

# Welding Alloy Filler Materials

## Procedure data for various tool die/mold steels using CRONAWELD™, CRONATIG™ and CRONAMIG™ tool steel alloys

Recommended Alloy for SMAW & GMAW (2)	TIG Alloy Equivalent DCSP	AISI-SAE Designation (1)	Hardened Base Metal			Guidelines for Base Metal Heat Treatment (3)						Resulting Hardness H Rc	
			Preheat °F (°C)	Postheat °F (°C)	Normal H Rc as Deposited	Annealing Temperature °F (°C)	Preheat °F (°C)	Postheat °F (°C)	Hardening Temperature °F (°C)	Quench Media	Normal Tempering Temperature °F (°C)		
Cronaweld 340 Cronamig 340M	Cronatig 340T (340MIt) (20T)	400 Series Stainless Steel	300/400 (149/204)	Slow Cool	40/42								40/42
(Cronaweld 343) (218)	Cronatig 343T (343MIt) (18T)	Shock-Resistant S1 S5 S7	500/600 (260/316)	500/600 (260/316)	52/56	S1-1,475 (802) S5-1,450 (788) S7-1,500/1,550 (816/843)	300/500 (149/260)	300/500 (149/260)	S1-1,750 (954) S5-1,600 (871) S7-1,725 (940)	Oil Oil Air or Oil	300/500 500 Minutes 400/425 DBL*	55/57 55/59 56/58	
			900/950 (482/510)	900/950 (482/510)	59/61	1,650 (899)	700/900 (371/482)	700/900 (371/482)	1,850 (1,010)	Air	900/925 DBL* (482/495)	58/60	
			700/1,000 (371/538)	500/1,000 (371/538)	52/58	H11-1,600 (871) H12-1,625 (885) H13-1,600 (871)	900/1,200 (482/649)	900/1,200 (482/649)	1,850 (1,010)	Air	1,000/1,150 DBL* (538/621)	40/50	
(Cronaweld 346) (215)	Cronatig 346T (346MIt) (15T)	Air-Hardening A2, A4, A6	300/400 (149/204)	300/400 (149/204)	56/62	1,650 (899)	300/500 (149/260)	300/500 (149/260)	1,775 (968)	Air	350/400 DBL* (177/204)	59/60	
(Cronaweld 347) (213)	(Cronatig) 347T & 347MIt (13T)	Oil-Hardening 01 06	300/400 (149/204)	300/400 (149/204)	56/62	01-1,450 (788) 06-1,425/1,450 (775/788)	300/400 (149/204)	300/400 (149/204)	01-1,475 (802) 06-1,450/1,500 (788/816)	Oil	300/450 (149/232)	61/63	
Cronaweld 349 (720)	Cronatig 349T (349MIt) (72T)	Chrome-Moly and Mold Steels P20	450/550 (232/288)	450/550 (232/288)	33/36	1,400/1,450 (760/788)	450/550 (232/288)	450/550 (232/288)	1,500/1,600 (816/871)	Oil	900/1,100 (482/593)	29/35	
Cronaweld 349	Cronatig 349T (349MIt)	Tool Steel Buildup and Joining	According to Base Metal	According to Base Metal	32/40					According to Base Metal			

\*DBL = Double Tempering (1) Former matching alloys, available through special orders.

### NOTES:

- (1) CRONATIG 345T is recommended when base metal analysis is unknown, since it is compatible with most tool steel types.
- (2) When welding a cracked die or joining two pieces of tool steel together, the weld metal does not need to be of matching analysis or hardness (except at cutting edges or wear surfaces). It is often advisable to use a filler material of lower strength and higher ductility, leaving approximately 3/16" (4.8mm) for finishing with the required tool steel alloy. CRONAWELD 349/349T is widely recommended for this application as a shock absorber between the base metal and the finishing tool steel alloy. It is important that the cushion layer is thoroughly covered or premature wear will result.
- (3) Heat-treating data are for guidelines only. Contact Cronatron's Engineering Department for actual heat-treating procedures. The properties listed in this chart are typical or average values based on laboratory tests conducted by the manufacturer. They are indicative only of the results obtained in such tests and should not be considered as guaranteed maximums or minimums. Materials must be treated under actual service to determine their suitability for a particular purpose.