

Approval Standard

Wafer Carriers for
Use in Cleanrooms

Class Number 4911
April 2010



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Foreword

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Products submitted for certification by FM Approvals shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing shall ensure a consistently uniform and reliable product. Approval Standards strive to be performance-oriented. They are intended to facilitate technological development.

For examining equipment, materials and services, Approval Standards:

- a) must be useful to the ends of property conservation by preventing, limiting or not causing damage under the conditions stated by the Approval listing; and
- b) must be readily identifiable.

Continuance of Approval and listing depends on compliance with the Approval Agreement, satisfactory performance in the field, on successful re-examinations of equipment, materials, and services as appropriate, and on periodic follow-up audits of the manufacturing facility.

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1 INTRODUCTION

1.1 Purpose

This standard states Approval requirements for wafer carriers used in cleanrooms. Wafer carriers are used by the semiconductor industry to store and transport wafers. The wafer carriers not FM Approved are typically fabricated from materials that may be considered to be a fire hazard and require special protection for potential fire situations.

1.2 Scope

1.2.1 This standard sets performance requirements for wafer carriers used in cleanrooms by evaluating the ability of these products to limit fire spread and smoke damage. All requirements in this standard shall be met in order for these products to be eligible to receive Approval recognition. Wafer carriers that receive Approval recognition do not require special fixed fire protection in and of themselves.

1.2.2 This standard addresses Class 1 classification and the requirements to obtain recognition for situations when the wafer carrier is designed and FM Approved for use anywhere within a cleanroom.

1.2.3 The fire performance and smoke generation requirements contained in the standard are based on storage arrangements and fuel loadings considered to be typical of cleanrooms used in the semiconductor industry. The exposure used to qualify Class 1 wafer carriers is considered to be a fire hazard encountered by wafer carriers in a typical semiconductor fabrication facility.

1.2.4 This standard is not intended to determine the suitability for all end use conditions of a product. Conditions under which wafer carriers are used vary widely. For example, these materials may be subjected to environments, storage arrangements and fuel loadings not anticipated by this standard. In addition, this standard does not evaluate a wafer carrier's process compatibility. It is the responsibility of the manufacturer to determine the suitability of the wafer carrier's process compatibility as it relates to the effects of, but not limited to, outgassing, leaching, extraction and other related process compatibility concerns.

1.2.5 This standard does not address the issue of toxicity or outgassing of the materials when they are subjected to fire conditions nor does it address the capability of the wafer carrier to protect wafers during transport or seismic events.

1.3 Basis for Requirements

1.3.1 The requirements of this standard are based on experience, research and testing and/or the standards of FM Approvals and other organizations. The advice of manufacturers, users, trade associations and loss control specialists was also considered.

1.3.2 Meeting the requirements of this standard qualifies a product as an FM Approved Class 1 wafer carrier. Approval recognition shall be for use anywhere in a cleanroom. Requirements prohibit component substitution without prior authorization by FM Approvals.

1.3.3 The requirements of this standard reflect tests and practices used to examine characteristics of wafer carriers for the purpose of obtaining Approval. These requirements are intended primarily as guides and strict conformity is not always mandatory. Wafer carriers having characteristics not anticipated by this standard may be FM Approved if performance equal or superior to that required by this standard is