Aluminum alloys

Thermal stable

Category:

High temperature
High strength
High modulus

Aluminum-alloy Al-MS89

General charactaristics and applications:

Features: High strength and high fatigue at elevated temperatures
Excellent corrosion resistance, not sensible for SCC
Dispersion strengthened alloy, no heat treatment required

Applications: Engine parts such as impellors, pump housings, valves, vanes, pistons, conrods
High precision parts (due to absense of heat treatment); such as optical mounts,
Replacing: Titanium, Stainless steel, Conventional al alloys like 2618, 2014, 4032, 6082

Chemical composition:

	Si	Fe	V	Others each	Others total	Al
min [wt%]	1,7	8,4	1,1	0,00	0,00	
max [wt%]	1,9	8,9	1,5	0,05	0,15	
Typical [wt%]	1,8	8,7	1,3	-	-	rest

Physical properties:

PHYSICAL PROPERTIES		Density ρ [gr/cm^3]	Thermal expansion α [10^{-6}/K]	Thermal conductivity k [W /m.K]	Electrical conductivity [%IACS]
SPECIFICATION	Minimum	-	-	-	-
	Typical / calculated / estim	2,92	19,0	115	25

Mechanical properties:

Conition: As Extruded or annealed

TENSILE PROPERTIES Extruded bars / L-direction		Hardness (62,5 kg / 2,5mm) [HB]	Ultimate Tensile Strength UTS [Mpa]	Yield Strength YS [Mpa]	Elongatn e [%]	Stiffness E-modulus [Gpa]
SPECIFICATION	Minimum	133	435	365	10	-
	Typical	138	460	385	15	90

FATIGUE smooth / R0,1 S (10E7) [Mpa]
280

NOTCHED TENSILE PROPERTIES	Tensile test UTS [Mpa]	YS [Mpa]	e [%]	Notched Tensile test (NT) UTS [Mpa]	e [%]	Notch fctr UTS-NT / YS
Al-MS89 As-Extruded	440	390	15,7	580	0,6	1,5

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Mechanical properties at elevated Temperatures:

Conition: As Extruded or annealed

TYPICAL TENSILE PROPERTIES AT ELEVATED TEMPERATURE	Temp	Ultimate Tensile Strength	Yield Strength	Elongatn	Stiffness
		UTS	YS	e	E-modulus
	[C]	[Mpa]	[Mpa]	[%]	[Gpa]
	21	460	385	15	90
	100	410	370	13	-
	150	380	350	12	-
	200	350	310	10	-
	250	310	275	12	-
	300	270	240	13	-

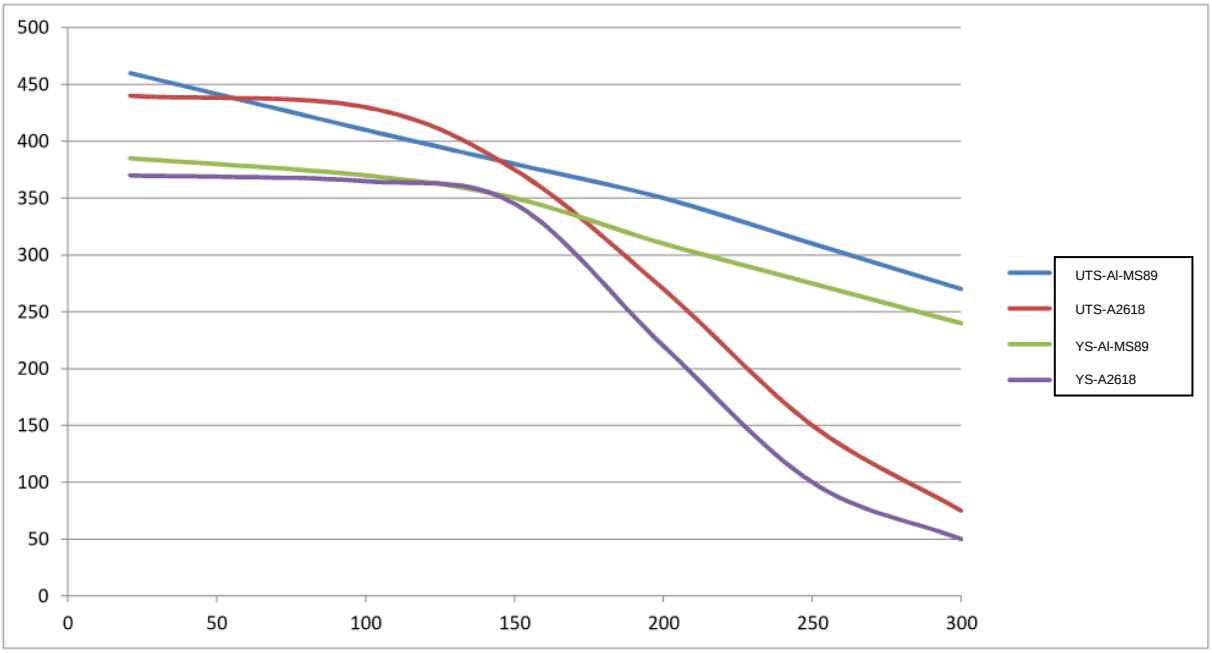
Corrosion

		Condition	Load	Time	Res Stress	Remarks
Ascor test ASTM G44 / G49	SCC, alternate immersion conditions in 3,5% sodium chloride over 30-day exposure period (720 hours)	AE/AN	90%	720 hours	100%	excellent SCC resistance / no surface corrosion

Machining	Machining parameters are consistant with those used for conventional aluminium alloys
Anodising	Accepts H2SO4 anodised coating per MIL-8625D

Mechanical properties at elevated Temperatures compared with conventional 2618:

Exposure time: 1.000 hours



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