ASTM D 1056 Presentation
Understanding ASTM D1056

American Society For Testing Materials  D1056 (ASTM D1056)

Standard Specification For Classification of Flexible Cellular Materials

Sponges (Open Cell) and Expanded (Closed Cell) Foams

Reviewed and revised periodically

ASTM D 1056-68  - The last two digits refer to the year of the test method issued (1968)

If there is no year mentioned that means the most recent version of ASTM D 1056 is being referred to.

Sponge products are identified by a three-character Grade Number (example: 2A2).

The three characters represent Type, Class and Grade.
Understanding ASTM D1056

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**Type**
Type 1 = Open cell  
Type 2 = Closed cell

**Class**
Class A = Non-oil resistant (example: EPDM)  
Class B = Oil resistant, low swell (example: Nitrile)  
Class C = Oil resistant, medium swell (example: Neoprene)  
Class D = Extreme temperature resistance (example: Silicone)

**Grade**
Grade ratings represent compression deflection, or the amount of force in pounds per square inch to deflect the sample 25% of its height.

Grade 0 = less than 2 psi  
Grade 1 = 2-5 psi  
Grade 2 = 5-9 psi  
Grade 3 = 9-13 psi (for classes A, B, C) 9-15 psi (for class D)  
Grade 4 = 13-17 psi (for classes A, B, C) 15-22 psi (for class D)  
Grade 5 = 17-25 psi (for classes A, B, C) 22-30 psi (for class D)
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Suffix Letter Test Required
A Heat resistance
C Ozone or weather resistance
E Fluid resistance (Fuel B)
G Tear resistance
K Adhesion resistance
M Flammability resistance
P Staining resistance
T Tensile and Elongation
Z Any special requirements

B Compression set
D Compression deflection resistance
F Low temperature resistance
J Abrasion resistance
L Water absorption
N Impact resistance
R Resilience
W Density

Suffix numbers that follow the suffix letter denote different testing parameters or conditions for that suffix.

For e.g. B1 stands for C. Set at 70°C (158°F) and B2 stands for C.Set at 23°C (74.3°F) or Room Temp.
Example Line Call Out for Sponge ASTM D-1056

2C2 A1 B2 E1 Z (Z = material passes FMVSS 302)

2 - Closed Cell,

C - Medium Oil Swell or Medium Oil Resistance

2 - C.D (25% Compression) 5 to 9psi,

A1 - Change in C.D. after aging for 22h at 100°C to be +/- 30% from Original C.D.,

B2 - Compression Set at 23°C for 22h (50% compression) and after 24h recovery to be max. of 25%,

E1 - Change in weight after 7 days at 23°C in ASTM Reference Fuel B to be max. of 150% and

Z = States special requirement as stated.
## Understanding ASTM D1056

### D 1056 Equivalency Cross-Reference Chart for Years as Noted

<table>
<thead>
<tr>
<th>Grades: 40, 41, 42, 43, 44 and 45</th>
<th>Grades: 40, 41, 42, 43, 44 and 45</th>
<th>Grades: 40, 41, 42, 43, 44 and 45</th>
<th>Grades: 0, 1, 2, 3, 4 and 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type S</td>
<td>No SBE and SCE. Everything is RE</td>
<td>No SBE or SCE. Everything is RE</td>
<td>A-No Oil resistance</td>
</tr>
<tr>
<td>Class SB - Low Fuel Swell (50% Max.) or Excellent Oil Resistance</td>
<td>Suffix E1 – Medium Oil Swell (150%)</td>
<td>Suffix B1 – C. Set at 70°C; Suffix B2 – C. Set at 23°C</td>
<td>B- Excellent Oil Resistance</td>
</tr>
<tr>
<td>Class SC – Medium Swell, (150% Max)</td>
<td>Suffix E2 – Low Oil Swell (50%)</td>
<td></td>
<td>C- Medium Oil Resistance</td>
</tr>
<tr>
<td>Density Less Than 10 pcf given greater allowance for Oil Swell. E1-250% and E2 -100%</td>
<td>Density Less Than 10 pcf</td>
<td>Density Less Than 10 pcf</td>
<td></td>
</tr>
</tbody>
</table>

**Suffixes**
- RE: Resistance to Swell
- B: Moderate Swell
- E: Low Swell
- S: Superior Swell

**Density**
- Grades: 0, 1, 2, 3, 4 and 5
- Grades: 40, 41, 42, 43, 44 and 45
- Grades: 40, 41, 42, 43, 44 and 45
- Grades: 40, 41, 42, 43, 44 and 45

**Notes**
- No SBE or SCE. Everything is RE
- A-No Oil resistance
- B- Excellent Oil Resistance
- C- Medium Oil Resistance

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**ASTM D1056 - 85**

- RE41 BF1
- SBE 43 BCF2
- SCE 42

**ASTM D1056 - 77**

- RE 41 BF1
- RE 43 BCE2F2
- RE 42 E1

**ASTM D1056 - 73**

- RE 41 B2F1
- RE 43 B2C1E2F2
- RE 42 E1

**ASTM D1056 - 68**

- 2A1 B2F1
- 2B3 B2C1F2
- 2C2
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MIL- C - 3133; MIL- STD 670:
Exactly the same as D 1056 and were discontinued in 1986.

SAE J18; Exactly the same as D 1056

ASTM D1667; Very similar to 1056. Specifically for PVC containing closed cell foams.

ASTM D3575; similar to 1056 for polyolefin foams. Plastics like polyethylene and ethylene vinyl acetate.

ASTM D 1056 is The Industry Standard!