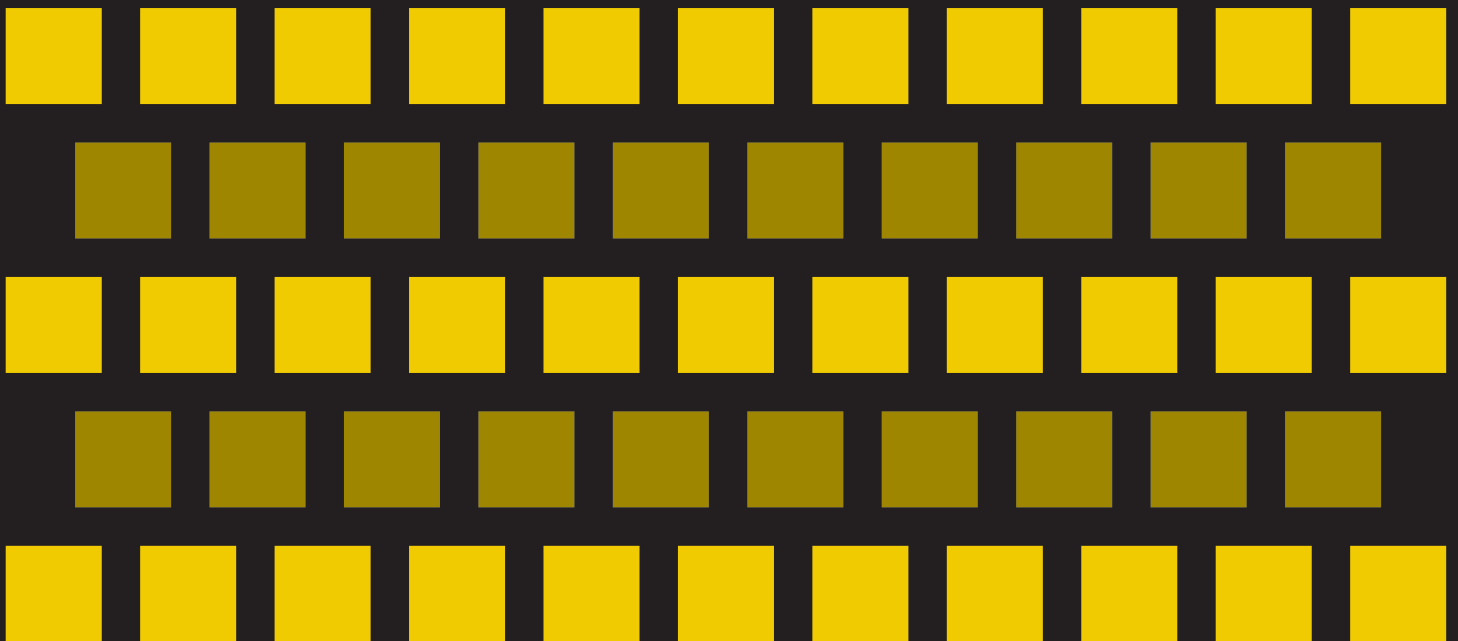


# COMPARISON OF FEM STORAGE/RETRIEVAL MACHINE DOCUMENTS TO THE ASME B30.13 SPECIFICATION



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## FOREWORD

The consumer activity that is present in the North American market creates the need for guidelines to facilitate safe design, maintenance and operation of Automated Storage and Retrieval System (ASRS) and the included SR Machines. The intent of this document is to provide a broad perspective on the major differences between the FEM and ASME standards that can be used for consideration to maintain the technical relevance of ASME Codes and Standards products.

Established in 1880, the American Society of Mechanical Engineers (ASME) is a professional not-for-profit organization with more than 127,000 members promoting the art, science and practice of mechanical and multidisciplinary engineering and allied sciences. ASME develops codes and standards that enhance public safety, and provides lifelong learning and technical exchange opportunities benefiting the engineering and technology community. Visit [www.asme.org](http://www.asme.org) for more information.

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## ABSTRACT

The content of this report evaluates variances between Federation Europeenne de la Manutention (FEM) Automated Storage and Retrieval System (ASRS) standards and ASME B30.13 2003 Storage/Retrieval (S/R) Machines and Associated Equipment [1]. The intent of this document is to provide a broad perspective on the major differences between the FEM and ASME standards that can be used for consideration to maintain the technical relevance of ASME Codes and Standards products.

This document compares thirteen FEM ASRS documents that are outlined below to the ASME B30.13 specification.

- FEM 9.001 Terminology - Dictionary, Storage and Retrieval Machines
- FEM 9.101 Terminology - Storage and Retrieval Machines - Definitions
- FEM 9.221 Performance Data of SR Machines - Reliability/Availability
- FEM 9.222 Standards of the Acceptance and Availability of Installations with Storage Retrieval Machines and Other Machinery
- FEM 9.223 Basic Data and Criteria for the Construction of Automatic High Bay Warehouses with Distribution Systems
- FEM 9.311 Rules for the Design of Storage and Retrieval Machines - Structures
- FEM 9.512 Rules for the Design of Storage and Retrieval Machines - Mechanisms
- FEM 9.754 Safety Rules for Automatic Mini-Load Storage and Retrieval Machines
- FEM 9.831 Calculation Principles of Storage and Retrieval Machines - Tolerances, Deformations and Clearances in the High-Bay Warehouse
- FEM 9.832 Basis of Calculation Principles for SR machines - Tolerances, Deformations and Clearances in Automatic Small Parts Warehouses (not silo design)
- FEM 9.851 Performance Data of SR Machines - Cycle Times
- FEM 9.871 Logbook for Storage and Retrieval Machines and Transfer Devices
- FEM 9.881 Project Planning Data for Selection of Drives for Storage and Retrieval Machines

European ASRS equipment suppliers and consumers follow FEM standards while the ASME B30.13 specification is focused on applicability to the North American market. FEM standards cover a broad spectrum including project planning, equipment simulation and throughput, design standards, safety, defined operating clearances, etc. The ASME B30.13 specification is primarily directed to outlining safety and safe practices as it relates to equipment design, inspection, maintenance and operation. As a result, variances in the FEM and ASME B30.13 specifications exist. These variances could create opportunities for enhancements to the ASME B30.13 specification (if the safety directive of B30.13 was expanded) or new document development opportunities.