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Cellular Urethane Foams

Unsupported Industrial Materials Typical Physical Properties

PORON® cellular urethane foams offer a broad range of design solutions for gasketing, sealing, and energy absorption.

Through a unique manufacturing process, PORON materials can be formulated in a wide range of firmnesses and a variety of densities within each formulation.

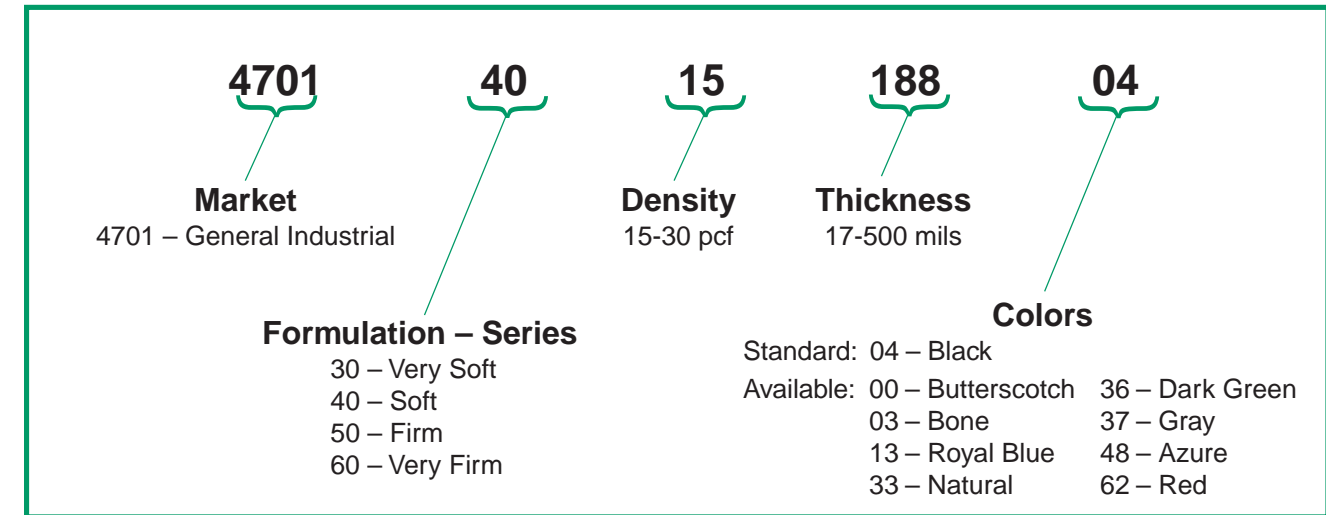
PORON urethanes are supplied in continuous rolls and can be easily fabricated: die-cut, slit, machined and laminated.

An outstanding combination of properties are exhibited by PORON urethanes:

- Excellent resistance to compression set
- High energy absorption
- Low outgassing
- Resistance to temperatures
- Bondable surface
- Low hydrolysis
- No plasticizers to migrate
- High internal strength and dimensional stability
- Chemical resistance



Product Identification



Product Availability – Unsupported Industrial Materials

THICKNESS			FORMULATION											
			4701-30			4701-40			4701-50			4701-60		
INCHES	MM		15	20	25	15	20	30	15	20	30	15	20	25
FRACTIONAL	THOUSAND		PCF	PCF	PCF	PCF	PCF	PCF	PCF	PCF	PCF	PCF	PCF	PCF
Tolerance, %			±10	±10	±15	±10	±10	±20	±10	±10	±20	±10	±10	±15
1/32	0.031	0,79			●			●			●		●	●
–	0.035	0,89			●			▲			▲		▲	▲
3/64	0.045	1,14			●			●			●		▲	▲
1/16	0.062	1,57		●	▲		●	▲		●	▲	▲	●	●
3/32	0.093	2,36		●	▲		●	▲		●	▲	▲	▲	●
1/8	0.125	3,18	▲	●		▲	●		▲	●		●	●	
3/16	0.188	4,78	●	▲		●	▲		●	▲		●	●	
1/4	0.250	6,35	●	▲		●	▲		●	▲		●	▲	
3/8	0.375	9,53	●			●			●	▲				
1/2	0.500	12,70	●			●			●	▲				

PORON industrial materials are produced on a “make to order” basis. Although off-the-shelf stock may be available for standard grades and thicknesses, normal lead time is two weeks. Check with your Customer Service Representative for your specific requirements. Rogers also offers other specialty materials such as thin as cast, closed cell, slow rebound and materials supported on 2 mil polyester film.

- **Standard Product Offering** – Material with a broad base of sales to multiple customers. Lead time is two weeks after receipt of order.
- ▲ **Non-Standard Product** – Can be produced to special order. Requires a higher minimum order. Lead time is three weeks after receipt of order. Both formulation and density effect modulus, when selecting a non-standard material be aware that a standard material in another formulation/density may be similar in properties.

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Unsupported Industrial Materials – Typical Physical Properties

PROPERTY	TEST METHOD	PORON® Cellular Urethane Material												
		4701-30 (replaces 4701-59)			4701-40 (replaces 4701-01, 4716-16, -01 & -71)			4701-50 (replaces 4701-05)			4701-60 (replaces 4701-12 & -13)			
Density, lb./ft. ³ (kg/m. ³) Tolerance, %	ASTM D3574 Test A	15 (240)	20 (320)	25 (400)	15 (240)	20 (320)	30* (480)	15 (240)	20 (320)	30 (480)	15 (240)	20 (320)	25 (400)	
		± 10			± 10			± 10			± 10			
PHYSICAL														
Standard Color, (Code) Special Colors Available		Black (04)			Black (04)			Black (04)			Black (04)			
Compression Set, % max.	ASTM D1667 Test D @ 73°F (23°C) ASTM D3574 Test D @ 158°F (70°C) ASTM D3574 Test J / Test D after autoclaved 5 hrs. @ 250°F (121°C)	2 10 5	2 10 5	2 10 5	2 10 5	2 10 5	2 10 5	2 10 5	2 10 5	2 10 5	5 10 10	5 10 10	5 10 10	
Compression Force Deflection, psi (kPa)	0.2"/min. Strain Rate Force Measured @ 25% Deflection	1 – 5 (7 – 35)	3 – 8 (21 – 55)	5 – 12 (35 – 83)	4 – 8 (27 – 55)	7 – 13 (48 – 90)	15 – 40 (104 – 276)	8 – 14 (55 – 97)	13 – 23 (90 – 159)	30 – 60 (207 – 415)	18-50 (124 – 345)	35-85 (241 – 586)	50-130 (345 – 896)	
Dimensional Stability, %, max. change	22 hrs. @ 176°F (80°C) in a forced-air oven	± 4			± 2.5			± 2.5			± 5			
Flammability	UL HBF (File E20305) MVSS 302 CSA Component Acceptance HBF (File 188149)	Pass ≥ 0.188"	Pass ≥ 0.093"	—	Pass ≥ 0.188"	Pass ≥ 0.062"	—	Pass ≥ 0.188"	Pass ≥ 0.062"	—	Pass ≥ 0.125"	Pass ≥ 0.062"	—	
		Pass ≥ 0.188"	Pass ≥ 0.062"	Pass ≥ 0.062"	Pass ≥ 0.188"	Pass ≥ 0.062"	—	Pass ≥ 0.188"	Pass ≥ 0.062"	Pass ≥ 0.045"	Pass ≥ 0.125"	Pass ≥ 0.062"	Pass ≥ 0.062"	
		Pass ≥ 0.188"	Pass ≥ 0.093"	—	Pass ≥ 0.188"	Pass ≥ 0.062"	—	Pass ≥ 0.188"	Pass ≥ 0.062"	—	Pass ≥ 0.125"	Pass ≥ 0.062"	—	
Fogging	SAE-J 1756 3 hrs. @ 212°F (100°C)	Pass			Pass			Pass			Pass			
Hardness, Durometer, Shore "O" Shore "A"	ASTM D2240	< 3 < 3	8 5	16 12	12 8	17 12	34 25	18 13	24 18	55 42	42 30	55 42	63 53	
Outgassing, Total Mass Loss, (TML), % Collected Volatile Condensable Materials, (CVCM), % Water Vapor Regain (WVR), %	ASTM E595 24 hrs. @ 257°F (125°C) @ < 7x10 ⁻³ Pa	0.8 0.1 0.2	1 0.1 0.3	1.3 0.2 0.6	0.7 0.04 0.3	0.8 0.04 0.3	1.0 0.05 0.62	0.6 0.04 0.1	0.8 0.05 0.3	0.9 0.06 0.4	0.6 0.05 0.5	0.7 0.02 0.5	0.7 0.03 0.6	
Tear Strength, pli, min. (kN/m)	ASTM D624 Die C	1 (0.2)	3 (0.5)	4 (0.7)	3 (0.5)	5 (0.9)	12 (2.1)	6 (1.1)	10 (1.8)	13 (2.3)	12 (2.1)	17 (3.0)	19 (3.3)	
Tensile Elongation, %, min.	ASTM D3574 Test E	100			100			100			90			
Tensile Strength, psi, min. (kPa)	ASTM D3574 Test E	20 (138)	30 (207)	35 (242)	40 (276)	75 (518)	120 (829)	80 (553)	120 (829)	200 (1382)	135 (931)	200 (1382)	250 (1700)	
THERMAL														
Temperature Resistance Cold Flexibility Embrittlement Recommended Constant Use, max. Recommended Intermittent Use, max.	MIL-P-12420D @ -40°F (-40°C) ASTM D746	Pass -60°F (-51°C) 158°F (70°C) 250°F (121°C)			Pass -40°F (-40°C) 194°F (90°C) 250°F (121°C)			— — 194°F (90°C) —	Pass -40°F (-40°C) 194°F (90°C) 250°F (121°C)			Pass -3F° (-16°C) 194°F (90°C) 250°F (121°C)		
Thermal Conductivity, W/m-C (BTU-in./hr.-ft. ² -F)	ASTM C518	—	0.076 (0.53)	—	—	0.086 (0.60)	—	—	0.090 (0.63)	—	—	0.088 (0.61)	—	
Coefficient of Thermal Expansion		2.3 – 3.1 x 10 ⁻⁴ in./in./°C			2.3 – 3.1 x 10 ⁻⁴ in./in./°C			2.3 – 3.1 x 10 ⁻⁴ in./in./°C			2.3 – 3.1 x 10 ⁻⁴ in./in./°C			
ELECTRICAL														
Surface Resistivity, ohm/sq.	ASTM D257	6 x 10 ¹¹			2 x 10 ¹²			7 x 10 ¹²			3 x 10 ¹²			
Volume Resistivity, ohm. cm	ASTM D257	3 x 10 ¹¹			1 x 10 ¹²			2 x 10 ¹²			7 x 10 ¹²			
Dielectric Constant, K' ("DK")	ASTM D150 measurements @ 72°F (22°C) relative humidity 50% for 24 hrs.	1.75			1.71			1.63			1.60			
Dissipation Factor, tan D ("DF")	ASTM D150	0.05			0.05			0.05			0.05			
Dielectric Strength, volts/mil	ASTM D149	50			50			50			50			
ENVIRONMENTAL														
Corrosion Resistance	AMS 3568	Pass			Pass			—			Pass			
Gasketing and Sealing	UL JMST2 (consisting of - UL50 and - UL508) CAN/CSA – C22.2 No. 94-M91	File MH15464			File MH15464			—			File MH15464			
Mildew/Bacteria Resistance	ASTM G-21	Good			Good			—			Good			
Ozone Resistance	GM 4486P	Pass			Pass			—			Pass			
Skin Contact	Schwartz and Peck Human Patch Test	No Irritation			No Irritation			—			No Irritation			
Staining	ASTM D925	No Stain			No Stain			—			No Stain			
UV Resistance	ASTM G53	Good			Good			—			Good			
Water Absorption, % weight gain, typical Immersion Testing, % weight gain, typical	AMS 3568 ASTM D570	2 12	9 9	14 14	19 19	10 10	— —	13 13	8 8	5 5	19 19	20 20	6 6	
CHEMICAL														
Static Solvent Resistance	Specimens immersed for 10 min. in 75% Naptha, 25% 1, 1, 1-trichloroethane, then allowed to dry completely	—			No tackiness or surface deterioration			—			No tackiness or surface deterioration			
Additional Solvent Resistance	– Antifreeze and Water 50/50 – Windshield Washer Solution – Electrical Grease – Soap and Water 50/50	No tackiness or surface deterioration			No tackiness or surface deterioration			—			No tackiness or surface deterioration			

The above data represents typical values. It is not intended to and does not create any warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose. The relative merits of Rogers PORON materials for a specific application should be determined by the user.

*The properties listed for 4701-40-30 material are preliminary.

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Notes:

1. All metric conversions are approximate.
2. Microgrinding of some materials for improved thickness tolerance is available upon request.
3. Additional technical services available.