TDB 12.08.2009 Page 1 of 1	Technical data sheet GS17-4PH	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material-no..	1.4542
DIN	X5CrNiCuNb 16 4
AISI	~630
Others	17-4PH

Corrosive resistant Chromium-Nickel steel, similar to AISI 300, 303 and 304, suitable for precipitation hardening.

Application field

Suitable for many applications in instrumental medicine, aviation and cognate industries.

Approximate Analysis in %

C	Si	Mn	P	S	Ni	Cr	Cu	Mo	Fe
< 0,07	< 0,07	< 1,5	< 0,04	< 0,03	3-5	15-17	3-5	< 0,6	balance

Physical Characteristic

Hardness solution annealed (HB)	< 360
precipitation hardened 500°C – 4 h (HV10)	appr. 410
Tensile strength Rm (MPa)	800-1150

Welding instruction

Remove damaged material, care for clean welding area and proper cover of shielding gas.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 18.07.2006 Page 1 of 1	Technical Data GS2®	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

DIN 8555: WSG 3-GZ-55-ST

Solid filler wire, for high temperature strong welding on hot and cold work tools.

Application field

For hard welding on hot and cold work tool, they are heavily stressed of pressure, friction and moderate impact stress. Suitable for armouring on unalloyed and low-alloyed steel.

Approximate Analysis in %

C	Si	Mn	Cr	Mo	Ti	Fe			
0,35	0,3	1,2	7,0	2,0	0,3	rest			

Physical Characteristic

hardness untreated	600 – 700 HV10
soft annealed	env. 235 HB
Hardened 1050°C in Oil	env. 58 HRC (650 HV10)
tempered 600°C	env. 53 HRC

Welding instruction

Clean welding area required. Good weldable on edges even on areas with increased wear. On bigger Areas we advise a buffer layer with GSNI10, GSCO12 or GS3. This material may show success on first layer, if GS3 or GSCO12 cracks. Lower light reflection. Avoid needless laser flattening. Preheating up to 400°C and following tempering up to 550°C preferable, but on very small welding not absolute required.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 19.04.2006 Page 1 of 1	Technical Data GS20®	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

W.-Nr. 1.5424

Solid filler wire. Carburizeable, aging resistant filler material, heat resistant up to 550°C steel

Application field

For joining and build up welding, e.g. for not yet carburized case hardening steel and quenched and tempered steel.

Approximate Analysis in %

C	Si	Mn	Mo	Fe					
0,10	0,6	1,2	0,5	rest					

Physical Characteristic

untreated	minimum at 20°C
tensile stength R_m (N/mm²)	560
proof strength $R_{p\,0,2}$ (N/mm²)	460
ultimate elongation A_5 (%)	18
notched bar impact work A_v (J)	47

Welding instruction

Clean welding area required.

Available

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 18.07.2006 Page 1 of 1	Technical Data GS3®	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

DIN 8555: WSG 3-GZ-45-T

Solid metal wire, for wear resistant welding on hot work tools they are stressed of friction and pressure and moderate impact.

Application field

For laser welding on tools very universal applicable. Best compromise between hardness and crack resistance. High wear resistance, even in die cast moulds.

Approximate Analysis in %

C	Si	Mn	Cr	Mo	Ti	Fe			
0,25	0,5	0,7	5,0	4,0	0,6	rest			

Physical Characteristic

hardness:	approx. at 20°C
untreated	42 - 46 HRC
soft annealed	env. 230 HB
hardened 1030°C / oil	env. 48 HRC
tempered 600°C	env. 45 HRC

Welding instruction

Clean welding area required. Cracks work off completely. Preheating, depending to basic material and welding process, up to 400°C. In laser welding often without preheating. Take care of processing instruction of basic material.

Deliverable

straightened rods of 1 meter in diam. 0,15 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 18.07.2006 Page 1 of 1	Technical Data GS33	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

DIN 8555: MSG 6-45-RZ
Material number: 1.4115

Martensitic weld metal. For welding on corrosion and scale resistant chromium steel with ferritic and martensitic structure.

Application field

Heat and scale resistant up to 900°C, temper resistant up to 550°C. High resistance against abrasion, adhesion und cavitation and combined wear mechanism. Good corrosion resistance against many saline solutions, particularly sea water.

Approximate Analysis in %

C	Si	Mn	Cr	Ni	Fe				
0,2	0,5	1,0	17,0	0,5	rest				

Physical Characteristic

Weld metal tempered	approx. at 20°C
hardness untreated	45 HRC
tensile strength Rm (N/mm²)	690
proof strength Rp 0,2 (N/mm²)	490
ultimate elongation A5 (%)	15

Welding instruction

Clean welding area required.

Deliverable

straightened rods of 1 meter in diam. 0,15 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 03.08.2006 Page 1 of 1	Technical Data GS4	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

DIN 8555: SG 3-GZ-40-T

Filler wire for wear resistant welding on hot work tools they are stressed of abrasion, pressure and impact at increased temperature.

Application field

Very universal applicable for laser repair welding on tools. High cracking resistance with lower hardness. Good wear resistance, on die cast molds too.

Approximate Analysis in %

C	Si	Mn	Cr	Mo	Fe				
0,1	0,4	0,6	6,5	3,3	Rest				

Physical Characteristic

hardness of solid weld metal	approximate
untreated	38-42 HRC

Welding instruction

Clean welding area required. Cracks remove completely. Preheating depending to basic material and welding procedure up to 400°C. In laser welding often without preheating. Follow welding advise for basic material.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 24.07.2006 Page 1 of 1	Technical Data GS4122	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material-No.: 1.4122

Solid filler wire, 17% Chromium steel, corrosion resistant.

Application field

For joining and build up welding on homogeneous or similar alloyed, corrosive resistant steel, operating temperature up to 450°C.

Approximate Analysis in %

C	Si	Mn	Cr	Mo	Ni	Fe			
0,4	<0,5	<0,5	16,5	1,0	0,5	Rest			

Physical Characteristic

untreated	approx. at 20°C
hardness	up to 48 HRC
tensile strength R_m (N/mm²)	800
proof strength $R_{p\,0,2}$ (N/mm²)	600
ultimate elongation A_5 (%)	12

Welding instruction

Clean welding area required. Use stainless steel wire brush only. Preheating depending to basic material and welding procedure 150°C – 400°C. We advise subsequent tempering, subsequent hardening and tempering is possible.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 25.07.2006 Page 1 of 1	Technical Data GS4310	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material-No.: 1.4310

Stainless Cr-Ni steel without special additions.

Application field

For homogeneous and similar joining and build up welding, even springs up to 300°C processing temperature.

Approximate Analysis in %

C	P	S	Si	Mn	Cr	Mo	Ni	N	Fe
0,1	0,045	0,015	2,0	2,0	17,5	0,8	8,0	0,11	Rest

Physical Characteristic

solution annealed	approximate at 20°C
tensile strength R_m (N/mm²)	500-750
hardness	$\leq$ 230 HB 30
poof strength $R_{p\,0,2}$ (N/mm²)	$\geq$ 195
ultimate elongation A_5 (%)	$\geq$ 40

Welding instruction

Clean welding area required. Use austenitic Cr-Ni steel brushes only.

Deliverable

straightened rods of 1 meter in diam. 0,50 mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 25.07.2006 Page 1 of 1	Technical Data GS4401	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material-No.: 1.4401

Stainless austenitic Cr-Ni-Mo steel without special additions.

Application field

For homogeneous and similar joining and build up welding, even on springs and tools up to 350°C working temperature, hardenable.

Approximate Analysis in %

C	P	S	Si	Mn	Cr	Mo	Ni	N	Fe
0,07	0,045	0,015	1,0	2,0	17,5	2,2	11,5	0,11	Rest

Physical Characteristic

solution annealed	approximate at 20°C
tensile strength R_m (N/mm²)	500-700
poof strength $R_{p\,0,2}$ (N/mm²)	$\geq$ 200
ultimate elongation A_5 (%)	$\geq$ 40
hardness	$\leq$ 215 HB 30

Welding instruction

Clean welding area required. Use austenitic Cr-Ni wire brushes only.
Hardening: 1020-1120°C >2mm water, <2 mm moved air, compressed air.

Deliverable

Straightened rods of 1 meter in diam. 0,50 mm
other sizes and forms on request.

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 08.07.2007 Page 1 of 1	Technical Data GS4430	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 1.4430

Austenitic filler material with low carbon content and approx. 10 % δ-ferrite. Resistant against pitting corrosion and intercrystalline corrosion up to 400 °C. Scale resistant up to 800 °C. Lowest working temperature –196°C.

Application field

For joining and build up welding on stabilized and unstabilized Cr-Ni steel, applicable for mirror polishing.

Approximate Analysis in %

C	Si	Mn	Cr	Ni	Mo	Fe			
0,02	0,45	1,4	18,5,0	12,5	2,6	Rest			

Physical Characteristic

proof strength Rp 0,2 (N/mm²)	440
tensile strength Rm [MPa]	620
ultimate elongation A5 [%]	40
notched bar impact work AV [J] (ISO-V)	120

Welding instruction

Clean welding area required, use austenitic Cr-Ni wire brushes only.

Deliverable

Straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,70mm
100 m spool 0,25 to 0,70mm
1 Kg spool 0,25 to 0,70mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 02.08.2006 Page 1 of 1	Technical Data GS45	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

DIN 8555: WSG 3 - 45 - T
Material number: 1.2567

Martensitic weld metal with embedded carbides and restaustenite. Highly tempering resistance and heat strength up to 500 °C. Excellent resistance against adhesive wear and fatigue.

Application field

For welding on hot work tools, they are heavily stressed of abrasion and thermal alternating.

Approximate Analysis in %

C	Mn	Cr	W	V	Fe				
0,3	0,3	2,3	4,3	0,6	rest				

Physical Characteristic

hardness untreated	approx. 46 HRC
soft annealed 760°C – 800°C, 2 – 4 h	approx. 22 HRC
hardened 1050°C in Öl	approx. 50 HRC
tempered 400°C	approx. 44 HRC
tempered 600°C	approx. 45 HRC

Welding instruction

Clean welding area required. Hardenable steel only weld preheated up to 450°C. In laser welding first layer is subject to cracks. For bigger build ups we advise to buffer layers.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 02.08.2006 Page 1 of 1	Technical Data GS4551	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 1.4551

Solid filler wire, Niob-stabilized, austenitic material with low ferritic content.

Application field

For joining and build up welding on stabilized and unstabilized Cr-Ni steel. Resistant against intercristaline corrosion up to 400°C, against scale up to 800°C. Lowest working temperature –196°C.

Approximate Analysis in %

C	Si	Mn	Cr	Ni	Nb	Fe			
0,05	0,8	1,6	19,5	9,8	0,7	Rest			

Physical Characteristic

untreated	approximate at 20°C
tensile strength R_m (N/mm²)	650
poof strength $R_{p\,0,2}$ (N/mm²)	430
ultimate elongation A_5 (%)	44

Welding instruction

Clean welding area required, use austenitic Cr-Ni wire brushes only.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,70mm
100 m spool 0,25 to 0,70mm
1 Kg spool 0,25 to 0,70mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 02.08.2006 Page 1 of 1	Technical Data GS4571	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 1.4571

Solid filler wire, stainless, Titanium-stabilized, austenitic Cr-Ni-Mo steel.

Application field

For joining and build up welding on stabilized and unstabilized Cr-Ni-steel. Suitable for low temperature and up to 700°C applications.

Approximate Analysis in %

C	Si	Mn	Cr	Mo	Ni	Ti			
0,08	>1,0	>2,0	17,5	2,2	12,0	0,4			

Physical Characteristic

untreated	approximate at 20°C
tensile strength R_m (N/mm²)	500-700
hardness	≥ 195 HB
ultimate elongation A_5 (%)	≥ 40
notched bar impact work A_v (J)	≥ 100

Welding instruction

Clean welding area required. Use austenitic Cr-Ni wire bushes only.

Deliverable

straightened rods of 1 meter in diam. 0,20 to 0,50 mm
50 m spool 0,25 to 0,60mm
100 m spool 0,25 to 0,60mm
1 Kg spool 0,25 to 0,60mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 02.07.2009 Page 1 of 1	Technical Data GS4937	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material-No.: 1.4937
AWS A 5.9 ER505 (mod.)
EN 12070 G CrMoWV12Si

Solid filler wire for high heat strong welding on hot work tools.

Application field

For welding on similar and cognate highly heat resistant, quenched and tempered, martensitic 12% Chromium steel. Heat resistant up to 550°C, scale resistant up to 600°C.

Approximate Analysis in %

C	Si	Mn	Cr	Mo	Ni	W	V	Fe	
0,2	0,3	0,6	11	1	0,4	0,5	0,3	balance	

Physical Characteristic

Yield strength 0,2% (N/mm²)	590
Tensile strength Rm (N/mm²)	700
Elongation $L_0=5d_0$ (%)	15
notched bar impact work ISO-V (J)	35

Welding instruction

Preheating up to 300°C, slow cooling (furnace, hot sand) down to 120°C with subsequent tempering 4h at 720 - 760°C / air. Possibly tempering at 1050°C / air or oil and 4h at 700 – 760 °C / air. Bigger build ups temper immediately after welding at 550°C for 2h, an above annealing job must follow.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GS55®	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

DIN 8555: SG-6-60-GTZ
Material number: 1.4718

Martensitic Cr-steel wire with good heat strength up to 500 °C. Scale resistant up to 800 °C. High resistance against adhesive and abrasive wear. Resists impact stress, hardenable.

Application field

For highly wear resistant welding on e.g. cutting and bending tools and drawing dies, further different hot work tool. Repair of edges with laser welding.

Approximate Analysis in %

C	Si	Mn	Cr	Fe					
0,4	3,1	0,45	9,0	Rest					

Physical Characteristic

hardness untreated	approx. 60 HRC
hardened 1050°C in air or oil	approx. 61 HRC
tempered 300 °C	approx. 54 HRC
tempered 400 °C	approx. 57 HRC
tempered 500 °C	approx. 55 HRC
tempered 600 °C	approx. 42 HRC
tempered 700 °C	approx. 38 HRC

Welding instruction

Clean welding area required. In laser welding the material subjects heavy to micro cracks. For big build up welding we advise buffer layers.

Deliverable

straightened rods of 1 meter in diam. 0,20 to 0,50 mm
50 m spool 0,25 to 0,70mm
100 m spool 0,25 to 0,70mm
1 Kg spool 0,25 to 0,70mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GS60	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

DIN 8555: SG 4 - 60 - S
Material number: 1.3348

Solid high speed steel filler wire with improved toughness and good cutting performance. Martensitic material with embedded carbides and rest austenite. High hot hardness, tempering and scale resistance, hardenable.

Application field

For armouring wear susceptible areas and edges on tools. Even cracking free in first layer on very critical materials as 1.2379 (D2).

Approximate Analysis in %

C	Si	Mn	Cr	Mo	W	V	Fe		
1,0	0,45 max.	0,40 max.	4,0	9,0	1,8	2,0	Rest		

Physical Characteristic

hardness untreated	approx. 63 HRC
soft annealed (780°C- 820°C, 2-4 h)	approx. 27 HRC
hardened (compressed air 1180°C – 1220°C)	approx. 63 HRC
tempered twice (540°C-560°C, 1 h, air)	approx. 65 HRC

Welding instruction

Clean welding area required. We advise necessarily preheating at 250°C – 450°C. For multilayer build ups we advise buffer layers.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 20.08.2009 Page 1 of 1	Technical Data GS7734	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material-No. 1.7734
EN1 2070 15CrMoV6
AIR 9117 15CDV6

Uncoated solid filler wire for materials as 15CrMoV6, 25CrMo4, 35CrMo4 and 20CrMo12.

Application field

A high clean filler material for welding without micro porosity.

Approximate Analysis in %

C	Si	Mn	Cr	Mo	V	P	S	Fe	
0,14	0,15	1,0	1,4	0,9	0,25	< 0,02	< 0,02	balance	

Physical Characteristic

hardness untreated (HV10)	approx. 410
Tensile strength Rm (MPa)	1080-1280
Yield strength Rp0,2 (MPa)	930

Welding instruction

Remove damaged material. Keep weld area clean and care welding advise of basic material.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 23.1.2007 Page 1 of 1	Technical Data GSALSI12	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Al 4047A

High Si-alloyed Aluminium filler wire with excellent weldability.

Application field

For homogeneous and similar welding. Very cracking resistant weld metal.

Approximate Analysis in %

Si	Fe	Cu	Al						
12,0	max. 0,6	max. 0,3	rest						

Physical Characteristic

untreated weld metal	approximate at 20°C
tensile strength R_m (N/mm²)	130
proof strength Rp 0,2 (N/mm²)	60

Welding instruction

Clean welding area required. Follow common welding rules.

Deliverable

straightened rods of 1 meter in diam. 0,40 and 0,50 mm
50 m spool 0,40 and 0,50 mm
100 m spool 0,40 and 0,50 mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSCO12	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 1.6356

High-alloy, maraging steel wire used e.g. for aluminium die casting moulds and trimming tools, capable of being machined.

Application field

For high stressed cold and hot work tools. Best hot wear and spalling resistance available after artificial aging. After welding good machinable.

Approximate Analysis in %

C	Si	Mn	Ni	Co	Mo	Al	Ti	Fe	
0,02	0,03	0,02	18,0	12,0	4,0	0,1	1,8	Rest	

Physical Characteristic

hardness of solid filler material	approximate at 20°C
untreated	32-35 HRC
artificial aged 3 - 4 h / 480°C	50-54 HRC

Welding instruction

Clean welding area required. Remove cracks completely. Preheating for laser welding usually not necessary, take care operating instruction of basic material.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSCU10	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 2.1367
AWS A5.13: ERCuMnNiAl

Solid multi-alloy bronze welding wire for joining and deposition welding on aluminium-bronze, steel and cast-iron materials. Excellent corrosion resistance and gliding quality.

Application field

This material suits very good for wear protection on sliding faces, for sealing faces, for drawing tools and pistons.

Approximate Analysis in %

Al	Fe	Ni	Mn	CU					
7,0	2,5	2,5	13,0	Rest					

Physical Characteristic

hardness untreated approx. 220HB

Welding instruction

Clean welding area required. Cracks work off completely. Parts to weld prepare following manufacturer instructions (e.g. preheating).

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSCU20	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Copper based solid filer wire for homogeneous and similar joining and deposition welding.

Application field

For changes and repairs on parts they are made of Ampcoloy 940 or similar materials. Heterogeneous welding is difficult but possible in restrictive conditions.

Approximate Analysis in %

Ni	Si	Cr	Andere	CU					
2,0-3,0	0,4-0,8	0,1-0,6	max. 0,5	Rest					

Physical Characteristic

hardness untreated approx. 210 HB 10/30

Welding instruction

Clean welding area required, cracks work off completely. Prepare basic material following manufacturers' instructions.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,60mm
100 m spool 0,25 to 0,60mm
1 Kg spool 0,25 to 0,60mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 19.07.2007 page 1 from 9	Technical data sheet GSINC625	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Nonmagnetic, corrosion - and oxidation-resistant, nickel-based alloy. High strength and toughness in the temperature range cryogenic to 1090°C.

Application field

For welding on e.g. heat shields, seawater applications, gas turbine engine ducting, chemical plant hardware and other heat and corrosion affected applications

Approximate Analysis in %

C	Si	Mn	Cr	Mo	Ti	Fe	Co	Nb+Ta	Al	Ni
Max. 0,1	0,5	0,5	20-23	8-10	0,4	Max. 5	Max. 1	3,2-4,1	0,4	Balance

Physical Characteristic

tensile strength Rm (N/mm²)	880 - 910
proof strength Rp 0,2 (N/mm²)	450 - 550

Welding instruction

Clean welding area and proper gas protection required. Remove damaged material, work off cracks completely. Prepare shape of connection area as usual. Use austenitic Cr-Ni-steel wire brushes only.

Deliverable

Straightened rods in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 20.8.2009 page 1 from 9	Technical data sheet GSINC718	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Material-No. 2.4668

Specification

Precipitation Hardening Nickel-Chromium alloy with long period creep resistance up to 700°C.

Application field

For welding on e.g. gas turbine engine ducting, rocket-drives, aircraft turbo-jets, nuclear reactors and pumps.

Approximate Analysis in %

C	Cr	Mo	Ti	Fe	Ni+Co	Nb+Ta	Al
< 0,1	17-21	2,8-3,3	0,65-1,15	Balance	50-55	4,75-5,5	0,2-0,8

Physical Characteristic

Density Kg/dm³	8,19
Melting temperature °C	1336
Modulus of rigidity KN/mm²	77,2
Modulus of elasticity KN/mm²	204,9

Welding instruction

Clean welding area and proper gas protection required. Remove damaged material, work off cracks completely. Prepare shape of connection area as usual.
Solution annealing 980°C, 1 h cooling down in air.
Age hardening at 720°c for 8 h, slow cooling in furnace down to 620°C and further hold time for 18 h for a complete hardening.

Deliverable

Straightened rods in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.8 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 10.09.2007 page 1 from 1	Technical data Sheet GSINV36	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Weld material with high mechanical properties and very low thermal elongation.

Application field

For similar welding on cast steel with a 34 – 40 % Nickel content (INVAR-materials). Very good suitable for welding operations on sheet metal and cast steel constructions with 36% Nickel.

Approximate Analysis in %

C	Si	Mn	Ni	P	S	Fe		
0,015 – 0,025	0,1	0,3	34 – 38	<0,01	<0,01	Rest		

Physical Characteristic

proof strength Rp 0,2 (N/mm²)	>280
tensile strength Rm (N/mm²)	>350
ultimate elongation A5 (%)	>25
notched bar impact work Av (J)	>80
hardness [HB]	appr. 150

Welding instruction

Clean weld are is required. Care low heat affecting zone. Prefer impulse technology or use a pulsed solid state (Nd-YAG) laser.

Deliverable

Straightened rods in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSNI10	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 2.4806
DIN 1736: SG-NiCr20Nb
AWS A5.14: ERNiCr-3

Nickel-based wire, scale-resistant up to 1000°C, heat-strong up to 850°C, cold ductile to –269°C. Crack-proof and resistant to corrosion in many environments.

Application field

For joining and deposition welding on Ni-based materials and steel and joining different steel qualities. Excellent for buffer-layers in hard facing operations.

Approximate Analysis in %

C	Si	Mn	Fe	Cr	Nb	Ni			
max.0,025	max. 0,3	4,0	max. 3,0	19,0	2,0	Rest			

Physical Characteristic

untreated weld material	minimum value at 20°C
tensile strength Rm (N/mm²)	600
proof strength Rp 0,2 (N/mm²)	360
ultimate elongation A5 (%)	25
notched bar impact work Av (J)	80
notched bar impact work Av (J) at –196°C	60

Welding instruction

Clean welding area required. Cracks work off completely. Remove damaged material. Use austenitic Cr-Ni-steel wire brushes only.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSNI50	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 2.4654
DIN 8555: MSG 23-250-RTZ
DIN 1736: SG-NiCr20Co14MoTi

Ni-based solid filler wire. Resistant against scale, cold-condition and high-temperature corrosion up to 1000°C. Heat strong up to 900°C. Increased hardness with artificial aging.

Application field

For hot work tools, for deposition on un-, low- and high-alloyed steel and cast steel. For joining and deposition welding on homogeneous and similar materials and high-strong steel.

Approximate Analysis in %

C	Si	Mn	Fe	Cr	Mo	Co	Al	Ti	Ni
0,03	0,3	0,3	max. 2,0	20,0	4,5	14,0	1,5	3,0	rest

Physical Characteristic

weld metal untreated	approximate at 20°C
hardness	245 HB
artificial aged	375 HB

Welding instruction

Clean welding area and proper gas protection required. Remove damaged material, work off cracks completely. Use austenitic Cr-Ni-steel wire brushes only. Artificial aging at 840°C 4 h / air or at 760°C 16 h / air.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSNIMO15	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 2.4839
DIN 1736: SG-NiCr20 Mo 15
AWS A 5.14: ERNiCrMo-7

Ni-based solid filler wire. Highly corrosive resistance in reductive, especially in oxidation conditions.

Application field

For joining and deposition operations on homogeneous and similar materials (Hastelloy C-type)

Approximate Analysis in %

C	Si	Mn	Fe	Cr	Mo	Ni			
0,015	0,1	1,0	max. 1,0	20,0	15,0	Rest			

Physical Characteristic

weld metal untreated	minimum value at 20°C
tensile strength (N/mm²)	700
proof strength $R_{p\,0,2}$ (N/mm²)	450
proof strength $R_{p\,1,0}$ (N/mm²)	470
ultimate elongation A5 (%)	40
notched bar impact work Av (J)	60

Welding instruction

Clean welding area required. Remove damaged material, work off cracks completely. Use austenitic Cr-Ni-steel brushes only.

Deliverable

straightened rods of 1 meter in diam. 0,25 to 0,50 mm
50 m spool 0,25 to 0,80mm
100 m spool 0,25 to 0,80mm
1 Kg spool 0,25 to 0,80mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSS6	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Cobalt-based filler material with high carbide content in stick form.

Application field

For armouring tool edges, to protect from abrasive wear.

Approximate Analysis in %

C	Si	W	Cr	Co					
1,1	1,0	4,0	28	Rest					

Physical Characteristic

hardness untreated approximate 36-43 HRC

Welding instruction

Clean welding area required. Prepare parts following manufacturer instructions (e.g. preheating). This filler material only can be welded in 1-2 layers, because of its extreme cracking sensitivity. Machining is very difficult.

Deliverable

Ten sticks approximate 0,4 x 0,7 x 150 mm in a tube. The sticks are more fragile than glass.

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 04.08.2006 Page 1 of 1	Technical Data GSTI2	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Material number: 3.7036

Unalloyed Titanium wire grade 2.

Application field

For homogeneous welding operations.

Approximate Analysis in %

C	Fe	Ti							
max.0,03	max. 0,2	balance							

Physical Characteristic

No figures available.

Welding instruction

Clean welding area and proper gas protection required. Prepare parts following manufacturer instructions.

Deliverable

straightened rods of 1 meter in diam. 0,30 and 0,50 mm

We advise shielding gas Argon 4.6 or higher.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.

TDB 20.08.2009 Page 1 of 1	Technical Data GSTI23	Stehle LASER-SCHWEISSTECHNIK ...punktgenau!

Specification

Ti 6Al-4V ELI (**E**xtra **L**ow **I**nterstitials)
Grade 23 (Grade 5 with reduced oxigene content)

Solid filler wire of a high strength Titanium alloy, for challenging applications in surgery, orthopedy, aviation and mechanics.

Application field

Typical applications are orthophedic pins and screws, springs and jaw-orthopedic equipment.

Approximate Analysis in %

C	N	H	Fe	O	Al	V	Ti		
0,015	0,011	0,0058	0,12	0,11	6,06	3,97	balance		

Physical Characteristic

Density (Kg/dm³)	4,429
Tensile strength Rm (MPa)	795
Delivery condition	hard

Welding instruction

Keep welding are free of cracks and clean. Follow welding advise of basic material.

Deliverable

straightened rods of 1 meter in diam. 0,40 and 0,50 mm
50 m spool 0,40 and 0,50mm
100 m spool 0,40 and 0,50mm
1 Kg spool 0,40 and 0,50mm

We advise shielding gas Argon 5.0.
These statements base on our experience, for its correctness we exclude liability. For special applications we advise a comparator check.