

SM-70

Mild Steel & 490 MPa high tensile steels



Conformances

AWS A5.18 / ASME SFA5.18 ER70S-6
 JIS Z3312 YGW12
 EN ISO 14341-A G 42 2 C 3Si1 / 14341-A G 42 4 M 3Si1
 KR 3SG, 3YSG(C)
 ABS 3SA, 3YSA
 LR 3YS, 3YM H15
 TÜV EN ISO 14341-A - G42 2 C1 3Si1 / G42 4 M21 3Si1
 DB DIN EN ISO 14341-A-G 42 2 C1 3Si1
 DIN EN ISO 14341-A-G 42 4 M21 3Si1

BV SA3, SA3YM
 DNV IIIYMS
 GL 3YS
 NK KSW53G(C)
 CWB CSA W48 B-G 49A 3 C G6
 NAKS
 RS 3YSM
 CE

Applications

- General fabrication
- Steel Industry
- Automotive

Features

- All position welding by short-circuiting type transfer
- Stable arc and low spatter
- Good bead appearance

Welding Position



1G 2F 3G 4G
 (PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

100% CO₂
 Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.9 (0.035) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.0 (0.040) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.2 (0.045) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.4 (0.052) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.6 (1/16) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S |
|------|------|------|-------|-------|
| 0.07 | 0.83 | 1.48 | 0.011 | 0.015 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|---|---------------------------------|---------------------------------|-----------|----------------|---------------------------------|
| As welded with 100% CO ₂ | 460 (67,000) | 555 (80,000) | 29.3 | -29 (-20) | 85 (63) |
| As welded with 80% Ar + CO ₂ | 495 (72,000) | 585 (85,000) | 27.5 | -29 (-20) | 113 (83) |
| As welded with 90% Ar + CO ₂ | 495 (72,000) | 590 (85,600) | 26.4 | -29 (-20) | 101 (74) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 5.8 (230) | 18.5 | 150 | 2.9 (6.4) |
| | | 9.0 (350) | 25 | 200 | 4.5 (9.9) |
| | | 14.5 (570) | 31 | 280 | 7.3 (16.1) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 3.7 (145) | 17.5 | 150 | 1.9 (4.2) |
| | | 6.2 (244) | 24 | 200 | 3.1 (6.8) |
| | | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| 1.4mm (0.052in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 8.8 (346) | 29 | 250 | 6.1 (13.4) |
| | | 12.0 (472) | 34 | 300 | 8.3 (18.3) |
| | | 14.6 (575) | 36 | 340 | 10.1 (22.2) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 28 | 250 | 4.6 (10.1) |
| | | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 35 | 340 | 6.6 (14.5) |
| 1.6mm (1/16in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 8.6 (339) | 34 | 320 | 7.8 (17.2) |
| | | 9.4 (370) | 37 | 340 | 8.5 (18.7) |
| | | 11.7 (460) | 43 | 390 | 10.6 (23.3) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.2 (244) | 30 | 320 | 5.6 (12.3) |
| | | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |

SM-70EN

Mild Steel & 490 MPa high tensile steels



Conformances

AWS A5.18/ ASME SFA5.18 ER70S-6
 JIS Z3312 YGW12
 EN ISO 14341-A G 42 2 C 4Si1
 EN ISO 14341-A G 46 4 M 4Si1
 TÜV EN ISO 14341-A - G42 2 C1 4Si1 / G46 4 M21 4Si1
 DB DIN EN ISO 14341-A-G 42 2 C1 4Si1
 DIN EN ISO 14341-A-G 46 4 M21 4Si1

CE
 DNV IIIY40MS
 GL 3Y40S

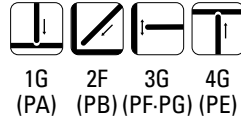
Applications

- Structural fabrication
- Automotive
- Machinery
- Steel Industry

Features

- All position welding by short-circuiting type transfer
- Mixed gas
- Good bead appearance and low spatter

Welding Position



Current

DC +

Shielding Gas

Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.9 (0.035) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.0 (0.040) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.2 (0.045) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.4 (0.052) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.6 (1/16) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S |
|------|------|-----|-------|-------|
| 0.08 | 0.95 | 1.7 | 0.012 | 0.015 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft-lbs) |
|---|---------------------------------|---------------------------------|-----------|----------------|--------------------------------|
| As welded with 80% Ar + CO ₂ | 477 (69,000) | 540 (86,000) | 28.5 | -29 (-20) | 101 (75) |
| As welded with 90% Ar + CO ₂ | 492 (71,300) | 585 (85,000) | 27.9 | -29 (-20) | 100 (74) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 3.7 (145) | 17.5 | 150 | 1.9 (4.2) |
| | | 6.2 (244) | 24 | 200 | 3.1 (6.8) |
| | | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| 1.4mm (0.052in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 28 | 250 | 4.6 (10.1) |
| | | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 35 | 340 | 6.6 (14.5) |
| 1.6mm (1/16in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.2 (244) | 30 | 320 | 5.6 (12.3) |
| | | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |

SMW

SAW

GMW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-70G

Mild Steel & 490 MPa high tensile steels

Conformances

AWS A5.18/ ASME SFA5.18 ER70S-G
 JIS Z3312 YGW11
 EN ISO 14341-A G3Si1
 KR 3SG, 3YSG, 3MG, 3YMG (C1)
 ABS 3SA, 3YSA
 LR 3YSH15

BV SA3, 3YM
 DNV IIIYMS
 GL 3YS
 NK KSW53G, KAW53MG(C)
 KSW3G, KSW53G(M2)
 KAW3MG, KAW53MG(M2)

Applications

- Structural fabrication
- Shipbuilding
- Transportation equipment
- Heavy equipment
- Bridge construction

Features

- Good performance with high current
- High deposition rate
- Deep penetration

Welding Position



1G 2F 3G 4G
 (PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

100% CO₂
 Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | √ | √ | √ | √ | √ | √ |
| 0.9 (0.035) | √ | √ | √ | √ | √ | √ |
| 1.0 (0.040) | √ | √ | √ | √ | √ | √ |
| 1.2 (0.045) | √ | √ | √ | √ | √ | √ |
| 1.4 (0.052) | √ | √ | √ | √ | √ | √ |
| 1.6 (1/16) | √ | √ | √ | √ | √ | √ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S | Ti |
|------|------|-----|-------|-------|------|
| 0.05 | 0.82 | 1.5 | 0.011 | 0.010 | 0.18 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|---|---------------------------------|---------------------------------|-----------|----------------|---------------------------------|
| As welded with 100% CO ₂ | 518 (75,000) | 591 (86,000) | 30.4 | -29 (-20) | 92 (68) |
| As welded with 80% Ar + CO ₂ | 534 (77,400) | 600 (87,000) | 28.6 | -29 (-20) | 102 (76) |
| As welded with 90% Ar + CO ₂ | 554 (80,300) | 630 (91,400) | 27.4 | -29 (-20) | 95 (70) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 14.5 (570) | 31 | 280 | 7.3 (16.1) |
| | | 17.0 (670) | 34 | 320 | 8.6 (19.0) |
| | | 21.0 (830) | 37 | 350 | 10.6 (23.3) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| | | 12.8 (503) | 33 | 320 | 6.5 (14.3) |
| | | 14.0 (551) | 36 | 350 | 7.1 (15.7) |
| 1.4mm (0.052in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 12.0 (472) | 34 | 300 | 8.3 (18.3) |
| | | 14.6 (575) | 36 | 340 | 10.1 (22.2) |
| | | 15.8 (622) | 39 | 360 | 11.0 (24.2) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 34 | 340 | 6.6 (14.5) |
| | | 10.0 (394) | 35 | 360 | 6.9 (15.3) |
| 1.6mm (1/16in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 9.4 (370) | 37 | 340 | 8.5 (18.7) |
| | | 11.7 (460) | 43 | 390 | 10.6 (23.3) |
| | | 12.2 (480) | 44 | 400 | 11.1 (24.4) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |
| | | 8.6 (339) | 38 | 400 | 7.8 (17.2) |

SM-70S

Mild Steel & 490 MPa high tensile steels

Conformances

AWS A5.18/ ASME SFA5.18 ER70S-3

JIS Z3312 YGW16

EN ISO 14341-A G2Si

ABS 3SA, 3YSA

LR 3S, 3YSH15

Applications

- Automotive
- Galvanized steel
- Machinery

Features

- All position welding by short-circuiting type transfer
- Mixed gas
- Galvanized steel applicable
- Stable arc and low spatter
- Low slag
- Good bead appearance

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.9 (0.035) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.0 (0.040) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.2 (0.045) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.4 (0.052) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.6 (1/16) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S |
|------|------|------|-------|-------|
| 0.07 | 0.65 | 1.14 | 0.011 | 0.008 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft-lbs) |
|---|---------------------------------|---------------------------------|-----------|----------------|--------------------------------|
| As welded with 80% Ar + CO ₂ | 455 (66,000) | 533 (77,300) | 31.2 | -20 (-4) | 168 (124) |
| As welded with 90% Ar + CO ₂ | 467 (67,700) | 551 (79,800) | 30.6 | -20 (-4) | 166 (123) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 3.7 (145) | 17.5 | 150 | 1.9 (4.2) |
| | | 6.2 (244) | 24 | 200 | 3.1 (6.8) |
| | | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| 1.4mm (0.052in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 28 | 250 | 4.6 (10.1) |
| | | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 35 | 340 | 6.6 (14.5) |
| 1.6mm (1/16in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.2 (244) | 30 | 320 | 5.6 (12.3) |
| | | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |

SMAW

SAW

GMAW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-70GS

Mild Steel & 490 MPa high tensile steels

Conformances

AWS A5.18/ ASME SFA5.18 ER70S-G

JIS Z3312 YGW15

EN ISO 14341-A G2Si

LR 3YSH15

Applications

- Shipbuilding
- Structural fabrication
- Transportation equipment
- Heavy equipment

Features

- Mixed gas
- Good performance high-current
- Good bead appearance
- Low slag

Welding Position



1G 2F
(PA) (PB)

Current

DC +

Shielding Gas

Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.9 (0.035) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.0 (0.040) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.2 (0.045) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.4 (0.052) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.6 (1/16) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S | Ti |
|------|------|------|-------|-------|------|
| 0.06 | 0.62 | 1.21 | 0.013 | 0.007 | 0.10 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|---|---------------------------------|---------------------------------|-----------|----------------|---------------------------------|
| As welded with 80% Ar + CO ₂ | 480 (69,600) | 550 (79,700) | 28.0 | -20 (-4) | 186 (128) |
| As welded with 90% Ar + CO ₂ | 515 (74,600) | 556 (80,600) | 27.4 | -20 (-4) | 173 (119) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 10.1 (397) | 28 | 250 | 5.1 (11.2) |
| | | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| | | 12.8 (503) | 33 | 320 | 6.5 (14.3) |
| 1.4mm (0.052in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 34 | 340 | 6.6 (14.5) |
| | | 10.0 (394) | 35 | 360 | 6.9 (15.3) |
| 1.6mm (1/16in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |
| | | 8.6 (339) | 38 | 400 | 7.8 (17.2) |

SMW

SAW

GMW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-1N

High tensile steels

Conformances

AWS A5.28/ ASME SFA5.28 ER80S-Ni1

ABS AWS A5.28 ER80S-Ni1(-50)

Applications

- Structural fabrication
- Shipbuilding
- Rail road car
- Heavy equipment

Features

- Good impact value at low temperature(1% Ni)
- Good performance to mechanical properties

Welding Position



1G 2F
(PA) (PB)

Current

DC +

Shielding Gas

Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | √ | √ | √ | √ | √ | √ |
| 0.9 (0.035) | √ | √ | √ | √ | √ | √ |
| 1.0 (0.040) | √ | √ | √ | √ | √ | √ |
| 1.2 (0.045) | √ | √ | √ | √ | √ | √ |
| 1.4 (0.052) | √ | √ | √ | √ | √ | √ |
| 1.6 (1/16) | √ | √ | √ | √ | √ | √ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S | Ni | Cu |
|------|------|------|-------|------|------|------|
| 0.08 | 0.62 | 1.15 | 0.011 | 0.01 | 0.93 | 0.08 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft-lbs) |
|---|---------------------------------|---------------------------------|-----------|----------------|--------------------------------|
| As welded with 80% Ar + CO ₂ | 500 (72,500) | 585 (84,900) | 27.8 | -45 -60 | 115 (85) 62 (45) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| | | 12.8 (503) | 33 | 320 | 6.5 (14.3) |
| | | 14.0 (551) | 36 | 350 | 7.1 (15.7) |
| 1.4mm (0.052in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 34 | 340 | 6.6 (14.5) |
| | | 10.0 (394) | 35 | 360 | 6.9 (15.3) |
| 1.6mm (1/16in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |
| | | 8.6 (339) | 38 | 400 | 7.8 (17.2) |

SM-55H

High tensile steels

Conformances

JIS Z3312 YGW18
EN ISO 14341-B S18

Applications

- High tensile welded structure
- Heavy equipment
- Structural fabrication

Features

- Good performance with high-current
- CO₂ gas
- High efficiency
- Deep penetration

Welding Position



1G 2F
(PA) (PB)

Current

DC +

Shielding Gas

100% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.9 (0.035) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.0 (0.040) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.2 (0.045) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.4 (0.052) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.6 (1/16) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S | Ti |
|------|------|------|-------|-------|------|
| 0.07 | 0.89 | 1.95 | 0.013 | 0.007 | 0.18 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|-------------------------------------|---------------------------------|---------------------------------|-----------|----------------|---------------------------------|
| As welded with 100% CO ₂ | 550 (79,800) | 630 (91,500) | 28 | 0 (32) | 110 (81) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 14.5 (570) | 31 | 280 | 7.3 (16.1) |
| | | 17.0 (670) | 34 | 320 | 8.6 (19.0) |
| | | 21.0 (830) | 37 | 350 | 10.6 (23.3) |
| 1.4mm (0.052in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 12.0 (472) | 34 | 300 | 8.3 (18.3) |
| | | 14.6 (575) | 36 | 340 | 10.1 (22.2) |
| | | 15.8 (622) | 39 | 360 | 11.0 (24.2) |
| 1.6mm (1/16in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 9.4 (370) | 37 | 340 | 8.5 (18.7) |
| | | 11.7 (460) | 43 | 390 | 10.6 (23.3) |
| | | 12.2 (480) | 44 | 400 | 11.1 (24.4) |

SM-80G

High tensile steels

Conformances

AWS A5.28/ ASME SFA5.28 ER80S-G
JIS Z3312 G 59J A 1 U C 3M1T
EN ISO 14341-B S3M1T
ABS AWS A5.28 ER80S-G (-20°C ≥47J)

Applications

- High tensile welded structure
- Pressure vessels
- Machinery

Features

- High deposition rate
- Special alloying elements added
- Stable arc with high current

Welding Position



1G 2F
(PA) (PB)

Current

DC +

Shielding Gas

100% CO₂
Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.9 (0.035) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.0 (0.040) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.2 (0.045) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.4 (0.052) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.6 (1/16) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S | Mo | Ti |
|------|------|------|-------|-------|------|------|
| 0.06 | 0.81 | 1.85 | 0.013 | 0.007 | 0.27 | 0.15 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|---|---------------------------------|---------------------------------|-----------|----------------|---------------------------------|
| As welded with 100% CO ₂ | 571 (77,100) | 645 (93,500) | 26.6 | -20 (-4) | 117 (86) |
| As welded with 80% Ar + CO ₂ | 651 (94,400) | 715 (103,600) | 25.6 | -20 (-4) | 72 (53) |
| As welded with 90% Ar + CO ₂ | 668 (96,800) | 732 (106,140) | 22.8 | -20 (-4) | 65 (48) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 14.5 (570) | 31 | 280 | 7.3 (16.1) |
| | | 17.0 (670) | 34 | 320 | 8.6 (19.0) |
| | | 21.0 (830) | 37 | 350 | 10.6 (23.3) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| | | 12.8 (503) | 33 | 320 | 6.5 (14.3) |
| | | 14.0 (551) | 36 | 350 | 7.1 (15.7) |
| 1.4mm (0.052in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 12.0 (472) | 34 | 300 | 8.3 (18.3) |
| | | 14.6 (575) | 36 | 340 | 10.1 (22.2) |
| | | 15.8 (622) | 39 | 360 | 11.0 (24.2) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 34 | 340 | 6.6 (14.5) |
| | | 10.0 (394) | 35 | 360 | 6.9 (15.3) |
| 1.6mm (1/16in), DC + | | | | | |
| 100% CO ₂ Gas | 20 (3/4) | 9.4 (370) | 37 | 340 | 8.5 (18.7) |
| | | 11.7 (460) | 43 | 390 | 10.6 (23.3) |
| | | 12.2 (480) | 44 | 400 | 11.1 (24.4) |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |
| | | 8.6 (339) | 38 | 400 | 7.8 (17.2) |

SM-100

High tensile steels

Conformances

AWS A5.28/ ASME SFA5.28 ER100S-G

Applications

- 0.3Cr-1.7Ni-0.25Mo-alloyed, High strength steel

Features

- Good TS and impact value at low temperature
- Stable arc with high-current
- Low spatter

Welding Position



1G 2F
(PA) (PB)

Current

DC +

Shielding Gas

Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | √ | √ | √ | √ | √ | √ |
| 0.9 (0.035) | √ | √ | √ | √ | √ | √ |
| 1.0 (0.040) | √ | √ | √ | √ | √ | √ |
| 1.2 (0.045) | √ | √ | √ | √ | √ | √ |
| 1.4 (0.052) | √ | √ | √ | √ | √ | √ |
| 1.6 (1/16) | √ | √ | √ | √ | √ | √ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S | Cr | Ni | Mo |
|-------|------|------|-------|-------|------|------|------|
| 0.081 | 0.48 | 1.76 | 0.013 | 0.012 | 0.28 | 1.76 | 0.23 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|---|---------------------------------|---------------------------------|-----------|-----------------------|---------------------------------|
| As welded with 80% Ar + CO ₂ | 711 (103,100) | 756 (109,600) | 20.4 | -20 (-4) -40 (-40) | 114 (84) 83 (61) |
| As welded with 90% Ar + CO ₂ | 724 (105,000) | 766 (111,100) | 18.9 | -20 (-4) -40 (-40) | 106 (79) 78 (57) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| | | 12.8 (503) | 33 | 320 | 6.5 (14.3) |
| | | 14.0 (551) | 36 | 350 | 7.1 (15.7) |
| 1.4mm (0.052in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 34 | 340 | 6.6 (14.5) |
| | | 10.0 (394) | 35 | 360 | 6.9 (15.3) |
| 1.6mm (1/16in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |
| | | 8.6 (339) | 38 | 400 | 7.8 (17.2) |

SMAW

SAW

GMAW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-110

High tensile steels

Conformances

AWS A5.28/ ASME SFA5.28 ER110S-G

Applications

- 0.3Cr-1.9Ni-0.5Mo-alloyed, High strength steel

Features

- Good TS and impact value at low temperature
- Stable arc with high-current
- Low spatter

Welding Position



1G 2F
(PA) (PB)

Current

DC +

Shielding Gas

Ar + 20~25% CO₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | √ | √ | √ | √ | √ | √ |
| 0.9 (0.035) | √ | √ | √ | √ | √ | √ |
| 1.0 (0.040) | √ | √ | √ | √ | √ | √ |
| 1.2 (0.045) | √ | √ | √ | √ | √ | √ |
| 1.4 (0.052) | √ | √ | √ | √ | √ | √ |
| 1.6 (1/16) | √ | √ | √ | √ | √ | √ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | P | S | Cr | Ni | Mo |
|-------|------|------|-------|-------|------|-----|------|
| 0.089 | 0.75 | 1.83 | 0.011 | 0.012 | 0.30 | 1.9 | 0.52 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|---|---------------------------------|---------------------------------|-----------|-----------------------|---------------------------------|
| As welded with 80% Ar + CO ₂ | 700 (103,000) | 858 (124,400) | 19.4 | -40 (-40) 60 (-76) | 82 (60) 69 (51) |
| As welded with 90% Ar + CO ₂ | 725 (105,100) | 871 (126,300) | 17.2 | -40 (-40) 60 (-76) | 71 (53) 60 (45) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 11.2 (440) | 30 | 280 | 5.6 (12.3) |
| | | 12.8 (503) | 33 | 320 | 6.5 (14.3) |
| | | 14.0 (551) | 36 | 350 | 7.1 (15.7) |
| 1.4mm (0.052in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 8.7 (343) | 32 | 300 | 6.0 (13.2) |
| | | 9.5 (374) | 34 | 340 | 6.6 (14.5) |
| | | 10.0 (394) | 35 | 360 | 6.9 (15.3) |
| 1.6mm (1/16in), DC + | | | | | |
| Mixed Gas (Ar + CO ₂) | 20 (3/4) | 6.6 (260) | 34 | 340 | 6.0 (13.2) |
| | | 8.2 (322) | 38 | 390 | 7.4 (16.3) |
| | | 8.6 (339) | 38 | 400 | 7.8 (17.2) |

SMAW

SAW

GMAW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-80CM

Heat resistance – low alloy steel

Conformances

AWS A5.28/ ASME SFA5.28 ER80S-G

JIS Z3317 YG1CM-A

EN ISO 14341-B S2M3

Applications

- Structural fabrication
- Offshore structure
- Pressure vessels
- Machinery
- Chemical industry

Features

- MIG welding for boiler steam pipe of Steam power generation and 1.0~1.25%Cr-0.5%Mo heat resisting steel using for refining oil & chemical industrial machine tool.
- Good TS and Impact value in a high temperature after heat treatment.

Welding Position



1G 2F
(PA) (PB)

Current

DC +

Shielding Gas

100% Ar
Ar + 2% O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|--------------|--------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 15kg (33lbs) | 20kg (44lbs) | 250kg (551lbs) | 300kg (661lbs) | 350kg (771lbs) |
| 0.8 (0.033) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 0.9 (0.035) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.0 (0.040) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.2 (0.045) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.4 (0.052) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1.6 (1/16) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Mo |
|------|------|------|------|------|
| 0.09 | 0.67 | 1.02 | 1.19 | 0.45 |

Typical Mechanical Properties of All-Weld Metal

| | YS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) |
|---------------------------------------|---------------------------------|-----------|--------------------|---------------------------------|
| As welded with 100% Ar | 630 (91,500) | 27 | 0 (32) -20 (-4) | 140 (103) 120 (88) |
| As welded with Ar + 2% O ₂ | 680 (98,000) | 23 | 0 (32) -20 (-4) | 140 (103) 115 (85) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.2mm (0.045in), DC + | | | | | |
| Ar + 2% O ₂ | 20 (3/4) | 4.5 (177) | 16 | 150 | 2.3 (5.1) |
| | | 7.7 (303) | 22 | 200 | 3.9 (8.6) |
| | | 11.7 (460) | 29 | 280 | 5.9 (13.0) |
| 1.4mm (0.052in), DC + | | | | | |
| Ar + 2% O ₂ | 20 (3/4) | 7.2 (283) | 30 | 300 | 5.0 (11.0) |
| | | 8.6 (339) | 32 | 340 | 6.0 (13.2) |
| | | 9.5 (374) | 33 | 360 | 6.6 (14.5) |
| 1.6mm (1/16in), DC + | | | | | |
| Ar + 2% O ₂ | 20 (3/4) | 7.7 (303) | 32 | 340 | 7.7 (15.4) |
| | | 10.2 (402) | 36 | 390 | 9.3 (20.5) |
| | | 10.8 (425) | 37 | 400 | 9.8 (21.6) |

SMW
SAW
GMAW
GTAW
FCAW
Non-FERROUS
APPENDIX

SM-307Si

STS 304 & high Mn steels

Conformances

EN ISO 14343-A G 18 8 Mn

Applications

- Structural fabrication
- Automotive
- Machinery

Features

- Good resistance to crack and corrosion
- High efficiency

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | | |
|-------------|---------|----------------|---------------|--------------|----------------|----------------|----------------|
| | mm (in) | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | ✓ | | | | | | |
| 0.9 (0.035) | ✓ | | | | | | |
| 1.0 (0.040) | ✓ | | | | | | |
| 1.2 (0.045) | ✓ | | | | | | |
| 1.4 (0.052) | | | | | | | ✓ |
| 1.6 (1/16) | ✓ | | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|-----|------|
| 0.08 | 0.87 | 7.17 | 19.6 | 9.3 | 0.12 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft-lbs) | PWHT |
|---------------------------------|-----------|--------------------|--------------------------------|-------------|
| 610 (88,600) | 42 | 0 (32) -20 (-4) | 83 (63) 59 (43) | 690°C × 1Hr |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SMW

SAW

GMW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-308

Stainless steel

Conformances

AWS A5.9/ ASME SFA5.9 ER308

JIS Z3321 YS308

EN ISO 14343-A G 19 9

Applications

- Structural fabrication
- Petrochemical
- Oil and textile industries
- Nuclear reactor

Features

- Good resistance to crack and corrosion
- High efficiency

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | | |
|-------------|---------|----------------|---------------|--------------|----------------|----------------|----------------|
| | mm (in) | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | ✓ | | | | | | |
| 0.9 (0.035) | ✓ | | | | | | |
| 1.0 (0.040) | ✓ | | | | | | |
| 1.2 (0.045) | ✓ | | | | | ✓ | |
| 1.4 (0.052) | | | | | | | |
| 1.6 (1/16) | ✓ | | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni |
|------|------|------|------|-----|
| 0.04 | 0.41 | 1.65 | 19.9 | 9.8 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft-lbs) |
|---------------------------------|-----------|--------------------|--------------------------------|
| 590 (85,600) | 40 | 0 (32) -20 (-4) | 100 (74) 50 (37) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SMW

SAW

GMW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-308L

Low carbon 18%Cr-8%Ni steel

Conformances

AWS A5.9/ ASME SFA5.9 ER308L

JIS Z3321 YS308L

EN ISO 14343-A G 19 9L

Applications

- Structural fabrication
- Petrochemical
- Oil and textile industries
- Nuclear reactor

Features

- Good resistance to crack and corrosion
- High efficiency

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | | |
|-------------|---------|----------------|---------------|--------------|----------------|----------------|----------------|
| | mm (in) | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | ✓ | | | | | | |
| 0.9 (0.035) | ✓ | | | | | | |
| 1.0 (0.040) | ✓ | | ✓ | | | | |
| 1.2 (0.045) | ✓ | | ✓ | | | | |
| 1.4 (0.052) | | | | | | | ✓ |
| 1.6 (1/16) | ✓ | | | | | | ✓ |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni |
|------|------|------|------|------|
| 0.02 | 0.35 | 1.60 | 19.9 | 10.1 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.lbs) |
|---------------------------------|-----------|--------------------|--------------------------------|
| 560 (81,300) | 42 | 0 (32) -20 (-4) | 90 (66) 50 (37) |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SWAW

SAW

GMAW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-308LSi

Low carbon 18%Cr-8%Ni steel

Conformances

AWS A5.9/ ASME SFA5.9 ER308LSi

JIS Z3321 YS308LSi

EN ISO 14343-A G 19 9L Si

Applications

- Structural fabrication
- Petrochemical
- Oil and textile industries
- Nuclear reactor

Features

- Good resistance to crack and corrosion
- High efficiency
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | | |
|-------------|---------|----------------|---------------|--------------|----------------|----------------|----------------|
| | mm (in) | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | ✓ | | | | | | |
| 0.9 (0.035) | ✓ | | | | | | |
| 1.0 (0.040) | ✓ | | | | | | |
| 1.2 (0.045) | ✓ | | | | | ✓ | |
| 1.4 (0.052) | | | | | | | |
| 1.6 (1/16) | ✓ | | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|-------|------|------|-------|-------|-----|
| 0.027 | 0.79 | 1.96 | 20.78 | 10.02 | 0.1 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 610 (88,500) | 40.4 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SMW

SAW

GMW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-309

22%Cr-12%Ni steel, 18%Cr-8%Ni clad steel, STS-CrMo, STS-Carbon steel

Conformances

AWS A5.9/ ASME SFA5.9 ER309

JIS Z3321 YS309

EN ISO 14343-A G 23 12

Applications

- Structural fabrication
- Petrochemical
- Oil and textile industries
- Nuclear reactor

Features

- Good resistance to crack and heat
- High efficiency

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter mm (in) | Spool | | | Pac | | |
|---------------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | √ | | √ | √ |
| 1.2 (0.045) | √ | | | | √ | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni |
|------|------|------|------|------|
| 0.09 | 0.39 | 1.60 | 23.5 | 12.8 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 660 (95,700) | 36 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-309L

22%Cr-12%Ni steel, 18%Cr-8%Ni clad steel, STS-CrMo, STS-Carbon steel

Conformances

AWS A5.9/ ASME SFA5.9 ER309L

JIS Z3321 YS309L

EN ISO 14343-A G 23 12L

Applications

- Structural fabrication
- Petrochemical
- Oil and textile industries
- Nuclear reactor

Features

- Good resistance to crack and heat
- High efficiency

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|----------------|---------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 12.5kg (28lbs) | 15kg (33 lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | | ✓ | | | | |
| 0.9 (0.035) | | ✓ | | | | |
| 1.0 (0.040) | | ✓ | | | | |
| 1.2 (0.045) | ✓ | ✓ | | ✓ | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | | ✓ | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni |
|------|------|------|------|------|
| 0.03 | 0.41 | 1.58 | 23.5 | 12.8 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 640 (92,900) | 38 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-309LSi

22%Cr-12%Ni steel, 18%Cr-8%Ni clad steel, STS-CrMo, STS-Carbon steel

Conformances

AWS A5.9/ ASME SFA5.9 ER309LSi

JIS Z3321 YS309LSi

EN ISO 14343-A G 23 12L Si

Applications

- Structural fabrication
- Petrochemical
- Oil and textile industries
- Nuclear reactor

Features

- Good resistance to crack and corrosion
- High efficiency
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | | | | |
| 1.2 (0.045) | √ | | | √ | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|-------|------|------|-------|-------|-----|
| 0.022 | 0.79 | 1.61 | 24.11 | 13.97 | 0.1 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 571 (82,800) | 40.2 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-309MoL

Dissimilar metals such as stainless steels and carbon steels

Conformances

AWS A5.9/ ASME SFA5.9 ER309LMo

JIS Z3321 YS309LMo

EN ISO 14343-A G 23 12 2L

Applications

- STS clad steel (316, 316L)

Features

- Good resistance to crack and corrosion
- High efficiency
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | | | | |
| 1.2 (0.045) | √ | | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|------|------|-----|------|------|-----|
| 0.01 | 0.35 | 1.8 | 23.2 | 13.7 | 2.5 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 660 (95,700) | 34 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15-20 (0.59-0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15-20 (0.59-0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15-20 (0.59-0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15-20 (0.59-0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SMW

SAW

GMW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-310

25%Cr-20%Ni STS

Conformances

AWS AWS A5.9/ ASME SFA5.9 ER310

JIS Z3321 YS310

EN ISO 14343-A G 25 20

Applications

- STS clad steel

Features

- Good resistance to crack and corrosion
- High efficiency
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | | | | |
| 1.2 (0.045) | √ | | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni |
|------|------|------|------|------|
| 0.09 | 0.35 | 1.90 | 26.8 | 20.9 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 610 (88,500) | 40 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-312

29%Cr-9%Ni STS, joining of dissimilar-metal

Conformances

AWS A5.9/ ASME SFA5.9 ER312

JIS Z3321 YS312

EN ISO 14343-A G 25 20

Applications

- Welding of dissimilar-metal STS to ferritic steel or special steel

Features

- Good resistance to crack and corrosion
- High efficiency
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | | | | |
| 1.2 (0.045) | √ | | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni |
|------|------|------|------|-----|
| 0.10 | 0.38 | 1.68 | 30.0 | 8.8 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 720 (104,400) | 32 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SMAW

SAW

GMAW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-316

18%Cr-12%Ni-2%Mo STS

Conformances

AWS A5.9/ ASME SFA5.9 ER316

JIS Z3321 YS316

EN ISO 14343-A G 19 12 3

Applications

- Structural fabrication
- Chemical industries
- Nuclear reactors

Features

- Good resistance to crack and corrosion
- High efficiency
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | | | | |
| 1.2 (0.045) | √ | | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|------|-----|
| 0.06 | 0.40 | 1.71 | 19.4 | 12.6 | 2.5 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 580 (84,200) | 39 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-316L

Low carbon 18%Cr-12%Ni-2%Mo STS

Conformances

AWS A5.9/ ASME SFA5.9 ER316L

JIS Z3321 YS316L

EN ISO 14343-A G 19 12 3L

Applications

- Structural fabrication
- Chemical industries
- Nuclear reactors

Features

- Good resistance to crack and corrosion
- High efficiency
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | √ | | | | |
| 1.2 (0.045) | √ | √ | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|------|-----|
| 0.02 | 0.39 | 1.69 | 19.5 | 12.8 | 2.5 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 570 (82,700) | 39 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-316LSi

Low carbon 18%Cr-12%Ni-2%Mo STS

Conformances

AWS A5.9/ ASME SFA5.9 ER316LSi

JIS Z3321 YS316LSi

EN ISO 14343-A G 19 12 3L Si

Applications

- Structural fabrication
- Chemical industries
- Nuclear reactors

Features

- Good crack sensitivity
- High Si content
- Good arc stability and bead wetting

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter mm (in) | Spool | | | Pac | | |
|---------------------|-------------|----------------|---------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 12.5kg (28lbs) | 15kg (33 lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | | √ | √ | | | |
| 0.9 (0.035) | | √ | | | | |
| 1.0 (0.040) | √ | √ | √ | | | |
| 1.2 (0.045) | | √ | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | | √ | | | | |
| 2.0 (0.079) | | √ | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|-------|------|------|-------|-------|------|
| 0.030 | 0.65 | 2.36 | 19.76 | 11.62 | 2.50 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 597 (86,600) | 37 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SMW

SAW

GMAW

GTAW

FCAW

Non-FERROUS

APPENDIX

SM-347

18%Cr-8%Ni-Nb(STS 347) & 18%Cr-8%Ni-Ti(STS 321)

Conformances

AWS A5.9/ ASME SFA5.9 ER347

JIS Z3321 YS347

EN ISO 14343-A G 19 9 Nb

Applications

- Boiler
- Gas turbine

Features

- Good resistant to crack
- Good resistance corrosion and heat(Nb contents)

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | | | | |
| 1.2 (0.045) | √ | | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Nb |
|------|------|------|------|-----|-----|
| 0.05 | 0.43 | 1.66 | 20.0 | 9.6 | 0.7 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 680 (98,600) | 30 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-2209

22%Cr-5%Ni-2%Mo-0.15%N STS

Conformances

AWS A5.9/ ASME SFA5.9 ER2209

JIS Z3321 YS2209

EN ISO 14343-A G 22 9 3N L

Applications

- Offshore
- Petrochemical

Features

- Good resistance to corrosion
- High resistance to chloride stress corrosion cracking(CSCC)

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|----------------|---------------|--------------|----------------|----------------|----------------|
| | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | √ | | | | | |
| 0.9 (0.035) | √ | | | | | |
| 1.0 (0.040) | √ | | | | | |
| 1.2 (0.045) | √ | | | | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | √ | | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni | Mo |
|------|------|------|------|-----|-----|
| 0.01 | 0.41 | 1.70 | 23.4 | 8.9 | 3.2 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) | Temp °C(°F) | CVN-Impact Value J (ft.-lbs) | PREN |
|---------------------------------|-----------|----------------|---------------------------------|------|
| 784 (113,700) | 30 | -20 (-4) | 83 (61) | 35 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-410

13%Cr STS(STS 403, STS 410)

Conformances

AWS A5.9/ ASME SFA5.9 ER410

JIS Z3321 YS410

EN ISO 14343-A G 13

Applications

- Hardfacing application

Features

- Good resistance to corrosion and abrasion
- Good anti-abrasive property

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | |
|-------------|-------------|----------------|---------------|----------------|----------------|----------------|
| | 5kg (11lbs) | 12.5kg (28lbs) | 15kg (33 lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| mm (in) | | | | | | |
| 0.8 (0.033) | | √ | | | | |
| 0.9 (0.035) | | √ | | | | |
| 1.0 (0.040) | | √ | | | | |
| 1.2 (0.045) | √ | √ | | √ | | |
| 1.4 (0.052) | | | | | | |
| 1.6 (1/16) | | √ | | | | |

Typical Chemical Composition of the Wire(%)

| C | Si | Mn | Cr | Ni |
|------|------|------|------|------|
| 0.10 | 0.38 | 0.34 | 12.0 | 0.17 |

Typical Mechanical Properties of All-Weld Metal

| TS MPa(lbs/in ²) | EL (%) |
|---------------------------------|-----------|
| 540 (78,300) | 35 |

Typical Operating Procedures

| Diameter, Polarity Shielding Gas | CTWD mm(in) | Wire Feed Speed m/min (in/min) | Voltage (volts) | Approx. Current (amps) | Melt-Off Rate kg/hr (lb/hr) |
|-------------------------------------|----------------------|-----------------------------------|--------------------|------------------------------|--------------------------------|
| 1.0mm (0.040 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 6.0 (236) | 24 | 140 | 2.1 (4.6) |
| | | 7.1 (280) | 24 | 160 | 2.5 (5.5) |
| | | 9.2 (362) | 24 | 190 | 3.2 (7.1) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 5.2 (204) | 26 | 160 | 1.8 (4.0) |
| | | 7.0 (276) | 26 | 190 | 2.4 (5.3) |
| | | 8.3 (327) | 26 | 220 | 2.9 (6.4) |
| 1.2mm (0.045 in), DC + | | | | | |
| 100% Ar Gas | 15~20 (0.59~0.78) | 9.2 (362) | 27 | 190 | 4.6 (10.1) |
| | | 11.9 (469) | 27 | 220 | 6.0 (13.2) |
| | | 15.5 (610) | 27 | 260 | 7.8 (17.2) |
| Mixed Gas (Ar + 2% O ₂) | 15~20 (0.59~0.78) | 7.7 (303) | 28 | 200 | 3.9 (8.6) |
| | | 8.6 (339) | 28 | 230 | 4.3 (9.5) |
| | | 10.1 (398) | 28 | 260 | 5.1 (11.2) |

SM-430LNb

13%Cr STS(STS 403, STS 410)

Conformances

EN ISO 14343-A G 18LNb

JIS Z3321 YS430LNb

Applications

- Automotive (Exhaust pipe)

Features

- Good bead appearance
- Soft stable arc and low spatter

Welding Position



1G 2F 3G 4G
(PA) (PB) (PF-PG) (PE)

Current

DC +

Shielding Gas

Ar / Ar + O₂

Diameter / Packaging

| Diameter | Spool | | | Pac | | | |
|-------------|---------|----------------|---------------|--------------|----------------|----------------|----------------|
| | mm (in) | 12.5kg (28lbs) | 15kg (33 lbs) | 20kg (44lbs) | 150kg (330lbs) | 200kg (440lbs) | 250kg (551lbs) |
| 0.8 (0.033) | ✓ | | | | | | |
| 0.9 (0.035) | ✓ | | | | | | |
| 1.0 (0.040) | ✓ | | | | | | |
| 1.2 (0.045) | ✓ | | | | | | |
| 1.4 (0.052) | | | | | | | ✓ |
| 1.6 (1/16) | ✓ | | | | | | |