

STARLET DATA SHEET or TECHNICAL DATA



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Standards

TS EN ISO 14172	: E Ni 6182 (mod)(NiCr15Fe6Mn)
EN ISO 14172	: E Ni 6182 (mod)(NiCr15Fe6Mn)
AWS A5.11	: ~E NiCrFe-3

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
min. 360	660-715	40-45	200

Features and Applications

- A high-alloyed nickel based electrode giving weld metal of Inconel-type resistant to cracking and impact at low temperatures
- Excellent result in the production of welding bead subject to various corrosive media and temperatures from -196° to 1000°C
- Mechanical properties of weld is not affected by heat treatment
- High resistance to heat, oxidation and corrosion, also suitable for nickel alloys such as Inconel and Incoloy
- Joint welding of different steels with each other
- Also include cement kiln rings , blast furnace components , chemical containers and liquid gas installations
- It is also used in crack repairing and joint welding

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100020	2.50 x 250	3/32 x 10"	50-60	4	1600
3030100022	3.20 x 300	1/8 x 12"	70-95	5	2850
3030100023	4.00 x 350	5/32 x 14"	90-120	5	5000
3030100024	5.00 x 350	3/16 x 14"	130-160	5	6970

Standards

TS EN ISO 18274	: S Ni 6082
EN ISO 18274	: S Ni 6082
AWS A5.14	: ER NiCr-3

Chemical Composition of Welding Wire % (Typical)

Ni	C	Cr	Mn	Fe	Nb
Rest	0.02	20.0	3.0	4.0	2.5

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
400	650	150 J	40

Typical Base Material Grades

- 2.4816 - 2.4817 - 2.4806 - Alloy 600 - 1.4876 - 1.5662 - 1.5680, 2.4951, 2.4961, 1.4981, 1.4985

Features and Applications

- Especially in welding of Nickel based alloys high temperature and creep resistant steels, problematic steels and dissimilar joints
- Weld metal mechanical properties are resistant to heat treating
- Shielding gas: Ar (MIG and TIG)

Welding Positions



Welding Electrode

STARLET 757 E

Current Type

MIG D.C. (+) / TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)	Package Weight (Kg)
6031100301	1.00 / 0,040"	15
6031100302	1.20 / 0,047"	15
6031100106	1.6 x 1000 / 1/16 x 39"	5
6031100107	2.0 x 1000 / 5/64 x 39"	5
6031100303	2.4 x 1000 / 3/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 18274	: S Ni 6082
EN ISO 18274	: S Ni 6082
AWS A5.14	: ER NiCr-3

Chemical Composition of Welding Wire % (Typical)

Ni	C	Cr	Mn	Fe	Nb
Rest	0.02	20.0	3.0	4.0	2.5

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
400	650	150 J	40

Typical Base Material Grades

- 2.4816 - 2.4817 - 2.4806 - Alloy 600 - 1.4876 - 1.5662 - 1.5680, 2.4951, 2.4961, 1.4981, 1.4985

Features and Applications

- Especially in welding of Nickel based alloys high temperature and creep resistant steels, problematic steels and dissimilar joints
- Weld metal mechanical properties are resistant to heat treating
- Shielding gas: Ar (MIG and TIG)

Welding Positions



Welding Electrode

STARLET 757 E

Current Type

MIG D.C. (+) / TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)	Package Weight (Kg)
6031100301	1.00 / 0,040"	15
6031100302	1.20 / 0,047"	15
6031100106	1.6 x 1000 / 1/16 x 39"	5
6031100107	2.0 x 1000 / 5/64 x 39"	5
6031100303	2.4 x 1000 / 3/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

AWS A5.11 : ~E NiCrFe-3

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ($L_0=5d_0$) (%)	Impact Strength (ISO-V/+20°C)	Impact Strength (ISO-V/-196°C)
min. 380	550	min. 30	min. 70J	min. 50J

Features and Applications

- Nickel based basic type electrode
- Applicability in welding high-temperature steels and low-temperature alloyed or unalloyed steels, Nickel & Ni-alloys, casting steels
- Also include cement kiln rings, blast furnace components, chemical containers and liquid gas installations
- Used for the materials which are difficult to welding
- Electrode has a stabil arc
- The weld metal is resistant to cracking (cracking test results are suitable)
- Weldability in all position especially for vertical upward position (PF)

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)	Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100025	2.50 x 250	70 - 100	5	2640
3030100026	3.20 x 300	80 - 130	5	4620
3030100029	4.00 x 350	130 - 160	5	5420

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3581-A	: E 29 9 R 12
EN ISO 3581-A	: E 29 9 R 12
AWS A5.4	: ~E 312-16

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Ni	Cr
0.12	1.0	0.8	10.5	30.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)
min. 490	700-830	min. 24 J	min. 20

Typical Base Material Grades

DIN: X7Cr13	G-X7Cr13	AISI: 403
X7CrAl13	G-X20Cr14	405
X10CrAl13	G-X10CrMo13	410
X8Cr17	G-X8CrNi13	420
X20Cr13		430
X15Cr13		430Ti
X22CrNi 17		431
X15CrNi13 4		446
	X8Cr1117	

Features and Applications

- Alloyed-unalloyed high-resistant steels, Cr and Mn steels, joint welding of tool steels and different steels and repair welding of sprockets and wheelshaft
- Weld metal is resistant to corrosions, cracks and rust
- Requirement of re-drying for min. 2 hours at the temperatures between 120°C and 200°C

Welding Positions



Current Type

D.C.(+) / A.C.

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010101208	2.50 x 250	3/32 x 10"	50 - 80	1260
3010101213	3.20 x 300	1/8 x 1 2"	80 - 110	2470
3010101218	3.20 x 350	1/8 x 14"	80 - 110	2890
3010101223	4.00 x 350	5/32 x 14"	110 - 160	4470

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 17633-A	: T W 29 9 M21/C1 1
EN ISO 17633-A	: T W 29 9 M21/C1 1
AWS A5.22	: E312 T1-1/-4

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni
0.12	0.40	1.30	29.5	9.5

Mechanical Properties - (Typical): (With M21 gas)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-60°C)	Elongation ((L ₀ =5d ₀) (%))
min 490	700 - 830	min 24 J	20

Typical Base Material Grades

- High-strength unalloyed and heat-treatable steels, ferritic Cr and austenitic CrNi steels, austenitic Mn steels, unalloyed tempered steels, tool steels, hard manganese steels, ferritic chromium steels, austenitic nickel-chromium steels, hard-to-weld steels, similar-type austenitic steels, dissimilar metals, joining of corrosion resistant stainless steel with mild or low alloy steels, clad steels. (AISI 403, 405, 410, 420, 430, 430 Ti, 431, 446)

Features and Applications

- S 737 FC (312) is rutile fast freezing type flux cored wire
- Austenitic-ferritic deposit in over-alloyed CrNi steel type 312, with optimised ferrite content for joining dissimilar metals
- Alloyed-unalloyed high-resistant steels, Cr and Mn steels, joint welding of tool steels and different steels and repair welding of sprockets and wheelshafts
- Weld metal is resistant to corrosions, cracks and rust
- Buffering before cladding. Service temperatures from - 60°C to + 350°C
- Shieldin Gas: CO₂ or M21 (Ar 75% - 82%, CO₂ 18% - 25%)

Welding Positions



Current Type

D.C (+) / FCAW

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
6011100256	1.20	0.047"	15	D 300

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G 29 9
EN ISO 14343-A	: G 29 9
TS EN ISO 14343-A	: W 29 9
EN ISO 14343-A	: W 29 9
AWS A5.9	: ER 312

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.12	0.40	1.80	30.0	9.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 450	min. 660	47 J	min. 20

Typical Base Material Grades

DIN: X7Cr13	G-X 7 Cr 13	AISI: 403
X7CrAl13	G-X 20 Cr 14	405
X10CrAl13	G-X 10 Cr Mo 13	410
X 8 Cr17	G-X 8 Cr Ni 13	420
X20Cr13		430
X 15Cr 13		430 Ti
X22CrNi17		431
X15CrNi134		446
X 8 Cr 11 17		

Features and Applications

- Applicability in joint- welding of unalloyed and alloyed high-strength steels, Cr and Mn steels, tool steels, and of different metals
- Resistance to wearing, cracking and corrosion
- Requirement of use of Ar as shielding gas in TIG welding, and Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mix as shield gas in MIG welding

Welding Positions



Current Type

TIG D.C.(-) / MIG D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100153	0,8	0.030"	15	BS 300
6011100343	1	0.040"	15	BS 300
6011100156	1,2	0.047"	15	BS 300
6011100157	1,60 x 1000	1/16 x 39"	5	Plastic Box
6011100344	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100345	2,40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G 29 9
EN ISO 14343-A	: G 29 9
TS EN ISO 14343-A	: W 29 9
EN ISO 14343-A	: W 29 9
AWS A5.9	: ER 312

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.12	0.40	1.80	30.0	9.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)
min. 450	min. 660	47 J	min. 20

Typical Base Material Grades

DIN: X7Cr13	G-X 7 Cr 13	AISI: 403
X7CrAl13	G-X 20 Cr 14	405
X10CrAl13	G-X 10 Cr Mo 13	410
X 8 Cr17	G-X 8 Cr Ni 13	420
X20Cr13		430
X 15Cr 13		430 Ti
X22CrNi17		431
X15CrNi134		446
X 8 Cr 11 17		

Features and Applications

- Applicability in joint- welding of unalloyed and alloyed high-strength steels, Cr and Mn steels, tool steels, and of different metals
- Resistance to wearing, cracking and corrosion
- Requirement of use of Ar as shielding gas in TIG welding, and Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mix as shield gas in MIG welding

Welding Positions



Current Type

TIG D.C.(-) / MIG D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100153	0,8	0.030"	15	BS 300
6011100343	1	0.040"	15	BS 300
6011100156	1,2	0.047"	15	BS 300
6011100157	1,60 x 1000	1/16 x 39"	5	Plastic Box
6011100344	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100345	2,40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3581 - A	: E 29 9 R 12
EN ISO 3581 - A	: E 29 9 R 12
AWS A5.4	: ~E 312-16

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation (L ₀ =5d ₀) (%)	Hardness (HB)
min. 450	790 - 860	20 - 25	250 - 300

Features and Applications

- Include rebuilding gear teeth, repairing cracks in casing, buffering layers and repairs on earth moving and drilling equipment and rebuilding worn shafts
- Materials of low weldability such as unalloyed high carbon steels, low and high alloyed steels, tool steels, high speed steels, manganese hardening steels, rail steels and iron based cast materials
- It is also extremely usefull for repairs where the base metal is unknown grade steels
- High alloyed special manuel electrode for joining a broad range of difficult-to-weld metals including special, austenitic-manganese, air hardening materials for dissimilar joining
- Rutile type austenitic-ferritic electrode containing 29 9 Cr-Ni-Cobalt
- Weld metal hardness increases by work hardening and cold torming
- Depending on the ferrit content suitable for designed for joining difficult-to- weld steels, welding of dissimilar joints and rebuilding or buffering before hardsurfacing

Welding Positions



Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100032	2.50 x 250	3/32 x 10"	40-70	4	1350
3030100034	3.20 x 350	1/8 x 14"	70-100	5	3350
3030100036	4.00 x 350	5/32 x 14"	90-140	5	4500

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3581-A	: E 29 9 R 52
EN ISO 3581-A	: E 29 9 R 52
AWS A5.4	: ~E 312-26

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Ni	Cr	Mo	Cu
0.086	0.630	0.319	9.556	30.48	0.432	0.03

Mechanical Properties

Tensile Strength (N/mm ²)	: 790 - 830
Elongation (Lo=5 do) (%)	: min. 20
Hardness (HB)	: 250 - 340

Typical Base Material Grades

DIN: X7Cr13	G-X7Cr13	AISI: 403
X7CrAl13	G-X20Cr14	405
X10CrAl13	G-X10CrMo13	410
X8Cr17	G-X8CrNi13	420
X20Cr13		430
X15Cr13		430Ti
X22CrNi 17		431
X15CrNi13 4		446
	X8CrTi17	

Features and Applications

- It is used for joining difficult to weld steels, building thick machine parts bridge low and high alloy structural steels, cast steels, roller presses, shaft, extruder screws, coupling boxes and sleeves, joining mechanically welded parts and coating turbine component seats of super heater steam valves and heat exchangers etc.
- Rutile electrode with high deposition rate containing 29 9 Cr-Ni-Cobalt. Suitable for joining and build up welding of materials have tendency to cracking due to their high tensile and impact strength

Welding Positions



Current Type

D.C.(+).

Operating Data

Diameter x Length		Welding Current	Weight
(mm)	(inch)	(A)	g/100 pcs
3.20 x 300	1/8 x 14"	100 – 160	5100
4.00 x 400	5/32 x 14"	140 – 200	7600

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3581 - A	: E 29 9 R 52
EN ISO 3581 - A	: E 29 9 R 52
AWS A5.4	: ~E 312-26

Mechanical Properties

Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
790 - 830	min. 20	220 - 300

Features and Applications

- It is also used for joining difficult-to-weld steels, building thick machine parts, bridge building materials, low and high alloyed structural steels, cast steels, roller presses, extruder screws, cuppling boxes and sleeves, joining mechanically welded parts and coating turbine components, seats of super heater steam valves and heat exchangers, etc
- Rutile electrode with high deposition rate containing 29.9 Cr-Ni-Cobalt. Suitable for joining and build up welding of materials have tendency to cracking due to their high tensile and impact strength

Welding Positions



Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100030	3.20 X 350	1/8 X 14"	100-160	5	5100
3030100031	4.00 X 350	5/32 X 14"	140-200	5	7600

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G 18 8 Mn / W 18 8 Mn
EN ISO 14343-A	: G 18 8 Mn / W 18 8 Mn
AWS A5.9	: ~ER 307

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni
0.08	0.9	7.0	19.2	9.0

Mechanical Properties - (Typical): (With M21 gas)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
Min. 370	580 – 750	Min. 63 J	Min. 30

Features and Applications

- Filler welding of high-strength low-alloyed and alloyed heat-treatable steels, armor steels, steels including 14% Mn, ferritic chromium steels, heat-resistant steels, non-magnetic steels, etc.
- Joint welding of different types of steel with each other
- Filler welding of abrasion-resistant steels for valves and turbines
- As shielding gas, argon is used at TIG welding, where as Ar+CO₂ or mixed gas is used at MIG welding

Welding Positions



Current Type

TIG D.C. (-)

MIG D.C. (+)

Operating Data

Diameter x Length		Weight
(mm)	(inch)	(Kg)
1.6 x 1000	1/16 x 39"	5
2.0 x 1000	5/64 x 39"	5
2.4 x 1000	3/32 x 39"	5
0.8	0.030"	12.5
1.0	0.040"	15
1.2	0.047"	15

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G 18 8 Mn
EN ISO 14343-A	: G 18 8 Mn
TS EN ISO 14343-A	: W 18 8 Mn
EN ISO 14343-A	: W 18 8 Mn
AWS A5.9	: ~ER 307

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.08	0.9	7.0	19.2	9.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 370	580 - 750	min. 63 J	min. 30

Features and Applications

- Filler welding of high-strength low-alloyed and alloyed heat-treatable steels, armor steels, steels including 14 % Mn, ferritic chromium steels, heat-resistant steels, non-magnetic steels etc.
- Joint welding of different types of steels with each other
- Filler welding of abrasion-resistant steels for valves and turbines
- As shielding gas, Argon is used at TIG welding, where as Ar+ % 2.5 O₂ or Ar+ % 2.5 CO₂ mixed gas is used at MIG welding

Welding Positions



Current Type

MIG DC(+) / TIG DC(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100313	0,8	0.030"	12.5	BS 300
6011100381	1	0.040"	15	BS 300
6011100314	1,2	0.047"	15	BS 300
6011100312	1,6	0.062"	15	BS 300
6011100315	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100316	2,40 x 1000	3/32 x 39"	5	Plastic Box
6011100317	3,20 x 1000	1/8 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G 18 8 Mn
EN ISO 14343-A	: G 18 8 Mn
TS EN ISO 14343-A	: W 18 8 Mn
EN ISO 14343-A	: W 18 8 Mn
AWS A5.9	: ~ER 307

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.08	0.9	7.0	19.2	9.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 370	580 - 750	min. 63 J	min. 30

Features and Applications

- Filler welding of high-strength low-alloyed and alloyed heat-treatable steels, armor steels, steels including 14 % Mn, ferritic chromium steels, heat-resistant steels, non-magnetic steels etc.
- Joint welding of different types of steels with each other
- Filler welding of abrasion-resistant steels for valves and turbines
- As shielding gas, Argon is used at TIG welding, where as Ar+ % 2.5 O₂ or Ar+ % 2.5 CO₂ mixed gas is used at MIG welding

Welding Positions



Current Type

MIG DC(+) / TIG DC(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100313	0,8	0.030"	12.5	BS 300
6011100381	1	0.040"	15	BS 300
6011100314	1,2	0.047"	15	BS 300
6011100312	1,6	0.062"	15	BS 300
6011100315	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100316	2,40 x 1000	3/32 x 39"	5	Plastic Box
6011100317	3,20 x 1000	1/8 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 17633-A	: T 18 8 Mn P M21/C1 1
EN ISO 17633-A	: T 18 8 Mn P M21/C1 1
AWS A5.22	: E307T1-1/-4 (mod.)

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni
0.10	0.70	6.00	19.0	9.0

Mechanical Properties - (Typical): (With M21 gas)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
480	630	50 J	40

Typical Base Material Grades

- High-strength low alloyed and alloyed heat-treatable steels, armor steels, steels including 14 % Mn, ferritic chromium steels, heat-resistant steels, non-magnetic steels, dissimilar joints and repair welding.

Features and Applications

- STARLET 717 FC is rutile fast freezing type flux cored wire
- Work-hardening austenitic deposit in CrNiMn steel modified type 307
- Dissimilar joint , welding of steels of unknown types, armouring steels, buffering joining of 14 %Mn austenitic steels
- Service temperatures from -120°C to +300°C
- Shielding Gas: CO₂ or M21

Welding Positions



Current Type

D.C (+)

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
6011100006	1.20	0.047"	15	D 300

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: W 23 12 L
EN ISO 14343-A	: W 23 12 L
AWS A5.9	: ER 309 L

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.03	0.45	1.80	23.5	13.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 320	min. 520	min. 47 J	min. 30

Typical Base Material Grades

- Ferritic Cr and austenitic CrNi steels, austenitic manganese steels, unalloyed high strength steels, high temperature steels

Features and Applications

- Applicability on ferritic Cr or austenitic CrNi steels, austenitic manganese steels, unalloyed high-strength steels, heat-treated steels
- Usability in welding austenitic stainless steels, in joint-welding of different kinds of metals, in buffer layers, in joint-welding of corrosion-resistant stainless steels to each other or to low-alloyed steels, and in welding coated steels
- Requirement of use of Ar as shielding gas

Welding Positions



Current Type

TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100333	1.6 x 1000	1/16 x 39"	5	Plastic Box
6011100334	2.0 x 1000	5/64 x 39"	5	Plastic Box
6011100335	2.4 x 1000	3/32 x 39"	5	Plastic Box
6011100396	3.2 x 1000	1/8 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: W 23 12 L
EN ISO 14343-A	: W 23 12 L
AWS A5.9	: ER 309 L

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.03	0.45	1.80	23.5	13.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 320	min. 520	min. 47 J	min. 30

Typical Base Material Grades

- Ferritic Cr and austenitic CrNi steels, austenitic manganese steels, unalloyed high strength steels, high temperature steels

Features and Applications

- Applicability on ferritic Cr or austenitic CrNi steels, austenitic manganese steels, unalloyed high-strength steels, heat-treated steels
- Usability in welding austenitic stainless steels, in joint-welding of different kinds of metals, in buffer layers, in joint-welding of corrosion-resistant stainless steels to each other or to low-alloyed steels, and in welding coated steels
- Requirement of use of Ar as shielding gas

Welding Positions



Current Type

MIG DC(+) / TIG DC(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100313	0,8	0.030"	12.5	BS 300
6011100381	1	0.040"	15	BS 300
6011100314	1,2	0.047"	15	BS 300
6011100312	1,6	0.062"	15	BS 300
6011100315	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100316	2,40 x 1000	3/32 x 39"	5	Plastic Box
6011100317	3,20 x 1000	1/8 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 17633-A	: T 23 12 L P M21/C1 1
EN ISO 17633-A	: T 23 12 L P M21/C1 1
AWS A5.22	: E309L T1-1/4

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni
0.03	0.70	1.40	23.5	13.0

Mechanical Properties - (Typical): (With M21 gas)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-60°C)	Elongation ((L ₀ =5d ₀) (%))
460	580	40 J	35

Typical Base Material Grades

- High-strength unalloyed and heat-treatable steels, ferritic Cr and austenitic CrNi steels, austenitic Mn steels, unalloyed tempered steels, tool steels, hard manganese steels, ferritic chromium steels, austenitic nickel-chromium steels, hard-to-weld steels, similar-type austenitic steels, dissimilar metals, joining of corrosion resistant stainless steel with mild or low alloy steels, clad steels.

Features and Applications

- STARLET 373 FC is rutile fast freezing type flux cored wire
- Austenitic-ferritic deposit in over-alloyed CrNi steel type 309L, with optimised ferrite content for joining dissimilar metals
- Joining of steels with similar compositions and joining carbon steels to Stainless steels
- Buffering before cladding. Service temperatures from - 60°C to + 350°C
- Shieldin Gas: CO₂ or M21

Welding Positions



Current Type

D.C (+)

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
6011100256	1.20	0.047"	15	D 300

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3581-A	: E 19 9 L R 32
EN ISO 3581-A	: E 19 9 L R 32
AWS A5.4	: E 308 L- 16

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Ni	Cr
0.03	0.8	0.9	10.5	20.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)
min. 355	520 - 660	min. 47 J	min. 35

Typical Base Material Grades

- X2CrNi 19 11, X5CrNi 18 10, X6CrNiTi 18 10, X6CrNiNb 18 10, X2CrNiN 18 10, X10CrNiNb 18 10, X12CrNi 18 8, 304 L, 304 LN, 321, 347, 302

Features and Applications

- Rutile-coated low-carbon electrode for use in chemical, petrochemical and food industries where similar steel types, including higher carbon grades as well as ferritic 13% -Cr steels are welded. Resistant to corrosion and cracks. Working temperatures up to +350°C
- Requirement of Re-drying for min. 2 hours at the temperatures between 120°C and 200°C

Welding Positions



Current Type

D.C.(+) / A.C

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010100963	2.50 x 250	3/32 x 10"	50 - 90	1500
3010100968	3.20 x 300	1/8 x 12"	80 - 120	2930
3010100973	3.20 x 350	1/8 x 14"	80 - 120	3510
3010100978	4.00 x 350	5/32 x 14"	110 - 160	5100

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: W 19 9 L
EN ISO 14343-A	: W 19 9 L
AWS A5.9	: ER 308 L

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.02	0.5	1.7	20.1	9.8

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 390	540 - 660	min. 63 J	min. 35

Typical Base Material Grades

- X2CrNi 19 11, X5CrNi 18 10, X6CrNiTi 18 10, X6CrNiNb 18 10, X2CrNiN 18 10, X10CrNiNb 18 10
- AISI & ASTM: 304, 304L, 304LN, 347, 321, A320Gr.B8C, A320Gr.B8D

Features and Applications

- TIG welding of 13% Cr ferritic stainless steels, high-carbon steels of type 304, or stabilized steels of type 347, or steels of similar qualities, all of which used in drug, cellulose, paper and food (production) industries
- The shielding gas is Argon (Ar).
- Maintenance of ductile behavior at temperature values down to -196°C
- Maintenance of resistance against intergranular corrosion at temperatures up to 400°C

Welding Positions



Current Type

TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100326	1.6 x 1000	1/16 x 39"	5	Plastic Box
6011100327	2.0 x 1000	5/64 x 39"	5	Plastic Box
6011100328	2.4 x 1000	3/32 x 39"	5	Plastic Box
6011100329	3.2 x 1000	1/8 x 39"	5	Plastic Box

Approvals: GOST-R, SEPPO

Standards

TS EN ISO 17633-A	: T 19 9 L P M21/C1 1
EN ISO 17633-A	: T 19 9 L P M21/C1 1
AWS A5.22	: E 308 L T1-1/-4

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni
0.03	0.70	1.40	20.0	10.5

Mechanical Properties - (Typical): (With M21 gas)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-196°C)	Elongation ((Lo=5d _o) (%))
460	620	34 J	36

Typical Base Material Grades

- (1.4306) X2CrNi19-11, (1.4301) X5CrNi18-10, (1.4311) X2 CrNiN 18-10, (1.4312) GX10CrNi18-8)
- AISI 304-304L-304LN, 302, 321-347, ASTM: A 157, Gr C9, A 320 Gr B8C or D

Features and Applications

- Rutile type, rapid hardening flux cored wire
- Weld metal structure is austenitic (CrNi alloyed, 308 type)
- Used in pharmaceutical, paper and food industry
- Ferritic stainless steel, high carbon 304 and stabilized 347 grades can be welded this wire
- Weld metal has resisting between -196°C and 400°C service temperature
- Shielding Gas: CO₂ or M21

Welding Positions



Current Type

FCAW / D.C (+)

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
6011100255	1.20	0.047"	15	D 300

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: W Z 19 12 3 L
EN ISO 14343-A	: W Z 19 12 3 L
AWS A5.9	: ER 316 L

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Mo	Cr	Ni
0.02	0.5	1.6	2.2	18.5	11.5

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 420	570 - 700	min. 63 J	min. 30

Typical Base Material Grades

- X2 CrNiMo 1814 3, XS CrNiMo 1713 3, X2 CrNiMo 1713 2, XS CrNiMoTi 1712 2, X6 CrNiMoTi 1712 2, X6 CrNiMoNb 1712 2, X2 CrNiMoN 1713 3, X2 CrNiMoN 1712 2
- AISI: 316, 316L, 316Cb, 316Ti

Features and Applications

- TIG welding of 13% Cr ferritic stainless steels, high-carbon or stabilized steels of type 316, low-carbon stainless steels of type 316 L, all of which are used in machinery and equipment parts at production plants for food, chemical, drug textile and similar kinds of industries
- As shielding gas, Argon (Ar) is used
- Maintenance of resistance to intergranular corrosion at temperature valves up to 400°C.
- Resistance to low temperatures varying at values down to -196°C

Welding Positions



Current Type

TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100351	1,60 x 1000	1/16 x 39"	5	Plastic Box
6011100400	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100352	2,40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO17633-A	: T Z 19 12 3 L P M21/C1 1
EN ISO 17633-A	: T Z 19 12 3 L P M21/C1 1
AWSAS.22	: E316LT1-1/-4

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni	Mo
0.03	0.80	1.40	19.0	12.0	2.10

Mechanical Properties - (Typical): (With M21 gas)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-110°C)	Elongation ((Lo=5d _o) (%))
490	600	35 J	32

Typical Base Material Grades

- (1.4401) X5CrNiMo 17-12-2 , (1.4404) X2CrNiMo 17-12-2 , (1.4435) X2CrNiMo 18-14-3 , (1.4436) X3 CrNiMo 17- 13-3, (1.4571) X6 CrNiMoTi 17-12-2 , (1.4580) X6 CrNiMoNb 17-12-2, (1.4583) X10 CrNiMoNb 18-12, (1.4409) GX2 CrNiMo 19-11-2
- AISI 316 L, 316 Ti, 316 Cb

Features and Applications

- Rutile type, rapid hardening flux cored wire
- Weld metal microstructure is austenite (CrNiMo alloyed, 316 type)
- Used in welding of high carbon and stabilized 316 grade steels, low carbon 316 L grade stainless steels, food, pharmaceutical, chemical dye and machinery and equipment industries
- Weld metal has resisting between -110°C and 400°C service temperature
- Shielding Gas: CO₂ or M21

Welding Positions



Current Type

FCAW / D.C (+)

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
6011100257	1.20	0.047"	15	D 300

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G Z 19 12 3 L Si
EN ISO 14343-A	: G Z 19 12 3 L Si
AWS A5.9	: ER 316 LSi

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni	Mo
0.02	0.80	1.6	18.5	11.5	2.2

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 400	550 - 700	min. 63 J	min. 30

Typical Base Material Grades

- X2 CrNiMo 1814 3, X5 CrNiMo 17 13 3, X2 CrNiMo 1713 2, , X5 CrNiMo 1712 2, X6 CrNiMoTi 17 12 2, X6 CrNiMoNb 17 12 2, X2 CrNiMoN 1713 3, X2 CrNiMoN 1712 2
- AISI: 316, 316Cb, 316L, 316Ti

Features and Applications

- MIG welding of 13% ferritic stainless steels, high-carbon or stabilized stainless steels of type 316 and low carbon stainless steels of type 316 L, used in machinery and equipment parts of production plants for food, chemical, drug, textile and similar kinds of industries
- As shielding gas, Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mixed gas is used
- Maintenance of resistance to intergranular corrosion at temperature values up to 400°C.
- Resistance to low temperatures varying at values down to -196°C

Welding Positions



Current Type

MIG D.C.(+)

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
6011100348	0,8	0.030"	12.5	BS 300
6011100398	1	0.040"	15	BS 300
6011100349	1,2	0.047"	15	BS 300
6011100350	1,6	0.062"	15	BS 300

Approvals: GOST-R, SEPRO

Standards

AWS A5.22	: R316LT1-5
JIS Z 3323	: TS316L-R1

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Ni	Mo
0.03	0.5-2.5	1.2	17-20	11-14	2-3
P		S		Cu	
0.04		0.03		0.75	

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))
-	485	30

Features and Applications

- STARLET 323TGX is applicable for 316 and 316L type steels
- The main component is low carbon 18%Cr-12%Ni-2%Mo
- In order to avoid defects, TGX filler rod must be moved quickly at short pitch, unlike TIG filler rod
- Suitable for base welding of 18%Cr-12%Ni-2%Mo stainless steel SUS316L, etc. in petrochemical, pressure vessels, cryogenic storage tanks, fertilizer, urea, and food machinery industries
- The back side of the weld does not need to be protected by argon gas, it can be welded in all positions, the back side is well formed, and the welding slag on the back side is easy to fall off.
- Stainless steel general and architectural fabrication.

Welding Positions



Current Type

AC / DC.(+)

Operating Data

Diameter (mm)	2.2
Length (mm)	1000

Standards

TS EN ISO 14343-A	: G 25 20
EN ISO 14343-A	: G 25 20
TS EN ISO 14343-A	: W 25 20
EN ISO 14343-A	: W 25 20
AWS A5.9	: ER 310

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.12	0.5	1.6	25.0	20.5

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 350	550 - 720	min. 63 J	min. 30

Typical Base Material Grades

- X15CrNiSi 25 20, X12CrNi 25 21, X15CrNi 20 12, G-X15CrNi 25 20, G-X40 CrNi 25 21, X10CrAl 7, X10CrAl 18, X10CrAl 24, 305, 310, 314, A297 HF, A297 HJ

Features and Applications

- Applicability in cement and ceramic industries, in manufacturing processes of industrial furnaces, oil refineries, in welding of steel and steel castings used in steam boiler manufacturing
- Suitability of weld metal for use at temperatures between -196°C and 1200°C
- Suitability for both TIG and MIG welding
- Requirement of use of Ar as shielding gas in TIG welding, and of Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mixed gas as shielding in MIG welding

Welding Positions



Current Type

TIG D.C.(-) / MIG D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100402	0,8	0.030"	12.5	BS 300
6011100338	1	0.040"	15	BS 300
6011100374	1,2	0.047"	15	BS 300
6011100339	1,60 x 1000	1/16 x 39"	5	Plastic Box
6011100340	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100341	2,40 x 1000	3/32 x 39"	5	Plastic Box
6011100342	3,20 x 1000	1/8 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G 25 20
EN ISO 14343-A	: G 25 20
TS EN ISO 14343-A	: W 25 20
EN ISO 14343-A	: W 25 20
AWS A5.9	: ER 310

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni
0.12	0.5	1.6	25.0	20.5

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 350	550 - 720	min. 63 J	min. 30

Typical Base Material Grades

- X15CrNiSi 25 20, X12CrNi 25 21, X15CrNi 20 12, G-X15CrNi 25 20, G-X40 CrNi 25 21, X10CrAl 7, X10CrAl 18, X10CrAl 24, 305, 310, 314, A297 HF, A297 HJ

Features and Applications

- Applicability in cement and ceramic industries, in manufacturing processes of industrial furnaces, oil refineries, in welding of steel and steel castings used in steam boiler manufacturing
- Suitability of weld metal for use at temperatures between -196°C and 1200°C
- Suitability for both TIG and MIG welding
- Requirement of use of Ar as shielding gas in TIG welding, and of Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mixed gas as shielding in MIG welding

Welding Positions



Current Type

TIG D.C.(-) / MIG D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100402	0,8	0.030"	12.5	BS 300
6011100338	1	0.040"	15	BS 300
6011100374	1,2	0.047"	15	BS 300
6011100339	1,60 x 1000	1/16 x 39"	5	Plastic Box
6011100340	2,00 x 1000	5/64 x 39"	5	Plastic Box
6011100341	2,40 x 1000	3/32 x 39"	5	Plastic Box
6011100342	3,20 x 1000	1/8 x 39"	5	Plastic Box

Standards

TS EN ISO 3581 - A	: E Z 13 B 62
EN ISO 3581 - A	: E Z 13 B 62
AWS A5.4	: E 410 - 25 (mod.)

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))
740	950 - 1100	min. 15

Features and Applications

- The application, of cavitation resistancy, bulid up welding on parts working in water, stream and seawater, Hydroelectric power plants and turbine blades,propellersparts
- Basic type high recovery electrode for use in joint welding and build up welding application to 12-14 % Cr ferritic-martensitic stainless steel and cast steels
- It is for build up welding on impermeable surfaces of gas, water and stream armatures of unalloyed and low alloyed steels for service temperatures up to 450°C

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100046	2.50 x 350	3/32 x 14"	60-90	4	2510
3030100047	3.20 x 350	1/8 x 14"	90-120	5	3700
3030100048	4.00 x 350	5/32 x 14"	110-160	5	5540
3030100049	5.00 x 350	3/16 x 14"	150-1 90	5	6970

Standards

TS EN ISO 14343-A	: G/W 13
EN ISO 14343-A	: G/W 13
AWS A5.9	: ER 410

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr
0.10	0.35	0.50	13.0

Mechanical Properties (MIG)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Heat Treatment
min. 250	min. 520	min. 20	840 °C - 870 °C/2h

Typical Base Material Grades

- X 6 CrTi 17, X 20 CrNi 17 2, 431, 430 Ti
- AISI: 431, 430Ti

Features and Applications

- Preferred use in formation of surfaces resistant to corrosion, wear, and heat.
- Maintained hardness at temperatures of up to 500°C
- Resistance to formation of oxide layers at temperatures up to 900°C
- Required use of Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mixed gas as shielding gas
- For TIG; Ar gas as shielding

Welding Positions



Current Type

MIG D.C. (+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100365	1.0	0.040"	15	BS 300
6011100375	1.2	0.047"	15	BS 300
6011100196	2.40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G/W 13
EN ISO 14343-A	: G/W 13
AWS A5.9	: ER 410

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr
0.10	0.35	0.50	13.0

Mechanical Properties (MIG)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Heat Treatment
min. 250	min. 520	min. 20	840 °C - 870 °C/2h

Typical Base Material Grades

- X 6 CrTi 17, X 20 CrNi 17 2, 431, 430 Ti
- AISI: 431, 430Ti

Features and Applications

- Preferred use in formation of surfaces resistant to corrosion, wear, and heat.
- Maintained hardness at temperatures of up to 500°C
- Resistance to formation of oxide layers at temperatures up to 900°C
- Required use of Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mixed gas as shielding gas
- For TIG; Ar gas as shielding

Welding Positions



Current Type

MIG D.C. (+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100365	1.0	0.040"	15	BS 300
6011100375	1.2	0.047"	15	BS 300
6011100196	2.40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3581-A: E 20 25 5 Cu N L R 32
EN ISO 3581-A : E 20 25 5 Cu N L R 32
AWS A5.4 : E 385 -16

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Mo	Ni	Cr	Cu
<0.03	0.75	1.0	4.5	25.0	20.0	1.5

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)
min. 400	550-700	min. 47 J	min. 30

Typical Base Material Grades

- EN & DIN: X5NiCrMoCuNb 20 18, X5NiCrMoCuTi 20 18, X2NiCrMoCu 25 20 5, X5NiCrMoCuNb 22 18, G-X7CrNiMoCuNb 18 18, G-X7NiCrMoCuNb 25 20
- AISI: 317L, 904L

Features and Applications

- Resistant to intercrystalline corrosion / wet corrosion up to 350°C
- High corrosion resistance similar to that of matching steels / cast steel grades, above all in reducing environments
- For joining and surfacing work on matching austenitic CrNiMoCu steels/cast steel grades
- For joining these types of steels with unalloyed / low alloy steels / cast steel grades
- Re-drying: 120°C - 200°C / min. 2h

Welding Positions



Current Type

D.C.(+) / A.C.

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010101428	2.50 x 250	3/32 x 10"	50 - 90	1570
3010101433	3.20 x 350	1/8 x 14"	80 - 120	3470
3010101438	4.00 x 350	5/32 x 14"	110 - 160	5200

Standards

TS EN ISO 14343-A: E 25 20 5 Cu L
EN ISO 14343-A : E 25 20 5 Cu L
AWS A5.9 : ER385

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Mo	Ni	Cr	Cu
0.0008	0.35	1.9	4.31	25.0	20.0	1.4

Mechanical Properties

~650n/mm	>490	>35	>100 (ISO-V)
UTS n/mm	YIELD 0.2%	ELONG A5%	Impact (J) – 196%

Typical Base Material Grades

- UNS S 31703. N 08904. Werkstoffe No. 1.4563, 1.4539.
- Creusot Loire Uranus B28, B6, Sanicro 28.

Features and Applications

- MIG/TIG Filler wire for the joining and overlay of Stainless Steels of similar composition (904L). Due to its alloy composition, high Mo-content and Cu, the weld metal is suited against attacks by phosphoric and sulphuric acids, it shows a high resistance against pitting and stress corrosion in chloride containing media.

Welding Instructions

- Shielding gas MIG <3%, 2% Argon-Ox or proprietary special gas. TIG 100% Argon. Do not allow the base material to overheat, maintain interpass temperature below 150°C.

Operating Data

	Diameter (mm)			Packaging
MIG	0.8	1.0	1.2	15kg Spools
TIG	1.6	2.4	3.2	5kg Tubes

Standards

TS EN ISO 14343-A	: G/W 17
EN ISO 14343-A	: G/W 17
AWS AS.9	: ER 430

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr
0.05	0.40	0.40	17.0

Mechanical Properties (MIG)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Heat Treatment
min. 300	min. 450	min. 20	760 - 790°C /2h

Typical Base Material Grades

- X 6 CrTi 17, X 20 CrNi 17 2
- AISI: 431, 430Ti

Features and Applications

- Applicability in surfacing to provide resistance to corrosion, wearing, and heat
- Requirement of use of for MIG : Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mix gas as shielding
- For TIG : Ar gas as shielding

Welding Positions



Current Type

MIG D.C.(+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100403	1.0	0.040"	15	BS 300
6011100366	1.2	0.047"	15	BS 300
6011100376	1.6	0.062"	15	BS 300
6011100367	2.40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: G/W 17
EN ISO 14343-A	: G/W 17
AWS AS.9	: ER 430

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr
0.05	0.40	0.40	17.0

Mechanical Properties (MIG)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Heat Treatment
min. 300	min. 450	min. 20	760 - 790°C /2h

Typical Base Material Grades

- X 6 CrTi 17, X 20 CrNi 17 2
- AISI: 431, 430Ti

Features and Applications

- Applicability in surfacing to provide resistance to corrosion, wearing, and heat
- Requirement of use of for MIG : Ar+ %2.5 O₂ or Ar+ %2.5 CO₂ mix gas as shielding
- For TIG : Ar gas as shielding

Welding Positions



Current Type

MIG D.C.(+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100403	1.0	0.040"	15	BS 300
6011100366	1.2	0.047"	15	BS 300
6011100376	1.6	0.062"	15	BS 300
6011100367	2.40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3581-A	: E 22 9 3 N L R 32
EN ISO 3581-A	: E 22 9 3 N L R 32
AWS A5.4	: E 2209 - 17

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Mo	Ni	Cr	N
0.03	0.5	0.9	2.7	10.0	22.0	0.12

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)
min. 520	690-850	min. 47 J	min. 20

Typical Base Material Grades

- X2CrNiMoN22-5-3, X2CrNiMoN23-4, X2CrNiMoN22-5-3 with X2CrNiMoNb18-12, X2CrNiMoN22-5-3 with P235GH/ P265GH, S255N, P295GH, S355N, 16Mo3

Features and Applications

- Applicability in welding duplex steels
- Suitability to joint- and surfacing applications of similar-type austenitic steels and cast steels
- Electrode coating of rutile character
- Excellent weldability
- Very high resistance to stress corrosion cracking and to corrosion at particularly chlorious and sulphurous media
- In the liquid conditions at chemical industry, serviceability at temperatures of values up to 280°C
- Re-drying : 250°C - 300°C / min. 2h

Welding Positions



Current Type

D.C.(+) / A.C.

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010101533	2.50 x 250	3/32 x 10"	50 - 90	1410
3010101538	3.20 x 350	1/8 x 14"	80 - 120	3540
3010101543	4.00 x 350	5/32 x 14"	110 - 160	5200

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: W 22 9 3 N L
EN ISO 14343-A	: W 22 9 3 N L
AWS A5.9	: ER 2209

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni	Mo	N
0.02	0.40	1.70	22.80	7.80	2.90	0.15

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Impact Strength (ISO-V/-46°C)
550	700	28	100 J

Typical Base Material Grades

- SAE 2209, SAE 2205, EN14462, X2CrNiMoN22-5-3, X2CrNiN23-4, X2CrNiMoN22-5-3 with X10CrNiMoNb18- 12 and X2CrNiMoN22-5-3 with P235GH/ P265GH, S255N, P295GH, S355N and 16Mo3 combinations, UNS S31803, S32205.

Features and Applications

- STARLET S393T is duplex stainless steel TIG Welding rod contains low Carbon and approximate %22Cr, %9Ni and %3Mo
- Microstructure is Austenite + Ferritic
- The weld metal has an excellent resistance to stress corrosion, cracking and pitting
- The use of this welding rod, pipe and general manufacturing industries, offshore applications, oil, gas, chemical and petrochemical industry
- Shielding gas: TIG; pure Ar or Ar+%1-2N₂ mix gases can be used

Welding Positions



Current Type

MIG D.C. (+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100308	1,2	0.047"	15	BS 300
6011100309	2.00 x 1000	5/64 x 39"	5	Plastic Box
6011100310	2.40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: W 22 9 3 N L
EN ISO 14343-A	: W 22 9 3 N L
AWS A5.9	: ER 2209

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni	Mo	N
0.02	0.40	1.70	22.80	7.80	2.90	0.15

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Impact Strength (ISO-V/-46°C)
550	700	28	100 J

Typical Base Material Grades

- SAE 2209, SAE 2205, EN14462, X2CrNiMoN22-5-3, X2CrNiN23-4, X2CrNiMoN22-5-3 with X10CrNiMoNb18- 12 and X2CrNiMoN22-5-3 with P235GH/ P265GH, S255N, P295GH, S355N and 16Mo3 combinations, UNS S31803, S32205.

Features and Applications

- STARLET 393 M is duplex stainless steel TIG Welding rod contains low Carbon and approximate %22Cr, %9Ni and %3Mo
- Microstructure is Austenite + Ferritic
- The weld metal has an excellent resistance to stress corrosion, cracking and pitting
- The use of this welding rod, pipe and general manufacturing industries, offshore applications, oil, gas, chemical and petrochemical industry
- Shielding gas: TIG; pure Ar or Ar+%1-2N₂ mix gases can be used

Welding Positions



Current Type

MIG D.C. (+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100308	1,2	0.047"	15	BS 300
6011100309	2.00 x 1000	5/64 x 39"	5	Plastic Box
6011100310	2.40 x 1000	3/32 x 39"	5	Plastic Box

Standards

TS EN ISO 17633-A	: T 22 9 3 N L P M21/C 1 1
EN ISO 17633-A	: T 22 9 3 N L P M21/C 1 1
AWS A5.22	: E 2209 T1-1/-4

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni	Mo	N
0.03	0.80	1.40	23.0	9.0	3.20	0.14

Mechanical Properties - (Typical): (With M21 gas)

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-60°C)	Elongation (L ₀ =5d ₀) (%)
630	780	32 J	28

Typical Base Material Grades

- (1.4462) X2CrNiMoN 22-5-3, (1.4362) X2 CrNiN 23-4, UNS S31803, S32205, J92295, S31500, S32304, S32404

Features and Applications

- Rutile type and rapid hardening flux cored wire
- Weld metal microstructure is austenite - ferritic
- The weld metal has an excellent resistance to stress corrosion, cracking and pitting
- Used in duplex stainless steel and similar materials
- Shielding Gas: CO₂ or M21

Welding Positions



Current Type

FCAW / D.C (+)

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
6011100254	1.20	0.047"	15	D 300

Approvals: GOST-R, SEPRO

Standards

TS 9463 EN ISO 1071	: E C Ni-CI 1
EN ISO 1071	: E C Ni-CI 1
AWS A5.15	: E Ni-CI

Mechanical Properties

Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
240-300	min. 5	~170 HB

Features and Applications

- Low-heat-input manual electrode for joining old cast iron
- Electrode with pure nickel core for assembly and suriacing of broken or worn parts made of grey cast iron, also for reclamation of casting defects and for welding grey cast iron to steel
- Ni-cast electrode can be machinable by cutting tools
- Before welding large sections, preheating is usefull
- Depending on quality of cast iron post weld may be needed
- Ensure that all areas to be welded are free from contaminant, remove casting defects such as sand inclusions, oil, damages of fatigue base material
- Controllable weld pool, excellent bonding, easy slag removal, dense, homogeneous and porosity-free deposit

Welding Positions



Current Type

D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)	Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100004	2.50 x 300 3/32 x 12"	60 - 90	5	1830
3030100006	3.20 x 300 1/8 x 12"	90 - 120	5	2840
3030100008	4.00 x 350 5/32 x 14"	120 - 150	5	5150

Standards

TS 9463 EN ISO 1071	: E C Ni-CI 1
EN ISO 1011	: E C Ni-CI 1
AWS A5.15	: E Ni-CI

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
285	335	min. 5	~180

Features and Applications

- Barium free (contain minimal emission for the environment), Non-conductive (better safety), basic graphite coated electrode with a nickel core wire
- Repair welding of problematic cast iron parts of irregular shapes
- Joint welding of cast iron parts and cast iron parts to steel parts
- Pre-heating to 200°C is recommended for thick-walled components
- Welding in short runs and preening are required

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3030100009	3.20 x 300	1/8 x 12"	100 - 130	2840

Approvals: GOST-R, SEPRO

Standards

TS 9463 EN ISO 1071	: E C NiFe-CI 1
EN ISO 1071	: E C NiFe-CI 1
AWS A5.15	: E NiFe-CI

Mechanical Properties

Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
450	min. 10	~190 HB

Features and Applications

- Include machine bases, pump casing, gear housing, gear boxes, engine blocks, compressors, machine frames, dies, flanges, tables, levers and generators
- Low-heat-input manuel electrode for repair and maintenance of cast iron and for joining cast iron with steels or copper alloys. Its excellent weldability makes it easy to use in position.
- It also suitable for joining and building cast irons
- Weld deposit can be machinable by cutting tools
- It has high tensile strength and ductility and nodular graphite deposit resists to cracking
- For semi-hot and cold welding technique of parts made of grey cast iron, malleable cast iron or nodular graphite cast iron, some nickel and copper alloys such as housing and frames of machinery, subject to dynamic and heavy load

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100012	2.50 x 250	3/32 x 10"	60 - 90	4	1560
3030100014	3.20 x 350	1/8 x 14"	80 - 120	5	3100
3030100016	4.00 x 350	5/32 x 14"	120 - 150	5	1560

Standards

TS 9463 EN ISO 1071	: E C NiFe-CI 1
EN ISO 1071	: E C NiFe-CI 1
AWS A5.15	: E C NiFe-CI

Mechanical Properties

Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
450	min. 10	~190 HB

Features and Applications

- Include machine bases, pump casing, gear housing, gear boxes, engine blocks, compressors, machines frames, dies, flanges, tables, levers and generators
- Low-heat-input manuel electrode for repair and maintenance of cast iron and for joining cast iron with steels or copper alloys. Its excellent weldability makes it easy to use in position.
- It also suitable for joining and building cast irons
- Weld deposit can be machinable by cutting tools
- It has high tensile strength and ductility and nodular graphite deposit resists to cracking
- For semi-hot and cold welding technique of parts made of grey cast iron , malleable cast iron or nodular graphite cast iron, some nickel and copper alloys such as housing and frames of machinery, subject to dynamic and heavy load
- Weld metal recovery is more than 100 %

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100017	3.20 x 350	1/8 x 14"	80 - 120	5	3100
3030100018	4.00 x 350	5/32 x 14"	120 - 150	5	4530

Standards

Chemical Composition of Welding Wire % (Typical)

TS 9463 EN ISO 1071 : S C NiFe-1
EN ISO 1071 : S C NiFe-1

C	Cu	Mn	Fe	Ni
0.05	0.35	0.60	44-46	min.53

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Hardness (HB)	Elongation ((L ₀ =5d ₀) (%))
min. 290	min. 425	200	min. 8

Features and Applications

- STARLET 232 T wire is used for joining and build-up of all types of cast irons (gray, tempered, sfero) and cast iron to non alloyed and high alloyed steels, copper and nickel based alloys
- Especially it is suitable for building up cast mouldsin automotive industry and iron and steel sector
- Machinability is easy and weld metal surface must be clean and pre-heat at 150°C - 250°C
- Shielding gas: Ar (MIG and TIG)

Welding Positions



Welding Electrode

STARLET 232 E / STARLET 232 EC

Current Type

MIG D.C. (+) / TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)	Package Weight (Kg)
6031100308	1.20 / 0,047"	15
6031100309	1.6 x 1000 / 1/16 x 39"	5
6031100310	2.0 x 1000 / 5/64 x 39"	5
6031100311	2.4 x 1000 / 3/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 18274	: S Ni 6625 (NiCr22Mo9Nb)
EN ISO 18274	: S Ni 6625 (NiCr22Mo9Nb)
AWS A5.14	: ER Ni Cr Mo 3

Chemical Composition of Welding Wire % (Typical)

Ni	C	Cr	Mn	Fe	Mo	Nb
Rest	0.02	22.0	0.20	1.0	9.0	3.50

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Impact Strength (ISO-V/-196°C)	Elongation ((L ₀ =5d ₀) (%))
540	800	140 J	75 J	38

Typical Base Material Grades

• 1.4583 X10CrNiMoNb18-12, 1.4876 X10NiCrAlTi32-20, 1.4529 X1NiCrMoCuN25-20-7, X2CrNiMoCuN20-18-6, 2.4641 NiCr 21 Mo 6 Cu, 2.4856 NiCr 22 Mo 9 Nb, 2.4858 NiCr 21 Mo, 2.4816 NiCr 15 Fe • Welding of Joining: P265GH, P285NH, P295GH, 16Mo3, S355N, X8Ni9 ((Inconel 600), ((Inconel 625), ((Incoloy 800)

Features and Applications

- Applicability in joint welding of steels with high Mo-contents to steels with Ni-based alloy steels, joint welding of different types of steels, and in welding of low-alloyed problematic steels
- Suitability for use in manufacture processes of pressure vessels with service temperatures between -196°C and + 550°C • High resistance to creep, to high temperatures, and to low temperatures (cryogenic applications) • Resistance to formation of oxide layers at temperatures up to 1200°C • Loss of elasticity at temperatures between 600°C - 800°C. • High strength against hot cracking. • General tendency towards diffusion of carbon at high temperatures or towards heat treatments of different materials. • Very high resistance to stress corrosion and to pitting corrosion (PREN 52). • Resistance to thermal shocks • Austenitic-structured stainless material with low coefficient of thermal expansion. • Very excellent performance in TIG welding.
- Use of Ar or Ar+He mix as shielding gas.

Welding Positions



Current Type

MIG D.C. (+) / TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)	Package Weight (Kg)
6031100099	1.00 / 0,040"	15
6031100298	1.20 / 0,047"	15
6031100101	1.6 x 1000 / 1/16 x 39"	5
6031100299	2.0 x 1000 / 5/64 x 39"	5
6031100300	2.4 x 1000 / 3/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

AWS A5.14 : ER NiCrMo-2

Deposited Chemical Compositions % (Typical)

C	Fe	Cr	Mo	Ni
0.10	19.5	22.0	9.75	Bal.

AWS Chemical Composition Requirements %

C	Mn	Fe	P	S
0.05-0.15	1.0	17.0-20.0	0.04	0.03
Co	W	Cr	Cu	Si
0.5-2.5	0.2-1	20.5-23.0	0.5	1.0
Mo	Ni		Other	
8.0-10.0	Remainder		0.50	

Deposited All Weld Metal

Properties % (AW)

Tensile Strength : 99.000 psi

Elongation : 27%

Deposited Charpy-V-Notch Impact Properties %

Not Applicable

Application

STARLET 767 T/M is used for welding nickel-chromium-molybdenum base materials to itself, steel and other nickel base alloys. Can clad steel using GTAW, GMAW, welding processes. Can weld on high nickel base alloys exposed to high temperatures.

Recommended Welding Parameters

Process	Diameter of Wire	Voltage (V)	Ampere (A)	Gas
TIG	.035 inches x 36	12 – 15	60 – 90	100% Argon
	.045 inches x 36	13 – 16	80 – 110	100% Argon
	1/16 inches x 36	14 – 18	90 – 130	100% Argon
	3/32 inches x 36	15 – 20	120 – 175	100% Argon
	1/8 inches x 36	15 – 20	150 – 220	100% Argon
MIG	.035 inches	26 – 29	150 – 190	75% Argon + 25% Helium
	.045 inches	28 – 32	180 - 220	75% Argon + 25% Helium
	1/16 inches	29 – 33	200 – 250	75% Argon + 25% Helium

Note: Other shielding Gases may be used for Mig and Tig welding. Shielding gases are chosen taking Quality, cost, and Operability into consideration.

Approvals: GOST-R, SEPRO

Standards

ASME SFA A 5.14 : ERNiCrMo-13
EN ISO 18274 : Ni6059–NiCr23Mo16
BS 2901 : Pt 5 NA 48
Werkstoff Nr, : 2.4607

Chemical Composition of Welding Wire % (Typical)

C	Mn	Fe	P	S	Al
0.01	0.5	1.5	0.02	0.005	0.1-0.4
Ni	Co	Si		Cr	Mo
56.0	0.3	0.08		22-24	15-16.5

Typical Applications

This grade may be used for welding of:

- low-carbon nickel-chromium-molybdenum alloys and chromium-nickel-molybdenum austenitic stainless steels;
- the clad side in steel clad with low-carbon nickel-chromium-molybdenum alloy;
- low-carbon nickel-chromium-molybdenum alloys to steel and other nickel-base alloys;
- duplex, super-duplex and super-austenitic stainless steels;
- applications in chloride environment.

Weldable Base Materials

Alloy 22, Alloy 625, Alloy 276, Alloy 686

All Weld Metal Mechanical Properties

Tensile Strength (Rm) : $\geq 760 \text{ N/mm}^2$

Standard Packing Data

Welding Process	Product Type	Ø mm (inches)	Packing Type	Weight kg (lbs)	Length mm (inches)
GMAW	Filler Wire	0.8 – 1.2 (0.030 – 0.047)	Spools BS300 / D300	15 (33)	n.a.
GTAW	Filler Rod	1.6 – 4.0 (1/16 – 5/32)	Cardboard boxes / tubes	5 (11)	1000 (39.4)
SAW	Filler Wire	1.6 – 4.0 (1/16 – 5/32)	Basket rims B450	25 (55)	n.a.

Marking & Lot Classification

- Each filler rod for GTAW welding is durably marked with an identification traceable to the unique product type. Welding filler materials wound on spools or in coils are durably marked on the coil or spool with an identification traceable to the unique product type.
- The outside of each unit package is suitably labelled with at minimum the following data: grade, diameter, heat, lot no., classifications.
- Customized labels are available upon request.

All our productions fulfill the **Class B3** requirements acc. to EN ISO 14344

Approvals: GOST-R, SEPRO

Standards

ASME SFA A 5.14 : ERNiCrMo-14
EN ISO 18274 : Ni6059–NiCr23Mo16
BS 2901 : Pt 5 NA 48
Werkstoff Nr, : 2.4607

Chemical Composition of Welding Wire % (Typical)

C	Mn	Fe	P	S	Al
0.01	0.5	1.5	0.02	0.005	0.1-0.4
Ni	Co	Si		Cr	Mo
56.0	0.3	0.08		22-24	15-16.5

Typical Applications

This grade may be used for welding of:

- low-carbon nickel-chromium-molybdenum alloys and chromium-nickel-molybdenum austenitic stainless steels;
- the clad side in steel clad with low-carbon nickel-chromium-molybdenum alloy;
- low-carbon nickel-chromium-molybdenum alloys to steel and other nickel-base alloys;
- duplex, super-duplex and super-austenitic stainless steels;
- applications in chloride environment.

Weldable Base Materials

Alloy 22, Alloy 625, Alloy 276, Alloy 686

All Weld Metal Mechanical Properties

Tensile Strength (Rm) : $\geq 760 \text{ N/mm}^2$

Standard Packing Data

Welding Process	Product Type	Ø mm (inches)	Packing Type	Weight kg (lbs)	Length mm (inches)
GMAW	Filler Wire	0.8 – 1.2 (0.030 – 0.047)	Spools BS300 / D300	15 (33)	n.a.
GTAW	Filler Rod	1.6 – 4.0 (1/16 – 5/32)	Cardboard boxes / tubes	5 (11)	1000 (39.4)
SAW	Filler Wire	1.6 – 4.0 (1/16 – 5/32)	Basket rims B450	25 (55)	n.a.

Marking & Lot Classification

- Each filler rod for GTAW welding is durably marked with an identification traceable to the unique product type. Welding filler materials wound on spools or in coils are durably marked on the coil or spool with an identification traceable to the unique product type.
- The outside of each unit package is suitably labelled with at minimum the following data: grade, diameter, heat, lot no., classifications.
- Customized labels are available upon request.

All our productions fulfill the **Class B3** requirements acc. to EN ISO 14344

Approvals: GOST-R, SEPPO

Standards

TS EN 14700	: E Co 2
EN 14700	: E Co 2
AWS A5.13	: E CoCr A
DIN 8555	: E 20-UM-45 CTZ

Chemical Composition of Weld Metal % (Typical)

C	Cr	W	Co
1.1	28	4	Rest

Mechanical Properties

Hardness (HRC)
42

Features and Applications

- Valve shutters and caps, wood working tools, saw chains and slide ways, hot shear blades, pump components, hot pressing tools, valve seats, ingot tong ends, conveyor screws, for chemical and food processing industries
- STARLET 515 E is a versatile cobalt containing alloy with high mechanical impact and high temperature resistance
- It is used primarily on workpieces exposed to high alternating temperatures and corrosion
- STARLET 515 E deposit is especially suited for carbon steels, stainless steel, nickel, monel and manganese steels

Welding Positions



Flux Cored Wire

STARLET 515 M

TIG Wire

STARLET 515 T

Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100071	3.20 x 350	1/8 x 14"	90 - 120	5	3500
3030100072	4.00 x 350	5/32 x 14"	135 - 160	5	5200

Approvals: GOST-R, SEPRO

Standards

EN 14700	: T Co2
AWS A 5.21	: ERCCoCr-A

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	W	Fe	Co
1.1	1.0	1.2	29.0	5.0	3.5	Bal

Description and Applications

- Chromium and tungsten carbides deposit in an austenitic matrix
- Exceptional resistance to metal-to-metal wear in corrosive media at high temperatures, to erosion and to thermal shocks
- Used for hardfacing parts exposed to the single or combined effects of metal-to-metal wear, abrasion, impact, temperatures ranging from RT to 800°C, and corrosive environments

Valve seats of diesel engines, cams, chainsaw bars, hot shear blades, cold forming rolls and hot forming rolls, for hot rolling reinforcing bar, pump parts and components in hot zinc baths, etc.

Mechanical Properties

Hardness : 40 – 44 HRC (as welded, three-layers)

Pulsed current favors high deposition rates and low dilution.

High heat inputs result in lower hardness.

Hardness at high temperatures : 20°C: 420 HB / 200°C: 360 HB / 400°C: 330 HB / 600°C: 240 HB / 800°C: 140 HB

Abrasion 

Impact 

Metal – metal 

Corrosion 

Temperature 

Welding Positions

All positions.

Welding Parameters

Diameter [mm]	Welding Position	Polarity	Intensity [A]	Voltage [V]	Stick-out [mm]
1.2	PA / 1G or 1F	DC+	150 – 250	26 – 30	25 ± 5
1.6	PA / 1G or 1F	DC+	200 – 300	26 – 30	25 ± 5
2.0	PA / 1G or 1F	DC+	250 – 350	26 – 30	25 ± 5
2.4	PA / 1G or 1F	DC+	300 – 400	26 – 30	25 ± 5

Packaging

Diameter	1.2 – 2.4 mm	2.4 mm	
Standard Packaging	BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters, please consult us.

Standards

TS EN 14700	: E Co3
EN 14700	: E Co3
AWSA5.13	: E CoCr B
DIN 8555	: E 20-UM-50 CTZ

Chemical Composition of Weld Metal % (Typical)

C	Cr	W	Co
1.4	29	8	Rest

Mechanical Properties

Hardness (HRC)
48 - 52

Features and Applications

- Include tools to cut paper, cardboard, floor covering, roofing, wood, screw conveyors for chemical and food industries
- Electrode with Co-Cr-W alloyed core wire
- Hard surfacing of parts subjected to either the single or combined effect of heavy to metal wear abrasion, high temperatures (ranging from 500 to 800°C occasionally up to 1100°C) and corrosive environments
- 307 and 309 stainless steel electrode can be used as buffering

Welding Positions



Flux Cored Wire

STARLET 525 M

TIG Wire

STARLET 525 T

Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100068	3.20 x 350	1/8 x 14"	90 - 120	5	3530
3030100069	4.00 x 350	5/32 x 14"	130 - 160	5	5390

Approvals: GOST-R, SEPRO

Standards

EN 14700	: T Co2
AWS A 5.21	: ERCCoCr-B

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	W	Fe	Co
1.5	1.0	1.0	30.0	7.5	3.5	Bal

Description and Applications

- Chromium and tungsten carbides deposit in an austenitic matrix
 - Exceptional resistance to metal-to-metal wear in corrosive media at high temperatures, to erosion and to thermal shocks
 - Used for hardfacing parts exposed to the single or combined effects of metal-to-metal wear, abrasion, impact, temperatures ranging from RT to 800°C, and corrosive environments
- Saw teeth, cams, shafts, tappets and push rods for engines, screw conveyors and augers for rubber and plastics, seats and valves for oil and gas, etc.

Mechanical Properties

Hardness : 44 – 48 HRC (as welded, three-layers)

Pulsed current favors high deposition rates and low dilution.

High heat inputs result in lower hardness.

50 HRC can be reached in first layer by minimising dilution (1.2 mm at 16 V)

Abrasion 

Impact 

Metal – metal 

Corrosion 

Temperature 

Welding Positions

All positions.

Welding Parameters

Diameter [mm]	Welding Position	Polarity	Intensity [A]	Voltage [V]	Stick-out [mm]
1.2	PA / 1G or 1F	DC+	150 – 250	26 – 30	25 ± 5
1.6	PA / 1G or 1F	DC+	200 – 300	26 – 30	25 ± 5
2.0	PA / 1G or 1F	DC+	250 – 350	26 – 30	25 ± 5
2.4	PA / 1G or 1F	DC+	300 – 400	26 – 30	25 ± 5

Packaging

Diameter	1.2 – 2.4 mm	2.4 mm	
Standard Packaging	BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters, please consult us.

Standards

TS EN 14700	: E Co 1
DIN 8555	: E 20-UM-300-CKTL

Chemical Composition of Weld Metal % (Typical)

C	Mo	Co	Cr	Ni
0.3	5.6	Rest	26.0	3.0

Mechanical Properties

Hardness (HRC)	
After Welding	After Working
30 - 32	45

Features and Applications

- It is used for hardfacing of materials subject to impact, pressure, abrasion, corrosion and high temperature or combination of these
- Die molds, extruder, screws, hot cutting and working boiler steels, shafts, pumps, valves and seats
- Weld metal has work hardening ability under impact and friction
- Before welding, it must be buffering with 307 and 309 electrodes

Welding Positions



Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100070	3.20 x 350	1/8 x 14"	90 - 120	5	3500

Approvals: GOST-R, SEPRO

Standards

EN 14700	: T Co1
AWS A 5.21	: ERCCoCr-E

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Ni	Mo	Fe	Co
0.30	1.0	1.0	28.0	3.2	5.5	3	Bal

Description and Applications

- Low carbon deposit with multiple carbides in an austenitic matrix
- Excellent metal-to-metal wear resistance combined with good corrosion resistance
- The toughness of the deposit provides excellent resistance to thermal cycles and shocks
- Used for hardfacing parts subjected to a combination of impact, abrasion, compression, corrosion and high temperatures up to 900°C
- Less crack sensitive than other cobalt based alloys, STARLET 535M is used to hardface large-scale sections

Seats and guides of large water and highpressure valve bodies, drop forging dies, pump shafts and sleeves, hot punches etc..

Mechanical Properties

32 – 34 HRC (as welded, three-layers)

45 – 48 HRC (work hardened, three-layers)

Abrasion 

Impact 

Metal – metal 

Corrosion 

Temperature 

Welding Positions

All positions.

Welding Parameters

Diameter [mm]	Welding Position	Polarity	Intensity [A]	Voltage [V]	Stick-out [mm]
1.2	PA / 1G or 1F	DC+	150 – 250	26 – 30	25 ± 5
1.6	PA / 1G or 1F	DC+	200 – 300	26 – 30	25 ± 5
2.0	PA / 1G or 1F	DC+	250 – 350	26 – 30	25 ± 5
2.4	PA / 1G or 1F	DC+	300 – 400	26 – 30	25 ± 5

Packaging

Diameter	1.2 – 2.4 mm	2.4 mm	
Standard Packaging	BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters, please consult us.

Standards

TS EN 14700	: E Co 3
EN 14700	: E Co 3
AWSA5.13	: E CoCr C
DIN 8555	: E 20-UM-55 CTZ

Chemical Composition of Weld Metal % (Typical)

C	Cr	W	Co
2.1	31	13	Rest

Mechanical Properties

Hardness (HRC)
50 - 57

Features and Applications

- STARLET 545 E is cobalt based hard facing electrode
- It is used for hard facing of valves and fittings which requires resistance to high temperature , pressure and corrosion, sliding stressing metal-to-metal and is recommended in welding of cutter tools, screw conveyors, wear rings and guide rails

Welding Positions



Flux Cored Wire

STARLET 545 M

TIG Wire

STARLET 545 T

Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100066	3.20 x 250	1/8 x 14"	90 - 120	5	3660
3030100067	4.00 x 350	5/32 x 14"	130 - 160	5	5200

Approvals: GOST-R, SEPRO

Standards

EN 14700	: T Co3
AWS A 5.21	: ERCCoCr-C

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	W	Fe	Co
2.4	1.0	1.2	28.5	12.5	4.0	Bal

Description and Applications

- Chromium and tungsten carbides deposit in an austenitic matrix
- Exceptional resistance to metal-to-metal wear in corrosive media at high temperatures, where impact is low to moderate
- Used for hardfacing parts exposed to the single or combined effects of metal-to-metal wear or abrasion, temperatures ranging from RT to 800°C, and corrosive environments

Steam valves, wire guides, rubber and plastic mixers, extrusion screws, conveyors, etc.

Mechanical Properties

Hardness : 52 – 55 HRC (as welded, three-layers)

Pulsed current favors high deposition rates and low dilution.

High heat inputs result in lower hardness.

Hardness at high temperatures : 20°C: 560 HB / 200°C: 540 HB / 400°C: 480 HB / 600°C: 400 HB / 800°C: 220 HB

Abrasion	
Impact	
Metal – metal	
Corrosion	
Temperature	

Welding Positions

All positions.

Welding Parameters

Diameter [mm]	Welding Position	Polarity	Intensity [A]	Voltage [V]	Stick-out [mm]
1.2	PA / 1G or 1F	DC+	150 – 250	26 – 30	25 ± 5
1.6	PA / 1G or 1F	DC+	200 – 300	26 – 30	25 ± 5
2.0	PA / 1G or 1F	DC+	250 – 350	26 – 30	25 ± 5
2.4	PA / 1G or 1F	DC+	300 – 400	26 – 30	25 ± 5

Packaging

Diameter	1.2 – 2.4 mm	2.4 mm	
Standard Packaging	BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters, please consult us.

Standards

SAE	: 5759
WNR	: 2.4964
DIN	: COCR20W15Ni
ANFOR	: KC20WN

Chemical Composition of Welding Wire % (Typical)

C	Cr	W	Ni	Fe	Co
0.1-0.2	19-21	14-16	9-10	1-2	Base/Rest

Mechanical Properties

Hardness	: 20 - 45 HRC
Density	: 8.31 g/cm ³ / 0.300 lb/in ³
Melting Range	: 2425 – 2573 °F / 1329 – 1410 °C

Descriptions

- STARLET cobalt base alloys consist of complex carbides in an alloy matrix. They are resistant to wear, galling and corrosion and retain these properties at high temperatures. Their exceptional wear resistance is due mainly to the unique inherent characteristics of the hard carbide phase dispersed in a CoCr alloy matrix.
- This tungsten strengthened cobalt-chromium alloy is the cast version of the wrought alloy L605. A special low carbon material has been found to have exceptional thermal fatigue resistance and is useful for tools to work hot steel. The alloy also resists hot metal on metal wear.
- STARLET 25 is resistant to oxidation and carburization up to 1900°F. The alloy resists wet chlorine at ambient temperatures and is resistant to nitric and hydrochloric acids under certain conditions. Exposure testing is recommended to verify performance.
- STARLET 25 forms a protective oxide film during hot metal-on-metal wear which prevents metal transfer and damage due to adhesion. The alloy is resistant to thermal cracking and surface fatigue. Since the micro-structure is relatively free of carbide reinforcement, it is not recommended for low stress or low angle particle erosion service.
- Carbide tools allow a variety of conventional machining operations. Use positive rake angle to avoid burnishing since the alloy work hardens readily. Sharp tools and coolant are recommended for drilling.

Nominal Thermal Expansion Coefficient

	200°C (392°F)	400°C (752°F)	600°C (1112°F)	800°C (1472°F)	1000°C (1832°F)
μ-inch/inch.°F	6.8	7.2	7.6	7.8	8.0

Nominal Tensile Properties at Room Temperature

	Ultimate Tensile Strength Rm		Yield Stress Rp(0.2%)		Elongation	Elastic Modulus	
	ksi	MPa	ksi	MPa	A (%)	ksi	GPa
Castings	134	925	130	895	5	30.000	207

Approvals: GOST-R, SEPRO

Nominal Hot Hardness (Brinell Hardness Number) as-cast

20°C (68°F)	500°C (932°F)	900°C (1652°F)
350	280	130

Thermal and Electrical Properties

	Approximate Value at Room Temperature
Thermal Conductivity	65 Btu-in/hr/ft ² /°F
Electrical Resistivity	34.9 μ-ohm.inch

Applications and Available Forms

- Metal working tools where a combination of metal-on-metal wear, thermal fatigue and hot corrosion resistance are required, such as piercing points, forming tools, and extrusion dies. Also used for furnace hardware.
- For Casting and Welding Consumables.

Standards

EN 14700 : T Z Co

Description and Applications

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Ni	W	Fe	Co
0.15	1.5	1	20	9,5	14	4	Bal

- Dispersed carbides and intermetallic component precipitates deposit in an austenitic matrix.
- The deposit maintains stable hardness at high temperatures and offers high resistance to creep.
- Used for hardfacing parts subjected to metal-to-metal wear at temperatures up to 800°C
- The toughness of the deposit provides excellent resistance to thermal cycles and shocks.

Extrusion dies, nozzles, pump shafts, etc.

Mechanical Properties

200 – 220 HB (as welded, three-layers)

38 – 42 HRC (work hardened, three-layers).

Hardness at high temperatures: 20°C: 210 HB / 400°C: 145 HB / 600°C: 130 HB / 800°C: 120 HB

Abrasion 

Impact 

Metal – metal 

Corrosion 

Temperature 

Welding Positions

All positions.

Welding Parameters

Diameter [mm]	Welding Position	Polarity	Intensity [A]	Voltage [V]	Stick-out [mm]
1.2	PA / 1G or 1F	DC+	150 – 250	26 – 30	25 ± 5
1.6	PA / 1G or 1F	DC+	200 – 300	26 – 30	25 ± 5
2.0	PA / 1G or 1F	DC+	250 – 350	26 – 30	25 ± 5
2.4	PA / 1G or 1F	DC+	300 – 400	26 – 30	25 ± 5

Packaging

Diameter	1.2 – 2.4 mm	2.4 mm	
Standard Packaging	BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters, please consult us.

STARLET 515 T AWS A521: ER.CoCr-A

This wire is suitable for hardfacing of parts subjected to a combination of pressure, impact, abrasion, corrosion, erosion, cavitation and high heat up to 900°C, such as tight surfaces of fittings, valve seats and cones for combustion engines, gliding surfaces of fittings, valve seats and cones for combustion engines, gliding surfaces of fittings, valve seats and cones for combustion engines, gliding surfaces metal to metal highly stressed hot working tools without thermal shock, milling, mixing and drilling tools. Excellent gliding characteristics, very good polishability, high toughness, non magnetic.

Machinable by grinding and with tungsten carbide tools.

Chemical composition %: C:1.1 / Cr:28 / W:4.0 / Co:Rest

Hardness: TIG:40HRC Oxy-acetylene: 40 HRC

Dimensions: 3.20 - 4.0 -5.0 x 1000mm

Welding Electrode : STARLET 515 E
Flux Cored Wire : STARLET 515 M

STARLET 525 T AWS A5.21 : ER.CoCr-B

This wire is suitable for highly wear resistant hardfacing of parts subjected to a combination of hardfacing, abrasion, corrosion, erosion, cavitation and high heat up to 900°C, such as a running sealing and gliding faces of fittings and pumps, valve seats and cones for combustion engines tools for the wood, paper and plastic industry, gliding surfaces metal to metal, milling, mixing and drilling tools, heavy duty hot working tools without thermal shock. Excellent gliding characteristics very good polishability high toughness, non magnetic. Machinable by grinding and with tungsten carbide tools.

Chemical Composition %C: 1.4, Cr: 29, W:8, Co:Rest

Hardness: TIG :47 HRC Oxy-acetylene: 48 HRC

Dimensions: 3.20 -4.0-5.0x 1000 mm

Welding Electrode : STARLET 525 E
Flux Cored Wire : STARLET 525 M

STARLET 535 T AWSN521: E R.Co Cr-C

This wire is suitable for highly wear resistant hardfacing of parts subjected to a combination of abrasion, corrosion and high heat up to 900°C, such as working parts in the chemical industry running and sealing faces of fittings, valve seats and cones for combust on engines, cutting shearing tools, milling, mixing, drilling tools, heavy-duty hot working tools without thermal shock Excellent gliding characteristics, good polishability, slightly, magnetic. Mach nable by grinding and with tungsten carbide tools.

Chemical Composition %C: 2.5,Cr:30 , W:12, Co:Rest

Hardness: TIG:54HRC Oxy-acetylene: 53 HRC

Dimensions: 3. 20 -4.0-5.0 X 1000mm

Welding Electrode : STARLET 535 E
Flux Cored Wire : STARLET 535 M

Operating Data

Product	Product Code	Diameter (mm)	Diameter (inch)	Package Weight (kg)
STARLET 515 T	6031100133	3.2 x 1000	1/8 x 39"	10
STARLET 515 T	6031100134	4.0 x 1000	5/32 x 39"	10
STARLET 525 T	6031100135	3.2 x 1000	1/8 x 39"	10
STARLET 525 T	6031100136	4.0 x 1000	5/32 x 39"	10
STARLET 535 T	6031100321	3.2 x 1000	1/8 x 39"	10
STARLET 535 T	6031100322	4.0 x 1000	5/32 x 39"	10

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: E Z Fe 14
EN 14700	: E Z Fe 14
DIN 8555	: E 10-UM-60 GRZ
AWS A5.13	: ~E FeCr-A8

Chemical Composition of Weld Metal % (Typical)

C	Cr	Si	Mn
4.5	34.0	1.0	0.5

Mechanical Properties

Hardness (HRC)

58 – 64

Features and Applications

- Special coating, high-chromium carbide electrode for hardfacing operations to provide maximum resistance to extreme mineral abrasion
- A typical application is stringer beads on earth-moving, cement mill and brick making equipment
- Weld metal efficiency is ~ % 220.
- Re-drying : 300°C-350°C / min. 2h

Welding Positions



Current Type

D.C.(+)(-) / A.C.

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010101960	3.20 x 350	1/8 x 14"	125 - 160	5030
3010101963	4.00 x 350	5/32 Xx 14"	170 - 200	7420
3010101969	5.00 x 350	3/16 x14"	190 - 260	12000

Standards

TS EN 14700	: E Fe 9
EN 14700	: E Fe 9
DIN 8555	: E 7-UM-250KP

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni	P
1.11	1.225	17.603	14.33	0.17	0.081
Mo	Cu	V	Al	Fe	
0.001	0.085	0.093	0.001	Rest/Kalan	

Mechanical Properties - (Typical):

Hardness (after welding) : 250 HB

Hardness (after working) : 550 HB

Features and Applications

- Suitability for uses in hardfacing of high-manganese steels
- Most common applications in hardfacing of various equipment parts that are exposed to deep impacts, pressure and wearing in cement, mining and earth-moving industries
- High resistance to impact and to friction
- Increasing hardness of weld metal after operations including its exposure to impact and friction
- High toughness
- Requirement of electrode holding in perpendicular direction to work piece, by maintaining short and uniforml - exposed arc
- Requirement of two-pass buffer-layering with the electrode GeKaTec 660 HD for providing good connection and crack protection in case of thick-layer hardfacing operations
- Requirement of re-drying at 300°C for 2 hours

Welding Positions



Current Type

DC (+)

AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100050	3.20 x 350	1/18 x 14"	110 – 140	5	4790
3030100051	4.00 x 350	5/32 x 14"	150 – 180	5	7320
3030100049	5.00 x 350	3/16 x 14"	150 – 190	5	6970

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: T Fe9
EN 14700	: T Fe9
DIN 8555	: MF-7-GF-200-KP

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	P	Ni
1.110	1.225	17.603	14.330	0.081	0.17
Mo	Cu	V	Al	Fe	
0.001	0.085	0.093	0.001	Rest / Kalan	

Mechanical Properties

Hardness (as welded) : 18 – 24 HRc
 hardness (after working) : 45 – 52 HRc

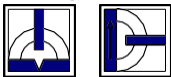
Typical Base Material Grades

Manganese rock crushing hammers and rolls, impactor bars, gyratory mantles, dredge components.

Features and Applications

- Applicability in buffer layer and surfacing of carbon and manganese steels.
- High resistance to impact and friction
- Most common applications in hardfacing of various equipment parts that are exposed to deep impact, pressure and wearing in cement, mining and earth moving industries
- Build up depth is generally unlimited.
- Weld metal hardness increases by work hardening.
- Shielding Gas : Open Arc

Welding Position



Current Type

D.C.(+)

Operating Data

Diameter (mm)	Welding Current (A)	Voltage (V)	Stick-out (mm)
1.6	130 – 200	26 – 31	25 – 30
2.8	300 – 500	25 - 31	25 – 30

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
6031100379	1.6	1/16	15
6031100380	2.8	7/64	25

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: E Fe 16
EN 14700	: E Fe 16
DIN 8555	: E 10-UM-65 GRZ

Chemical Composition of Weld Metal % (Typical)

C	Mn	Si	Mo	V	W	Cr	Nb
4.5	0.3	1.0	5.0	1.7	2.5	23.5	4.0

Mechanical Properties

Hardness (HRC)
61 - 68

Features and Applications

- Super hardfacing electrode with very high content of carbide formers (Mo, V, W, Nb) for deposits subject to extreme sliding mineral abraision
- Used in blast furnace cover mechanism, breakers, mixers, gimlet, non-steel and cement industry, mining coal industries, weld metal efficiency is ~ % 230
- Re-drying : 300°C-350°C / min. 2h

Welding Positions



Current Type

D.C.(+) / A.C.

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010101975	3.20 x 350	1/8 x 14"	110 - 150	5500
3010101978	4.00 x 350	5/32 x 14"	170 - 200	8200
3010101981	5.00 x 350	3/16 x 14"	190 - 250	12500

Standards

TS EN 14700	: E Fe 16
EN 14700	: E Fe 16
DIN 8555	: ~ E 10-UM-60 GRZ

Chemical Composition of Weld Metal % (Typical)

C	Cr	Nb
6.5	24.0	7.5

Mechanical Properties

Hardness (HRC)

60 – 62

Features and Applications

- On parts primarily exposed to abraision combined with light impact, such as conveyor screws, mixer blades and sand pumps
- Weld metal has resistant to corrosion, friction and impact
- It is not recommended overlap passes
- Requirement of re-drying for minimum 2 hours at temperatures between 300°C and 350°C

Welding Positions



Current Type

D.C.(+) / A.C.

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010101951	3.20 x 350	1/8 x 14"	125 - 160	5040
3010101954	4.00 x 350	5/32 x 14"	170 - 200	7710

Standards

TS EN 14700	: T Fe 15
EN 14700	: T Fe 15
DIN 8555	: MF 10-GF-60 G

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Cr	Fe
5.0	1.5	1.3	27.0	Rest

Mechanical Properties

Hardness

(As Welded) (HRC)

60 - 64

Typical Base Material Grades

- Ventilators, wear plates, crushers for soft materials, shredders, chemical and food processing industries.

Features and Applications

- Open arc, hardfacing flux cored wire with Cr-Carbides
- It is suitable for low alloyed steel and carbon steels
- Weld metal is very hard and it is common to have transverse cracks on weld seam
- Max. two passes can be weld with this wire

Welding Positions



Operating Data

Diameter (mm)	Welding Current (A)	Voltage (V)	Stick-out (mm)
1.60	130 - 220	26.0 - 31.0	20.0 - 25.0
2.80	300 - 500	25.0 - 31.0	20.0 - 25.0

Current Type

FCAW / D.C. (+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
6031100374	1.60	1/16	15
6031100186	2.80	7/64	25

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: T Fe8
EN 14700	: T Fe8
DIN 8555	: MF 6 GF 55 GT

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	P	W	S	V
0.65	3.40	1.55	7.50	0.017	1.00	0.012	0.10

Mechanical Properties

Hardness

(As Welded) (HRC)

56 - 64

Features and Applications

- MAG welding wire for heavy abrasion resistance with martensitic structure. It can be used for Augers, Bucket lips, Conveyor screws, Blower blades, Dozer blades, etc.
- This hardfacing flux cored wire has excellent wear resistance and keeps its strength at high temperatures.
- Used in cold and hot work tool steels, hot shape knives, extrusion die and steel casting and dies.
- Shielding gas : CO₂ (M21)

Welding Positions



Operating Data

Diameter (mm)	Welding Current (A)	Voltage (V)	Stick-out (mm)
1.20	150 - 220	26 - 30	20 - 25

Current Type

FCAW / D.C. (+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
3030500024	1.20	0.047"	15

Approvals: GOST-R, SEPRO

Standards

DIN 8555 : MF 6-GF-60-GP

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Fe
0.40	2.00	0.60	9.0	Rest
Mo	P	S		
0.45	0.012	0.007		

Mechanical Properties

Hardness (as welded)
(HB)

600

Typical Base Material Grades

- Hardfacing of parts of earth and mineral mining machines, impact drilling and crushing devices, guide springs, edges of cutting tools, hard bucket edges and teeth, all of which are made of alloyed or unalloyed steels, as well as in other materials required to have high resistance to wear, debarking knives, agricultural tillage tools, earth moving bucket lips.

Features and Applications

- STARLET 555 MCO is metal cored flux-cored wire for hardfacing
- High resistance to wear and to impact
- Alloy group is martensitic tool steel
- Weld metals of high hardness and high toughness
- Machinability of metal through grinding only
- It is excellent choice for components that are required to maintain a sharp edge
- Shielding Gas: CO₂ (M21)

Welding Positions



Current Type

FCAW / D.C. (+)

Operating Data

Diameter (mm)	Welding Current (A)	Voltage (V)	Stick-out (mm)
1.20	170 - 200	27.0 - 30.0	20.0 - 25.0
1.60	180 - 220	26.0 - 31.0	20.0 - 35.0

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
3030500030	1.20	0.047"	15
3030500031	1.60	0.062"	15

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: E Fe 14
EN 14700	: E Fe 14
DIN 8555	: E 10-UM-60 GRZ

Chemical Composition of Weld Metal % (Typical)

C	Mn	Si	Cr
3.2	0.5	1.0	29.0

Mechanical Properties

Hardness (HRC)
57 - 63

Features and Applications

- On parts primarily exposed to abraision combined with light impact, such as conveyor screws, mixer blades and mud pumps
- Requirement of re-drying for 2 hours at the temperatures between 300°C and 350°C

Welding Positions



Current Type

D.C.(+) / A.C.

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010101942	3.20 x 350	1/8 x 14"	110 - 140	5080
3010101945	4.00 x 350	5/32 x 14"	170 - 200	7960
3010101948	5.00 x 350	3/16 x 14"	190 - 260	11400

Standards

EN 14700 : T Fe16

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Nb	Mo	W	V
5.5	0.5	1.5	22	6	7	2	1

Mechanical Properties

Hardness : 3 layer deposit on mild steel : 65 HRC

Description and Applications

- Tubular wire for self-shielded metal arc hardfacing
- High chromium cast iron with alloying additions giving a high concentration of complex carbides
- Resists extreme conditions of abrasion and temperature up to 700°C

STARLET 138 M is designed to give a weld deposit of particularly high hardness and wear resistance on account of the dispersion of hard complex carbides it contains. This gives superior performance compared to standard chromium cast irons. Optimum properties are reached in three layers. Relief checking is normal.

Welding Positions

Flat, Half up, Half down

Condition of Use

Current Type : DC (+)

Protection : Self-shielded

Operating Conditions

Diameter (mm)	Current (A)		Voltage (V)		Stick-out (mm)	
	Range	Optimum	Range	Optimum	Range	Optimum
1.2	100 – 300	160	24 – 30	28	25 – 50	25
1.6	150 – 350	250	24 – 30	28	25 – 50	25
2.0	200 – 400	300	26 – 30	28	25 – 50	35
2.4	250 – 450	350	26 – 30	28	25 – 50	40
2.8	250 – 450	400	28 - 32	30	25 – 50	40
3.2	250 – 500	450	28 - 32	30	25 – 50	40

Recovery : 90%

Packaging

Diameter	≤ 2.4 mm	≥ 2.4 mm	
Standard Packaging	EN ISO 544 : BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters: please consult us

Approvals: GOST-R, SEPRO

Features and Applications

Welding rod combination of tin and silver solder is used for soldering equipment made of copper, steel, and can be used on electrical and other equipment

Mechanical Properties

Melting point	230-240°C
Program	Sn-01-M
Comment	Orientation Sn-Base
Average	(n-0)

Chemical Composition

Ele	%	+/-	±2σ
Sb	<LOD	:	0.485
Sn	96.535	+/-	1.562
Cd	<LOD	:	0.122
Pd	<LOD	:	0.056
Ag	2.766	+/-	0.118
Al	<LOD	:	80.000
Mo	<LOD	:	0.017
Nb	<LOD	:	0.010
Zr	<LOD	:	0.013
Bi	<LOD	:	0.038
Pb	0.070	+/-	0.038
Se	<LOD	:	0.022
Au	<LOD	:	0.071

Ele	%	+/-	±2σ
W	<LOD	:	0.002
Zn	<LOD	:	0.102
Cu	0.627	+/-	0.124
Ni	<LOD	:	0.178
Co	<LOD	:	0.222
Fe	<LOD	:	0.395
Mn	<LOD	:	0.413
Cr	<LOD	:	0.834
V	<LOD	:	1.055
Ti	<LOD	:	2.757

Packaging

Diameter	1.60 mm
Standard Packaging	Spool
Weight	1 KG

Other packaging and other diameters: please consult us

Standards

EN 14700 : T Fe15

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Nb	Mo
5.2	0.5	1	22	7	0.6

Mechanical Properties

Hardness : 3 layer deposit on mild steel : 62 – 64 HRc

Description and Applications

- Tubular wire for self-shielded metal arc hardfacing
- High chromium cast iron containing hard complex carbides in a tough austenitic matrix
- Resists extreme conditions of abrasion and temperature up to 450°C with moderate impact

STARLET 238 M is designed to give a weld deposit of high hardness and wear resistance. It is used for hardfacing components undergoing heavy wear by earth, sand or other abrasives. Relief checking is normal.

Welding Positions

Flat, Half up, Half down

Condition of Use

Current Type : DC (+)

Protection : Self-shielded

Operating Conditions

Diameter (mm)	Current (A)		Voltage (V)		Stick-out (mm)	
	Range	Optimum	Range	Optimum	Range	Optimum
1.2	100 – 300	230	22 – 28	24	25 – 50	25
1.6	150 – 350	270	24 – 28	24	25 – 50	25
2.0	200 – 400	300	26 – 30	26	25 – 50	35
2.4	250 – 450	350	26 – 30	28	25 – 50	40
2.8	250 – 450	400	28 - 32	30	25 – 50	40
3.2	250 – 500	450	28 - 32	30	25 – 50	40

Recovery : 90%

Packaging

Diameter	≤ 2.4 mm	≥ 2.4 mm	
Standard Packaging	EN ISO 544 : BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters: please consult us

Approvals: GOST-R, SEPRO

Standards

EN 14700 : T Fe16

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Mo	Fe
3.5-4.5	0.5-0.8	0.7-1	20-23	7	Rest

Mechanical Properties

Hardness : 3 layer deposit on mild steel : 58-62 HRc

Description and Applications

- Tubular wire for self-shielded metal arc hardfacing
- High chromium cast iron with alloying additions giving a high concentration of complex carbides
- Resists extreme conditions of abrasion and temperature up to 700°C

STARLET 238 M is designed to give a weld deposit of particularly high hardness and wear resistance on account of the dispersion of hard complex carbides it contains. This gives superior performance compared to standard chromium cast irons. Optimum properties are reached in three layers. Relief checking is normal.

Welding Positions

Flat, Half up, Half down

Condition of Use

Current Type : DC (+)

Protection : Self-shielded

Operating Conditions

Diameter (mm)	Current (A)		Voltage (V)		Stick-out (mm)	
	Range	Optimum	Range	Optimum	Range	Optimum
1.2	100 – 300	160	24 – 30	28	25 – 50	25
1.6	150 – 350	250	24 – 30	28	25 – 50	25
2.0	200 – 400	300	26 – 30	28	25 – 50	35
2.4	250 – 450	350	26 – 30	28	25 – 50	40
2.8	250 – 450	400	28 - 32	30	25 – 50	40
3.2	250 – 500	450	28 - 32	30	25 – 50	40

Recovery : 90%

Packaging

Diameter	≤ 2.4 mm	≥ 2.4 mm	
Standard Packaging	EN ISO 544 : BS 300 spool	B 450 coil	Drum
Weight	15 kg	25 kg	Up to 330 kg

Other packaging and other diameters: please consult us

Approvals: GOST-R, SEPRO

Standards

EN 14700 : T Z Fe16

Chemical Composition of Welding Wire % (Typical)

C	Cr	Si	Mo	B	Fe
5	28.1	0.7	1	0.2	Bal

Mechanical Properties

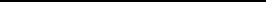
Hardness Multilayer : 58 – 60 HRC

Description and Applications

High wear-resisting surfacing can also be achieved under lower impact force. In addition to the carbide of chromium, it also contains special carbides with fine distribution, which can improve the wear resistance, strong gain and flexible response to impact load. It is best suited for working layers on components that bear high wear and moderate impact loads.

Application in up to 350°C temperature of the workpiece. The sugar rolling roller, chute, grinding roller, grinding plate and roller press need to solve the material wear, which can be used under moderate impact condition.

Wear Resistance

Q235B		01/25
FGS-400HB		04/25
S 238 Mo		10/25

*In grinding applications, compared with Q235B, The service life of MHC-100MO is extended 10 times

Standards

TS EN 14700	: T Fe8
EN 14700	: T Fe8
DIN 8555	: MF-10-GF-55-GP

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Mo	Ti	Fe
1.8	1.5	2	7	1.4	5	Rest

Mechanical Properties

Hardness : 52 – 57 HRC

Features and Applications

- FC wire containing C, Cr, Ti and Mo alloys
- Weld metals with martensitic microstructure including titaniumcarbide
- High resistance to wear and to impact
- Machinability of weld metal through grinding
- Best suited for applications involving extreme wear under high pressure
- Shielding Gas: Open Arc

Current Type

FCAW / D.C.(+)

Operating Data

Diameter [mm]	Current [A]		Voltage [V]		Stick-out [mm]	
	Range	Optimum	Range	Optimum	Range	Optimum
1.2	100 - 300	250	21 - 35	28	25 - 50	25
1.6	150 - 350	270	24 - 35	28	25 - 50	25
2.0	200 - 400	300	26 - 35	28	25 - 50	35
2.4	250 - 450	350	26 - 35	28	25 - 50	40
2.8	250 - 450	400	28 - 35	30	25 - 50	40

Standards

EN 14700 : T Z Fe16

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Mo	Fe
4.8-5.5	0.5-1.5	0.5-1.5	22-24	-	Bal

Mechanical Properties

Multilayer : 58 – 62 HRC

Description and Applications

- Hardfacing surfacing material containing chromium carbide.
- High chromium cast iron is used for hard-faced components that are subject to heavy machine wear and moderate impact.

Composite wear-resistant plate hard surface layer, transition layer.

Standards

TS EN 14700	: T Fe15
EN 14700	: T Fe15
DIN 8555	: MF-10-GF-60-G

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Fe
4.5-5.0	1.0-1.5	0.5-1.3	27-34	Rest
Mo	Nb	V		
0.5-1	0.2-0.4	0.1-0.3		

Mechanical Properties

Hardness : 60 – 64 HRC

Features and Applications

- Special coating, high-chromium carbide electrode for hardfacing operations to provide maximum resistance to extreme mineral abrasion.
- A typical application is stringer beads on earth-moving, cement mill and brick making equipment. Weld metal efficiency is ~ % 220.
- Re-drying: 300°C-350°C/min. 2h

Current Type

D.C.(+/-) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)
6011100374	1.6	1/16	130 – 220	15
6011100186	2.8	7/64	300 – 500	25

Standards

TS EN 14700	: T Fe16
EN 14700	: T Fe16
DIN 8555	: MF-10-GF-65-GT

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Mo	Fe
5.0	1.2	0.15	37-40	-	Bal

Mechanical Properties

First Layer : 48 – 54 HRc

Second Layer : 56 – 62 HRc

Third Layer : 58 – 66 HRc

Features and Applications

- Suitable for surfacing a wide range of steels including 13Mn types. Because thermal contractional stresses will cause stress relieving cross-cracking, buildups should be limited to 3 layers, preferably two when restraint is high.
- The deposit has excellent resistance to abrasion against minerals, sand and sludges which leads to its extensive use in the earth moving, cement, dredging and steel industries.
- For build-ups on carbon and low alloy steels or 13Mn steel, NS-307 should be used as a buffer layer.

Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)
6011100374	1.6	1/16	130 – 220	15
6011100186	2.8	7/64	300 – 500	25

Standards

EN 14700 : T Z Fe16

Chemical Composition of Welding Wire % (Typical)

C	Mn	Si	Cr	Mo	Fe
5.0-5.5	0.5-1.5	0.5-1.5	28-29	-	Bal

Mechanical Properties

Multilayer : 58 – 62 HRC

Description and Applications

Hardfacing surfacing material containing chromium carbide.

- Sugar roller, cement mixing cutter
- Hardfacing of wear resistant composite steel plate
- Surfacing welding of mining crushing, crushing teeth and coke crushing equipment
- Surfacing strengthening of mud pump and pipeline transportation equipment

Standards

EN 14700	: TFe15 – C5Cr30-60
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Structure : Primary Chromium carbides in Austenitic matrix.

Chemical Composition of Weld Metal % (Typical)

C	Mn	Si	Cr	Fe
5.8	0.9	0.8	30	Bal

Mechanical Properties

Multi layer : ~ 61 HRc

Description & Applications

- High chromium cast iron for hardfacing components subjected to extremely severe abrasive wear and moderate impact
- The deposit contains a high proportion of hard primary chromium carbides in a tough austenitic matrix.

Typical applications include palm oil extruders, screw conveyors, gyratory crusher cones and mantles, dredge pump bodies, mining and earth moving equipment, agricultural equipment, wear plates, sugar mill crusher hammers, drag line components, quarry and sand handling equipment, brick manufacturing equipment etc.

Conditions of Use

Electrode Ø x L (mm)	6.0 x 450	8.0 x 450	12.0 x 450
Current (A)	85 - 135	130 - 190	200 - 430

Polarity AC or DC

Welding Positions

Flat, Half up, Half Down

Packaging

Diameter x Length [mm]	Quantity	Weight [kg]
6.0 x 450	~ 61	4 x 5.0
8.0 x 450	~ 36	4 x 5.0
12.0 x 450	~ 17	4 x 5.0

Typical Coverage (Approx) in Kg per Square M X 3mm High

Diameter x Length [mm]	Weight [kg]
6.0 x 450	4 x 5.0
8.0 x 450	4 x 5.0
12.0 x 450	4 x 5.0

Tip Colour Identification

- Blue

Approvals: GOST-R, SEPRO

Standards

EN 14700 : TFe14 – C6Cr40-62

Structure : Primary Chromium carbides in Austenitic matrix.

Chemical Composition of Weld Metal % (Typical)

C	Mn	Si	Cr	Fe
6.5	0.8	0.8	40	Bal

Mechanical Properties

Multi layer : ~ 62 HRc

Description & Applications

- High chromium cast iron for hardfacing components subjected to extremely severe abrasive wear and moderate impact
- The deposit contains hard primary chromium carbides in a tough austenitic matrix

Typical applications include palm oil extruders, screw conveyors, gyratory crusher cones and mantles, dredge pump bodies, mining and earth moving equipment, agricultural equipment, wear plates, sugar mill crusher hammers, drag line components, quarry and sand handling equipment, brick manufacturing equipment etc.

Conditions of Use

Electrode Ø x L (mm)	6.0 x 450	8.0 x 450	12.0 x 450
Current (A)	85 - 135	130 - 190	200 - 430

Polarity AC or DC

Welding Positions

Flat, Half up, Half Down

Packaging

Diameter x Length [mm]	Quantity	Weight [kg]
6.0 x 450	~ 61	4 x 5.0
8.0 x 450	~ 36	4 x 5.0
12.0 x 450	~ 17	4 x 5.0

Typical Coverage (Approx) in Kg per Square M X 3mm High

Diameter x Length [mm]	Weight [kg]
6.0 x 450	4 x 5.0
8.0 x 450	4 x 5.0
12.0 x 450	4 x 5.0

Tip Colour Identification

- Black

Approvals: GOST-R, SEPRO

Standards

EN 14700 : T Fe15T

Chemical Composition of Weld Metal % (Typical)

C	Mn	Si	Cr	Mo	Nb	Fe
6	0.8	0.8	27	1	8	Bal

Mechanical Properties

Single Layer : 55 – 61 HRc

Multi Layer : 60 – 64 HRc

Microstructures

Chromium and Niobium complex carbides in austenitic matrix

Description & Applications

High chromium cast iron with high proportion of complex carbides for applications involving extremely severe abrasive wear and moderate impact. The alloy maintains its abrasive resistance up to 450°C.

Typical applications include boiler fan blades, parts in coke plant, sinter and palletising plant hot crusher parts, hot sinter screens, burden areas of blast furnace.

Operation Data

Diameter x Length [mm]	Weight [kg]
6.0 x 450	5
8.0 x 450	5
12.0 x 450	5

Standards

EN 14700 : T Fe15T

Chemical Composition of Weld Metal % (Typical)

C	V	W	Cr	Mo	Nb	Fe
6	1.2	2	20	5	6	Bal

Mechanical Properties

Single Layer : 55 – 61 HRc

Multi Layer : 60 – 66 HRc

Microstructures

Heat resistant complex alloy carbides in austenitic matrix

Description & Applications

Applications involving extremely severe abrasive wear at high temperatures. The alloy maintains its abrasion resistance up to 600°C.

Typical applications include boiler components, high temperature components of process industry such as sinter plant or blast furnace components etc.

Operation Data

Diameter x Length [mm]	Weight [kg]
6.0 x 450	5
8.0 x 450	5
12.0 x 450	5

Standards

EN 14700 : T-ZFe20-C4Cr14WC25

Chemical Composition of Weld Metal % (Typical)

C	Mn	Cr	Si	Tungsten Carbide	Fe Bal
6	1.5	23	0.8	25	

Mechanical Properties

Single Layer : 60 – 65 HRc

Multi Layer : 62 – 68 HRc

Microstructures

Tungsten carbides and Fe-Cr-W carbides in austenitic matrix

Description & Applications

Applications which demand very high abrasive resistance materials and moderate impact.

Typical application include material handling components which handles medium to fine particles, coal crusher blades, conveyor screens, concrete mixer components, wood chipping or crushing machine components, brick and clay mill augers etc..

Operation Data

Diameter x Length [mm]	Weight [kg]
6.0 x 450	5
8.0 x 450	5

Standards

EN 14700 : T-ZFe20-C4Cr14WC45

Chemical Composition of Weld Metal % (Typical)

C	Mn	Cr	Si	Tungsten Carbide	Fe Bal
3.5	1.5	14	0.8	45	Bal

Mechanical Properties

Matrix : 58 – 64 HRC

Carbides : 2200 HV

Microstructures

Tungsten carbides and Fe-Cr-W carbides in martensitic matrix

Description & Applications

Applications which demand very high abrasive resistance materials and low impact.

Typical application include material handling components which handles medium to fine particles, coal crusher blades, conveyor screens, concrete mixer components, wood chipping or crushing machine components, brick and clay mill augers etc..

Operation Data

Diameter x Length [mm]	Weight [kg]
6.0 x 450	5
8.0 x 450	5

Standards

DIN 8555	: MSG 3-GZ-50-ST
	: WSG 3-GZ-50-ST

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ti	Mo
0.30	0.50	0.70	5.00	0.70	3.60

Mechanical Properties

Hardness (as welded) (HRC)
45 - 48

Typical Base Material Grades

- 1.2367-1.2365-1.274-1.2344-1.2343-1.2083

Features and Applications

- Generally are used in build-up for hot work tool steels
- Application areas forging dies, gravures, hot cutting tools, de-burring tools, punches, aluminum casting moulds, repair of 1.2344 hot work tool steels
- Used in steel casting and mold applications with 45-48 HRC strength of hardfacing welds
- Weld metal has wear and impact resistance at high temperatures
- 400°C pre-heat must be done before welding
- It has wear and impact resistance at high temperatures
- Shielding gas: MAG: Ar+CO₂

TIG: Ar

Welding Positions



Welding Electrode

STARLET 5154 E

Current Type

MAG D.C.(+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)	
			MAG	TIG
6031100143	1.00	0.040"	BS 300 15 Kg	Carton Box 5 Kg
6031100329	1.20	0.047"		
6031100330	1.6 x 1000	1/16 x 39"		
6031100331	2.0 x 1000	5/64 x 39"		
6031100332	2.4 x 1000	3/32 x 39"		

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: E Z Fe 8
EN 14700	: E Z Fe 8
DIN 8555	: E 3-UM-50 GTZ

Mechanical Properties

Hardness (HRC)	
As Welded	After Heat Treatment
45 - 50	48 - 54

Features and Applications

- Include spinning rotors, for glass-wool production, draw plates, stamping trimming dies, klin parts, pump shafts, chucks etc
- Manual electrode for anti-wear protective coatings on tool-steel parts working under very hot or cold conditions
- Electrode with Co, Cr, Mo alloys gives excellent metal / metal friction resistance at high temperatures
- Ideal for use as surfacing with no risk of cracking

Welding Positions



Flux Cored Wire

STARLET 5155 FC

Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100073	2.50 x 250	3/32 x 10"	75	4	1600
3030100074	3.20 x 350	1/8 x 14"	110	5	3680

Approvals: GOST-R, SEPRO

Standards

DIN 8555	: MSG 3-GZ-55-T
	: WSG 3-GZ-55-T

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Mo
0.35	0.40	1.00	7.00	1.10

Mechanical Properties

Hardness (as welded) (HRC)
53 -58

Typical Base Material Grades

- 1.2510-1.2363-1.2721-1.2379-1.2842-1.1730-1.2990

Features and Applications

- Application areas are cold and hot work tool steels which are used in machine parts, cold and hot cutting blades, extrusion dies, rollers, steel castings and moulds
- It is hard facing wire which has high abrasion resistance and keep hardness at high temperatures
- 400°C pre-heat temperature must be done before welding if it is needed, stress relieving must be done at 550°C after welding
- Shielding gas: MAG: Ar+CO₂
TIG: Ar

Welding Positions



Welding Electrode

STARLET 5155E

Current Type

MAG D.C.(+) / TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)	
			MAG	TIG
6031100148	1.00	0.040"	BS 300 15 Kg	Carton Box 5 Kg
6031100333	1.20	0.047"		
6031100334	1.6 x 1000	1/16 x 39"		
6031100389	2.0 x 1000	5/64 x 39"		
6031100335	2.4 x 1000	3/32 x 39"		

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: ER Z Fe8
EN 14700	: ER Z Fe8
DIN 8555	: E3-UM-40 PT

Chemical Composition of Weld Metal (Typical)

C	Si	Mn	Cr	Ni	Mo	V
0.18	0.21	0.28	2.45	3.53	0.25	0.59

Mechanical Properties - (Typical):

Hardness : ~400HB

Features and Applications

- Resistant to heat as well as to abrasion, due to its technical features also resistant to high temperature and pressure
- This especially use for the worn out parts of tool steels of surfacing jobs
- Main application fields are hardfacing of hot cutting blades, hammers, grinders, forming moulds, casting moulds, bravely and cylinder surfaces
- Also provides economical solutions as it is used on any kind of steel for surfacing without the use of a special tool steel
- Basic coated, Chrome-Molly alloyed, alm arc, shyntetic electrode with deep penetration
- Weld metal efficiency is - 120%
- It is recommended that the base metal should be pre-heated up to 400°C and after welding is completed
- It should be cooled down slowly
- This stick should be bake for 2 hours at 300°C temperature

Welding Positions



Current Type

DC (+)
AC

Operating Data

Diameter x Length (mm)	Welding Current (A)	Package Weight (Kg)
1.2 x 1000	110 – 140	5
1.6 x 1000	150 – 180	5
2.5 x 1000	150 – 190	5

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: EZ Fe 8
EN 14700	: EZ Fe 8
DIN 8555	: E 3-UM-60 ST

Mechanical Properties

Hardness (after working) (HRC)
58

Features and Applications

- A special kind of rutile-coated electrode for hardfacing of hot- and cold-work tool steels.
- Suitability for uses in hardfacing of hot or cold-work steels, edges of cutting dies, blades of hot-shearing machines, punching tools, rolls and impact punches, machinery tools for die-casting; at temperatures up to 550°C
- Applicability in hardfacing of steel materials such as ST50, ST60, ST70 as well as in re-manufacturing of tools
- Requirements of pre-annealing at 400°C of the base metal, welding through hammering, not exceeding the pre-annealing temperature by welding, and of very slow cooling of weld metal
- Variability of weld metal's hardness through heat treatment

Welding Positions



MIG Wire

STARLET 5157 M

Current Type

D.C.(-) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100084	2.50 x 350	3/32 x 14"	50 - 70	4	2070
3030100085	3.20 x 350	1/8 x 14"	90 - 120	5	3270

Approvals: GOST-R, SEPRO

Standards

DIN 8555 : M / WSG 3-GZ-60-T

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Mo	V	W
0.37	1.1	0.4	5.2	1.4	0.35	1.3

Mechanical Properties

Hardness (after welding)
(HRC)

57 - 60

Features and Applications

- High adhesive wear and impact-resistant, cold work tool steels require filling from strength, high temperature, abrasion and impact resistance that requires welding of hot-work tool steels are used
- The construction of non-alloy steel cutting edge, cutting and stripping tool steels used in the regions
- Tool steels can be given 300°C to 400°C pre-heating source
- Shielding Gas : MAG: Ar+CO₂ mix gases
TIG: Ar

Welding Positions



Welding Electrode

STARLET 5157E

Current Type

MAG D.C.(+) / TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
6031100358	1.20	0.047"	15
6031100359	1.6 x 1000	1/16 x 39"	5
6031100360	2.0 x 1000	5/64 x 39"	5
6031100153	2.4 x 1000	3/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

TS EN 14700	: E Fe 4
EN 14700	: E Fe 4
AWS A5.13	: E Fe 5-A
DIN 8555	: E 4-UM-60 S

Mechanical Properties

Hardness (after working) (HRC)
60 - 62

Features and Applications

- The weld deposit is the similar to the high speed steel so it is used for reconditioning the surface and cutting edges of hot working tool steels and tools made from unalloyed steels.
- Main applications are the tools exposed to heat, adhesion and impact wears
- It is recommended that preheating to 400°C before the welding of high carbon steels and tool steels
- Re-dry for 2 hours at 300°C - 350°C

Welding Positions



MIG Wire

STARLET 5158 M

Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)	Weight g / 100 pcs
3030100086	3.20 x 350	1/8 x 14"	90 - 120	5	3290

Approvals: GOST-R, SEPRO

Standards

DIN 8555 : M / WSG 4-60-S

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Mo	V	W
1.0	0.3	0.3	4.0	8.3	1.9	1.8

Mechanical Properties

Hardness (after welding)
(HRC)

60 - 62

Typical Base Material Grades

- 1.2436-1.3241-1.3344-1.3207

Features and Applications

- Application range is production of cutting edges of mild steels, hard facing of cutting edges of cutting dies
- It is hard facing wire
- Weld metal structure is similar to high speed steel and has abrasion, wear and pressure resistance
- Shielding gas: TIG : Ar

Welding Positions



Welding Electrode

STARLET 5158E

Current Type

TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
6031100336	1.6 x 1000	1/16 x 39"	5
6031100337	2.0 x 1000	5/64 x 39"	5
6031100338	2.4 x 1000	3/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

AWS A5.6 : E CuSn - C

Chemical Composition of Weld Metal % (Typical)

Sn	Cu
7.0-9.0	Rest

Mechanical Properties

Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
min. 420	min. 25	155

Features and Applications

- Tin bronze electrode for coating and repairing parts made of copper, bronze, brass and for joining of these to steels, cast iron, nickel, nickel alloys
- Good resistance to corrosion, particularly attack by acetone and dry ammoniac, industrial atmospheres and salty air, seawater and acids
- It is also resistant to metal / metal friction
- Applications include joining welding of machinery components made of copper and its alloys, steels and cast steels a grey cast iron, such as piston arms, sprockets, guides, turbine and centrifugal, blades, fans, ship's screw propellers, motor collector and valve seats, for the application of braze surfacing on this materials

Welding Positions



MIG Wire

STARLET 827 M

TIG Wire

STARLET 827 T

Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight kg
6031200023	3.20 x 350	1/8 x 14"	80 - 120	5
6031200024	4.00 x 350	5/32 x 14"	120 - 150	5

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 17672: Cu 922
EN ISO 17672 : Cu 922
AWS A5.7 : ER CuSn-C

Chemical Composition of Weld Metal % (Typical)

Cu	Sn	P
Rest	6.0	0.20

Mechanical Properties

Melting Range (°C)	Density (kg/dm ³)	Tensile Strength (N/mm ²)	Yield Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
910-1040	8.7	300	150	20	80

Features and Applications

- Highly wear resistant, good anti-friction properties suitable for joining copper-zinc alloys and coating of cast irons and steel materials and dissimilar materials like as steel and bronze
- Applications include bearing faces , art bronze, axle bearing
- Shielding Gas for TIG Welding: Ar
- Normal flame must be choosen
- 100 - 250°C pre-heat temperature must be done thicker than 10 mm materials

Welding Method

Gas Welding - TIG Welding

Current Type	MIG Wire	Electrode	Welding Positions
TIG D.C.(-)	STARLET 827 M	STARLET 827 E	

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
6031100388	2.0 x 1000	5/64 x 39"	5

Standards

TS 9604	: EL-AISI 5
AWS A5.3	: E 4043

Chemical Composition of Weld Metal % (Typical)

Si	Al
4.5 - 5.5	Rest

Mechanical Properties

Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Hardness (HB)
160 - 190	min. 10	50

Features and Applications

- Include also engine blocks, gear cases, engine gear box unit, miscellaneous components in light alloys, stroge tanks, containers, vessels, repair works on various kind of aluminium materials
- Manual welding electrode recommended for production and maintenance applications including repair of cracks, casting defects and building up sections also broken parts
- Suitable for made of aluminium applications
- Before welding on thick section preheat at about 200°C is recommended

Welding Positions



MIG Wire

STARLET 857M

TIG Wire

STARLET 857 T

Current Type

D.C.(+) / AC

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Package Weight (Kg)
6031200019	2.50 x 350	3/32 x 14"	50 - 80	2
6031200020	3.20 x 350	1/8 x 14"	70 - 100	2
6031200021	4.00 x 350	5/32 x 14"	90 - 130	2

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 18273	: S Al 4043 (AlSi5)
EN ISO 18273	: S Al 4043 (AlSi5)
TS EN ISO 17672	: Al 105
EN ISO 17672	: Al 105
AWS A5.10	: ER 4043

Chemical Composition of Welding Wire % (Typical)

Al	Si	Mn	Fe
rest	5.0	0.03	0.5

Mechanical Properties

Density (kg/dm ³)	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Melting Range (N/mm ²)
2.7	100	160	15	573-625

Features and Applications

- STARLET 857 T is aluminum TIG rod with high content of silicon
- It is used for joining and filling of aluminum silicon cast alloys including up to 7% silicon
- It is recommended that preheating to 150°C before welding of plates thicker than 15 mm
- For gas welding, GeKaTec F-LH1 is recommended

Welding Method

TIG Welding - Gas Welding

Current Type
TIG A.C.

Welding Positions



Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
6011100296	1.6 x 1000	1/16 x 39"	5
6011100249	2.0 x 1000	5/64 x 39"	5
6011100250	2.4 x 1000	3/32 x 39"	5
6011100251	3.2 x 1000	1/8 x 39"	5
6011100297	4.0 x 1000	5/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 18273	: S Al 4043 (AlSi5)
EN ISO 18273	: S Al 4043 (AlSi5)
AWS A5.10	: ER 4043

Chemical Composition of Welding Wire % (Typical)

Si	Mn	Al	Fe
5.0	0.03	rest	0.5

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Working Temperature (°C)
110	150	15	575 - 633

Typical Base Material Grades

- AlMgSi 0.5, AlMg1SiCu, AlMgSi 1, AlZn4.5Mg 1, Al 99.5, Al 99, AlCuMg 1, AlMgSi 0.7, AlMgSi 0.8, AlMgSiCu, AlMn 1, G-AlSi 6 Cu 4

Features and Applications

- It is S 857 M welding MIG wire
- Application range is joining of cast aluminum parts and aluminum profiles, motor blocks.
- Material range is AlMgSi 0.5, AlMgSiCu, Al99.5 etc
- It is recommended that preheating to 105°C before welding of plates thicker than 10 mm
- Required use of Ar, He or Ar+He gas as shielding gas

Welding Positions



Current Type

MIG D.C. (+)

Operating Data

Product Code	Diameter (mm) / (inch)		Package Weight (Kg)
6011100292	0.8	0.030"	5
6011100293	1.0	0.040"	7
6011100294	1.2	0.047"	7
6011100295	1.6	0.062"	7

Approvals: GOST-R, SEPRO

Standards

ISO 18273	: S Al 4047
SFA/AWS A5.10 /	
SFA/AWS A5.10M	: ER4047

Chemical Composition of Welding Wire % (Typical)

Si	Fe	Cu	Mn	Mg	Zn	Be	Ti
0.06	0.11	0.005	0.75	4.8	0.005	0.00	0.01

Mechanical Properties

Welding Consumables	Y.S (MPa)	T.S (MPa)	El. (%)	Melting Point (°C)	Anodizing Color
S 4047 T	124 – 224	275 – 330	12 – 16	579 – 582	White

Description, Features, and Applications

- STARLET 4047 T is the eutectic aluminum silicon alloy welding wire with about 12% Si element. Suitable for Al-Si, Al-Si-Mg, Al Si mg Cu wrought aluminium and aluminium (7%Si) argon arc welding.
- STARLET 4047 T is an aluminum-silicon welding filler designed for use in both welding and metal spraying applications. Similar to AlSi12 (Germany) and BS N21 (United Kingdom). Lower melting point and higher fluidity than 4043 wires. Widely used for brazing of aluminum, Al-Mn, Al-Si-Mg alloy materials. Can be used as a substitute for 4043 wires to increase silicon in the weld metal, minimize hot cracking and produce higher fillet weld shear strength.
- Can be applicate for Automotive components, Body panels, Brazing of aluminum sheets, extrusions, and castings.
- 100% Argon. Argon/Helium mixture.

Operating Data

Type	Diameters (mm)	Package	Weight (kg)
MIG wire	0.9mm, 1.0mm, 1.2mm, 1.6mm	Plastic Spool/Steel Spool	7
		Plastic Spool	7
	0.9mm, 1.0mm, 1.2mm	Plastic Spool	2
		Plastic Spool	0.5
TIG rod	1.6mm, 2.0mm, 2.4mm, 3.0mm, 3.2mm, 4.0mm, 5.0mm, 6.00mm	Carton or Plastic tube	5
			10
			20

Standards

TS EN ISO 14341-A	: G3Si 1
TS EN ISO 636-A	: W3Si1
EN ISO 14341-A	: G3Si 1
EN ISO 636-A	: W3Si 1
AWS A5.18	: ER 70 S-6

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn
0.08	0.85	1.45

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-30°C)	Elongation ((L ₀ =5d ₀) (%))
min. 420	500 - 640	min. 47 J	min. 22

Typical Base Material Grades

- E295, E335 , S235J2G3-S355J2G3, P235T1-P355T1, P235T2,P355T2, L210NB-L415NB, L290MB-L360MB, P235G1TH, P255G1TH, P235GH-P355GH, S235JRS1-S235J4S, S315G1S-S355G3S, S255N-S380N,P255NH P355NH, GE200- GE260

Features and Applications

- Steel construction and machinery production
- Welding of ships, boiler tanks, pipe parts
- Welding of thin walled steels
- Thin sheet welding in automotive industry
- Perfect smooth feedability, perfect welding characteristics
- Shielding gases: MAG; Ar+CO₂ mix gases, TIG ; % 100 Ar gas can be used
- It can be used at operating temperatures of 350°C-400°C.

Welding Positions



Current Type

TIG D.C.(-) / MAG D.C.(+)

Operating Data

Product Code		Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
BS 300	D 300				BS/D 300
3010200449	3010200523	0.8	0.030"	15	D 200
3010200451	3010200525	1.0	0.040"	15	D 100
3010200453	3010200527	1.2	0.047"	15	ECO PACK
3010200454	3010200529	1.6	0.062"	15	BIG PACK
		(0,6,0,9, 1.14,1.4)		(1,5,15,18,50,250,400)	
3010300156		1,60 x 1000	1 / 16 x 39"	5	Carton Box
3010300157		2,00 x 1000	5/64 x 39"	5	
3010300158		2,40 x 1000	3/32 x 39"	5	
3010300159		3,20 x 1000	1/8 x 39"	5	
3010300160		4,00 x 1000	5/32 x 39"	5	
3010300161		5,00 x 1000	3/16 x 39"	5	

Standards

TS EN ISO 14341-A	: G4Si 1
TS EN ISO 636-A	: W4Si1
EN ISO 14341-A	: G4Si 1
EN ISO 636-A	: W4Si1
AWS A5.18	: ER 70 S-6

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn
0.10	1.0	1.70

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-40°C)	Elongation ($L_0=5d_0$) (%)
min. 460	540- 680	min. 47 J	min. 22

Typical Base Material Grades

- E295, E360, S235J2G3-S355J2G3, P235T1-P355T1, P235T2, P355T2, L210NB-L415NB, L290MB-L415MB, P235G1TH, P255G1TH, P235GH-P355GH, S235JRS1-S235J4S, S315G1S-S355G3S, S255N-S420N, P255NH-P420NH, GE200-GE260

Features and Applications

- Used for the same welding purposes as SG2
- Its strength is increased by Si-Mn
- Low spatter although used under CO₂ atmosphere
- Excellent wire feeding capability
- Shielding gases: MAG; Ar+CO₂ mix gases, TIG; %100 Ar gas can be used

Welding Positions



Current Type

TIG D.C.(-) / MAG D.C.(+)

Operating Data

Product Code		Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
BS 300	D 300				BS/D300
3010201069	3010201107	0.8	0.030"	15	D 200
3010201071	3010201109	1.0	0.040"	15	D 100
3010201073	3010201111	1.2	0.047"	15	ECO PACK
3010201074	3010201113	1.6	0.062"	15	BIG PACK
		(0,6,0,9, 1.14, 1.4)		(1,5,15,18,50,250,400)	
	3010300203	1.6 x 1000	1/16 x 39"	5	Carton Box
	3010300204	2.0 x 1000	5/64 x 39"	5	
	3010300205	2.4 x 1000	3/32 x 39"	5	
	3010300206	3.2 x 1000	1/8 x 39"	5	
	3010300207	4.0 x 1000	5/32 x 39"	5	

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 17632-A	: T 42 4 P C 1 H5
EN ISO 17632-A	: T 42 4 P C 1 H5
AWS A5.20	: E 71T-1C-J

Chemical Composition of Weld Metal (Typical)

C	Si	Mn
0.06	0.5	1.3

Mechanical Properties

Heat Treatment	Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-40°C)	Elongation ((L ₀ =5d ₀) (%))
AW	min. 420	500- 640	min. 50 J	min. 22

AW: as welded

Typical Base Material Grades

- S235JR, S275JR, S235J2G3-S355J2G3, P 235T1-P355T1, P235T2-P355T2, L210NB-L360NB, L290MB L360MB , P235G1TH, P255G1TH, P235GH-P355GH , P295GH, S235JRS1-S235J4S, S315G1S-S355G3S, S255N-S380N, S255NL-S355NL, GE200-GE260

Features and Applications

- Rutile type flux-cored wire which is used for the production welding of machine and welding applications on ship, industry vehicle building and steel constructions in all positions
- Provides high mechanical properties, proper, smooth, X-ray safety seams
- It is economical as it has high melting ability and can work under high current in all positions
- Shielding gas : %100 CO₂

Welding Positions



Current Type

FCAW / D.C. (+)

Operating Data

Product Code	Diameter (mm) / (inch)		Weight (Kg)	Package Type
3010500008	1.20	0.047"	4.5	D 200
3010500018	1.20	0.047"	15	D 300
3010500023	1.20	0.047"	15	BS 300
3010500020	1.60	0.062"	15	BS 300
3010500035	1.60	0.047"	200	BIG PACK

Approvals: GOST-R, SEPPO

Standards

GB/T 10045	: T49TG-1NS
AWS A5.36	: E71T-GS /
	E71T-11

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	P	S	Cr	Ni	Mo	V
0.17	0.35	1.00	0.015	0.006	0.02	0.15	0.01	0.01

Mechanical Properties

R _m (MPa)	R _e or R _{p0.2} (MPa)	A (%)	(Indoor Temperature) KV ₂ (J)	Shielding Gas
595	-	24	-	Self-protection

Features and Applications

- STARLET 697 MO is a self-protection flux cored welding wire that does not require additional Shielding gas. It has excellent all position vertical down welding process performance, good operating process performance, and excellent wind resistance and rust resistance.
- Widely used for welding small structural components, it is easy to operate when paired with household portable welding machines.

Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight (kg)
3010500112	1.2	0.047"	180 - 280	15kg/roll
3010500116	1.6	0.062"	240 - 300	15kg/roll

The content of diffused hydrogen in deposited metal (Measured Value): 6.5ml/100g

Standards

TS EN ISO 21952-A	: G Z Cr Mo 1 Si
EN ISO 21952-A	: G Z Cr Mo 1 Si
TS EN ISO 21952-A	: W Z Cr Mo 1 Si
EN ISO 21952-A	: W Z Cr Mo 1 Si
AWS A5.28	: ER 80 S-B2

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	S	Ti	Mo	Cr
0.10	0.6	0.5	0.01	0.05	0.5	1.2
P			Cu			
0.01			0.14			

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/-50°C)	Elongation ((L ₀ =5d ₀) (%))	Heat Treatment
min. 480	580- 740	min. 47 J	min. 20	690°C/2h/300°C

Typical Base Material Grades

- 13CrMo4-5, 15CrMo5, 42CrMo4, 16CrMoV4, 25CrMo4, 24CrMo5, G22CrMo5-4, G17CrMo5-5GS22Mo4, E335, A193Gr.B7, A335P11, A333Gr.P11, P12.

Features and Applications

- Used for all type of steels included heat resistant steel up to 650°C. It is also used for steam boiler, pipe steel, pressure vessel steel, petrochemical and cast steel welding.
- It is extremely good for maintenance.

Welding Positions



Current Type

TIG D.C.(-) / MAG D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
3010300203	1.6 x 1000	1/16 x 39"	5	Carton Box
3010300204	2.0 x 1000	5/64 x 39"	5	
3010300205	2.4 x 1000	3/32 x 39"	5	
3010300206	3.2 x 1000	1/8 x 39"	5	
3010300207	4.0 x 1000	5/32 x 39"	5	

Standards

TS EN ISO 3580-A	: E CrMo2L B 42 H5
EN ISO 3580-A	: E CrMo2L B 42 H5
AWS A5.5	: E 8018-B3 L H4

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Mo	Cr
0.04	0.6	0.6	1.1	2.2

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)	Heat Treatment
min. 530	min. 620	min. 47 J	min. 18	690-750 °C / 1h / 300°C (air)

Typical Base Material Grades

- 2% Cr - 1% Mo Steels, A335 Gr. P22

Features and Applications

- Applicability in welding of heat-resisting steels containing 2% Cr - 1% Mn and similar alloys
- Electrode with basic-type coating
- Formation of more ductile and less hard weld metal due to low carbon content
- Serviceability at temperatures of values up to 600 °C
- Recommended pre-heating and post-heat treatment during welding processes
- Requirement of re-drying for min. 2 hours at the temperatures between 300°C and 350°C

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010100825	2.50 x 350	3/32 x 14"	80 - 110	2100
3010100828	3.20 x 350	1/8 x 14"	100 - 140	3480
3010100831	4.00 x 450	5/32 x 18 "	130 - 180	6680

Standards

TS EN ISO 3580-A	: E CrMo1 B 42 H5
EN ISO 3580-A	: E CrMo1 B 42 H5
AWS A5.5	: E 8018-B2 H4

Chemical Composition of
Weld Metal % (Typical)

C	Si	Mn	Mo	Cr
0.07	0.5	0.8	0.5	1.1

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)	Heat Treatment
min. 460	min. 550	min. 47 J	min. 20	690°C / 1h / 300°C (air)

Typical Base Material Grades

- 13CrMo4-5, 15CrMo5, 16CrMoV4, G17CrMo5-5, GS22Mo4, G22CrMo5-4, A193 Gr.B7, A335 Gr.P11

Features and Applications

- Steam boilers and steam pipes made of Cr-Mo-alloyed heat-resistant steels
- Cementation steels, nitrided steels
- Electrode coating of basic character
- Requirement of re-drying for 2 hours at the temperatures between 300°C and 350°C

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010100747	2.50 x 350	3/32 x 14"	80 - 110	2190
3010100750	3.20 x 350	1/8 x 14"	100 - 140	3520
3010100756	4.00 x 450	5/32 x 18"	140 - 190	6790
3010100759	5.00 x 450	3/16 x 18"	190 - 240	10020

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 3580-A	: E CrMo9 B 4 2 H5
EN ISO 3580-A	: E CrMo9 B 4 2 H5
AWS A5.5	: E 8018-B8 H4
AWS A5.4	: E 505-15

Chemical Composition of Weld Metal % (Typical)

C	Si	Mn	Mo	Cr
0.07	0.4	0.7	1.0	9.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation (L ₀ =5d ₀) (%)	Heat Treatment
min. 460	min. 590	min. 34 J	min. 19	740-780°C / 2h / 300°C (air)

Typical Base Material Grades

- X12CrMo9-1, X7CrMo9-1, GX12CrMo10.

Features and Applications

- Welding of boilers, pressure vessel steels, pipe steels and cast steels
- Electrode coating of basic character
- Electrode content of wt% 9 Chromium wt% 1 Molybdenum
- Serviceability at temperatures of values up to 650°C
- Requirement of re-drying for min. 2 hours at the temperatures between 300°C and 350°C

Welding Positions



Current Type

D.C.(+)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Welding Current (A)	Weight g / 100 pcs
3010100849	2.50 x 350	3/32 x 14"	60 - 90	2330
3010100852	3.20 x 350	1/8 x 14"	90 - 130	3810
3010100855	4.00 x 450	5/32 x 18"	120 - 160	6680

Approvals: GOST-R, SEPRO

Standards

TS EN ISO 14343-A	: W 25 9 4 N L
EN ISO 14343-A	: W 25 9 4 N L
AWS A5.9	: ER2594

Chemical Composition of Welding Wire % (Typical)

C	Si	Mn	Cr	Ni	Mo
0.02	0.35	0.70	25.0	9.00	3.80

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Elongation ((L ₀ =5d ₀) (%))	Impact Strength (ISO-V/+20°C)
min. 550	min. 760	min. 18	min. 47 J

Typical Base Material Grades

- (1.4501)X2CrNiMoCuWN25-7-4, (1.4515)GX3CrNiMoCuN26-6-3, (1.4517)GX3CrNiMoCuN25-6-3-3, UNS S 32750, S 32760 ZERON 100, SAF 2507, FALC100

Features and Applications

- STARLET 2594 T is a super duplex welding wire.
- Used for the welding Austenitic-Ferritic stainless alloys of %25 Cr, %9 Ni, %3.5 Mo and low C types
- It has high resistance to intergranular corrosion and pitting
- STARLET 2594 T is intended for welding super duplex alloys such as 2507, ASTM S32760, S32550 and A31260
- As the shielding gas, Argon (Ar) is used

Welding Positions



Current Type

TIG D.C. (-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Weight (Kg)	Package Type
6011100225	1.60 x 1000	1/16 x 39"	5	Plastic Box
6011100226	2.00 x 1000	5/64 x 39"	5	Plastic Box
6011100227	2.40 x 1000	3/32 x 39"	5	Plastic Box

Approvals: GOST-R, SEPRO

Description and Applications

Carbon Electrodes for bevelling, gouging, cleansing the broken surface and dirt, erasing the wrong welding deposit. It can be used for cutting metal parts into the desirable size. Used together with air compressor, and able to operate in all positions.

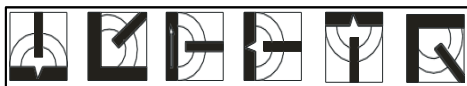
Operating Conditions

Diameter (mm)	Welding Current (A)
6.0 mm x 305 mm	180 – 240
8.0 mm x 305 mm	250 – 320
10.00 mm x 305 mm	350 – 650

Current Type

DC+

Welding Positions



Standards

AWS A5.14 : ER - Ni 1

Chemical Composition of Welding Wire % (Typical)

Ni	C	Si	Mn	Ti
Rest	0.02	0.4	0.4	3.0

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Impact Strength (ISO-V/+20°C)	Elongation ((L ₀ =5d ₀) (%))
min. 300	min. 500	min. 250 J	min. 30

Typical Base Material Grades

- 2.4061 , 2.4116 , 2.4170 as well as copper and its combinations with steel castings

Features and Applications

- Use in various applications of joint-welding of the materials Nikel 200/201 or stainless steels.
Suitability for use in welding of carbon steels or of high-alloyed nickel or nickel-copper alloys
- Required use of Ar (I1) as shielding gas in TIG welding

Welding Positions



Current Type

TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)
6031100304	1.20	0,047"	15
6031100110	2,4 x 1000	3/32 x 39"	5

Approvals: GOST-R, SEPRO

Standards

AWS A5.16 : ER Ti 2

Chemical Composition of Welding Wire % (Typical)

C	Fe	H	Ti
<0.03	<0.025	<0.008	Rest

Mechanical Properties

Yield Strength (N/mm ²)	Tensile Strength (N/mm ²)	Hardness (HB)	Elongation ((L ₀ =5d ₀) (%))
275	395 - 540	180	20

Features and Applications

- Suitability for uses in TIG welding of pure Titanium and of Titanium alloys
- Medium-strength wire with high percentage of elongation
- Requirement of pure Ar as shielding gas in TIG welding

Welding Positions



Current Type

TIG D.C.(-)

Operating Data

Product Code	Diameter x Length (mm) / (inch)		Package Weight (Kg)	Package Type
6031100323	2.00 x 1000	5/64 x 39"	5	Carton Box

Standards

AWS A5.8: BCuP-2

Chemical Composition of Welding Wire % (Typical)

Cu	P	Ag	Other
Balance	6.8-7.2	-	≤0.15

Mechanical Properties

Solid temperature : 710°C
 Liquids temperature : 800°C
 Welding temperature : 760-850°C

Description and Applications

- Brazing alloy designed for copper-to-copper joints
- Typically used in air-conditioning, refrigeration, plumbing, and general piping systems
- Flux-coated version eliminates the need for separate flux application, providing easier handling and cleaner joints
- Good capillary action, ensuring strong, leak-free connections
- Recommended for use where copper is joined in service temperature up to 200°C

Welding Positions

All positions (depending on joint design)

Condition of Use

Heating source : Oxy-acetylene, air-LPG, or induction heating
 Protection : integrated flux coating (no additional flux required)

Size

Diameter (mm)
1.6 x 500
2.0 x 500

Recovery : 100%

Packaging

Diameter	1.6 mm	2.00 mm
Standard Packaging	Plastic box	Plastic box
Weight	1 KG	1 KG

Other packaging and other diameters: please consult us

Chemical Composition of Tungsten Carbides %

Chemical Composition of Ni %

C	Co	Fe	W
3.8-4.2	≤0.1	≤0.5	Bal.

C	Si	Cr	Fe	B	Ni
0.2-0.4	2.9-3.8	7.0-8.0	≤5.0	1.5-1.9	Bal.

Spherical tungsten carbide casting : 65%
 NiCrBSi : 35%

Casting Hardness : 49 – 54 HRc
 Melting Point : 1050°C - 1150°C

Features

- STARLET 1457 T is a high performance anti-wear alloy. Produced in a single continuous coil from, 1457 T is a flexible continuous cord, comprised of a nickel core wire covered with an elastic binder which contains a high proportion of angular tungsten carbides and alloy powder. The coil is wound on a cellulosic material spool which can be mounted to facilitate use with automated wire feeder systems.
- 1457T deposits offer an extremely dense mass of ultrahard carbides (80% by weight) in a tough, durable coating with low sensitivity to cracking due to a nickel enhanced matrix.
- The deposit structure of 1457T offers demonstrably superior anti-abrasion properties against a wide variety of mineral matter. This is due not only to the extremely high hardness of the carbides, but also to their angular profiles. Unlike spheroidal shapes, carbides with angular profiles resist being ejected from the matrix as it wears around the carbides.
- The fluxing properties of both the binder and the alloy powder help control oxidation during deposition.

Typical Applications

- 1457T is designed expressly to provide durable protection of large industrial components against wear by abrasion, thereby greatly extending effective service life. It can be applied to a wide variety of ferritic base metals, although not for steels containing high percentages of Manganese (ie. 12 - 14% Mn).
- Can be apply for Ripper Teeth, Mixer & Scraper Blades, Extrusion Press Screws, Conveyor Screws, Decanter Pump Rotors and Sleeves, Guides & Scraper Blades, Cutting Edges on Plow Shares, Drill Bits, Stabilizers, etc.
- Can be used for several industries, like Mining & Earthmoving, Oil Exploration, Brick/Cement making, Mineral Processing, Iron & Steel, Agriculture.

Technical Data

Hardness, Matrix	Rc 35
Micro-Hardness, Carbides (50 – 100g load kg/mm ²)	K 2500
Granulometry	0.5 – 1.0 mm
Available Diameters	5.0, 6.0 and 8.0 mm
Max. Service Temperature	1300°F (704°C)
Storage Requirements	Cool and Dry, Max. Temp 100°F (38°C)

General Product Description

AlloyStar® 107AS is produced in single and multi-layer derivatives using the **STARLET** stringer bead welding process with refined heat input and cooling techniques. Dilution from the base material is kept to a minimum through these techniques which gives the product its outstanding properties. Abrasive resistant layer thicknesses from 3mm to 12mm are available on a wide selection of backing plate thicknesses. Other thicknesses are also available from **STARLET** manufacturing facilities upon request.

AlloyStar® 107AS has extremely high resistance to abrasive wear combined with low to moderate levels of impact.

These properties are fully maintained at temperatures of up to 300°C (570 °F).

Applications

AlloyStar® 107AS is the workhorse of the industry and widely used throughout the mining, cement, paper and pulp, petrochemical, dredging, glass, steel production, power generation and other industries where it successfully combats abrasive wear. Some specific areas of wear protection applications include:

Mining	Feed Chute Liners, Cyclones, Hoppers, Conveyor Systems, Truck Tray (Bin) & Bucket Liners, Piping Systems and Crusher Armouring.
Power Generation	Coal Transfer Systems, Crusher, Screens, Classifiers, Silos, Bunkers, Fans, Chutes and PF Systems.
Cement Manufacturing	Discharge Cones, Mill Liners, Storage Bins, Piping Systems, Separator Vanes, Fans, Chutes, Hoppers and Cyclones.
Other	Glass Recycling, Dredging Pipes, Feeding Hoppers, Feeding Skip Bases, Concrete Mixers, Feeding Cones and Agricultural Wear Parts.

For more in-depth information on applications, please contact **PT. ANUGERAH PANCA WISESA / STARLET**, consult our product and industry specific brochures or visit our website at www.anugerahpancawisesa.com.

Supply Conditions

AlloyStar® 107AS is typically supplied in the as-welded condition and can be shipped with Certificate of Conformance available on request.

Properties & Microstructures

The metallurgical structure of the overlay deposit of **AlloyStar® 107AS** consists of a high chromium cast iron, composed of primary and eutectic chromium carbides of the M7C3 type embedded in a ductile austenitic matrix. The carbide concentration is typically between 60 – 75% depending on the overlay thickness.

Typical Bulk Surface Hardness ⁽¹⁾			
AlloyStar® 107AS (5+3)	56 - 58 HRC (610 - 650 HV)	AlloyStar® 107AS (6+4)	56 - 58 HRC (610 - 650 HV)
AlloyStar® 107AS (6+6)	58 - 62 HRC (650 – 750 HV)	AlloyStar® 107AS (8+8)	58 - 62 HRC (650 - 750 HV)
AlloyStar® 107AS (10+6)	58 - 62 HRC (650 - 750 HV)	AlloyStar® 107AS (12+12)	62 - 64 HRC (750 - 800 HV)

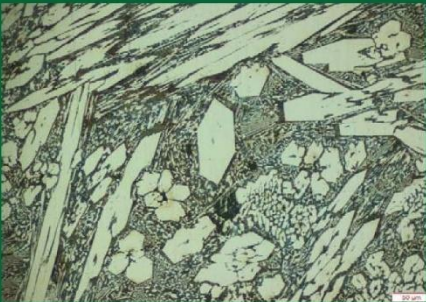
⁽¹⁾Bulk hardness is measures under controlled conditions.

As-Welded Surface Appearance



Homogeneous stringer beads with a regular distribution of stress relieve micro cracks.

X200 Metallographic Structure



A high concentration of primary and eutectic chromium carbides in an austenitic matrix.

Product Forms

AlloyStar® 107AS is available in both flat and tubular product form.

Flat products can be supplied in standard sizes:

3000mm x 1500mm or 3000mm x 2000mm

Tubular products are supplied in 3.0m maximum length, with a 75mm minimum internal diameter after welding.

Both flat and tubular products can be hardfaced on single or both sides⁽²⁾.

These products can also be supplied as pre-cut profiles to drawing or as manufactured components.

Various fitment options such as countersunk holes, welded studs or welded plug holes are available upon request.

⁽²⁾ Double siding capability could be restricted by total product thickness.

Note: Please check with **PT. ANUGERAH PANCA WISESA / STARLET** for product form availability.

Tolerances

Thickness	Overall thickness is maintained within 10% of the specified thickness.
Dimension	Dimensions are within $\pm 1.0\text{mm}$ of the specified dimension for all plasma cut parts. Other cutting methods such as laser and water-jet could be available on request.
Flatness	Plate flatness is maintained within $\pm 3\text{mm}$ over a 1.5m plate length.

Recommendations for Cutting and Fabrication

STARLET has an extensive brochure on fabrication, mechanical forming, drilling, machining, cutting and welding of our **AlloyStar®** range of products. This "**Workshop and Plate Processing Manual**" can be obtained from any **STARLET** Representative, **PT. ANUGERAH PANCA WISESA / STARLET office** or from our website www.anugerahpancawisesa.com.

Contact Information

For more information on this or any of our other products, equipment and services, please visit our website at www.anugerahpancawisesa.com or contact **PT. ANUGERAH PANCA WISESA / STARLET** office or our Marketing Team at anugerahpancawisesa@gmail.com.

General Product Description

AlloyStar® 307AS is produced in single and multi-layer derivatives using the **STARLET** stringer bead welding process with refined heat input and cooling techniques. Dilution from the base material is kept to a minimum through these techniques which gives the product its outstanding properties. Abrasive resistant layer thicknesses from 3mm to 12mm are available on a wide selection of backing plate thicknesses. Other thicknesses are also available from **STARLET** manufacturing facilities upon request.

AlloyStar® 307AS has extremely high resistance to abrasive wear combined with low to moderate levels of impact. These properties are fully maintained at temperatures of up to 450°C (840 °F).

Applications

AlloyStar® 307AS is widely used throughout the Cement, Mining, Petrochemical, Paper and Pulp, Dredging, Steel production, Power generation and other industries where resistance to very high levels of abrasion is required. Some specific areas of wear protection applications include:

Mining	Sizing Screens, Feed Chute Liners, Cyclones, Hoppers, Conveyor Systems, Piping Systems, Pumps, Crusher Armouring, Truck Tray (Bin) and Bucket Liners.
Power Generation	Coal Transfer Systems, Crusher Armouring, Screens, Classifiers, Silos, Bunkers, Fans Casings, Chutes, PF Systems, Coal Pulveriser Rolls, Valves and Valve Bodies.
Steel Manufacturing	Coke Hammers, Slag Cones, Hooks, Furnace Load Preparation Systems, Fans & Fan Casings, Wear Plates at Elevated Temperatures and Hot Gas Extraction.
Other	Glass Recycling and Manufacturing, Railway Ballast Tampers, Rippers, Rock Wool Rolls, Sugar Mill Crusher Hammers, Extruder Screws, Dredge Buckets and Shredders.

For more in-depth information on applications, please contact **PT. ANUGERAH PANCA WISESA / STARLET**, consult our product and industry specific brochures or visit our website at www.anugerahpancawisesa.com.

Supply Conditions

AlloyStar® 307AS is typically supplied in the as-welded condition and can be shipped with Certificate of Conformance available on request.

Properties & Microstructures

The metallurgical structure of the overlay deposit of **AlloyStar® 307AS** consists of a high chromium cast iron, composed of complex primary and secondary eutectic chromium and niobium carbides embedded in a ductile austenitic matrix. The carbide concentration is typically between 65 — 80% depending on the overlay thickness.

Typical Bulk Surface Hardness ⁽¹⁾			
AlloyStar® 307AS (5+3)	58 - 60 HRC (590 - 630 HV)	AlloyStar® 307AS (8+4)	58 - 62 HRC (590 - 630 HV)
AlloyStar® 307AS (6+6)	60 - 62 HRC (675 - 750 HV)	AlloyStar® 307AS (8+8)	58 - 62 HRC (675 - 750 HV)
AlloyStar® 307AS (10+6)	60 - 62 HRC (675 - 750 HV)	AlloyStar® 307AS (12+12)	62 - 64 HRC (700 - 810 HV)

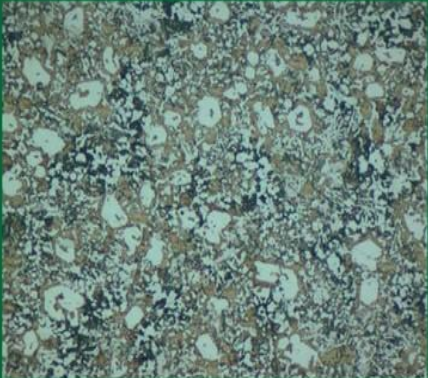
⁽¹⁾Bulk Overlay hardness is measures under controlled conditions.

As-Welded Surface Appearance



Homogeneous stringer beads with a regular distribution of stress relieve micro cracks.

x500 Metallographic Structure



A high concentration of primary and eutectic chromium and niobium carbides in an austenitic matrix.

Product Forms

AlloyStar® 307AS is available in both flat and tubular product form.

Flat products can be supplied in standard sizes:

3000mm x 1500mm or 3000mm x 2000mm

Tubular products are supplied in 3.0m maximum length, with a 75mm minimum internal diameter after welding.

Both flat and tubular products can be hardfaced on single or both sides⁽²⁾.

These products can also be supplied as pre-cut profiles to drawing or as manufactured components.

Various fitment options such as countersunk holes, welded studs or welded plug holes are available upon request.

⁽²⁾ Double siding capability could be restricted by total product thickness.

Note: Please check with **PT. ANUGERAH PANCA WISESA / STARLET** for product form availability.

Tolerances

Thickness	Overall thickness is maintained within 10% of the specified thickness.
Dimension	Dimensions are within $\pm 1.0\text{mm}$ of the specified dimension for all plasma cut parts. Other cutting methods such as laser and water-jet could be available on request.
Flatness	Plate flatness is maintained within $\pm 3\text{mm}$ over a 1.5m plate length.

Recommendations for Cutting and Fabrication

STARLET has an extensive brochure on fabrication, mechanical forming, drilling, machining, cutting and welding of our **AlloyStar®** range of products. This "**Workshop and Plate Processing Manual**" can be obtained from any **STARLET** Representative, **PT. ANUGERAH PANCA WISESA / STARLET office** or from our website www.anugerahpancawisesa.com.

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General Product Description

AlloyStar® 607AS is produced in single and multi-layer derivatives using the **STARLET** stringer bead welding process with refined heat input and cooling techniques. Dilution from the base material is kept to a minimum through these techniques which gives the product its outstanding properties. Abrasive resistant layer thicknesses from 3mm to 12mm are available on a wide selection of backing plate thicknesses. Other thicknesses are also available from **STARLET** manufacturing facilities upon request.

AlloyStar® 607AS has extremely high resistance to abrasive wear combined with low to moderate levels of impact. These properties are fully maintained at temperatures of up to 700°C (1290 °F).

Applications

AlloyStar® 607AS is widely used throughout the Cement, Mining, Petrochemical, Paper and Pulp, Dredging, Steel production, Power generation and other industries where resistance to extreme levels of abrasion at both room and elevated temperatures is required. Some specific areas of wear protection applications include:

Mining	Feed Chute Liners, Hot Piping Systems, Pumps & Pump Casings, Crusher Armouring, Truck Tray (Bin) and Bucket Liners.
Power Generation	Coal Transfer Systems, Crusher Armouring, Hot Classifiers, Fans & Fan Casings, PF Systems, Burner Components, Valves and Valve Bodies.
Steel Manufacturing	Coke Hammers, Slag Cones, Crush Decks, Furnace Hoppers and Throats, Fans & Fan Casings, Wear Plates at High Temperatures and Hot Gas Extraction.
Other	Glass Recycling & Manufacturing, Rippers, Rock Wool Rolls & Dicks, Sugar Mill Crusher Hammers, Extruder Screws and Wear Plates at Elevated Temperatures.

For more in-depth information on applications, please contact **PT. ANUGERAH PANCA WISESA / STARLET**, consult our product and industry specific brochures or visit our website at www.anugerahpancawisesa.com.

Supply Conditions

AlloyStar® 607AS is typically supplied in the as-welded condition and can be shipped with Certificate of Conformance available on request.

Properties & Microstructures

The metallurgical structure of the overlay deposit of **AlloyStar® 607AS** consists of a high chromium cast iron, composed of complex primary and secondary eutectic chromium and complex carbides embedded in a secondary carbide eutectic matrix. The carbide concentration is typically between 65 — 80% depending on the overlay thickness.

Typical Bulk Surface Hardness ⁽¹⁾			
AlloyStar® 607AS (6+4)	58 - 60 HRC (650 - 700 HV)	AlloyStar® 607AS (8+4)	58 - 60 HRC (650 - 700 HV)
AlloyStar® 607AS (6+6)	60 - 62 HRC (700 - 750 HV)	AlloyStar® 607AS (8+8)	60 - 62 HRC (700 - 750 HV)
AlloyStar® 607AS (10+10)	60 - 62 HRC (700 - 750 HV)	AlloyStar® 607AS (12+12)	62 - 64 HRC (750 - 800 HV)

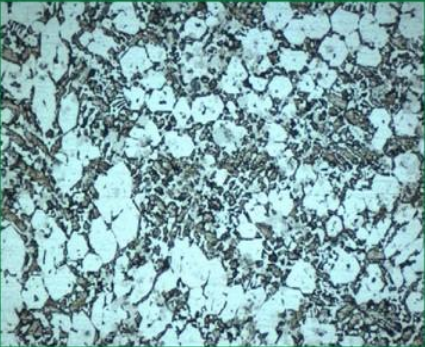
⁽¹⁾Bulk Overlay hardness is measures under controlled conditions.

As-Welded Surface Appearance



Homogeneous stringer beads with a regular distribution of stress relieve micro cracks.

x500 Metallographic Structure



A high concentration of primary and eutectic chromium and complex carbides in a carbide eutectic matrix

Product Forms

AlloyStar® 607AS is available in both flat and tubular product form.

Flat products can be supplied in standard sizes:

3000mm x 1500mm or 3000mm x 2000mm

Tubular products are supplied in 3.0m maximum length, with a 75mm minimum internal diameter after welding.

Both flat and tubular products can be hardfaced on single or both sides⁽²⁾.

These products can also be supplied as pre-cut profiles to drawing or as manufactured components.

Various fitment options such as countersunk holes, welded studs or welded plug holes are available upon request.

⁽²⁾ Double siding capability could be restricted by total product thickness.

Note: Please check with **PT. ANUGERAH PANCA WISESA / STARLET** for product form availability.

Tolerances

Thickness	Overall thickness is maintained within 10% of the specified thickness.
Dimension	Dimensions are within $\pm 1.0\text{mm}$ of the specified dimension for all plasma cut parts. Other cutting methods such as laser and water-jet could be available on request.
Flatness	Plate flatness is maintained within $\pm 3\text{mm}$ over a 1.5m plate length.

Recommendations for Cutting and Fabrication

STARLET has an extensive brochure on fabrication, mechanical forming, drilling, machining, cutting and welding of our **AlloyStar®** range of products. This "**Workshop and Plate Processing Manual**" can be obtained from any **STARLET** Representative, **PT. ANUGERAH PANCA WISESA / STARLET office** or from our website www.anugerahpancawisesa.com.

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