

Welding Data

Like Metal Fillers

Suggested Weld Fillers For Like Metal Joints

Base Metal	P Number	P Group	Weld Fillers			
			Bare Wire		Covered Electrodes	
			Grade	Specification	Grade	Specification
AL-6XN	45	–	625	ERNiCrMo-3	112	ENiCrMo-3
Alloy 20	45	–	320LR	ER320LR	320LR	E320LR
LDX 2101	10H	–	2209	ER2209	2209	E2209
2205	10H	–	2209	ER2209	2209	E2209
ZERON 100	10H	–	ZERON 100X	ER2594	ZERON 100X	E2595-15
600	43	–	82	ERNiCr-3	182	ENiCrFe-3
625	43	–	625	ERNiCrMo-3	112	ENiCrMo-3
718 NACE	–	–	718	AMS 5832	–	–
317L	8	1	317L	ER317L	317L	E317L-17
RA 253 MA	8	2	RA 253 MA	–	RA 253 MA-17	–
309	8	2	309	ER309	309	E309-16
310	8	2	310	ER310	310	E310-15
RA330	46	–	RA330-04	–	RA330-04-15	–
RA333	–	–	RA333	–	RA333-70-16	–
RA 602 CA	–	–	RA 602 CA	ERNiCrFe-12	RA 602 CA	ENiCrFe-12
304L	8	1	308L	ER308L	308L	E308L-15
316L	8	1	316L	ER316L	316L	E316L-17
321	8	1	347	ER347Si	347	E347-15
304H	8	1	308H	ER308H	308H	E308H-17
800H/AT	45	–	617	ERNiCrCoMo-1	117	ENiCrCoMo-1

Suggested Fillers

Dissimilar Metal Fillers

Suggested Weld Fillers for Heat Resistant Alloys

	Carbon or Low Alloy Steel	446	304, 316, 321	RA 253 MA	RA 602 CA
RA333	RA333, 82, RA182	RA333, 82, 182	RA333, 82	RA333	RA333, RA 602 CA
RA330	RA330-04, 82	RA330-04, 82	RA330-04, 82	RA333, RA330-04	617, RA333
800H/AT	RA330-04, 82	RA330-04, 82	RA330-04, 82	RA333, RA330-04	617, RA333
RA 602 CA	82	82	82	RA333	RA 602 CA
600	82, 182	82, 182	82, 182	RA333	182, RA 602 CA
601	82, 182	82, 182	82, 182	RA333	RA 602 CA
RA 253 MA	309	309	309	RA 253 MA	RA333
310	82, 309	309, 310	309	RA 253 MA, 309	RA333
309	82, 309	309	309	RA 253 MA, 309	RA333
446	309, 310	309, 310	309, 308	RA 253 MA, 309	82, 182

Suggested Fillers
Dissimilar Metal Fillers

Suggested Weld Fillers for Corrosion Resistant Alloys.

	Nickel 200/201	400	600	625	C22, C-276, Alloy 686	AL-6XN, Alloy 825, Alloy 20	Carbon, Low Alloy and Nickel	Austenitic Stainless	Duplex & Super Duplex Stainless
Nickel 200/201	Nickel 61	60, Nickel 61	82, Nickel 61	625, 82, Nickel 61	686CPT, C22, 82, Nickel 61	625, 82, 61	82, Nickel 61	82, Nickel 61	686CPT, 82, Nickel 61, C22
	Nickel 141								
400	190, Nickel 141	60, 625	625, 82	625, 82, Nickel 61	686CPT, 625, 82, C22	625, 82	625, 82, 60	625, 82	686CPT, 625, 82, C22
		112, 190							
600	112, 182, Nickel 141	625, 112	82	625, 82	686CPT, 625, 82, C22	625, 82	625, 82	82	686CPT, 82, C22
			182						
625	112, 182, Nickel 141	112, Nickel 141	112, 182	625	686CPT, 625, C22	625	625, 82	686CPT, 625, 82	686CPT, C22
			112						
C-276, C22	686CPT, Nickel 141	686CPT, 112	686CPT, 82	686CPT, 112	686CPT, C22	686CPT, 625	686CPT, 625, 82	686CPT, 625, 82	686CPT
					686CPT				
AL-6XN, 20	Nickel 141	112, 182	112, 182	112, 686CPT, C22	686CPT, 112, 122	625, 686CPT	625, 82	625, 309LMo, C22	686CPT, 625, C22
					112, 686CPT				
Austenitic Stainless	112, 182, Nickel 141	112, 182, MONEL® 190	112, 182	686CPT, 112	686CPT, 182, C22	309LMo, 112	316L, 309L	316L	ZERON 100X, 2209
								316L	
Duplex & Super Duplex Stainless	686CPT, Nickel 141, C22	686CPT, C22,	686CPT, 122, C22	686CPT, 112, C22	686CPT, C22	686CPT, 122, C22	309L	ZERON 100X, 2209	ZERON 100X
									ZERON 100X

Welded electrodes for SMAW (below highlighted diagonal) | Filler metals for GMAW, GTAW and SAW (above highlighted diagonal)

Machining

The alloys described on the following page work harden rapidly during machining and require more power to cut than mild steels. The metal is “gummy” with chips that tend to be stringy and tough. Machine tools should be rigid and used to no more than 75% of their rate capacity. Both work piece and tool should be held rigidly; tool overhang should be minimized. Rigidity is particularly important when machining titanium, as titanium has a much lower modulus of elasticity than either steel or nickel alloys. Slender work pieces of titanium tend to deflect under tool pressures causing chatter, tool rubbing and tolerance problems.

Make sure that tools are always sharp. Change to sharpened tools at regular intervals rather than out of necessity. Titanium chips in particular tend to gall and weld to the tool cutting edges, speeding up tool wear and failure. Remember - cutting edges, particularly throw-away inserts, are expendable. Don’t trade dollars in machine time for pennies in tool cost.