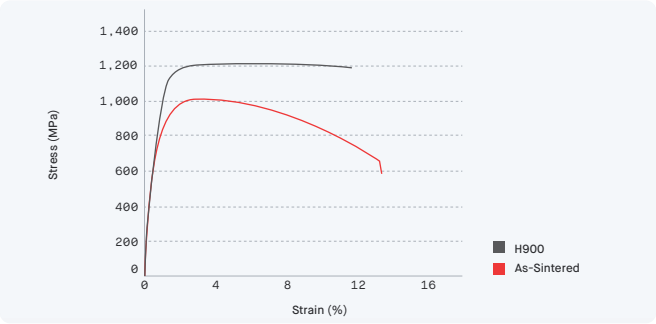
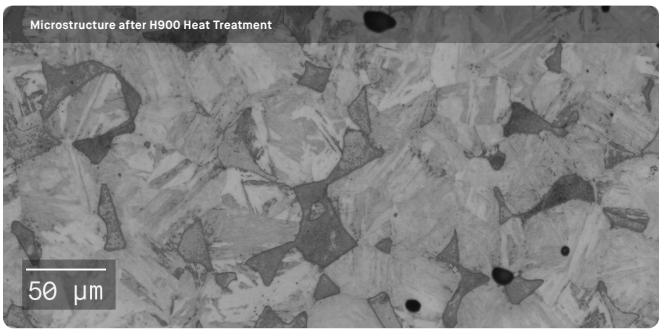
[Material Data Sheet]

17-4 PH
Stainless Steel
PureSinter Furnace



COMPOSITION %

C	0.07 (max)
Cr	15.5 - 17.5
Ni	3.0 - 5.0
Cu	3.0 - 5.0
Nb + Ta	0.15 - 0.45
Mn	1.0 (max)
Si	1.0 (max)
Fe	Balance



MECHANICAL PROPERTIES IN DESKTOP METAL PURESINTER FURNACE

	Standard	Shop System™ As-Sintered	MIM - MPIF 35 min As-Sintered	Shop System™ H900 Heat Treat	MIM - MPIF 35 min H900 Heat Treat
Ultimate tensile strength (MPa)	ASTM E8M	**925 ± 80**	790 - 900	**1205 ± 18**	1070 - 1190
Yield strength (MPa)	ASTM E8M	**730 ± 90**	650 - 730	**1020 ± 38**	970 - 1090
Elongation at break (%)	ASTM E8M	**10.4 ± 2.3**	4 - 6	**8.9 ± 3**	4 - 6
Young's modulus (GPa)	ASTM E111	**191**	190	**197**	190
Hardness (HRC)	ASTM E18	**26 ± 1.3**	27	**38.7 ± 1.4**	35
Un-notched charpy impact energy (J)	MPIF 59	**107 ± 14**	140	**158 ± 7**	140
Density (g/cc)	ASTM B311	**7.68 ± 0.02**	7.5		7.5

ATTRIBUTES & APPLICATIONS

- Acid & corrosion resistant
- High strength, hardness, & elongation
- Heat treatable to a range of strength and hardness levels
- Surgical tooling / end-of-arm components (e.g. grippers, cutters)
- Mechanical components (static & dynamically loaded)
- Impact components (e.g. golf iron heads)

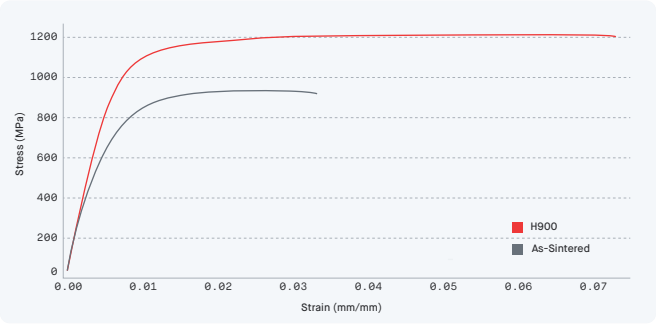
OTHER STANDARD DESIGNATIONS

- UNS S17400
- EN 1.4542
- ISO 4542-174-00-I

1. YS, UTS, Elongation, and Young's modulus properties noted represent Xy orientation
2. Listed designations are for reference purposes only. Composition and mechanical properties may vary.
3. Per MPIF Standard 35, Materials Standards for Metal Injection Molded Parts (MPIF 35-MIM, 2018). End-use material performance is impacted (+/-) by certain factors including but not limited to part geometry and design, application and evaluation conditions, etc.

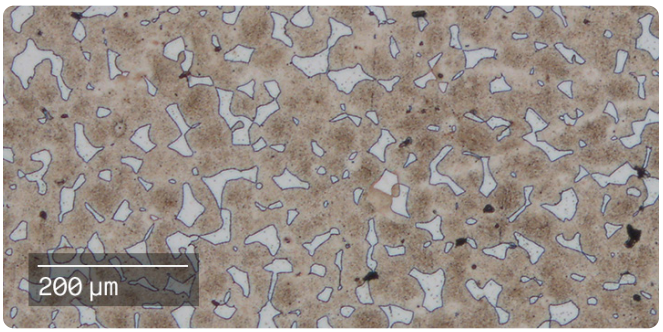
[Material Data Sheet]

17-4 PH
Stainless Steel



COMPOSITION %

C	0.07 (max)
Cr	15.5 - 17.5
Ni	3 - 5
Cu	3 - 5
Mn	1.0 (max)
Si	1.0 (max)
Nb + Ta	0.15 - 0.45
Fe	Balance



MECHANICAL PROPERTIES SINTERED IN THIRD-PARTY COMMERCIAL FURNACE **

	Standard	Shop System™ As-Sintered	MIM - MPIF 35 min ** As-Sintered	Shop System™ H900 Heat Treat	MIM - MPIF 35 min ** H900 Heat Treat
Yield strength (MPa)	ASTM E8M	**660 ± 40**	650	**981 ± 50**	970
Ultimate tensile strength (MPa)	ASTM E8M	**912 ± 35**	790	**1205 ± 35**	1070
Elongation at break (%)	ASTM E8M	**5.9 ± 2**	4	**11.9 ± 5**	4
Young's modulus (GPa)	ASTM E8M	**178 ± 30**	190 (typ)	**185 ± 20**	190 (typ)
Hardness (HRC)	ASTM E18	**26.4 ± 1**	27 (typ)	**40.5 ± 2**	35 (typ)
Density (g/cc)	ASTM B311	**7.5 - 7.66**	7.5	**7.5 - 7.66**	7.5
Unnotched Charpy impact energy - xy (J)	MPIF59	**150 ± 8**	140 (typ)	**152 ± 5**	140 (typ)

SURFACE ROUGHNESS (@ 75 µM LAYER THICKNESS)

xy (µm Ra)	**4.1**
z (µm Ra)	**8.0**

OTHER STANDARD DESIGNATIONS *

UNS S17400

EN 1.4542

ISO 4542-174-00-I

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** Per MPIF Standard 35, Materials Standards for Metal Injection Molded Parts (MPIF 35-MIM, 2018). End-use material performance is impacted (+/-) by certain factors including but not limited to part geometry and design, application and evaluation conditions, etc.

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