

# Guide to the Choice of Filler Metal for General Purpose Welding

Base Metal	201.0 206.0 224.0	319.0 333.0 354.0 355.0 C355.0	356.0 A356.0 357.0 A357.0 413.0 443.0 A444.0	511.0 512.0 513.0 514.0 535.0	7004 7005 7039 710.0 712.0	6009 6010 6070	6005 6061 6063 6101 6151 6201 6351 6951	5456	5454	5164 5254(i)	5086	5083	5252 5652(i)	5005 5050	3004 Alc3004	2219	2014 2036	1100 3003 Alc3003	1060 1070 1080 1350
1060 1070 1080 1350	ER4145	ER4145	ER4043(a,b)	ER5356(c,d)	ER5356(c,d)	ER4043(a,b)	ER4043(b)	ER5356(d)	ER4043(b,d)	ER5356(c,d)	ER5356(d)	ER5356(d)	ER4043(b,d)	ER1100(b,c)	ER4043(b,d)	ER4145(b,c)	ER4145	ER1100(b,c)	ER1188(b,c,h,j)
1100 3003 Alc3003	ER4145	ER4145	ER4043(a,b)	ER5356(c,d)	ER5356(c,d)	ER4043(a,b)	ER4043(b)	ER5356(d)	ER4043(b,d)	ER5356(c,d)	ER5356(d)	ER5356(d)	ER4043(b,d)	ER1100(b,c)	ER4043(b,d)	ER4145(b,c)	ER4145	ER1100(b,c)	
2014 2036	ER4145(e)	ER4145(e)	ER4145			ER4145	ER4145							ER4145	ER4145	ER4145(e)	ER4145(e)		
2219	ER2319(a)	ER4145(e)	ER4145(b,c)	ER4043	ER4043	ER4043(a,b)	ER4043(a,b)		ER4043(b)	ER4043			ER4043(b)	ER4043(a,b)	ER4043(a,b)	ER2319(a)			
3004 Alc3004		ER4043(b)	ER4043(b)	ER5356(f)	ER5356(f)	ER4043(b)	ER4043(b,f)	ER5356(d)	ER5356(f)	ER5356(f)	ER5356(d)	ER5356(d)	ER5356(c,f)	ER5356(c,f)	ER5356(c,f)				
5005 5050		ER4043(b)	ER4043(b)	ER5356(f)	ER5356(f)	ER4043(b)	ER4043(b,f)	ER5356(d)	ER5356(f)	ER5356(f)	ER5356(d)	ER5356(d)	ER5356(c,d)	ER5356(c,f)					
5052 5652(i)		ER4043(b)	ER4043(f)	ER5356(f)	ER5356(f)	ER4043(b)	ER5356(c,f)	ER5356(f)	ER5356(f)	ER5356(f)	ER5356(d)	ER5356(d)	ER5356(c,f,i)						
5083			ER5356(c,d)	ER5356(d)	ER5183(d)		ER5356(d)	ER5183(d)	ER5356(d)	ER5356(d)	ER5356(d)	ER5183(d)							
5086			ER5356(c,d)	ER5356(d)	ER5356(d)		ER5356(d)	ER5356(d)	ER5356(d)	ER5356(d)	ER5356(d)	ER5356(d)							
5154 5254i			ER4043(f)	ER5356(f)	ER5356(f)		ER5356(f)	ER5356(f)	ER5356(f)	ER5356(f,i)									
5454		ER4043(b)	ER4043(f)	ER5356(f)	ER5356(f)	ER4043(b)	ER5356(c,f)	ER5356(f)	ER5554(c,f)										
5456			ER5356(c,d)	ER5356(d)	ER5556(d)		ER5356(d)	ER5556(d)											
6005 6061 6063 6101 6151 6201 6351 6951	ER4145	ER4145(b,c)	ER4043(b,f,g)	ER5356(f)	ER5356(c,f)	ER4043(a,b,g)	ER4043(b,f,g)												
6009 6010 6070	ER4145	ER4145(b,c)	ER4043(a,b,g)	ER4043	ER4043	ER4043(a,b,g)													
7004 7005 7039 710.0 712.0		ER4043(b)	ER4043(b,f)	ER5356(f)	ER5356(d)														
511.0 512.0 513.0 514.0 535.0			ER4043(f)	ER5356(f)															
356.0 A356.0 357.0 A357.0 413.0 443.0 A44.0	ER4145	ER4145(b,c)	ER4043(b,h)																
319.0 333.0 345.0 355.0 C355.0	ER4145(e)	ER4145(b,c,h)																	
201.0 206.0 224.0	ER2319(a,h)																		

Notes:

- Service Conditions such as immersion in fresh or salt water, exposure to specific chemicals, or a sustained high temperature (over 150°F(66°C)) may limit the choice of filler metals. Filler metals ER5183, ER5356, and ER5654 are not recommended for sustained elevated temperature service.
- Recommendations in this table apply to gas shielded arc welding processes. For oxyfuel gas welding; only ER1188, ER1100, ER4043, ER4047, and ER4145 filler metals are ordinarily used.
- Where no filler metal is listed, the base metal combinations are not recommended for welding.
  - ER4145 may be used for some applications.
  - ER4047 may be used for some applications.
  - ER4043 may be used for some applications.
  - ER5183, ER5356, or ER5556 may be used.
  - ER2319 may be used for some applications. If can supply high strength when the weldment is postweld solution heat treated and aged.
  - ER5183, ER5356, ER5554, ER5556, and ER5654 may be used. In some cases, they provide: (1) improved color match after anodizing treatment. (2) highest weld ductility, and (3) higher weld strength ER5554 is suitable for elevated temperature service.
  - ER4643 will provide high strength in 1/2inch (12mm) and thicker groove welds in 6XXX base alloys when postweld solution heat treated and aged.
  - Filler metal with the same analysis as the base metal is sometimes use. The following wrought filler metals possess the same chemical composition limits as cast filler alloys: ER4009, and R4009 as R-C355.0; ER4010 and R4010 as R-A356.0; and R4011 as R-A357.0.
  - Base metal alloys 5254 and 5652 are used for hydrogen peroxide service. ER5654 filler metal is used for welding both alloys for service temperatures below 150°F (66°C).
  - ER1100 may be used for some applications.