

# **Dual Shield 55 and Dual Shield 62**

## **All positional rutile cored wires for high strength steel**

Dual Shield 55 and Dual Shield 62 are all positional rutile, low-hydrogen flux-cored wires for the welding of high strength steels with minimum yield strengths of 550MPa and 620MPa. They have excellent weldability and produce flat beads with good wetting and smooth appearance. Both wires are designed for use in Ar/CO<sub>2</sub> shielding gas.

Dual Shield 55 and Dual Shield 62 are extremely “welder friendly” wires with a soft, spatter-free arc that always operates in the spray arc mode. It is easy to obtain flat welds with a good penetration and smooth wetting onto the plate edges. The brittle slag is easily removed leaving behind a smooth weld appearance. Typical positional welding defects such as lack of fusion and slag inclusions are avoided, due to the spray arc operation. The wires have a good tolerance for fit-up variations. High quality one-sided root runs are made economically on ceramic backing.

The wire formulation provides a fast freezing slag that supports the weld pool well in positional welding, enabling deposition rates which can not be equalled by stick electrodes or solid wires. Deposition rates in vertical up welding can reach up to 4 kg/h (100% duty cycle), making it the most productive consumable available for manual welding in this position. Welding parameters are optimised per welding position for maximum productivity, but one single setting can be selected for all-positions (230A), making it ideal for fit-up work.

Diffusible hydrogen satisfies the EN H5 class tested under the conditions prescribed in the classification standard. Weld metal remains low-hydrogen over a wide envelope of welding parameters.



- **High deposition rate:** reduced welding times leading to overall lower welding costs.
- **All positional weldability:** one wire with the ability to weld several applications
- **Welder friendly:** easy to use with a lower risk of weld defects and reduced welder training costs
- **Excellent weld appearance:** minimal requirement for any post weld dressing (grinding)
- **High level of weld quality:** consistently low hydrogen (H5) provides assurance against the risk of HAZ hydrogen induced cold cracking

## Classification

Dual Shield	EN 12535	AWS A5.29
55	T 55 4 Z P M 2 H5	E91T1-GM
62	T 62 4 Mn1.5Ni P M 2 H5	E101T1-G

## Typical weld metal chemical composition(%), DC

Chemistry	C	Si	Mn	Ni	P	S
Dual Shield 55	0.05	0.41	1.45	0.95	0.008	0.011
Dual Shield 62	0.06	0.41	1.58	1.50	0.010	0.013

## Typical weld metal mechanical properties, DC+

	Rp0.2 (MPa)	Rm(MPa)	A5 (%)	CVN (J)
Dual Shield 55	584	660	26	-40°C: 105
Dual Shield 62	670	740	24	-40°C: 95

## Deposition data in Ar/15-25%CO<sub>2</sub>

Diameter: 1.2 mm / stick-out: 20 mm / recovery: 85%

I (A)	V wire (m/min)	Dep. Rate (kg/h)
170	6.0	2.5
250	11.6	4.2
300	14.5	5.8

## Procedure test results

	Dual Shield 55	Dual Shield 62
Groove	60-V	60-V
Welding position	PF	PF
Preheating	80 °C	80 °C
Interpass temperature	max 150 °C	max 150 °C
Shielding gas Ar/CO <sub>2</sub>	82/18	82/18
Type of current	DC+	DC+
Heat input	1,1-1,7 kJ/mm	1,0-1,7 kJ/mm
Mechanical tests		
Rp 0.2 (MPa)	600	680
Tensile strength (MPa)	656	744
Elongation (%)	24	23
Impact toughness	@ -40 °C	@ -40 °C
- cap	116 J	72 J
- middle	137 J	61 J

Plate thickness: 50 mm

## Welding parameters diameter 1.2mm

Current (A)	V wire (m/min)	Voltage (V)	
<b>1G, 1F / PA</b>			
170-190	6.0-8.0	23-26	root*
180-280	6.0-12.0	25-30	fill
<b>2F / PB</b>			
180-300	6.0-14.0	24-31	
<b>2G / PC</b>			
170-190	6.0-8.5	23-26	root*
180-260	6.0-10.0	25-29	fill
<b>3G-up/3F-up / PF</b>			
180-260	6.0-12.0	23-32	root*
180-280	6.0-12.0	24-30	fill
<b>3F-down / PG</b>			
180-220	6.0-9.0	23-26	
<b>4G / PE</b>			
Not recommended			root
180-260	6.0-10.0	24-28	fill
<b>4F / PD</b>			
180-250	6.0-10.0	23-28	

Parameter settings – diameter 1.2 mm in

Ar/CO<sub>2</sub> mixed gas.

\* Root pass on ceramic backing with rectangular groove.

Limit current to 180A for positions 1G and 2G.



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