ER80S-D2

Classification:
AWS A5.28 / ASME SFA5.28 Class ER80SD2

Description:
ER80S-D2 is a mild steel solid wire that contains ½ percent molybdenum for increased strength and high levels of manganese and silicon to provide good wetting and good rust and scale tolerance. It will give radiographic quality welds with excellent bead appearance in both ordinary and difficult-to-weld carbon and low alloy steels. It is suitable for single and multiple pass welding of carbon and low alloy steels and higher strength steels in the as welded and postweld heat treated conditions. It exhibits excellent out of position characteristics with the short circuiting and pulsed arc processes.

Typical Chemical Composition:

Carbon	0.07 – 1.12
Sulphur	0.025 max.
Manganese	1.60 – 2.10
Phosphorus	0.025 max.
Copper	0.50 max.
Molybdenum	0.40 – 0.60
Silicon	0.50 – 0.80
Nickel	0.158 max.
Others	0.50 max.

Typical Mechanical Properties:

	AWS Spec (CO2)	**100% CO2**	**75% Ar/25% CO2**	**90% Ar/10% CO2**
Tensile Strength	80,000 psi (min)	93,300 psi (643 MPa)	103,000 psi (710 MPa)	106,000 psi (731 MPa)
Yield Strength	68,000 psi (min)	81,900 psi (565 MPa)	88,900 psi (613 MPa)	90,200 psi (622 MPa)
Elongation % in 2”	17.0%	19.8%	22.5%	22.5%
Reduction in Area	not specified	62.0%	62.3%	63.0%

Typical Charpy V-Notch Impact Values:

	AWS Spec (CO2)	**100% CO2**	**75% Ar/25%**	**CO2 90% Ar/10% CO2**
Avg. at room temp.	not specified	55 ft·lbs (75 J)	62 ft·lbs (84 J)	75 ft·lbs (102 J)
Avg. at 0ºF (-18°C)	not specified	33 ft·lbs (47 J)	40 ft·lbs (54 J)	52 ft·lbs (71 J)
Avg. at –20ºF (-29°C)	20 ft·lbs (min)	27 ft·lbs (37 J)	30 ft·lbs (41 J)	36 ft·lbs (49 J)

Recommended Preheat, Interpass and Postweld Heat Treatment Temperatures:

Preheat & Interpass	275 – 325°F	135 - 165°C
PWHT	None	None

Standard Sizes:
MIG: .035” (.9mm), .045” (1.2mm), .062” (1.6mm)
TIG: 1/16” (1.6mm), 3/32” (2.4mm), 1/8” (3.2mm), 5/32” (4.0mm)

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SHORT-CIRCUIT TRANSFER WELDING PARAMETERS*:

Material Thickness[1] size	in. (decimal)	mm	Electrode Diameter in.	mm	Welding Current (DC) amps	Arc Voltage (electrode positive)	Wire Feed Speed ipm	Travel Speed ipm	Deposition Rate lbs/hr
20 ga.	0.037	0.9	.035	0.9	55-85	16-18	70-120	15-25	1.0-1.6
18 ga.	0.050	1.3	.035	0.9	70-100	17-20	100-160	20-35	1.3-2.1
1/16"	0.063	1.6	.035	0.9	80-120	17-20	120-180	20-35	1.6-2.4
5/64"	0.078	2.0	.035	0.9	100-130	18-21	160-220	20-35	2.1-2.9
1/8"	0.125	3.2	.035	0.9	120-175	19-22	210-290	20-30	2.7-3.8
1/8"	0.125	3.2	.045	1.1	140-160	18-21	120-160	15-25	3.1-4.2
3/16"	0.187	4.7	.035	0.9	140-175	19-22	240-290	14-19	3.1-3.8
3/16"	0.187	4.7	.045	1.1	160-200	19-22	150-225	15-22	3.9-5.9
1/4"	0.250	6.4	.035	0.9	140-160	19.22	240-290	9-13	3.1-3.8
1/4"	0.250	6.4	.045	1.1	180-225	20-23	190-240	12-18	5.0-6.3

*The above parameters are for flat and horizontal fillet welds. Reduce current ~10% for vertical or overhead welds

SPRAY TRANSFER WELDING PARAMETERS*:

Material Thickness[1] size	in. (decimal)	mm	Electrode Diameter in.	mm	Welding Current (DC) amps	Arc Voltage (electrode positive)	Wire Feed Speed ipm	Travel Speed ipm	Deposition Rate lbs/hr
1/8"	0.125	3.2	.035	0.9	160-170	23-24	320-340	17-22	5.1-5.4
1/8"	0.125	3.2	.045	1.1	170-180	23-24	170-185	16-21	4.5-4.8
3/16"	0.187	4.7	.035	0.9	180-190	24-25	360-380	15-20	5.7-6.0
3/16"	0.187	4.7	.045	1.1	190-200	24-25	195-210	14-19	5.1-5.5
1/4"	0.250	6.4	.035	0.9	200-210	24-25	400-420	12-18	6.3-6.6
1/4"	0.250	6.4	.045	1.1	210-220	25-26	220-240	11-17	5.8-6.3
5/16"	0.313	7.9	.035	0.9	220-250	25-26	420-510	11-16	6.6-8.0
5/16"	0.313	7.9	.045	1.1	220-300	26-28	240-375	11-18	6.3-9.8
3/8"	0.375	9.5	.045	1.1	300-350	26-28	375-475	11-19	9.8-12.4
1/2"	0.500	12.7	.045	1.1	325-375	27-29	400-550	12-18	10.5-14.4

*The above parameters are based on the use of 90%Ar/10%CO2 shielding gas at ~40cfh with an ~electrode stick-out of 5/8".

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