

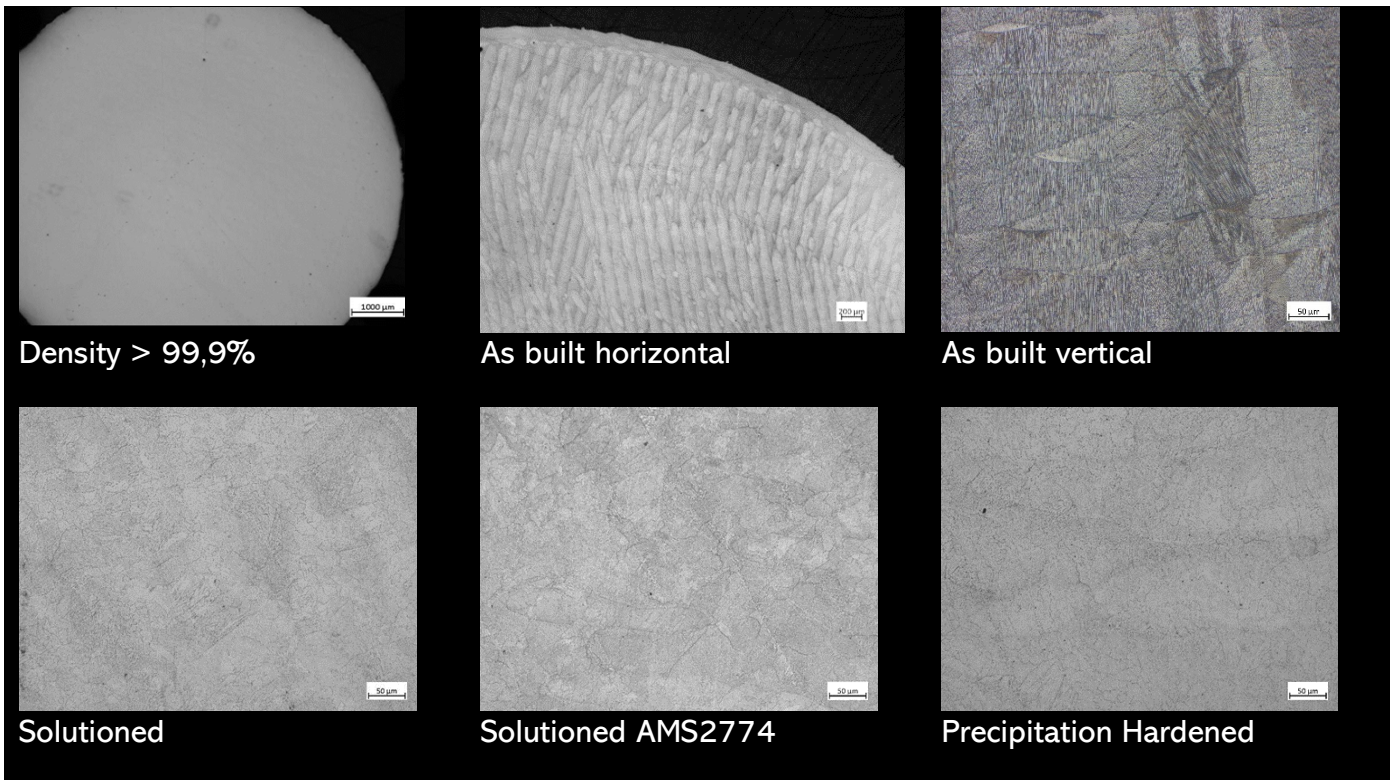


Inconel 718: this super alloy is characterized by excellent mechanical properties (resistance, hardness etc.), corrosion and high temperature resistance. It's mainly used for applications in the race engine and aeronautic fields. It's employed to produce turbine pallets in the energetic field and valves in severe industries such as the petrochemical sector.

Chemical Composition (%wt)

Fe	Ni	Cr	Nb	Mo	Ti	Al	Mn	Si	C	B	P	S	Cu	Co	O	N
balance	50,000	17,000	4,750	2,800	0,650	0,400	-	-	-	-	-	-	-	-	-	-
	55,000	21,000	5,500	3,300	1,150	0,800	0,350	0,350	0,080	0,006	0,015	0,015	0,300	2,000	0,040	0,200

Micrographies:



Mechanical properties:

Tensile properties at room temperature	As Built				Solution				Precipitation Hardening (Solution + Precipitation)			
	Z		XY		Z		XY		Z		XY	
	Mean	std. Dev.	Mean	std. Dev.	Mean	std. Dev.	Mean	std. Dev.	Mean	std. Dev.	Mean	std. Dev.
UTS [MPa]	967	20	1089	25	1355	60	1439	60	1354	15	1373	55
Yield Strenght [MPa]	640	25	781	30	1091	65	1214	60	1155	10	1195	20
Elongation at break [%]	31	4	21	5	21	5	13	5	7	4	7	3
Young's Modulus [GPa]	192	10	220	55	-	-	-	-	162	15	164	10

Tensile properties at 650°C	AMS2774 (stress relieve + HIP + solution + precipitation)	
	Z	
	Mean	std. Dev.
UTS [MPa]	906	15
Yield Strenght [MPa]	1110	15
Elongation at break [%]	27	5

Hardness	As Built		Precipitation Hardening (solution + precipitation)	
	HV	HRC	HV	HRC
HV/HRC min	255	23	404	42

