



# 3D PRINT

## Covestro Additive Manufacturing Materials Guide

At Covestro Additive Manufacturing, we draw on over 25 years of experience in 3D printing technologies, performance materials and deep application expertise to help manufacturers rethink the way they design products to manufacture tomorrow. Our goal is to unlock the full potential of additive manufacturing and help accelerate the adoption of 3D printing, creating brighter lives for all through both more sustainable high-performance materials and processes.

As additive manufacturing evolves from a prototyping technology into a mainstream manufacturing technology, the parts themselves - the applications - come under increasing scrutiny. Whether these are medical prostheses, trainer insoles or car parts, they all have specific requirements - which in turn drive the quest for the right materials.

Materials strong and rigid, or soft and flexible, Covestro Additive Manufacturing has a breadth of materials to meet a variety of application needs – with more in development.



SLA, DLP	Key Benefits	Applications	Appearance	Viscosity	Photo-speed	Tensile Modulus (MPa)	Tensile Strength (MPa)	Elonga-tion	Izod Impact Notched (J/m)	Heat Deflection Temperature @ 0.46 MPa (°C)	Heat Deflection Temperature @ 1.81 MPa (°C)	Material Properties/ Characteristics					Key Application Areas						
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Po-Like and flexible																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</
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Pp-Like and flexible

Somos® 9120	Superior chemical resistance & fatigue properties, strong memory retention	Automobile components, electrical housings, medical products	Translucent	450	65	1,350	31	20% @ Yield	51	49	N/A	••		•••	•	•••		•••	••	•••			
Somos® Momentum	High accuracy, color facilitates inspection of feature detail & quality	Footwear tooling	Pink	340	64	2,510	37	7.5% @ Break	26	46	41	••		•••		••	••	••	•••			•	

ABS-like

Somos® GP Plus 14122	Water resistant, low viscosity, extremely accurate, excellent humidity resistance	Functional prototypes, low volume production parts	White	340	64	2,510	37	7.5% @ Break	26	46	41	•••		•••		••	••	••	•••	•••		•	
Somos® ProtoGen 18420*	Superior chemical resistance, high tolerance to broad range of temperatures & humidity	Applications that demand accurate RTV patterns, humidity & temperature resistant parts	White	350	69	2,250	43	12% @ Break	21	55	46	•••	••	••	•	••	•••	••	•••	••		•	
Somos® WaterShed Black	Easy to use & fast processing with minimal finishing, truer black material off the machine, superior moisture resistance	Black ABS-like models & prototypes, general purpose prototyping, master patterns	Black	260	93	2,770	50 @ Break	15.5% @ Break	25	50	49	••		•••		••	••	•	•••	•••		•	

Tough and strong

Somos® EvoLVe 128	Fast processing, easy finishing, high durability, accurate & dimensionally stable	Jigs & fixtures, snap-fit designs, functional prototypes	White	380	95	2,964	57 @ Yield	11% @ Break	39	52	50	•••		•••		•••	•••	•••	•••	•••		••	
Somos® NeXt	Highly durable, superior strength, exceptionally versatile, thermoplastic-like performance, look & feel	Functional end-use performance prototypes, connectors & electronic covers, automotive housings	White	1,000	67	2,430	42 @ Yield	9% @ Break	50	56	50	•		•••		•••	•••	•••	•••	•••		••	
Somos® DMX-SL 100	High feature detail, withstands extreme autoclave process temperatures utilized in composites manufacturing	Intricate & hollow composite parts, transportation ducts, pipes & conduits, robotic components	Off-White	1,500	92	2,410	45 @ Yield	20% @ Break	66	44	41	••	•••			•••				•••			
Somos® Taurus	Superior strength & durability, heat tolerance up to 90°C, excellent surface quality & isotropy	Functional prototyping & end-use applications, automotive parts, low volume connectors for electronics	Charcoal	350	111	2,310	47 @ Yield	24% @ Break	48	91	73		••			••				•••			

High-temp and composite

Somos® ProtoTherm 12120*	High temperature resistance up to 121°C, dimensional stability in high humidity, precise accuracy for small details	High-temperature fluid flow analysis, functional prototypes requiring heat & humidity resistance	Transparent Red	550	63	3,250	77 @ Break	4.5% @ Break	17	126	N/A	•••	••	•••	•	•	•		•	••	••		
Somos® PerFORM*	Rigid, high strength, excellent detail resolution, high heat tolerance	Electrical casings, automotive housings	Off-White	1,000	80	9,800	80	1.2% @ Break	20	268	119	•••	•••	•••		•	••		•	••	•••	•••	
Somos® PerFORM Reflect	Ready-to-use material for PIV wind tunnel testing & laser imaging, saves up to 30% post treatment, improved surface quality	Wind tunnel aerodynamic testing, velocity measurements in water flows, high-temperature testing, electrical casings, automotive housings	Orange	1,100	93	10,135	64	0.79% @ Break	17	276	122	•••	•••	•••		•			•	••	•••		

\* Values for materials that have been thermally post-cured.  
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Values are indicative, and final results depend on machine and processing parameters.

Symbol key:    • good    •• better    ••• best

SLA, DLP	Key Benefits	Applications	Appearance	Viscosity	Photo-speed	Tensile Modulus (MPa)	Tensile Strength (MPa)	Elonga-tion	Izod Impact Notched (J/m)	Heat Deflection Temperature @ 0.46 MPa (°C)	Heat Deflection Temperature @ 1.81 MPa (°C)	Material Properties/ Characteristics				Key Application Areas							
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				(cps @ 30°C)		ASTM D638		ASTM D638		ASTM D648		Accuracy	Moisture Resistance	Durability	Snap Fit Assemblies	Automotive	Rapid Tooling
				(E <sub>10</sub> mJ/cm²)			ASTM D638		ASTM D256		ASTM D648	High Temp	Optical Clarity	RTV/ Master Patterns	General Purpose Models	Wind Tunnel Testing	Medical

Investment casting

Somos® Element	Low viscosity, antimony free, stronger green strength, dimensionally stable, minimal ash residue after burnout	High-end alloy castings	Clear	125	68	3,170	53 @ Break	2.3% @ Break	22	58	53	•••		•••	••								
Somos® WaterShed XC 11122	Dimensionally stable, accurate, fast processing, good clarity, excellent water & chemical resistance, easy to use & finish	Highly detailed parts with superior clarity & water resistance, fluid flow analysis, duct work, lenses	Clear	260	54	2,770	50	15.5% @ Break	25	50	49	••		•••	••	••	••	•	•••	•••		•	

Clear, transparent, PC-like

Somos® BioClear	Meets high level of detail required in medical & dental industries, passed ISO 10993-5 Cytotoxicity, ISO 10993-10 Irritation & Sensitization & USP Class VI testing	Small run, customized, non-implantable limited body contact (<24hr) medical & dental applications, anatomical models, surgical guides	Clear	260	54	2,770	50.4 @ Break	15.5% @ Break	25	50	49				••								•••
Somos® WaterClear Ultra 10122	Colorless, fast cure, extraordinary optical clarity, superior moisture resistance, easy to use & finish	Fluid flow analysis, concept & functional models, automotive lenses, bottles, light pipes	Clear	165	47	2,880	56 @ Break	7.5% @ Break	25	47	47	•••		••	•••	•	•	•	•••	•••			

For DLP/LCD 3D Printing

Somos® QuickGen 500	Fast printing, general purpose resin offering a balance of flexibility and stiffness for general and functional prototypes	General and functional prototyping resin, semi-flexible applications, applications with detailed features, fluid flow analysis	Opaque	1,450	22	465	20.4	42% @ Break	70	N/A	N/A	•••	•	••	••	•••		••	•••	•••			
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Symbol key:      • good      •• better      ••• best

FFF, FGF, PBF	Polymer	Key Benefits	Applications	Appearance	Tensile Strength (MPa)	Tensile Modulus (MPa)	Elongation at Break (%)	Heat Deflection Temperature @ 0.45 MPa (°C)	Heat Deflection Temperature @ 1.80 MPa (°C)	Hardness (Shore D)	Material Properties/Characteristics						Key Application Areas					
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												High Stiffness	Dimensionally Stable at Humid Conditions	Sustained High Temperature Use	Flexibility	Flame Retardancy	ISO 10993/10 & 5 & USP VI Approval	Transportation	Jigs & Fixtures	Sports & Lifestyle	Electronics	Medical	Functional Prototyping
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Polyamide filaments

Novamid® AM1030 FR (F)	Non-halogenated fire retardant PA6/66	UL Blue Card certified, V0 @ 1.6 & 3.2mm, V2 @ 0.85mm, open platform solution, easy to print	Electric & electronic connectors & enclosures, lighting enclosures, automotive connectors	Natural	50	3,500	7	TBD	TBD	N/A	••				•••						•••		
Novamid® ID1030	PA6/66	Easy to print, high inter-layer strength, excellent mechanical properties up to 125°C	Jigs & fixtures, functional prototyping	Green, Black, White	45.5	2,300	>50	84	51	N/A	•								•••				•••
Novamid® ID1030 CF10	10% carbon fiber reinforced PA6/66	Same print speed as unreinforced plastics, low warpage compared to unfilled PA & ABS	Automotive brackets, structural jigs & fixtures, sports gear, medical braces & prosthetics	Black	110	7,570	3	184	153	N/A	•••							•••	•••	••			
Novamid® ID1070	PA6	Optimized for ductility & stiffness, high inter-layer strength, temp resistant up to 150°C, suitable for harsh environments	Automotive air intake parts, ski binders	Black, White	47.5	2,590	>50	104	54	N/A	••							•••		••			

Flexible thermoplastic copolyester (TPC) filaments

Arnitel® ID2045	TPC	Highly elastic partially bio-based with Shore D34, 2x faster printer vs. other TPCs, high UV & chemical resistance, natural filament passes ISO 10993-10, ISO 10993-5 & USP class VI tests	Shoe insoles, midsoles, protective sports equipment, earbuds, watches, flexible tools & electronics, prosthetics	Natural, Black, Gray	8	29	350	N/A	N/A	34				•••		•••			•••	•••		•••	
Arnitel® ID2060 HT	TPC	Sustained high temperature use TPC filament: 175°C (1000 hrs), 190°C (500 hrs), 100% recyclable, excellent chemical resistance	Air-fuel management systems, automotive gaskets & seals, aluminium & rubber replacement for light-weighting applications, end-of-arm tooling	Black	32	305	245	N/A	N/A	61			•••	••				•••			••		

Polyester filaments

Arnite® ID3040	PET	High stiffness & ductility, low warpage, good resistance to weathering, high temperature use	Lamp housings, brake booster body valves, wipers, structural parts undergoing weathering phenomenon	Black, Gray	26.5	2,350	>50	71	65	N/A	•	•••									•••		
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Granules											High Stiffness	Sustained High Temperature Use	Flame Retardancy	Transportation	Sports & Lifestyle	Medical
											Dimensionally Stable at Humid Conditions	Flexibility	ISO 10993/10 & 5 & USP VI Approval	Jigs & Fixtures	Electronics	Functional Prototyping

Granules

Arnilene® AM6001 GF (G)	PP	High impact strength, printed parts demonstrate excellent z-strength, fatigue & impact resistance, easy processing & machining, low carbon footprint and low LCA	Low temperature tooling, structural, rigid or strong parts, applications for water, humid environments, automotive or infrastructure applications	Black	70	6,000	4	TBD	138	N/A	...	...	...				...	•		•		••
Arnite® AM8527	Glass reinforced PET	Superior mechanical performance, low CTE, low moisture uptake, easy processing, easy machining, milling & sanding	Autoclave tooling, structural components	Black	120	18,000	0.8	250	232	N/A	...	...					...	•				
EcoPaXX® AM4001 GF (G)	Partially bio-based PA410	>40% bio-based material derived from castor oil, excellent mechanical properties, excellent thermal and hydrolysis resistance, dimensional stability due to <40% lower moisture uptake vs PA6, highest melting temperature of bio-polyamides	Structural lightweight parts for automotive, tooling for production such as jigs & fixtures, components in contact with fuel, components requiring resistance to wear & friction	Black	165	9,400	2.1	230	190	N/A	...						...	...	...			...

Powders

Arnilene® AM6002 (P)	PP	Well-known industrial material, food contact approval in Europe, good balance of mechanical, chemical & thermal properties, easy to process, hydrophobic, 90% reuse rate	Conveyor belt guides, sprockets, slides, dosing blocks, creepers, food or beverage industry applications that require food contact approval, automotive components, prototyping for PP end-use parts	White	17.6	800	9.6	N/A	N/A	N/A		••	...				...	...				...
Arnite® T AM1210	PBT	Insulating electrical properties, easy to print, improved dimensional stability due to lower moisture uptake, >60% reuse rate, recyclable	Automotive connectors, electronics, lighting enclosures	White	47	2,600	4	165	55	N/A	...	...					...			...	•	...

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More information at [am.covestro.com](https://am.covestro.com)



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<sup>1</sup>Please see the "Guidance on Use of Covestro Products in a Medical Application" document.  
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