

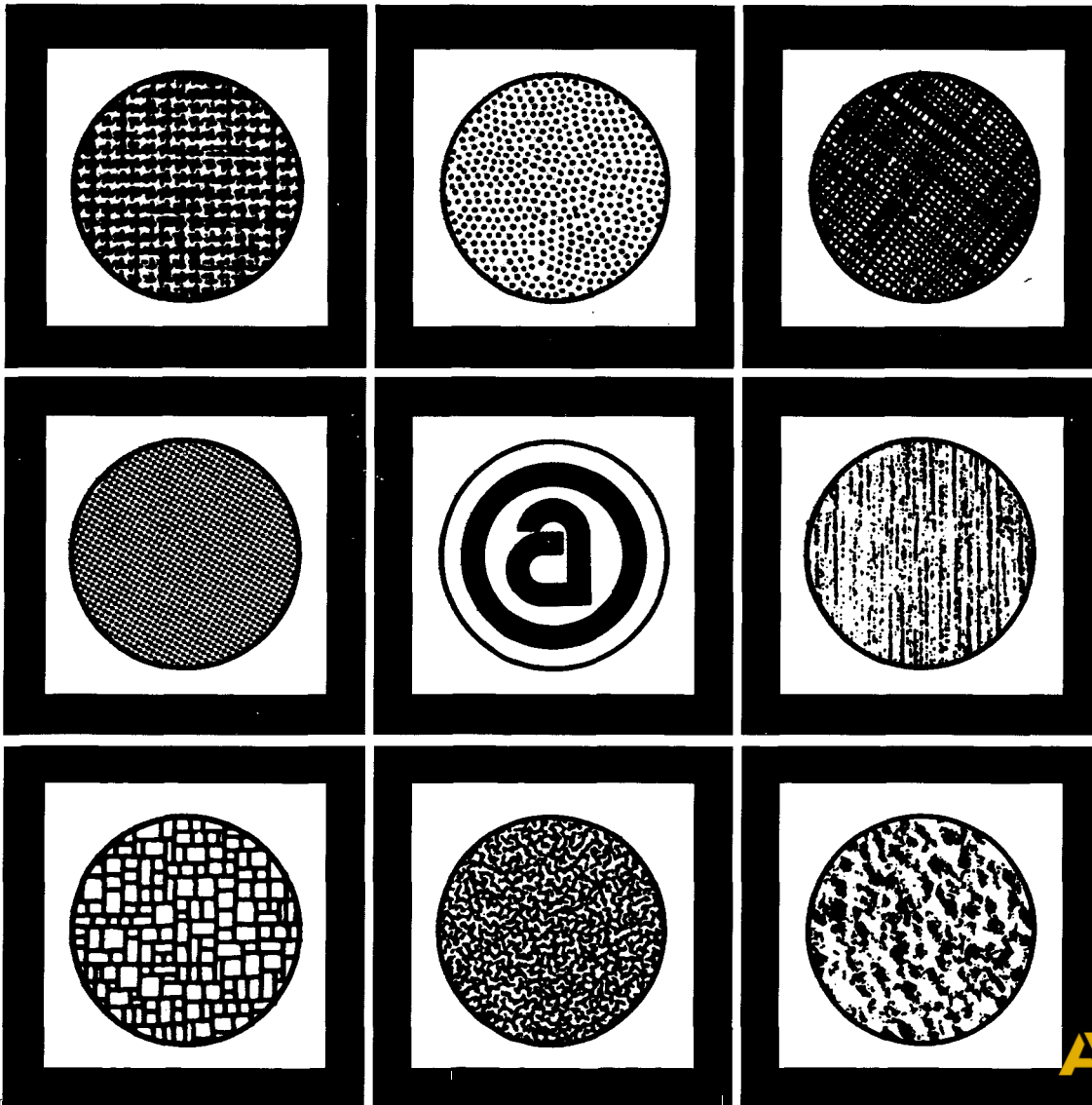
Recommendations for storage and handling of aluminum powders and paste

The Aluminum Association
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Recommendations for storage and
handling of aluminum powders and paste



About The Aluminum Association

The Aluminum Association Inc. (founded in November 1933) is the trade association for producers of primary aluminum, recyclers and semi-fabricated aluminum products, as well as suppliers to the industry.

Based in Arlington, VA, the Association provides leadership to the industry through its programs and services which aim to enhance aluminum's position in a world of proliferating materials, increase its use as the "material of choice," remove impediments to its fullest use, and assist in achieving the industry's environmental, societal, and economic objectives. Member companies operate about 200 plants in the U.S and many conduct business worldwide.

NOTICE

Disclaimer

The use of any information contained herein by any member or non-member of The Aluminum Association is entirely voluntary. The Aluminum Association has used its best efforts in compiling the information contained in this book. While the Association believes that its compilation procedures are reliable, it does not warrant, either expressly or implied, the accuracy or completeness of this information. The Aluminum Association assumes no responsibility or liability for the use of the information herein.

All Aluminum Association published standards, data, specifications and other technical materials are reviewed and revised, reaffirmed or withdrawn. Users are advised to contact The Aluminum Association to ascertain whether the information in this publication has been superseded in the interim between publication and proposed use.

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GENERAL SAFETY RECOMMENDATIONS FOR STORAGE OF ALUMINUM POWDER AND PASTE

Aluminum powder and paste can be shipped, stored and used safely if proper attention is given to the maintenance of scrupulous housekeeping practices, and if the basic rules of safety contained in this brochure and other referenced sources are carefully followed. However, under certain conditions, aluminum powder and paste products can ignite and/or explode.

To provide a better understanding of the recommended safe procedures, the Safety and Property Protection Committee of The Aluminum Association's Pigments and Powder Division has prepared this brochure. These recommendations were compiled by the Committee from those sources listed in the Appendix, from the technical information presently available and from the Member's collective experience in handling aluminum powder and paste. Important source documents referenced in this brochure are National Fire Protection Association Standards Nos. 70, 77, and 484. Readers of this publication are encouraged to refer to these NFPA standards.

The Committee believes that if the recommendations contained herein are followed, the hazards related to the handling and use of aluminum powders and pastes will be substantially reduced. It should be recognized, however, that under some conditions, additional precautions may be required. Likewise, technical advances may uncover better ways of dealing with these materials. If you have any questions concerning aluminum powder and paste, please contact the manufacturer.

The suggestions and information in this brochure concerning the storage and handling of aluminum powder and paste are general in nature. Readers are advised to seek expert advice in connection with their individual handling and storage needs. The Aluminum Association and its member companies make no warranty and assume no responsibility or liability with respect to the suggestions and data contained herein.

DEFINITIONS

Aluminum Powder: Aluminum powder can be divided into three broad classifications: atomized, flake and granules. The length, width, and thickness of an atomized particle are all of approximately the same order, the length dimension probably not exceeding two or three times the thickness dimension. The length or width of a flake particle may be several hundred times its thickness.

Aluminum Paste: Aluminum paste is aluminum flake pigment homogeneously incorporated in a solvent. A variety of solvents may be employed, including both low and high flash point types. Detailed information on the fire and/or explosion hazards associated with a specific paste formulation may be obtained from the Material Safety Data Sheet supplied with the shipment and in discussions with the paste supplier.

Storage Areas: In this brochure, a storage area is understood to be an area where powder and paste are kept in closed containers. Requests for additional information on storage should be addressed to the supplier.

BACKGROUND

WHY POWDER BURNS

Chemically, aluminum has an enormous affinity for oxygen. This results in a thin film of aluminum oxide being produced almost instantaneously on the surface of the aluminum, when exposed to the atmosphere. The aluminum oxide film is inert and protects the underlying metal from further reaction.

When an aluminum powder particle is heated to a certain temperature known as the "ignition temperature", the mass of the particle is so small, that the entire particle may oxidize almost instantly. Thus a pile of such particles will "burn." Since flake particles have a much greater surface area per unit mass than atomized or granular particles, they will ignite more readily and burn faster than the other types of powder.

Generally, aluminum powders with a particle size of 40 mesh (420 microns) or smaller present a fire and explosion hazard.