

DSA™ D22

Excellent Gas Corrosion Resistance at 250°C
Comparable to DSALLOY™ 22 (Hastelloy® C-22® equivalent)

Superior Machinability
Superior to DSALLOY™ 22 (Hastelloy® C-22® equivalent)

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Features and Chemical Compositions

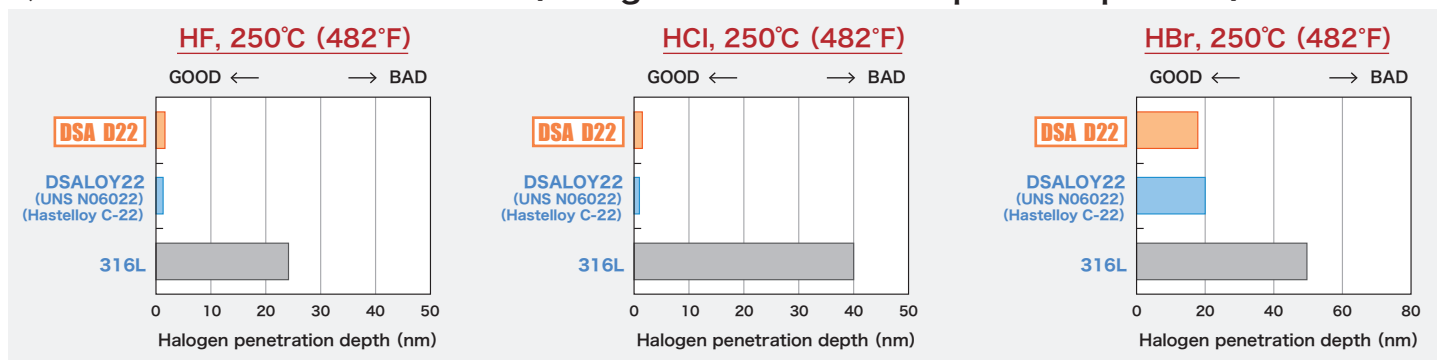
Gas corrosion resistance comparable to DSALLOY22 (UNS N06022 / Hastelloy C-22 equivalent), with reduced alloy content. Superior machinability to DSALLOY22.

	Chemical Composition (mass%)											
	Ni	Cr	Mo	Fe	W	Co	V	C	Si	Mn	P	S
DSALLOY22 (UNS N06022) (Hastelloy C-22)	Bal.	20.0 -22.5	12.5 -14.5	2.0 -6.0	2.5 -3.5	≤ 2.5	≤ 0.35	≤ 0.015	≤ 0.08	≤ 0.50	≤ 0.02	≤ 0.02
DSA D22	Bal.	23	9	16	≤1.0	↑	↑	↑	↑	↑	↑	↑

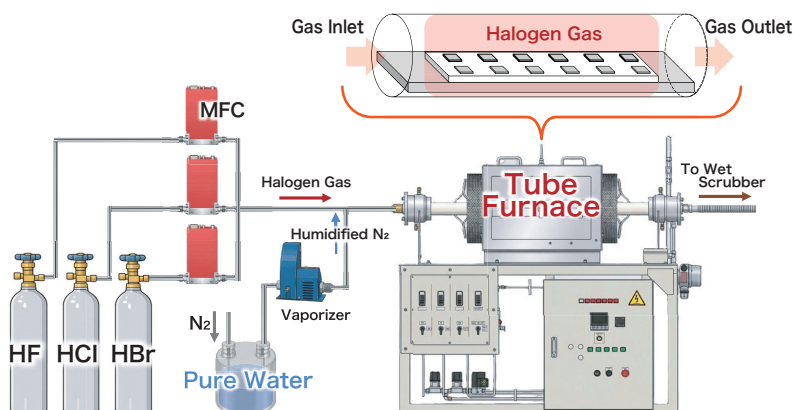
Gas corrosion resistance

The penetration depths of halogens were measured after a 5-hour exposure to dry HF, HCl, and HBr at 250°C (482°F). The results confirm that gas corrosion resistance is comparable to that of DSALLOY22 against all gas types.

Gas Corrosion Test Results (Halogen Penetration Depth Comparison)



Gas Corrosion Test Procedure

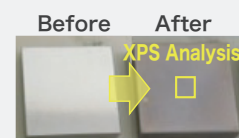


Schematic of Gas Corrosion Test Equipment

<Test Conditions>

Gas type	HF, HCl, HBr
Gas Concentration	100%
Pressure	133 Pa (1 Torr)
Temperature	250°C (482°F)
Humidity control	None (Dry)

※Specimens were analyzed by XPS after testing.

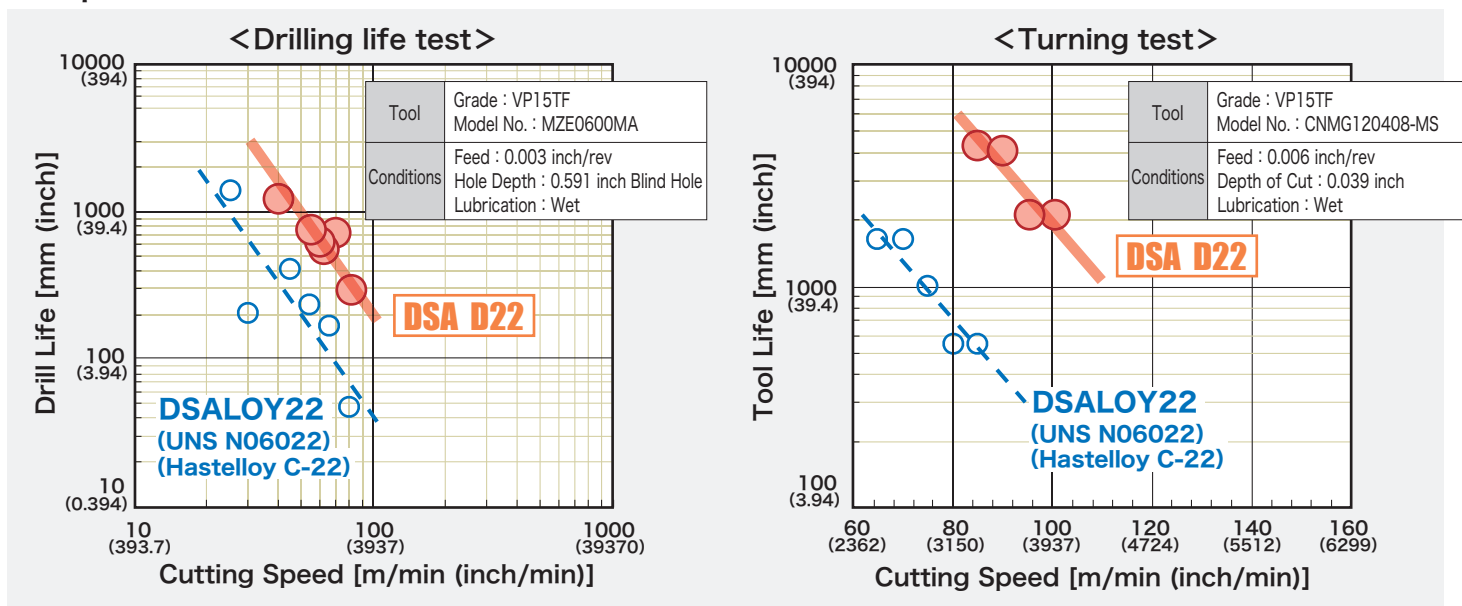


<Equipment Specifications>

Temperature	Max. 800°C (1472°F)
Pressure	10 Pa ~ 90 kPa
Humidity control	Possible : ≥10% at 25°C (77°F)

Machinability

In both drilling life and turning tests, DSA D22 demonstrated superior machinability compared to DSALLOY22.



Mechanical and Physical Properties

<Mechanical Properties>

After Annealing			
0.2% Yield Strength, MPa	Tensile Strength, MPa	Elongation, %	Reduction of Area, %
290	650	59	81

<Physical Properties>

■Coefficient of Linear Thermal Expansion (CTE)

°C (°F)	30 ~ 100 (86 ~ 212)	30 ~ 200 (86 ~ 392)	30 ~ 300 (86 ~ 572)	30 ~ 400 (86 ~ 752)	30 ~ 500 (86 ~ 932)	30 ~ 600 (86 ~ 1112)	30 ~ 700 (86 ~ 1292)	30 ~ 800 (86 ~ 1472)	30 ~ 900 (86 ~ 1652)
$\times 10^{-6} / K$ ($\times 10^{-6} / ^\circ F$)	12.4 (6.9)	13.2 (7.3)	13.6 (7.6)	14.0 (7.8)	14.2 (7.9)	14.6 (8.1)	15.1 (8.4)	15.6 (8.7)	16.0 (8.9)

■Thermal Conductivity and Specific Heat

Temperature °C (°F)	25(77.0)	100(212)	200(392)	300(572)	400(752)	500(932)	600(1112)	700(1292)	800(1472)	900(1652)
Thermal Conductivity, W/(m·K)	10.1	11.5	13.0	14.6	16.6	18.4	20.6	22.6	24.8	26.3
Specific Heat, J/(kg·K)	421	434	445	460	479	496	520	538	583	596

■Young's and Shear Moduli

Temperature °C (°F)	24(75.2)	100(212)	200(392)	300(572)	400(752)	500(932)	600(1112)	700(1292)	800(1472)	900(1652)
Young's Modulus, GPa	196.7	193.2	188.2	182.8	177.8	172.9	166.5	158.9	150.0	141.1
Shear Modulus, GPa	74.6	73.4	71.5	69.5	67.6	65.8	63.4	60.6	57.5	54.2

■Density

°C (°F)	25 (77.0)
kg/m ³	8.34×10 ³



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