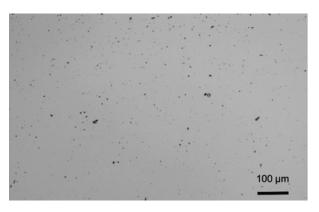


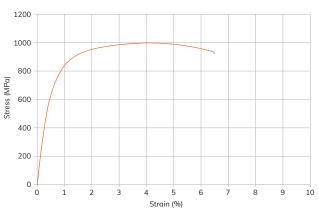
P2X

Mantle's P2X material is a versatile tool steel with properties similar to standard P20 tool steel. Its applications include plastic injection mold cavities, tooling, and die casting. P2X is optimized for Mantle's TrueShape™ additive manufacturing process that combines rough part creation with precision finishing to deliver a complete precision part solution. Mantle's P2X material has improved corrosion and abrasion resistance when compared to standard P20. Additional material performance data may be found in the P2X Material Performance Study, which includes machinability and mold wear analysis.

Microstructure of Mantle P2X As-Sintered



Stress-Strain Chart of Mantle P2X As-Sintered



Mechanical Property	Standard	Mantle P2X As-Sintered	Standard P20 Heat Treated
Ultimate Tensile (MPa)	ASTM E8	1000	965
Tensile Yield (MPa)	ASTM E8	740	830
Elongation (%)	ASTM E8	6.5	20
Hardness (HRC)	ASTM E18	32	30
Relative Density (%)	ASTM B311	97	100

Notes: Typical values for P2X as-sintered. Tensile Strengths and Yield measured by external laboratory. Specifications are subject to change without notice. End-use material performance may be impacted by factors such as part geometry, design, and application and evaluation conditions.