

# Guide to material thickness

CARBON STEEL	Shielding Gas	MIG Welding														Mild Steel	TIG Welding										Shielding Gas			
		Thickness (mm)															Thickness (mm)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		15+	1	2	3	4	5	6	7	8	9		10+		
Argoshield® Light	Argoshield® Universal	Argoshield® Heavy	Argoshield® 5	Fluxshield®															Solid Wire											Argon HP
																Cored Wire														

  

ALUMINIUM COPPER	Shielding Gas	MIG/TIG Welding														Non-Ferrous	TIG Welding										Shielding Gas	
		Thickness (mm)															Thickness (mm)											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		15+	1	2	3	4	5	6	7	8	9		10+
Alushield®	Copashield®															Aluminium											Argon HP	
																	Copper											

  

STAINLESS STEEL	Shielding Gas	MIG Welding														Stainless Steel	TIG Welding										Shielding Gas			
		Thickness (mm)															Thickness (mm)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		15+	1	2	3	4	5	6	7	8	9		10+		
Stainshield® Heavy	Stainshield® Plus	Stainshield®	Stainshield® Plus	Stainshield® Heavy															Austenitic											Stainshield® TIG Argon HP Stainshield® TIG Plus
Stainshield®	Stainshield® Plus	Stainshield® Heavy															Ferritic													
Stainshield® Plus	Stainshield® Heavy															Martensitic														
Stainshield® Heavy															Duplex															

**MIG welding of carbon manganese.**  
Low alloy and high strength low alloy steels  
*Benefits:* Excellent arc stability

- Minimal spatter
- Good penetration and fusion
- Flatter weld profiles
- Minimised post-weld treatment and rework.

**MIG, TIG and plasma welding of aluminium and copper**  
*Benefits:* Flatter weld profiles

- Excellent fusion profiles
- A fluid weld, minimising porosity and other defects
- Increased welding speeds.

**MIG welding of all grades of stainless steel**  
*Benefits:* Improved heat transfer

- Reduced wire usage
- Excellent positional welding characteristics
- Clean bright welds with a flat profile reducing post weld cleaning.

## Helpful welding tips

### General

- Ensure you are using the correct shielding gas
- Cleanliness is of prime importance to achieve good quality welds
- Always ensure the workplace is free from greases, rust and mill scale.

### MIG welding

- Avoid the wire snagging using the correct wire feed rollers, liner and contact tip
- Snip the end of the wire at an angle before beginning each weld run
- If possible use a parallel shroud to improve gas coverage
- Select the correct weld sequence before welding to minimise distortion.

### TIG welding

- Always use the tungsten polarity to DC negative when welding mild steel and stainless steel
- Use a gas lens to prevent turbulence in the shielding gas and improve gas coverage
- Porosity can be encountered when welding without filler wire, if this occurs a filler wire must be used
- Place tacks no more than 25 mm apart to minimise distortion
- Keep the filler rod under the gas shield at all times
- Tungsten stick out from the nozzle should generally be 3-4 mm
- Sharpen electrodes by grinding towards the top (longitudinally).

## Potential causes of weld defects

### Porosity

- Contaminated filler wire
- Dirty or incorrect stored wire
- Gas flow too high or too low
- Arc voltage too high
- Inadequate cleaning of the weld area
- Too much time between welding and cleaning
- Working in draughty conditions can entrain air or cause turbulence within gas shield
- Poorly maintained equipment.

### Solutions

- Use the most appropriate gas
- Operate within the recommended flow rates for the specific gas
- Use the correct equipment
- Eliminate leaks or gas entrainment in gas lines
- Screen the welding operation to prevent draughts
- Operate within the correct welding parameters
- If solution is not found, seek Afrox advice.

■ Recommended ■ Also suitable