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Compression Force Deflection Versus Shore Hardness

Why is the hardness characteristic of PORON® materials reported as Compression Force Deflection (CFD) instead of a Shore measurement? For reasons of usefulness and specification, CFD is better suited to describe PORON products.

CFD is an engineering measurement and is expressed in pounds force per square inch (psi). It is merely the force required to compress a material a fixed percentage. Poron Materials Unit (PMU) has chosen 25% compression to characterize PORON materials. Designers find this very useful in making material selections to meet engineering requirements. If you require CFD data at a level of compression other than 25%. Just ask us. We have that data available too. On the other hand, Shore measurements provide only relative information. A material with a Shore 5 rating is softer than one with Shore 10. We are often asked to convert from one measurement of Shore to another. (*Example: A to O or vice versa*) In **Table 2** you will find a conversion chart which we hope you will find helpful.

Finally, most of the test methods we employ are based on ASTM D3574. This method describes procedures for evaluating "Flexible Cellular Materials-Slab, Bonded and Molded Urethane Foams". In this test method, the hardness of urethane foams is determined by Compression Force Deflection (Test C).

PORON microcellular materials are available in a wide range of CFD and thicknesses. This broad offering is possible with our combination of formulations and densities. PORON products can be arranged into four general categories of CFD: **LOW**, **MEDIUM**, **HIGH**, and **VERY HIGH**. **Table 1** shows the formulation-density combinations for each category:

FORMULATION - DENSITY			
LOW	MEDIUM	HIGH	VERY HIGH
40 - 15	40 - 20	50 - 20	50 - 30
30 - 15 & 20	50 - 15	60 - 20	60 - 20, 25 & 30
	30 - 25		

Table 1

SHORE DUROMETER CONVERSION CHART					
A	B	C	D	O	OO
100	85	77	58		
95	81	70	46		
90	76	59	39		
85	71	52	33		
80	66	47	29	84	98
75	62	42	25	79	97
70	56	37	22	75	95
65	51	32	19	72	94

60	47	28	16	69	93
55	42	24	14	65	91
50	37	20	12	61	90
45	32	17	10	57	88
40	27	14	8	53	86
35	22	12	7	48	83
30	17	9	6	42	80
25	12			35	76
20	6			28	70
15				21	62
10				14	55
5				8	45

Table 2

If you have additional questions, please contact Fred Seidel, Applications Engineer, at 860-928-3622 Ext. 8835 or techpmu@rogers-corp.com

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