Shielding Gases

Gas	Parent metal					
	Austenitic	Duplex	Ferritic	High-alloy austenitic	Super-duplex	Nickel alloys
MIG welding						
Ar	(•)	(•)	(•)	•	• [a]	•
He	(•)	(•)	(•)	•	• [a]	•
Ar + He	(•)	(•)	(•)	•	• [a]	•
Ar + (1-3)% O_2	• [b]	• [b]	• [b]	• [c]	• [b]	
Ar + (1-3)% CO_2 [d]	• [e]	• [e]	• [e]	• [c]	• [e]	
Ar + 30% He + (1-3)% O_2	• [f]	• [f]	• [f]	• [c]	• [f]	
Ar + 30% He + (1-3)% CO_2 [d]	• [f]	• [f]	• [f]	• [c]	• [f]	
Ar + 30% He + (1-2)% N_2				• [g]	•	
TIG welding						
Ar	•	•	•	•	•	
He	•	•	•	•	•	•
Ar + He	•	•	•	•	•	• [h]
Ar + (2-5)% H_2	• [i]			• [i]		• [i]
Ar + (1-2)% N_2		•			•	
Ar + 30% He + (1-2)% N_2		•			•	

a Ar preferably in pulsed MIG welding

b Higher fluidity of the molten pool than with Ar

c Except for 22.12.HT and 27.31.4.LCu where Ar is preferred

d Not to be used in spray-arc welding where extra low carbon is required

e Higher fluidity of the molten pool than with Ar. Better short-arc welding properties than with Ar + (1-3)% O_2

f Higher fluidity of the molten pool than with Ar. Better short-arc welding properties than with Ar + (1-3)% CO_2 g For nitrogen alloyed grades

h Ar + 30% He improves flow compared with Ar

i Preferably for automatic welding. High welding speed. Risk of porosity in multi-run welds.