories

AZO targets are divided into planar targets and tubular targets according to their shapes; and are specified as one grade according to the mass ratio of ZnO and Al₂O₃. AZO98.

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