



# *Standard*

***FSA-NMEJ-703-99***

***Specifications of Elastomers Used in  
Piping Systems Non-Metallic Expansion Joints***



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**ASTM D-2000 SPECIFICATION FOR  
FLUROELASTOMER (FKM)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M3HK707A110Z1Z2**

**Details of D-2000 Specification Requirements:**

GRADE = **3**

DUROMETER, SHORE A = **70 + 5**

TENSILE STRENGTH, MINIMUM, MPa = **7**  
(Minimum Tensile Strength, psi) = **(1015)**

BASIC REQUIREMENT FOR ELONGATION @ BREAK = **175**

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@250°C  
Maximum allowed Change in Hd, points = **+ 10**  
Maximum allowed % Change in Tensile = **- 25**  
Maximum allowed % Change in Elongation = **- 25**

IRM 903 OIL TEST CONDITIONS: 70 Hr@150°C  
Maximum allowed Volume Change, % = **+ 10**

COMPRESSION SET TEST CONDITIONS: 22 Hr@175°C (METHOD "B",  
Maximum allowed compression set, % = **35** PLIED DISCS)

Z1 (SPECIAL REQUIREMENTS): Specific Gravity **1.80-1.90**

Z2 (SPECIAL REQUIREMENTS): **S/S measured on ASTM slabs which  
have not been oven-postcured**

**ASTM D-2000 SPECIFICATION FOR  
NEOPRENE (CR)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M2BC607A14Z1**

**Details of D-2000 Specification Requirements:**

GRADE= **2**

DUROMETER, SHORE A = **60 + 5**

TENSILE STRENGTH, MINIMUM, MPa = **7**  
(Minimum Tensile Strength, psi) = **(1015)**

BASIC REQUIREMENT FOR ELONGATION @ BREAK = **300**

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@100°C  
Maximum allowed Change in Hd, points = **+ 15**  
Maximum allowed % Change in Tensile = **- 15**  
Maximum allowed % Change in Elongation = **- 40**

IRM 903 OIL TEST CONDITIONS: 70 Hr@100°C  
Maximum allowed Volume Change, % = **+ 120**

COMPRESSION SET TEST CONDITIONS: 22 Hr@100°C (METHOD "B",  
Maximum allowed compression set, % = **80** PLIED DISCS)

Z1 (SPECIAL REQUIREMENTS): Specific Gravity **1.30-1.50**

**ASTM D-2000 SPECIFICATION FOR  
HYPALON® (CSM)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M2CE610A16Z1Z2**

**Details of D-2000 Specification Requirements:**

GRADE= 2

DUROMETER, SHORE A = 60 + 5

TENSILE STRENGTH, MINIMUM, MPa = 10  
(Minimum Tensile Strength, psi) = (1450)

BASIC REQUIREMENT FOR ELONGATION @ BREAK = 350

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@150°C  
Maximum allowed Change in Hd, points = + 20  
Maximum allowed % Change in Tensile = + 30  
Maximum allowed % Change in Elongation = - 60

IRM 903 OIL TEST CONDITIONS: 70 Hr@125°C  
Maximum allowed Volume Change, % = + 80

COMPRESSION SET TEST CONDITIONS: 22 Hr@70°C (METHOD "B",  
Maximum allowed compression set, % = 80 PLIED DISCS)

Z1 (SPECIAL REQUIREMENTS): Specific Gravity 1.25-1.40

Z2 (SPECIAL REQUIREMENTS): Material within a range of 50-65 A  
Hardness is acceptable

**ASTM D-2000 SPECIFICATION FOR  
EPDM (EP, EPDM)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M2CA610A25Z1Z2**

**Details of D-2000 Specification Requirements:**

GRADE= **2**

DUROMETER, SHORE A = **60 + 5**

TENSILE STRENGTH, MINIMUM, MPa = **10**  
(Minimum Tensile Strength, psi) = **(1450)**

BASIC REQUIREMENT FOR ELONGATION @ BREAK = **250**

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@125°C  
Maximum allowed Change in Hd, points = **+ 10**  
Maximum allowed % Change in Tensile = **+ 20**  
Maximum allowed % Change in Elongation = **- 40**

IRM 903 OIL TEST CONDITIONS: No Requirement  
Maximum allowed Volume Change, % = **No Requirement**

COMPRESSION SET TEST CONDITIONS: 22 Hr@100°C (METHOD "B",  
Maximum allowed compression set, % = **60** (PLIED DISCS)

Z1 (SPECIAL REQUIREMENTS): Specific Gravity **1.00-1.20**

Z2 (SPECIAL REQUIREMENTS): **Material within a range of 50-65 A  
Hardness is acceptable**

**ASTM D-2000 SPECIFICATION FOR  
BUTYL (IIR)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M2AA608A1 3Z1**

**Details of D-2000 Specification Requirements:**

GRADE = **2**

DUROMETER, SHORE A = **60 + 5**

TENSILE STRENGTH, MINIMUM, MPa = **8**  
(Minimum Tensile Strength, psi) = **(1160)**

BASIC REQUIREMENT FOR ELONGATION @ BREAK = **300**

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@70°C  
Maximum allowed Change in Hd, points = **+ 15**  
Maximum allowed % Change in Tensile = **+ 30**  
Maximum allowed % Change in Elongation = **- 50**

IRM 903 OIL TEST CONDITIONS: 70 Hr@70°C  
Maximum allowed Volume Change, % = **No Requirement**

COMPRESSION SET TEST CONDITIONS: 22 Hr@70°C (METHOD "B",  
Maximum allowed compression set, % = **50** PLIED DISCS)

Z1 (SPECIAL REQUIREMENTS): Specific Gravity **1.10-1.20**

**ASTM D-2000 SPECIFICATION FOR  
CHLOROBUTYL (CIIR)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M1BA607Z1Z2**

**Details of D-2000 Specification Requirements:**

GRADE= 1

DUROMETER, SHORE A = 60 + 5

TENSILE STRENGTH, MINIMUM, MPa = 7  
(Minimum Tensile Strength, psi) = (1015)

BASIC REQUIREMENT FOR ELONGATION @ BREAK = 200

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@100°C  
Maximum allowed Change in Hd, points = + 15  
Maximum allowed % Change in Tensile = + 30  
Maximum allowed % Change in Elongation = - 50

IRM 903 OIL TEST CONDITIONS: 70 Hr@100°C  
Maximum allowed Volume Change, % = **No Requirement**

COMPRESSION SET TEST CONDITIONS: 22 Hr@70°C (METHOD "B",  
Maximum allowed compression set, % = 50 PLIED DISCS)

Z1 (SPECIAL REQUIREMENTS): Specific Gravity 1.10-1.40

Z2 (SPECIAL REQUIREMENTS): **Material within a range of 50-65 A  
Hardness is acceptable**

**ASTM D-2000 SPECIFICATION FOR  
STYRENE-BUTADIENE (SBR)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M2AA608A13Z1**

**Details of D-2000 Specification Requirements:**

GRADE = **2**

DUROMETER, SHORE A = **60 + 5**

TENSILE STRENGTH, MINIMUM, MPa = **8**  
(Minimum Tensile Strength, psi) = **(1160)**

BASIC REQUIREMENT FOR ELONGATION @ BREAK = **300**

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@70°C  
Maximum allowed Change in Hd, points = **+ 15**  
Maximum allowed % Change in Tensile = **+ 30**  
Maximum allowed % Change in Elongation = **- 50**

IRM 903 OIL TEST CONDITIONS: 70 Hr@70°C  
Maximum allowed Volume Change, % = **No Requirement**

COMPRESSION SET TEST CONDITIONS: 22 Hr@70°C (METHOD "B",  
Maximum allowed compression set, % = **50** PLIED DISCS)

Z1 (SPECIAL REQUIREMENTS): Specific Gravity **1.10-1.20**

**ASTM D-2000 SPECIFICATION FOR  
NITRILE (NBR)  
USED IN NON-METALLIC EXPANSION JOINTS**

**D-2000 SPECIFICATION:**

**M3BG607A14Z1**

**Details of D-2000 Specification Requirements:**

GRADE = **3**

DUROMETER, SHORE A = **60 + 5**

TENSILE STRENGTH, MINIMUM, MPa = **7**  
(Minimum Tensile Strength, psi) = **(1015)**

BASIC REQUIREMENT FOR ELONGATION @ BREAK = **250**

HEAT RESISTANCE TEST CONDITIONS: 70 Hr@100°C  
Maximum allowed Change in Hd, points = **+ 15**  
Maximum allowed % Change in Tensile = **+ 30**  
Maximum allowed % Change in Elongation = **- 50**

IRM 903 OIL TEST CONDITIONS: 70 Hr@100°C  
Maximum allowed Volume Change, % = **+ 25**

COMPRESSION SET TEST CONDITIONS: 22 Hr@100°C (METHOD "B",  
Maximum allowed compression set, % = **50** PLIED DISCS)

**1.20-1.30**

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