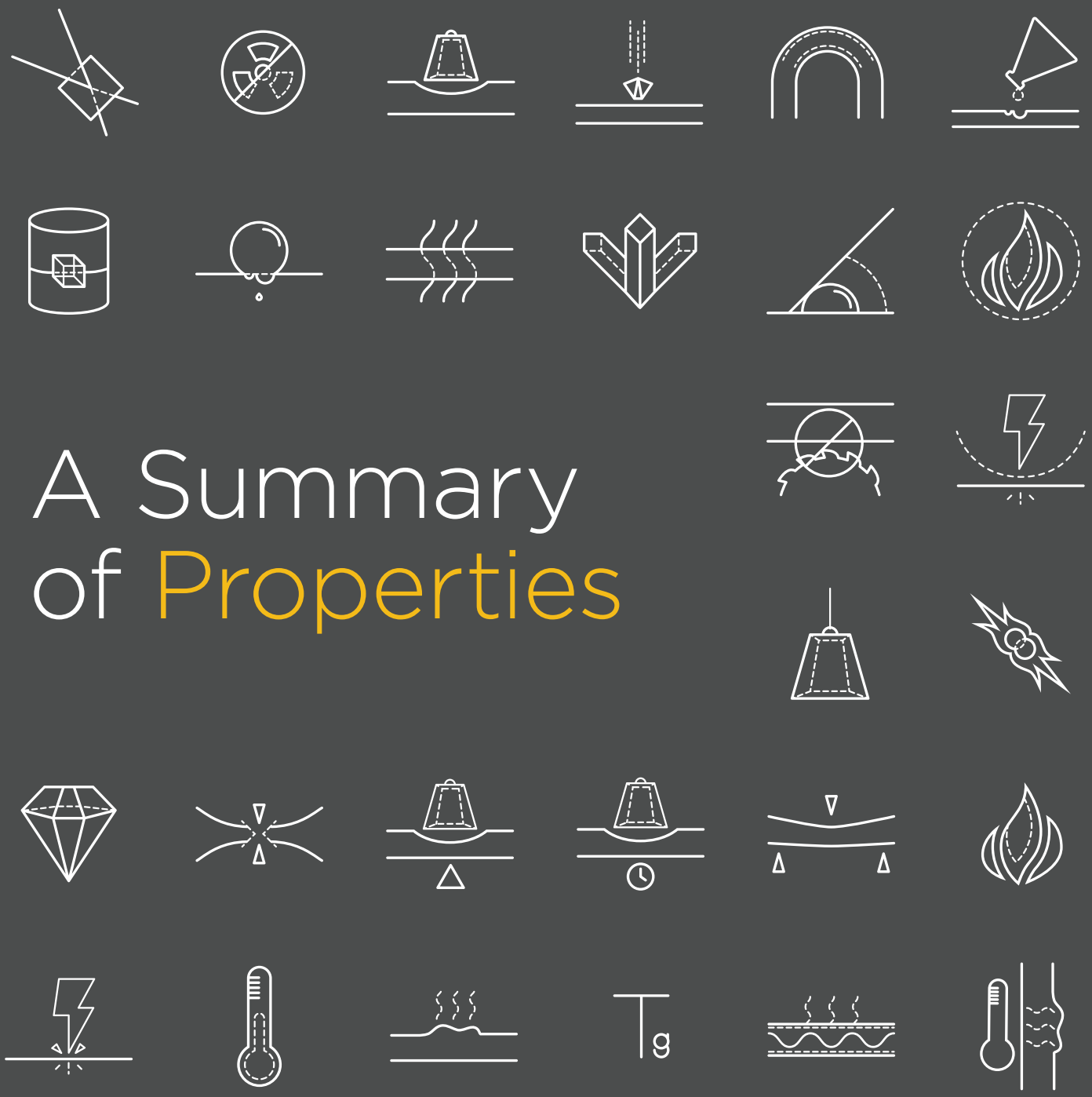

A Summary of Properties

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SUMMARY OF PROPERTIES

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DATA FOR PHYSICAL PROPERTIES OF MATERIALS ZEUS PROCESSES

PHYSICAL	ASTM	PTFE	FEP	PFA	PVDF
Density (g/cc)	D792/ ISO 12086*/ D1505**	2.16 - 2.18	2.12 - 2.17	2.14 - 2.16	1.76 - 1.82
Water Absorption (%)	D570/ISO 62-1*	≤ 0.01	≤ 0.01	< 0.03	0.02 - 0.07
Refraction Index (N_D)	D542				1.40 - 1.42
Oxygen Index (%)	D2863/2868*	≥ 95	≥ 95	≥ 95	42 - 44*
MECHANICAL					
Hardness, Shore D	D2240	50 - 65	55 - 56	55 - 60	50 - 80
Ultimate Tensile Strength (MPa)	D638/ISO 527 (1 or 3)*	21 - 35	19.6 - 34.32	28 - 30	14 - 55
Elongation at Break (%)	D638/ISO 527 (1 or 3)*	300 - 500	300 - 400	300	20 - 800
Modulus of Elasticity (MPa)	D638/D527*	392	343	451	241 - 2310
Flexural Modulus (MPa)	D790/ISO 178*	490 - 588	539 - 637	625 - 686	192 - 2310
Coefficient of Friction	D1894	0.02 - 0.10	0.04 - 0.06	0.04 - 0.06	0.14 - 0.54
ELECTRICAL					
Volume Resistivity (Ω - cm)	D257/ IEC 60096	$\leq 1.0 \times 10^{18}$	$< 1.0 \times 10^{18}$	$\leq 1.0 \times 10^{18}$	10^{15} - 2.0×10^{14}
Dielectric Constant 1 MHz	D150/ EIC 60250*/ DIN 53483**	2.10	2.03 - 2.10	2.03 - 2.10	4.5 - 13.5
Dielectric Strength (V/mil)	D149/ EIC 60243-1	457 - 483	500 - 2023	508 - 2000	254 - 1100
THERMAL					
Thermal Conductivity (W/m - K)	D433/ ISO 22007-4*/ C177**	0.025** - 0.300	0.250**	.26*	0.144 - 0.2
Maximum Service Temp, Air (°C)		260	200	260	150
Melt Temp (°C)	D4591/D3418*/ ISO 12086**/ DOW Method***	326 - 327*	260 - 275	300 - 310	117 - 172**
Decomposition Temp (°C)	AIR	505	450	475	375
Coefficient of Thermal Expansion, linear 20° (µm/m-°C)	D696/ISO 11359*	100	83 - 112	120	80 - 194

SUMMARY OF PROPERTIES

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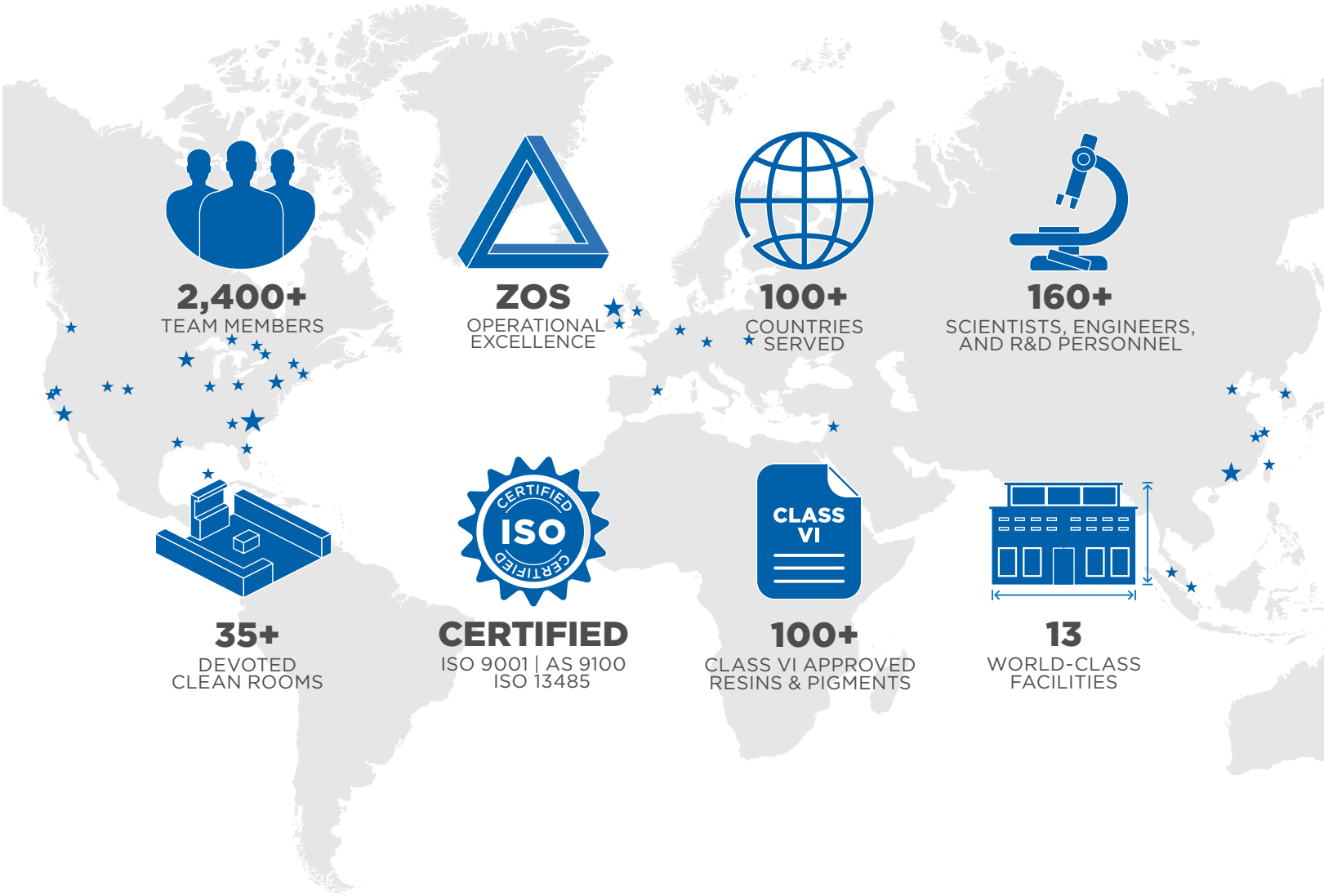
DATA FOR PHYSICAL PROPERTIES OF MATERIALS ZEUS PROCESSES

PHYSICAL		ASTM	EFEP	ETFE	ECTFE	PEEK
	Density (g/cc)	D792/ ISO 12086*/ D1505**	1-71 - 1.77	1.73 - 1.74	1.68	1.3
	Water Absorption (%)	D570/ISO 62-1*	≤ 0.10	< 0.03	< 0.1	0.07* - 0.45*
	Oxygen Index (%)	D2863/2868*	31	32*	52	24
MECHANICAL						
	Hardness, Shore D	D2240	75	67	75	84.5
	Ultimate Tensile Strength (MPa)	D638/ ISO 527 (1 or 3)*	30 - 60	47.99 - 51.99	54	98* - 100*
	Elongation at Break (%)	D638/ ISO 527 (1 or 3)*	370 - 540	382 - 415	250	40* - 45*
	Modulus of Elasticity (MPa)	D638/D527*	490 - 784		1655	3700* - 4000*
	Flexural Modulus (MPa)	D790/ISO 178*	882 - 1372	890 - 960	1690	3800* - 4200*
	Coefficient of Friction	D1894	0.055 - 0.08		0.2	0.58
ELECTRICAL						
	Volume Resistivity (Ω - cm)	D257/ IEC 60096	$\leq 10^{16}$	$> 1.0 \times 10^{17}$	1.0×10^{16} - 5.5×10^{16}	1.0×10^{16}
	Dielectric Constant 1 MHz	D150/ EIC 60250*/ DIN 53483**	2.6	2.6	2.57*	3.1**
	Dielectric Strength (V/mil)	D149/ EIC 60243-1	406	1800	350	584.2*
THERMAL						
	Thermal Conductivity (W/m - K)	D433/ ISO 22007-4*/ C177**	0.24**		0.15**	0.29* - 0.32*
	Maximum Service Temp, Air (°C)		150	150	150	260
	Melt Temp (°C)	D4591/D3418*/ ISO 12086**/ DOW Method***	155 - 170**	260 - 265**	242**	343**
	Decomposition Temp (°C)	AIR	357 - 380			541 542.6
	Coefficient of Thermal Expansion, linear 20° (µm/m-°C)	D696/D4702*	50 - 90	131.4	100	45*

Get to know Zeus.



OUR MISSION

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Zeus, headquartered in Orangeburg, South Carolina, is the world's leading polymer extrusion and catheter design manufacturer. With over 55 years of experience in medical, aerospace, energy, automotive, fiber optics, and other leading industries, Zeus's mission is to provide solutions, enable innovation, and enhance lives. The company employs over 2,400 people worldwide with facilities in Aiken, Columbia, Gaston, Orangeburg, and St. Matthews, South Carolina; Branchburg, New Jersey; Chattanooga, Tennessee; San Jose, California; Arden Hills, Minnesota; Guangzhou, China; and Letterkenny, Ireland. For more information, visit *www.zeusinc.com.*

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