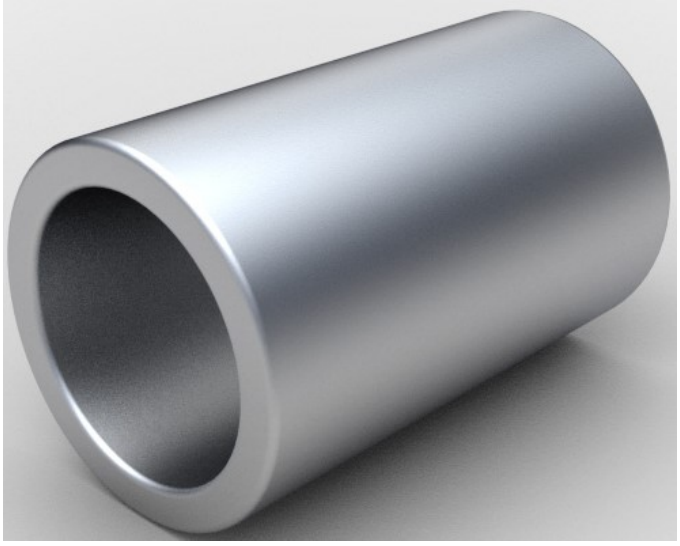
SPECIFICATIONS

Commercial	409-304
EN	1.4512 - 1.4301
US	409-304

The Aalco range of Stainless Steel Products for Automotive Exhaust Systems including Tube and Perforated Tube, 6011 Pattern, in grades 409 (1.4512) and 304 (1.4301) along with Fittings, MIG Welding Wire Reels/Coils and TIG Welding Rods and Grade 434 Wire Wool.
The Tube in grades 409 (1.4512) and 304 (1.4301) covers all the commonly used sizes from 32mm to 153mm O/D.
The Perforated Tube range in grades 409 (1.4512) and 304 (1.4301) covers all the commonly used sizes from 32mm to 76.2mm O/D.
90 Degree and 45 Degree Elbows are stocked in grade 304 (1.4301) with a Polished Finish.
0.8mm MIG Wire Reels/Coils are stocked in grades 308 and 316.
Grade 316L TIG Rods are stocked in 1.6mm and 2.4mm.
Stainless Steel Wire Wool rolls are stocked in grade 434 (1.4113).

TUBE



A wide range of Tube sizes is stocked in grade 409 (1.4512) and 304 (1.4301)
All the commonly used sizes are available from 32mm O/D x 1.2mm Wall to 153mm O/D x 1.5mm wall.
Tube length is 6m; some shorter lengths may be supplied.

MIG AND TIG WIRE

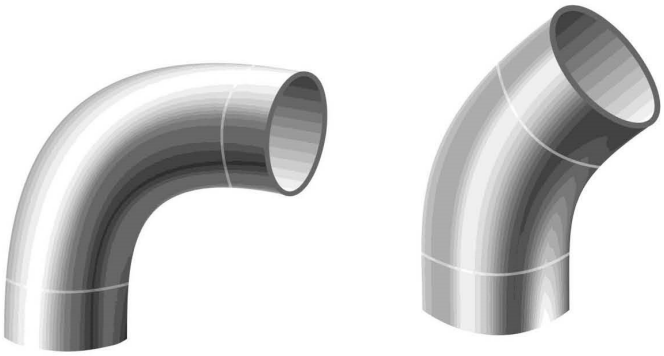
0.8mm diameter MIG Wire Reels/Coils are stocked in grades 308 and 316. The coils are approx 3000m long and weigh 15kg. Manufacturers datasheets are attached.
#
Grade 316L TIG Rods are stocked in diameters 1.6mm & 2.4mm. The rods are 1m long and come in 5kg boxes. A manufacturers datasheet is attached.

STAINLESS STEEL WIRE WOOL

6.5kg rolls of Stainless Steel Wire Wool are stocked in grade 434 (1.4113)
The rolls are 100mm wide and have an O/D of 500mm to 600mm.

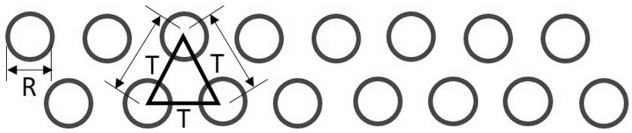
[1 OF 7] CONTINUED

ELBOWS



The range of elbows in stock includes:
- SMS Long 90 degree 1D Elbows
- BS Long 1.5D Elbows both 90 degree and 45 degree
Size range is from 38mm O/D to 101.6mm O/D
All items are grade 304 (1.4301) Stainless Steel and are supplied with a Satin Polished finish.

PERFORATED TUBE



R = Diameter of Hole (3mm) T = Pitch (5.66mm)

A wide range of Perforated Tube sizes is stocked in grade 409 (1.4512) and 304 (1.4301)
The 6011 Pattern is 3mm holes with a 5.66mm triangular pitch having 25% open area.
Tolerances are to ISO 1127:1992 (E.) D3/T3.
All the commonly used sizes are available from 32mm O/D x 1.2mm Wall to 76.2mm O/D x 1.2mm Wall.
Tube length is 5.8m; some shorter lengths may be supplied.

CONTACT

Address:	Please make contact directly with your local service centre, which can be found via the Locations page of our web site
Web:	www.aalco.co.uk

REVISION HISTORY

Datasheet Updated	23 January 2020

DISCLAIMER

This Data is indicative only and as such is not to be relied upon in place of the full specification. In particular, mechanical property requirements vary widely with temper, product and product dimensions. All information is based on our present knowledge and is given in good faith. No liability will be accepted by the Company in respect of any action taken by any third party in reliance thereon.

Please note that the 'Datasheet Update' date shown above is no guarantee of accuracy or whether the datasheet is up to date.

The information provided in this datasheet has been drawn from various recognised sources, including EN Standards, recognised industry references (printed & online) and manufacturers' data. No guarantee is given that the information is from the latest issue of those sources or about the accuracy of those sources.

Material supplied by the Company may vary significantly from this data, but will conform to all relevant and applicable standards.

As the products detailed may be used for a wide variety of purposes and as the Company has no control over their use; the Company specifically excludes all conditions or warranties expressed or implied by statute or otherwise as to dimensions, properties and/or fitness for any particular purpose, whether expressed or implied.

Advice given by the Company to any third party is given for that party's assistance only and without liability on the part of the Company. All transactions are subject to the Company's current Conditions of Sale. The extent of the Company's liabilities to any customer is clearly set out in those Conditions; a copy of which is available on request.

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Rodacciai

03-2014

DATASHEET RW 308 LSI – MIG wire

Description and Applications
Austenitic stainless steel welding wire suitable to weld base metals of similar compositions like AISI 304 and AISI 304L. Equivalent to RW 308 LAWS except for the higher Si content. This improves the arc stability, the base metal fluidity and the melt run appearance. If the dilution by the base metal produces a low ferrite or fully austenitic weld, the crack sensitivity of the weld is somewhat higher than that of a lower Si content weld metal.

Rodacciai denomination and approximate equivalent with other standards		**Approvals**
	RW 308 LSI	TÜV
EN ISO 14343-A:2009	G 19 9 LSi	DB
EN ISO 14343-B:2009	SS 308 LSi	CE
AWS A5.9-2012	ER 308 LSi	CWB

Filler metal properties
Chemical composition (nominal) in %

	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Co	Al	Ti	N	Ca	Nb	B	Ce
min		1,50	0,65			19,50	10,00										
max	0,023	2,04	1,00	0,015	0,025	20,50	11,00	0,30	0,30	0,20			0,060		0,050	0,003	

Metal properties
The following data are typical for non-heat treated weld metal from MIG welding with argon + 3 % oxygen as shielded gas.

Expected minimum mechanical properties of all weld metal

Temperature	°C	20	-110	-196
Yield strength, Rp 0,2	N/mm²	390		
Yield strength, Rp 1,0	N/mm²	415		
Tensile strength, Rm	N/mm²	570		
Elongation, A5	%	35		
Reduction of area Z	%	40		
Impact energy, ISO – V	J	140	84	52

Welding parameters

Wire diameter	1,2 mm
Current	250 – 280 A
Voltage	28 V
Gas	14 l/min
Type of current and polarity	Direct current, electrode positive
Intermediate temperature	max. 180 °C
Welding positions	downhand, horizontal/vertical, vertical upward, overhead
Wall thickness	max. 20 mm
Base metals	X2 CrNi 18 9 - X5 CrNi 18 10 - X6 CrNiTi 18 10 - X6 CrNiNb 18 10

Highest operating temperature, in the short term range, as for base metal, but not higher than 350 °C
Lowest operating temperature, as for base metal, but not lower than – 196°C
Resistance to intergranular corrosion proven in accordance with DIN 50914

Recommended welding parameters

Wire diameter (mm)	Wire feed (m/min)	Current (A)	Voltage (V)	Gas (l/min)
Short-arc welding				
0.8	4-8	40-120	15-19	12
1.0	4-8	60-140	15-21	12
Wire diameter (mm)	Wire feed (m/min)	Current (A)	Voltage (V)	Gas (l/min)
Spray-arc welding				
1.0	6-12	140-220	23-28	18
1.2	5-9	180-260	24-29	18
1.6	3-5	230-350	24-30	18

Packaging forms
Blue metallic wire baskets BS300 of 15 kg.
Plastic spools D300 of 12,5 kg for diam. 0,60 – 0,80 mm and of 15 kg for the other diameters.
Plastic spools D200 of 5 kg.
Drum packaging of about 150 kg for diameter 0,80 mm and of about 250 kg for the other diameters.
Diameters : 0,60 – 0,80 – 0,90 – 1,00 – 1,20 – 1,60 mm.

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Rodacciai

03-2014

DATASHEET RW 316 LSI – MIG wire

Description and Applications
Austenitic stainless steel welding wire suitable to weld base metals of similar compositions like AISI 316 and AISI 316L. Equivalent to RW 316 LAWS except for the higher Si content. This improves the arc stability, the base metal fluidity and the melt run appearance. If the dilution by the base metal produces a low ferrite or fully austenitic weld, the crack sensitivity of the weld is somewhat higher than that of a lower Si content weld metal. Guarantees a better corrosion resistance than RW 308 LSI.

Rodacciai denomination and approximate equivalent with other standards		**Approvals**
	RW 316 LSI	TÜV
EN ISO 14343-A:2009	G 19 12 3 LSi	DB
EN ISO 14343-B:2009	SS 316 LSi	CE
AWS A5.9-2012	ER 316 LSi	CWB

Filler metal properties
Chemical composition (nominal) in %

	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Co	Al	Ti	N	Ca	Nb	B	Ce
min		1,50	0,65	0,005		18,00	11,00	2,50									
max	0,030	2,00	1,00	0,015	0,030	20,00	14,00	3,00	0,30	0,30			0,060		0,050	0,003	

Metal properties
The following data are typical for non-heat treated weld metal from MIG welding with M1 DIN EN ISO 14175 as shielded gas.

Expected minimum mechanical properties of all weld metal

Temperature	°C	20	-110	-196
Yield strength, Rp 0,2	N/mm²	450		
Yield strength, Rp 1,0	N/mm²	490		
Tensile strength, Rm	N/mm²	630		
Elongation, A5	%	32		
Reduction of area Z	%	46		
Impact energy, ISO – V	J	152	110	53

Welding parameters

Wire diameter	1,2 mm
Current	250 – 280 A
Voltage	28 V
Gas	14 l/min
Type of current and polarity	Direct current, electrode positive
Intermediate temperature	max. 180 °C
Welding positions	downhand, horizontal/vertical, vertical upward, overhead
Wall thickness	max. 30 mm
Base metals	X2 CrNiMo 17 12 2 - X5 CrNiMo 17 12 2 - X2 CrNiMo 17 12 3 X6 CrNiMoTi 17 12 2 - X3 CrNiMo 17 13 3 - X6 CrNiMoNb 17 12 2

Highest operating temperature, in the short term range, as for base metal, but not higher than 350 °C
Lowest operating temperature, as for base metal, but not lower than – 196°C
Resistance to intergranular corrosion proven in accordance with DIN 50914

Recommended welding parameters

Wire diameter (mm)	Wire feed (m/min)	Current (A)	Voltage (V)	Gas (l/min)
Short-arc welding				
0.8	4-8	40-120	15-19	12
1.0	4-8	60-140	15-21	12
Wire diameter (mm)	**Wire feed (m/min)**	**Current (A)**	**Voltage (V)**	**Gas (l/min)**
Spray-arc welding				
1.0	6-12	140-220	23-28	18
1.2	5-9	180-260	24-29	18
1.6	3-5	230-350	24-30	18

Packaging forms
Blue metallic wire baskets BS300 of 15 kg.
Plastic spools D300 of 12,5 kg for diam. 0,60 – 0,80 mm and of 15 kg for the other diameters. Plastic spools D200 of 5 kg.
Drum packaging of about 150 kg for diameter 0,80 mm and of about 250 kg for the other diameters.
Diameters : 0,60 – 0,80 – 0,90 – 1,00 – 1,20 – 1,60 mm.

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NUOVA TEMAS SRL

Documento:	**DATA SHEET**	Pagina:	1 di 1
n° :	**1032**	Compilatore:	A. Braga
Ed. 1	del 23/03/2011	Visto:	F. Braga

Product

STAINLESS STEEL WOOL
Grade 434 / W.nr. 1.4113

Type **MEDIUM**

Identification

AISI	***434***	*SUS*	*434*
DIN	*X6 CrMo 17 1*	*ANFOR*	*Z8CD17-01*
	W.Nr. 1.4113		
UNI	*X8 CrMo 17*		

Chemical composition

C	*≤ 0,08%*
Si	*≤ 1,00%*
Mn	*≤ 1,00%*
P	*≤ 0,040%*
S	*≤ 0,030%*
Cr	*16,0÷18,0%*
Mo	*0,9÷1,25%*

Density in rolls *Med density ≥ 250 Kg/m³*

Weight for linear meter *Standard 40 gr.* *Allowance on Weight ±15%*
Streep width 100 mm

Form *Rolls Ø 500 - 600 mm*
Weight roll 6 - 9 Kg.

PHYSICAL PROPERTIES

Melting temperature *1425 - 1510 °C*

Max duty temp. on air

cyclic heating	*980 °C*
continuos service	*880 °C*

Tensile strenght

ambient temperature	*700-800 Mpa*
a 870 °C	*50-55 Mpa*

Coeff. of thermal expans. *13,1x10-6 a 870 °C*
Thermal conductivity *24,8 W.mK-1 a 540 °C*
Modulus of elasticity *97 GN.m-2a 870 °C per °C*

Filament cross section *dimensional distribution*
(expressed as en equivalent diameter)

< 85 µ	*5%*
85 - 100 µ	*10%*
100 - 120 µ	*70%*
120 - 150 µ	*10%*
>150 µ	*5%*

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Via per Lungavilla, n°1 - 27054 Montebello della battaglia - (PV) - ITALY

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Rodacciai

03-2014

DATASHEET RW 308 LAWS – TIG Rods

Description and Applications
Austenitic stainless steel TIG rod, suitable for welding steels like AISI 304 and AISI 304 L. This alloy has a good general corrosion resistance. The RW 308 LAWS has a low C content which reduces the possibility of intergranular carbide precipitation and therefore makes this alloy particularly recommended where there is a risk of intergranular corrosion.

Rodacciai denomination and approximate equivalent with other standards

	RW 308 LAWS	Approvals
EN ISO 14343-A:2009	W 19 9 L	TÜV
EN ISO 14343-B:2009	SS 308 L	CE
AWS A5.9-2012	ER 308 L	CWB

Filler metal properties
Chemical composition (nominal) in %

	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Co	N	Nb	B
min		1,50	0,30			19,50	9,50						
max	0,020	2,00	0,50	0,015	0,020	20,50	10,50	0,20	0,20	0,20	0,060	0,050	0,0018

Metal properties
The following data are typical for non-heat treated weld metal from TIG welding with I1 DIN EN ISO 14175 as shielding gas.

Expected minimum mechanical properties of all weld metal

Temperature	°C	20	-196
Yield strength, Rp 0,2	N/mm²	465	
Yield strength, Rp 1,0	N/mm²	490	
Tensile strength, Rm	N/mm²	630	
Elongation, A5	%	35	
Reduction of area Z	%	60	
Impact energy, ISO – V	J	261	59

Welding parameters
The welding parameters for TIG welding depend on the wire diameter and the welding application.
Electrode negative and a shielded gas of argon or helium has to be used to avoid burn-up of the tungsten electrode.
Welding positions : down hand, horizontal/vertical, vertical upward, overhead.
Wall thickness : max. 20 mm
Highest operating temperature, in the short term range, as for base metal, but not higher than 350 °C
Lowest operating temperature, as for base metal, but not lower than – 196°C
Resistance to intergranular corrosion proven in accordance with EN ISO 3651-2

Sizes and marking
Standard sizes : diam. 1,00 – 1,20 – 1,60 – 2,00 – 2,40 – 3,20 and 4,00 mm
Tolerances on diameter : + 0,01 / - 0,04 mm
Marking : Each rod is stamped one end with ER 308L and RW 1.4316

Packaging forms
White carton boxes of 5 kg.
Red, white or blue coloured cardboard tubes of 5 kg.
Wooden crates of 250 kg.

[6 OF 7] CONTINUED

DATASHEET RW 316 LAWS – TIG Rods

Description and Applications
Austenitic stainless steel welding wire suitable to weld base metals of similar compositions like AISI 316 and AISI 316L. Low C content reduces the possibility of intergranular carbide precipitation and therefore increases the resistance to intergranular corrosion. It is also suitable for welding steel that are stabilized with titanium or niobium. Guarantees a better corrosion resistance than RW 308 LAWS.

Rodacciai denomination and approximate equivalent with other standards

	RW 316 LAWS	**Approvals**
EN ISO 14343-A:2009	W 19 12 3 L	TÜV
EN ISO 14343-B:2009	SS 316L	CE
AWS A5.9-2012	ER 316L	CWB

Filler metal properties
Chemical composition (nominal) in %

	C	**Mn**	**Si**	**S**	**P**	**Cr**	**Ni**	**Mo**	**Cu**	**Co**	**Al**	**Ti**	**N**	**Ca**	**Nb**	**B**	**Ce**
min		1,50	0,30			18,00	12,00	2,50									
max	0,020	2,00	0,60	0,015	0,025	19,20	13,00	3,00	0,30	0,20			0,060		0,050	0,002	

Metal properties
The following data are typical for non-heat treated weld metal from TIG welding with I1 DIN EN ISO 14175 as shielding gas.

Expected minimum mechanical properties of all weld metal

Temperature	°C	20
Yield strength, Rp 0,2	N/mm²	450
Yield strength, Rp 1,0	N/mm²	505
Tensile strength, Rm	N/mm²	620
Elongation, A5	%	35
Reduction of area Z	%	64
Impact energy, ISO – V	J	222

Welding parameters

Wire diameter	3,2 mm
Current	180 – 190 A
Voltage	ca. 16 V
Gas	13 l/min
Type of current and polarity	Direct current, electrode positive
Intermediate temperature	max. 180 °C
Welding positions	downhand, horizontal/vertical, vertical upward, overhead
Wall thickness	max. 30 mm
Base metals	X2 CrNiMo 17 12 2 - X5 CrNiMo 17 12 2 - X2 CrNiMo 17 12 3 X6 CrNiMoTi 17 12 2 - X3 CrNiMo 17 13 3 - X6 CrNiMoNb 17 12 2

Highest operating temperature, in the short term range, as for base metal, but not higher than 350 °C
Lowest operating temperature, as for base metal, but not lower than – 196°C
Resistance to intergranular corrosion proven in accordance with DIN 50914

Sizes and marking
Standard sizes : diam. 1,00 – 1,20 – 1,60 – 2,00 – 2,40 – 3,20 and 4,00 mm
Tolerances on diameter : + 0,01 / - 0,04 mm
Marking : Each rod is stamped one end with ER 316L and RW 1.4430

Packaging forms
White carton boxes of 5 kg.
Red, white or blue coloured cardboard tubes of 5 kg.
Wooden crates of 250 kg.