PetraForge™ Product Specification Sheet

PetraForge™ is a proprietary new ceramic composition of matter offered exclusively by Covaron Advanced Materials. Combining the formulation versatility of a polymer with the physical properties of an advanced ceramic, PetraForge™ delivers many valuable material properties traditional ceramics cannot:

- Molecular bonding to ceramics and metals
- Total cure below 200 °F
- Customizability with functional composite additives
- Castability around models of nearly any material (e.g. 3D-printed prototypes)
- Reduced cost of ceramic production and post-cure machining
- No shrinkage from green state set to final cure

PetraForge™ is available as either a pre-finished material or a two-component system which can be poured, cast, extruded or sprayed by the end user in a variety of applications. The two components – a metal oxide mix, Part A, and a liquid catalyst, Part B – are combined and mixed into a slurry (gyro mixers, paint mixers, mortar mixers, and continuous dispersion mixers have all been successful). These ingredients may be paired with additives to modify physical and aesthetic properties. These additives can also control the rate at which PetraForge™ slurry fuses into its green state (in addition to simple factors such as temperature).

While in its green state, PetraForge™ may be cut, milled, sawed, ground, carved, tapped, prilled, sanded or polished with ordinary steel tooling. It cures to its final form in a humidity-controlled environment below 200 degrees Fahrenheit.

PetraForge™ may be used for any size product – as bulk material for precision or structural components, as impact-resistant anti-corrosive coatings, or as covalent bonding adhesives for metal and ceramics. The only working limitations are those imposed by mixing, handling and curing equipment.

For more information, please fill out a contact form on our website:

www.covaron.com

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PetraForge™ Physical Properties

	Parameter	Units	(metric)	Units	(imperial)
Cured state	Tensile strength	MPa	2.0 – 24.8	ksi	0.29 – 3.6
	Compressive strength	MPa	2.0 – 372	ksi	0.29 – 54
	Flexural strength	MPa	3.0 – 24.8	ksi	0.435 – 3.6
	Young's modulus	MPa	15,800 – 23,000	ksi	2291 – 3335
	Bulk density	g/cm^3	0.09 – 1.8	lb/in^3	0.003 – 0.06
	Thermal conductivity	W/(m·K)	0.21 – 12.4 (dense)	–	–
	Poisson's ratio	–	0.15 – 0.32	–	–
	Elongation to break	%	0.5 – 36	–	–
	Specific heat capacity	J/(kg·K)	0.9 – 1.34	–	–
	Electrical resistivity	Ω·m	$10^2 – 10^{16}$	–	–
	Hardness (Mohs)	–	3 – 6	–	–
Green state	Cure temperature	°C	82 – 94	°F	180 – 200
	Cure time	hours	2 – 96	–	–
	Working time	hours	2 – 240	–	–
	Shrinkage	%	≤ 0.1	–	–
	Hardness (Shore D)	–	20 – 80	–	–
Slurry	Viscosity	mPa·s	270 – 1,000,000	cPs	270 – 1,000,000
	Pot life	minutes	0.1 – 240	–	–

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