

HASTELLOY® B-3® alloy

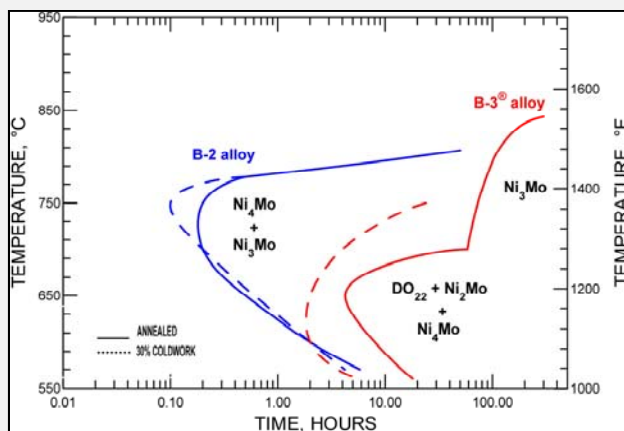
NOMINAL CHEMISTRY	Ni	Cr	Fe	Mo	C	Si
Weight Percent	65 ^a	1.5	1.5	28.5	0.01 Max.	0.10 Max.
^a As balance						

HASTELLOY B-3 (UNS NO. N10675) alloy is an additional member of the nickel-molybdenum family of alloys with a special chemistry designed to achieve a level of thermal stability greatly superior to that of its predecessors, e.g. HASTELLOY B-2 alloy. The improved thermal stability of B-3 alloy over that of B-2 alloy should minimize the problems associated with the fabrication of components. This is due to the reduced tendency to precipitate deleterious intermetallic phases in B-3 alloy, thereby, providing lower loss of ductility than B-2 alloy during and following various heat treating operations.

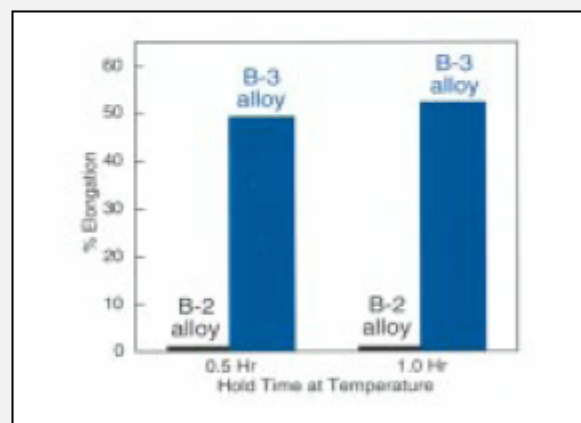
HASTELLOY B-3 alloy has low carbon content, which should permit its use in the as-welded condition. In addition, B-3 alloy has improved corrosion resistance to many non-oxidizing acidic environments (Acetic, Formic, and Hydrochloric acids). Furthermore, HASTELLOY B-3 alloy offers improved resistance to HAZ corrosion attack and to stress corrosion cracking when compared to B-2 alloy.

THERMAL STABILITY:

Comparison of T-T-T Characteristics

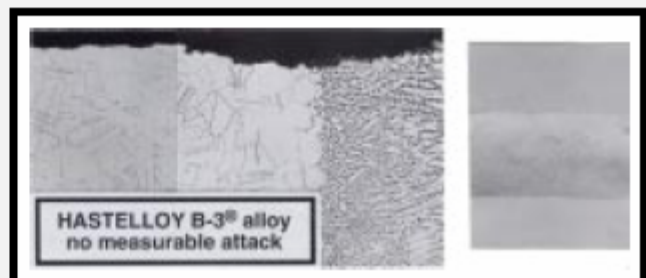
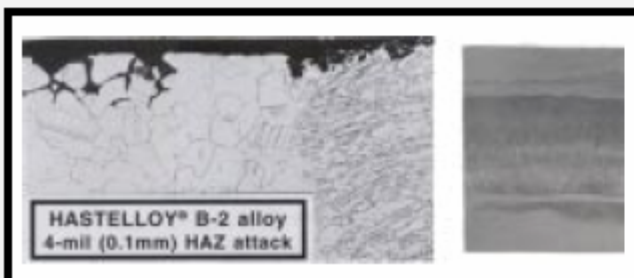


700°C Tensile Elongation



FIELD TEST:

20-30% H₂SO₄ + Ferrous Sulfate - 230°F (110°C) - 96 Days - pH<1



HASTELLOY® B-3® alloy

UNIFORM CORROSION RESISTANCE IN BOILING ACIDS:

Acid Medium	Average Corrosion Rate Per Year, mils*			
	B-3®	B-2	316L	MONEL®
50% Acetic Acid	0.1	0.4	0.2	-
40% Formic Acid	0.5	0.7	41	2.1
50-55% Phosphoric Acid	1.2	6	18	4.5
50% Sulfuric Acid	1.1	1.0	>20,000	185
20% Hydrochloric Acid	11	15	>20,000	1587

* To convert mils per year (mpy) to mm per year, divide by 40

STRESS CORROSION CRACKING TESTS:

U-Bend Specimens (ASTM G-30 Stress Method)

Boiling 60% H₂SO₄



HASTELLOY® B-3 alloy
Annealed + 1 hr at 700°C
(No cracking, 24 hours)



HASTELLOY B-2 alloy
Annealed + 1 hr at 700°C
(Intergranular cracking, 3 hours)

Mill Annealed and Aged
1 Hour at 700°C (1292°F)

Boiling Solution	B-2 alloy	B-3 alloy
5% H ₂ SO ₄	IG-SCC	NC*
0.5% H ₂ SO ₄	IG-SCC	NC
20% H ₂ SO ₄	IG-SCC	NC

*No Cracking

TYPICAL ROOM TEMPERATURE TENSILE PROPERTIES:

Thickness (in)	Ultimate Tensile Strength (Ksi)	0.2% Yield Strength Offset (Ksi)	Elongation in 2 in. (%)
0.125	129.0	64.5	57.5
0.250	128.7	63.0	58.2
0.500	131.5	62.5	59.8
1.00	130.5	58.0	60.0

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