16th International Symposium on the Packaging and Transport of Radioactive Materials
October 3-8, 2010
International Maritime Organization, London, UK

Panel Session 9 – No.034

Code Cases of Basket Material for Spent Fuel Transport/Storage Packagings (DPDMC) in the Japan Society of Mechanical Engineers

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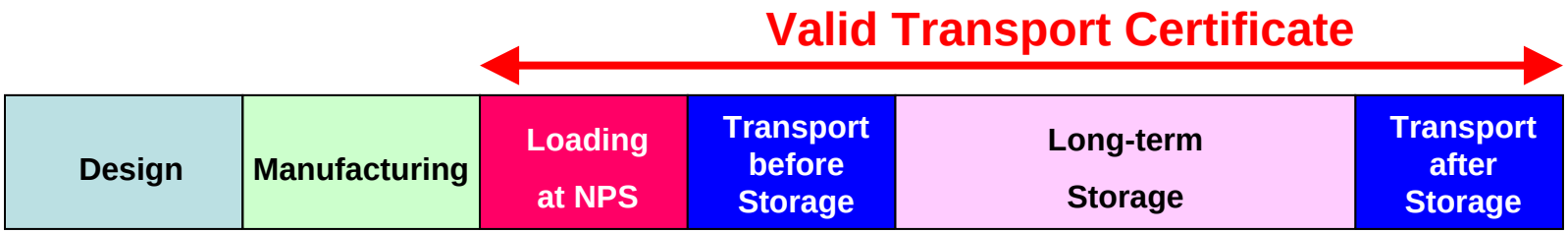
Holistic Approach on DPDMCs in Japan

- **Regulatory approach:**

Safety analysis for storage depends on the transportability of DPDMCs during/after long-term storage.



Standard for Safety Design and Inspection of DPDMCs by AESJ

- Requirements on design and inspection to maintain safety functions throughout the life of DPDMCs

Structural Design and Construction Rules on DPDMCs by JSME

- Requirements for materials, structural design, construction and inspection on the DPDMCs

Code Cases on New Materials

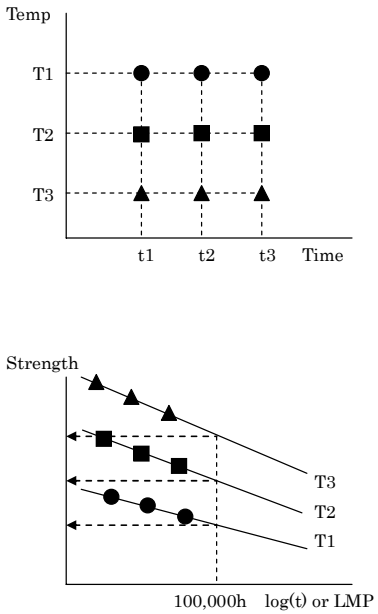
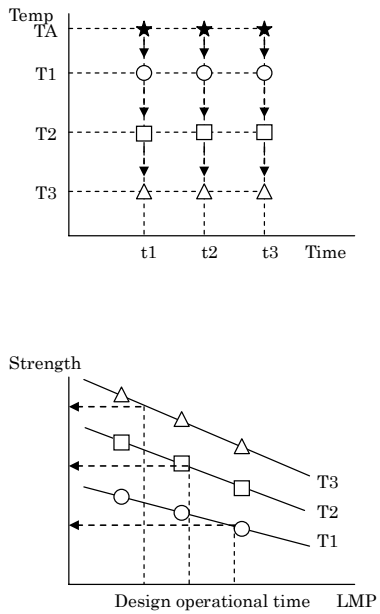
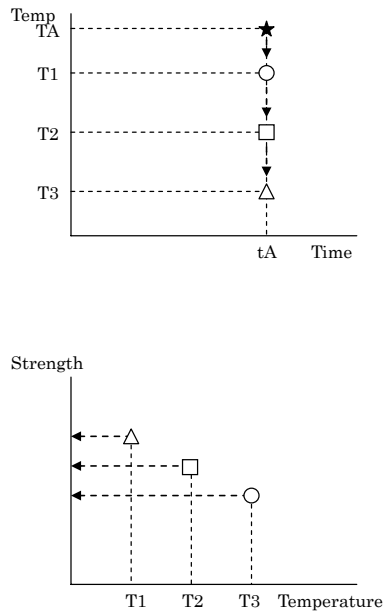
: Aluminum Alloys
Borated Aluminum Alloys
Borated Stainless Steel

Consideration of Long-term Effects in JSME Rules on DPDMCs

- Design Requirements for Aluminum Alloy Basket
  - Primary membrane stress limit : S
  - Creep strain limit : ＜0.2% for membrane strain
- Guidelines : New Material Code Case Application
  - Material specification, mechanical properties, etc.
  - Creep characteristics
  - Aging characteristics
  - Allowable stress vales for design
    - Data acquisition/processing method with consideration of overaging of alloy

Allowable Stress for Overaged Alloy; Data Acquisition and Processing Methods

- **Method 1: Derive from time/temp. map overaged specimen tests**
- **Method 2: Derive from conservatively overaged specimen tests**
- **Method 3: Derive from fully overaged specimen tests**

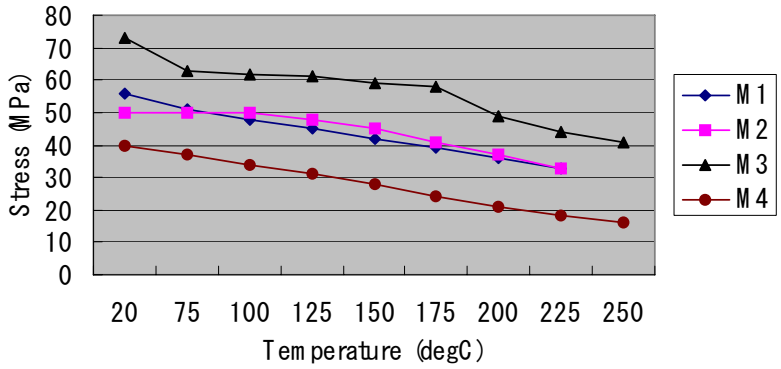
	Method 1	Method 2	Method 3
Method for data processing			

Code Case Materials

Code Numbers	Materials	Descriptions
JSME S FA-CC-001	Borated aluminum alloy	1 % borated Type A-6061-T6 and –T651 aluminum
JSME S FA-CC-002	Aluminum alloy	Type A-6061-T6 and –T651 aluminum
JSME S FA-CC-003	Aluminum alloy	Type A-5083FH-O aluminum
JSME S FA-CC-004	Borated stainless steel sheet	1 % borated Type 304 stainless steel
JSME S FA-CC-005	Borated aluminum alloy	Up to 9 % B4C added Type A6N1 aluminum (ASME Code case N-673)

Examples of Allowable Stress for Code Case Aluminum Alloys

Sm



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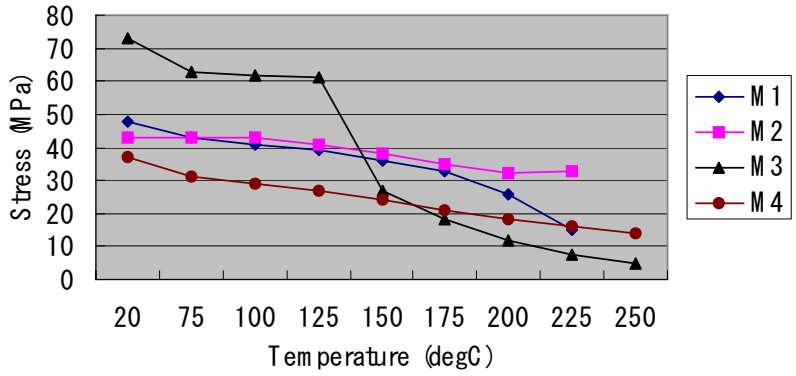

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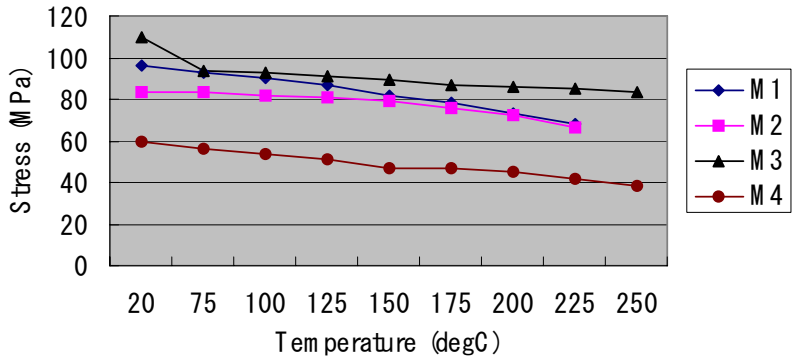

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