

# STAINLESS STEEL **WELDING WIRE**



BAR | WIRES | WELDING WIRES



# COMPANY PROFILE

## Introduction

As a distinguished Indian company with a legacy of 5 decades in the Stainless Steel Industry, Venus has established itself as a leading manufacturer and exporter of premium stainless steel wires and bars.

Our global footprint spans over 50+ countries, reflecting our steadfast commitment to delivering superior products.

Delve into our meticulously curated range, underpinned by a legacy of redefined industry benchmarks through unwavering dedication to quality and innovation.

### Mission

With our Forward thinking and Passion for Service and Innovation, we strive to help our customer optimize their productivity and build the most advanced products for the future world.

### Vision

To be a global leader in stainless & special steel long products known for its quality, continuous innovation, and impeccable service level.





# WHY CHOOSE VENUS WIRES?

## Uncompromising Quality

Quality is the essence of our culture; it defines everything we do.

## Seamless Service

We provide global customers with an exceptional experience, akin to having a next-door vendor.

## Sustainable Solutions

Our products are engineered with the most sophisticated and sustainable technologies, contributing to a better world.

## People-Powered

Our dedicated team forms the backbone of our success, and we pride ourselves on the industry's lowest attrition rate.

## Specialized Expertise

With over 5 decades of dedicated focus on manufacturing stainless and special steel wires and bars, we are global leaders in our domain.

## Continuous Innovation

We invest in research and development, cutting-edge machinery, and systems, and nurturing our skilled workforce to progress continually.

## Customer-Centric Approach

At the heart of our operations lies a passion for helping our customers achieve their goals and become industry leaders.



# APPROVALS

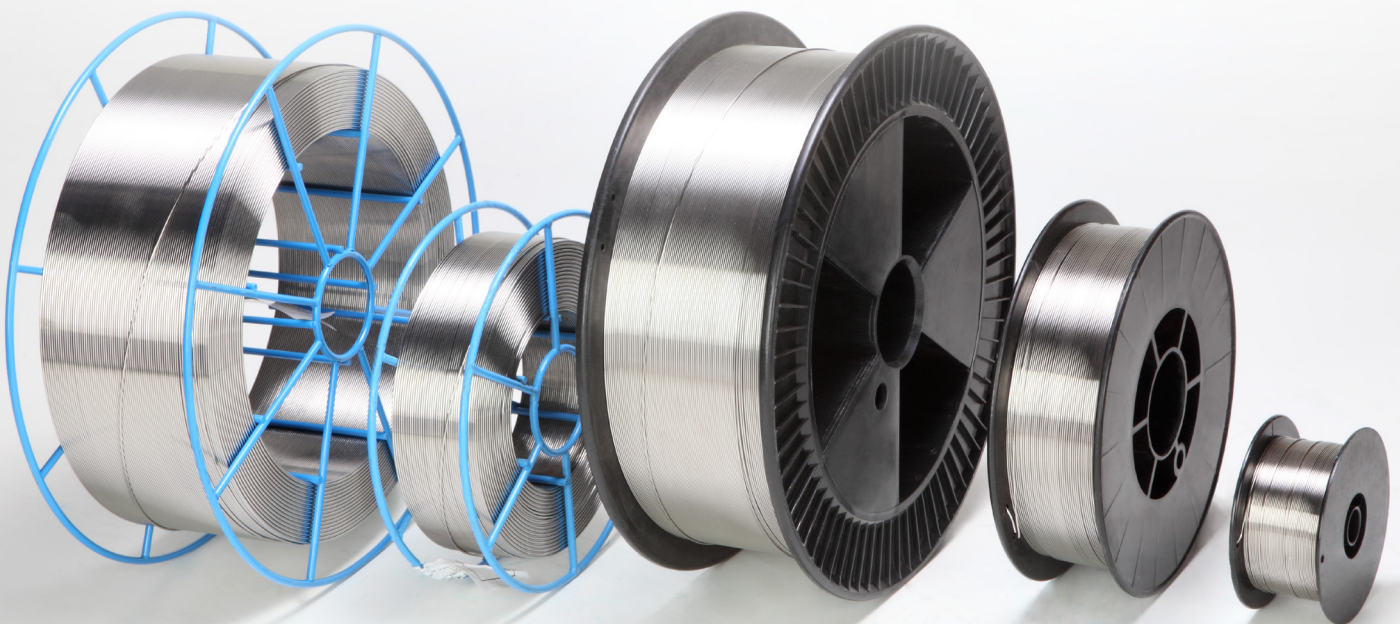
## System Certifications

ISO 9001:2015 | ISO 14001:2004 | ISO 45001:2018 | ISO IATF 16949:2016



## Product Approvals

VDTUV 1153 | CE | DB | CWB | NPCIL | RDSO | DNV GL





# SUSTAINABILITY

At Venus Wires Industries, sustainability is an integral part of our core values and business philosophy. As a leading player in the Stainless Steel Industry, we recognize our responsibility to prioritize environmental, social, and economic considerations in all aspects of our operations. With a commitment to creating a greener future, we have embraced sustainable practices that not only drive our success but also contribute positively to the communities we serve and the planet we call home.



Safety and sustainable living for our employees



Carbon management



Green energy



Circular economy



Energy monitoring and efficiency



Water and environment conservation

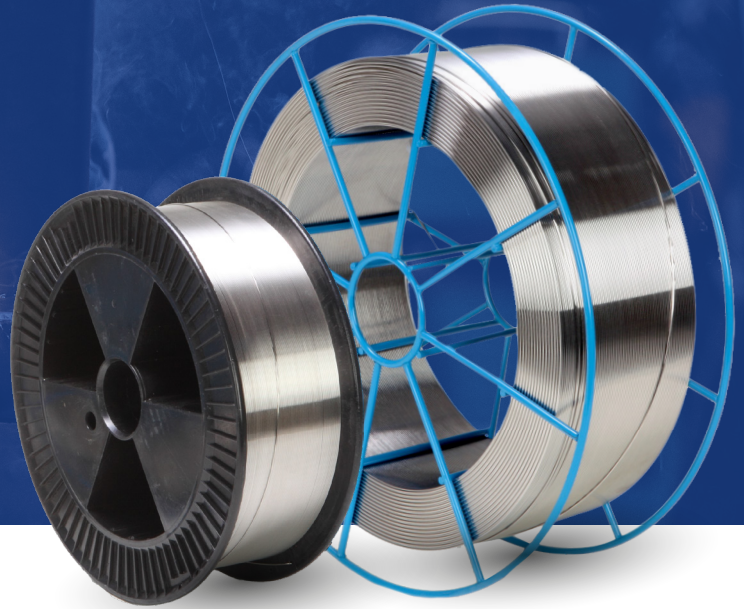


Social corporate responsibility





# MIG WIRE



## ALLOYS

<b>AWS</b>	307Si	308L	308LSi	308H	309L	309LSi	309LMo	316L	316LSi	310	312
<b>W. Nr. (EN)</b>	1.4370	1.4316	1.4316	1.4316	1.4332	1.4332	1.4459	1.4430	1.4430	1.4842	1.4337
<b>AWS</b>	317	317L	318Si	347Si	347	385	410	420L	410NiMo	630	
<b>W. Nr. (EN)</b>	1.4449	1.4438	1.4576	1.4551	1.4551	(20 25 5 Cu L)	(13)	1.4028	(13 4)	-	
<b>AWS</b>	430	430LNb	409Nb	439	2209	2594	NiCrMo-3	NiCr-3	430LNbW	430LNbTi	
<b>W. Nr. (EN)</b>	1.4016	1.4511	-	1.4509	(22 9 3 N L)	(25 9 4 N L)	2.4831	2.4806	1.4511	1.4509	

We also offer customized chemistry.

## DIAMETER

<b>MM</b>	0.60	0.80	0.90	1.00	1.20	1.60
<b>INCH</b>	0.025	0.030	0.035	0.040	0.045	0.062

## SURFACE FINISH

Bright, Matte & Semi Bright

## PACKAGING ON SPOOLS



12.5 kg/25lbs, 15kg/30 lbs – 33 lbs.  
Layer wound plastic spools SD 300/basket spool BS300



5 kg/10 lbs. Layer wound plastic spools SD 200/basket spool BS200



1 kg/2 lbs. Layer wound plastic spools

We also offer customized packaging.



# MIG WIRE FOR ROBOTIC WELDING



## VENUS DRUM-PACK FOR CONTINUOUS MIG WELDING

Venus offers wire systems for robotic, automatic, and semi-automatic MIG welding applications. This straight, twist free wire system offers increased productivity and offers a lot of welding advantages.

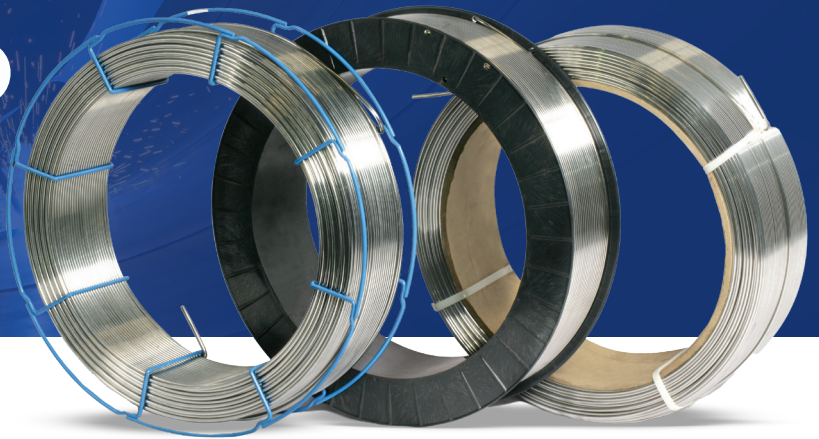
## VENUS DRUM PACK

DRUMS	DRUMS	760 METAL REEL
100 - 125 Kg (200 - 250 Lbs)	200 - 250 Kg (450 - 550 Lbs)	200 - 250 Kg (450 - 550 Lbs)

## VENUS DRUM PACK SPECIAL FEATURES

VENUS DRUM FEATURES	USER BENEFIT
Easy handling	Reduced change over time.
Reduce downtime	Increased productivity.
Process stability	Part to part consistent weld
Consistent weld quality	Reduction in rework, weld leakages and scrap
Better wire feedability	Reduction in line stoppage

# SUBMERGED ARC WIRE



## ALLOYS

<b>AWS</b>	307Si	308L	309L	309LMo	316L	312
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<b>W. Nr. (EN)</b>	1.4370	1.4316	1.4332	1.4459	1.4430	1.4337
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<b>AWS</b>	317L	347	420	410NiMo	430	2209	2594
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<b>W. Nr. (EN)</b>	1.4438	1.4551	1.4028	(13 4)	1.4016	(22 9 3 N L)	(25 9 4 N L)
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We also offer customized chemistry.

## DIAMETER

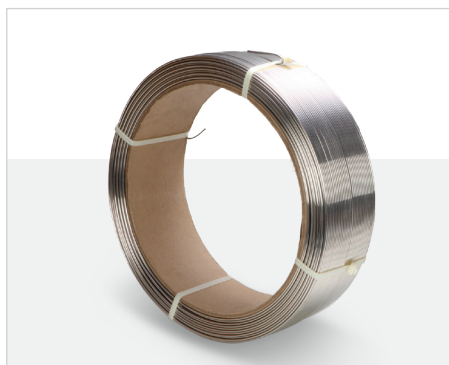
<b>MM</b>	1.60	2.00	2.40	3.20	4.00
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<b>INCH</b>	0.062	0.080	0.093	0.125	0.156
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## SURFACE FINISH

Bright & Matt

## PACKAGING ON SPOOLS



Layer wound coils of (paper core)  
25kg/50 - 60 lbs



Basket spools K415 of  
25kg/50 - 60 lbs



Plastic spools H 400 of  
25kg/50 - 60 lbs



# TIG WIRE



## ALLOYS

<b>AWS</b>	307Si	308L	308LSi	308H	309L	309LSi	309LMo	316L	316LSi	310	312
<b>W. Nr. (EN)</b>	1.4370	1.4316	1.4316	1.4316	1.4332	1.4332	1.4459	1.4430	1.4430	1.4842	1.4337
<b>AWS</b>	317	317L	318Si	347Si	347	385	410	420	410NiMo	630	
<b>W. Nr. (EN)</b>	1.4449	1.4438	1.4576	1.4551	1.4551	(20 25 5 Cu L)	(13)	1.4028	(13 4)	-	
<b>AWS</b>	430	430LNb	2209	2594	NiCrMo-3	NiCr-3					
<b>W. Nr. (EN)</b>	1.4016	1.4511	(22 9 3 N L)	(25 9 4 N L)	2.4831	2.4806					

We also offer customized chemistry.

## DIAMETER

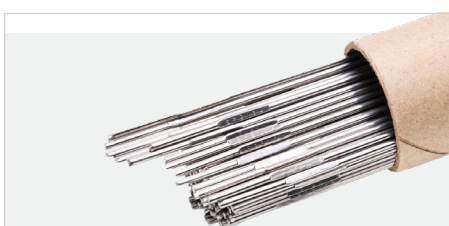
<b>MM</b>	0.80	0.90	1.00	1.20	1.60	2.00	2.40	3.20	4.00	5.00
<b>INCH</b>	0.030	0.035	0.040	0.045	0.062	0.080	0.093	0.125	0.156	0.1875

**LENGTH AVAILABLE** - 36 inches/1000 mm

**IDENTIFICATION** (Customized length available on request)

Grade & size embossed on both ends of rods for diameter 1.60 mm (0.062") & above.	
Customized embossing like heat number, brand name, batch number, etc. possible on request.	

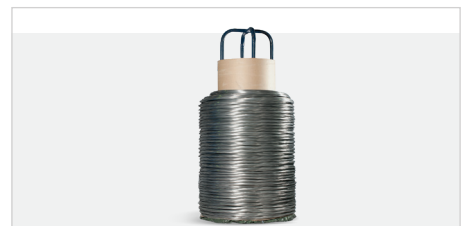
## PACKAGING



Packed in cardboard tube or plastic tubes (1 kg. to 10 kg.), (2 lbs to 22 lbs)



Further packed cardboard boxes. (25 kg / 50 lbs)



Or supplied wire on tubular carrier



FOR MANUFACTURING OF MANUAL METAL ARC WELDING (MMAW) ELECTRODES

**ALLOYS**

<b>AWS</b>	307Si	308L	309L	316L	310	312	347	410NiMo
<b>W. Nr. (EN)</b>	1.4370	1.4316	1.4332	1.4430	1.4842	1.4337	1.4551	(13 4)
<b>AWS</b>	430	2209	2594	308L	316L	309L		
<b>W. Nr. (EN)</b>	1.4016	(22 9 3 N L)	(25 9 4 N L)	1.4316	1.4430	1.4332		

We also offer customized chemistry.

**STANDARD DIAMETERS**


<b>MM</b>	1.60	2.00	2.40	3.20	4.00	5.00
<b>INCH</b>	0.062	0.080	0.093	0.125	0.157	0.1875

**STANDARD LENGTH**


<b>MM</b>	250	300	350	400	450
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Customized diameter and length available on request.


**PACKAGING ON SPOOLS**



**CUT LENGTHS**  
In wooden boxes of  
500 - 1000 kg/1000 - 2000 lbs



**COILS**  
300 - 1000 kg/650 - 2200  
lbs wound on tabular carrier



**COILS**  
100 - 200 kg/200 - 500  
lbs HDPE wrapped



# METALLIZING THERMAL SPRAY COATING WIRE



Our welding wires are also used for coating stainless steel on product surface using thermal spray technology.

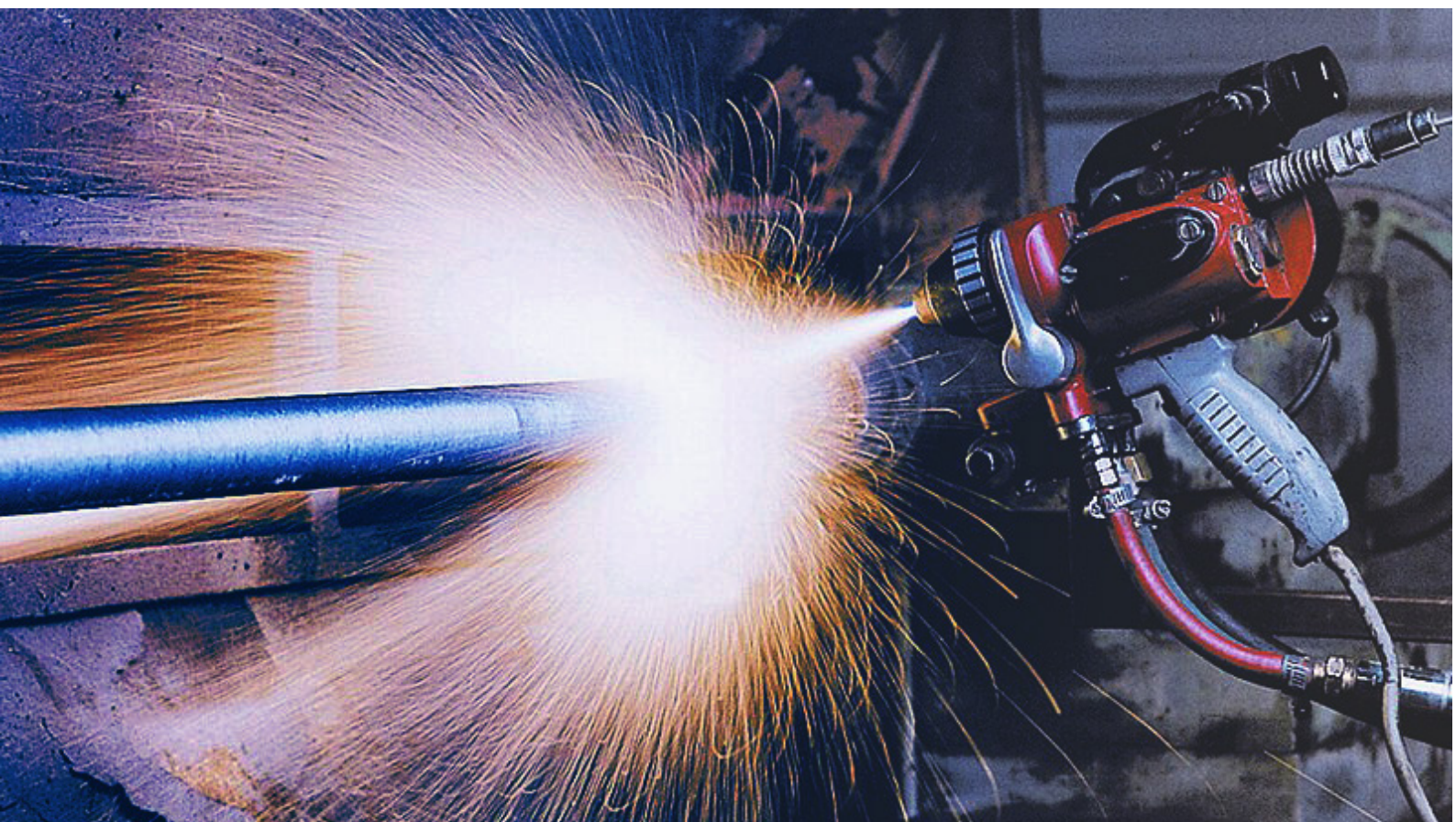
## ALLOYS

AWS	304	308	316	410	410NiMo	420
W. Nr. (EN)	1.4301	1.4316	1.4401	1.4006	(13 4)	1.4021

We also offer customized chemistry.

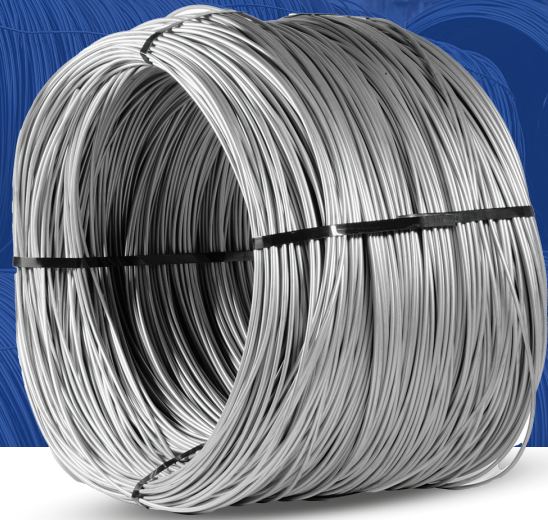
## PACKING

Venus Wires	Plastic Spool		Basket Spool		Coil	Drum
Diameter (mm)	0.80 to 2.40	1.00 to 2.40	0.80 to 2.40	1.60 to 4.00	1.80 to 5.00	0.80 to 1.60
Weight (Kg)	15	20	15	25	40 to 150	125 & 250
Spool Type	SD 300	H400, K415	BS 300	H400, K415	Id 300-500	OD: 510mm Height: 460mm & 815mm





# WIRE ROD



## ALLOYS

<b>AWS</b>	307Si	308L	308LSi	308H	309L	309LSi	309LMo	316L	316LSi	310	312
<b>W. Nr. (EN)</b>	1.4370	1.4316	1.4316	1.4316	1.4332	1.4332	1.4459	1.4430	1.4430	1.4842	1.4337

<b>AWS</b>	317	317L	318Si	347Si	347	385	410	420	410NiMo	630
<b>W. Nr. (EN)</b>	1.4449	1.4438	1.4576	1.4551	1.4551	(20 25 5 Cu L)	(13)	1.4028	(13 4)	-

<b>AWS</b>	430	430LNb	409Nb	439	2209	2594	NiCrMo-3	NiCr-3	430LNbW	430LNbW
<b>W. Nr. (EN)</b>	1.4016	1.4511	-	1.4509	(22 9 3 N L)	(25 9 4 N L)	2.4831	2.4806	1.4511	1.4509

We also offer customized chemistry.

## SUPPLY CONDITIONS

Hot Rolled, Annealed & Pickled (with or without coating)

## SIZE RANGE

5.5 mm – 26 mm (0.0217 – 1.000)

Tolerance : +/- 0.20mm












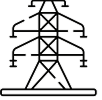



Ovality : 0.20 mm (maximum)

Surface Defect : 1% of diameter (maximum)



# INDUSTRY SEGMENT

Stainless Steel Welding Wire are used in various industries for welding of similar - dissimilar base material.

 Automotive	 Railways	 Pressure Vessels
 Oil & Gas	 Chemical	 Nuclear
 Aerospace	 Paper	 Food
 Engineering Fabrication	 Ship Building	 Power
 Electronics	 Seawater Desalination	 Pharmaceuticals

# APPLICATIONS

# QUALITY

In addition to the stringent process control techniques followed during production, Venus performs Comprehensive Chemical, Mechanical & Metallurgical testing on the final products to ensure compliance to customer's product specification and expectation.

Venus also offers third party inspection according to EN 10204 3.2 on demand.



## Wire Feeding Test

This test has been carried out as per Venus internal standard to ensure consistency in wire feeding during MIG welding process



## Chemical Analysis

The Chemical analysis of the weld metal is carried out as per test method ASTM E 1086, requirement in AWS 5.9, sample preparation as per AWS SFA 5,4



## UTS (Ultimate Tensile Strength) & % Elongation

UTS Testing as per ASTM A 370 / EN 10002-1.

Weldpad preparation as per AWS SFA 5.4.



## Impact Testing Machine

Sample preparation according to AWS SFA 5.4 and Testing method ASTM A370. Tested at room temperature and sub-zero temperature upto -196° C



# QUALITY

Weldability Test

All Weld Tensile Test

Fillet Weld Test

Impact Test

IGC Test

Ferrite No./Ferritoscope

Radiography Test

Hardness Test

Chemical Composition

Liquid Penetration Test



## Positive Material Identification (PMI)

Equipment using X-Ray fluorescence method for material identification in process & during final packing.



## Metallurgical Analysis

This test is for all kinds of metallurgical analysis like inclusion rating, Grain Size, Ferrite &, Micro / Macro Analysis.



## Corrosion Test

Apparatus for Ferric sulfate - sulfuric acid test



## Electrolytic Etching

## IGC (Inter Granular Corrosion) Test

This test is for detecting susceptibility to intergranular attack in Austenitic Stainless Steel as per test method ASTM A 262 / DIN 3651-2.

# OEM /PRIVATE LABELLING / CUSTOMISED PACKAGING

We partner with welding houses and welding brands across the globe to manufacture and supply stainless steel welding wire in their own brands. (OEM)

## WE PROVIDE

Customized packing and labelling

Customised labels with barcodes and RFID

Transfer of approvals to OEM's

Customised chemical composition

Bulk packaging





# Grade Chart

## STAINLESS STEEL WELDING ALLOYS

Venus	EN ISO 14343-A:2017 Nominal Composition	EN ISO 14343-B: 2017 Alloy Type	AWS A5.9-2017 Alloy Designation	AWS A5.9-2017 Nominal Composition Designation	DIN Werkstoff Nr.
VW 307SI	18 8 Mn	-	-	18 8 Mn	1.4370
VW 308L	19 9 L	SS308L	ER308L	19 9 L	1.4316
VW 308 LSi	19 9 LSi	SS308LSi	ER308LSi	19 9 LSi	1.4316
VW 308H	19 9 H	SS308H	ER308H	19 9 H	-
VW 309L	23 12 L	SS309L	ER309L	23 12 L	1.4332
VW 309LSi	23 12 L Si	SS309LSi	ER309LSi	23 12 L Si	1.4332
VW 309LMO	23 12 2 L	-	-	23 12 2 L	(1.4459)
VW 310	25 20	SS310	ER310	25 20	(1.4842)
VW 312	29 9	SS312	ER312	29 9	1.4337
VW 316L	19 12 3 L	SS316L	ER316L	19 12 3 L	1.4430
VW 316 LSi	19 12 3 LSi	SS316LSi	ER316LSi	19 12 3 LSi	1.4430
VW 316H	19 12 3 H	SS316H	ER316H	19 12 3 H	-
VW 317 L	18 15 3 L	SS317L	ER317L	18 15 3 L	1.4438
VW 318 Si	19 12 3 Nb Si	-	-	19 12 3 Nb Si	1.4576
VW 347	19 9 Nb	SS347	ER347	19 9 Nb	1.4551
VW 347Si	19 9 Nb Si	SS347Si	ER347Si	19 9 Nb Si	1.4551
VW 385	20 25 5 Cu L	SS385	ER385	20 25 5 Cu L	-
VW 410	13	SS410	ER410	13	-
VW 420	-	SS420	ER420	-	1.4021
VW 410NiMo	13,4	SS410NiMo	ER410NiMo	13,4	-
VW 430LNbTi	18 LNbTi	-	-	18 LNbTi	1.4509
VW 420C	-	(SS420)	(ER420)	-	1.4028
VW 409CB	-	SS409Nb	ER409Nb	-	-
VW 2209	22 9 3 N L	SS2209	ER2209	22 9 3 N L	(1.4462)
VW 2594	25 9 4 N L	SS2594	ER2594	25 9 4 N L	-
VW 430LNB	18 LNB	(SS430LNB)	(ER430LNB)	18 LNB	1.4511

## Stainless Steel for Welding Application

Type of Steel	Venus Grades	AWS Classification	EN ISO 14343	Application Of WIRE	Chemical Composition (%)					
					C	Si	Mn	P	S	Ni
Austenitic	VW 307Si	--	(307Si) 18 8 Mn	Mig,Tig,Core,Saw	≤ 0.20	1.20	5.50/8.00	≤ 0.03	≤ 0.03	7.00/10.00
	VW 308L	ER308L	19 9 L	Mig,Tig,Core,Saw	≤ 0.03	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.02	9.00/11.00
	VW 308Si	ER308LSi	19 9 LSi	Mig,Tig	≤ 0.03	0.65/1.00	1.00/2.50	≤ 0.03	≤ 0.02	9.00/11.00
	VW 308H	ER308H	(19 9 H)	Mig,Tig	0.04/0.08	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.02	9.00/11.00
	VW309L	ER309L	23 12 L	Mig,Tig,Core,Saw	≤ 0.03	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.02	12.00/14.00
	VW309LSi	ER309LSi	23 12 L Si	Mig,Tig	≤ 0.03	0.65/1.00	1.00/2.50	≤ 0.03	≤ 0.02	12.00/14.00
	VW 309LMo	--	(309LMo) 23 12 2 L	Mig,Tig,Saw	≤ 0.03	≤ 1.00	1.00/2.50	≤ 0.03	≤ 0.02	21.00/25.00
	VW316L	ER316L	19 12 3 L	Mig,Tig,Core,Saw	≤ 0.03	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.02	11.00/14.00
	VW 316LSi	ER316LSi	19 12 3 L Si	Mig,Tig	≤ 0.03	0.65/1.00	1.00/2.50	≤ 0.03	≤ 0.02	11.00/14.00
	VW310	ER310	25 20	Mig,Tig,Core	0.08/0.15	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.03	20.00/22.50
	VW312	ER312	29 9	Mig,Tig,Core,Saw	≤ 0.15	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.02	8.00/10.50
	VW317	ER317	--	Mig,Tig	≤ 0.08	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.03	13.00/15.00
	VW317L	ER317L	18 15 3 L	Mig,Tig,Saw	≤ 0.03	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.03	13.00/15.00
	VW 318Si	--	(318Si) 19 12 3 Nb Si	Mig,Tig	≤ 0.08	0.65/1.20	1.00/2.50	≤ 0.03	≤ 0.02	11.0/14.00
	VW347Si	ER347Si	19 9 Nb Si	Mig,Tig	≤ 0.08	0.65/1.00	1.00/2.50	≤ 0.03	≤ 0.02	9.00/11.00
	VW347	ER347	19 9 Nb	Mig,Tig,Core,Saw	≤ 0.08	0.30/0.65	1.00/2.50	≤ 0.03	≤ 0.02	9.00/11.00
	VW385	ER385	20 25 5 Cu L	Mig,Tig	≤ 0.025	≤ 0.50	1.00/2.50	≤ 0.02	≤ 0.02	24.00/26.00
Martensitic	VW410	ER410	13	Mig,Tig	≤ 0.12	≤ 0.50	≤ 0.60	≤ 0.03	≤ 0.02	≤ 0.50
	VW420	ER420	--	Mig,Tig,Saw	0.25/0.40	≤ 0.50	≤ 0.60	≤ 0.03	≤ 0.03	≤ 0.60
	VW410NiMo	ER410NiMo	13 4	Mig,Tig,Core,Saw	≤ 0.05	≤ 0.50	≤ 0.60	≤ 0.03	≤ 0.02	4.00/5.00
	VW 630	ER630	--	Mig,Tig	≤ 0.05	≤ 0.75	0.25/0.75	≤ 0.03	≤ 0.03	4.50/5.0
Ferritic	VW 430	ER430	17	Mig,Tig,Core,Saw	≤ 0.10	≤ 0.50	≤ 0.60	≤ 0.03	≤ 0.03	≤ 0.50
	VW 430LNb	--	430LNb (18LNb)	Mig,Tig	≤ 0.03	≤ 0.50	≤ 0.60	≤ 0.03	≤ 0.03	≤ 0.60
	VW 409Nb	ER409Nb	--	Mig	≤ 0.08	≤ 1.00	≤ 0.80	≤ 0.04	≤ 0.03	≤ 0.60
	VW 439	ER439	--	Mig	≤ 0.04	≤ 0.80	≤ 0.80	≤ 0.03	≤ 0.03	≤ 0.60
Duplex /	VW2209	ER2209	22 9 3 NL	Mig,Tig,Core,Saw	≤ 0.03	≤ 0.900	0.50/2.00	≤ 0.03	≤ 0.02	7.50/9.50
Super Duplex	VW2594	ER2594	25 9 4 NL	Mig,Tig,Core,Saw	≤ 0.03	≤ 1.00	≤ 2.50	≤ 0.03	≤ 0.02	8.00/10.50
Nickel Alloys	VW 625	ERNiCrMo-3		Mig,Tig	≤ .10	≤ 0.50	≤ 0.50	≤ 0.02	≤ 0.015	≥ 58.00
	VW 82	ERNiCr-3		Mig,Tig	≤ 0.10	≤ 0.50	2.50/3.50	≤ 0.03	≤ 0.015	≥ 67.00
		VENUS Special Grades			C	Si	Mn	P	S	Ni
For Electrodes	VWC 308L	308L		Core	≤ 0.02	≤ 0.20	≤ 2.00	≤ 0.02	≤ 0.015	9.50/10.50
	VWC 316L	316L		Core	≤ 0.02	≤ 0.20	≤ 2.00	≤ 0.02	≤ 0.015	11.50/12.00
	VWC 309L	309L		Core	≤ 0.02	≤ 0.40	≤ 2.00	≤ 0.02	≤ 0.015	12.70/13.0
	VW 430LNBW	430LNBW		Mig	≤ 0.03	0.30/0.60	0.30/0.60	≤ 0.03	≤ 0.03	0.20/0.60
For Automotive Exhaust	VW 430LNbTi	"430LNbTi (Dual Stabilized)"		Mig	≤ 0.03	≤ 1.50	≤ 1.0	≤ 0.03	≤ 0.03	≤ 0.50



## Stainless Steel for Welding Application

Chemical Composition (%)								Approval	
Cr	Mo	Cu	N	Others	DNV	TUV	DB	CWB	
17.00/20.00	≤ 0.50	≤ 0.50	--	--		Mig & Tig	Mig	--	
19.50/22.00	≤ 0.50	≤ 0.50	--	--		Tig	--	Mig & Tig	
19.50/22.00	≤ 0.50	≤ 0.50	--	--	Tig	Mig & Tig	Mig & Tig	Mig	
19.50/22.00	≤ 0.50	≤ 0.75							
23.00/25.00	≤ 0.50	≤ 0.50	--	--		Tig	--	Mig & Tig	
23.00/25.00	≤ 0.50	≤ 0.50	--	--	Tig	Mig & Tig	--	Mig	
11.00/15.50	2.00/3.50	≤ 0.50	--	--		--	--	--	
18.00/20.00	2.50/3.00	≤ 0.50	--	--		Tig	--	Mig & Tig	
18.00/20.00	2.50/3.00	≤ 0.50	--	--	Tig	Mig & Tig	Mig & Tig	Mig	
25.00/28.00	≤ 0.50	≤ 0.50	--	--		--	--	--	
28.00/32.00	≤ 0.50	≤ 0.50	--	--		--	--	--	
18.50/20.50	3.00/4.00	≤ 0.75	--	--		--	--	--	
18.50/20.50	3.00/4.00	≤ 0.50	--	--		--	--	--	
18.00/20.00	2.50/3.00	≤ 0.50	--	Nb 10XC/1.00		Mig & Tig	Mig & Tig	--	
19.00/21.00	≤ 0.50	≤ 0.50	--	Nb 10XC/1.00		Mig	--	--	
19.00/21.00	≤ 0.50	≤ 0.50	--	Nb 10XC/1.00		Tig	--	--	
19.50/21.50	4.20/5.20	1.20/2.00	--	--		--	--	--	
12.00/13.50	≤ 0.50	≤ 0.50	--	--		--	--	--	
12.00/14.00	≤ 0.75	≤ 0.75	--	--		--	--	--	
11.00/12.50	0.40/0.70	≤ 0.50	--	--		--	--	--	
16.00/16.75	≤ 0.75	3.25/4.00		Nb 0.15/0.30					
15.50/17.00	≤ 0.50	≤ 0.50	--	--		--	--	--	
15.50/17.00	≤ 0.75	≤ 0.75	--	Nb 8xC/1.20		--	--	--	
10.50/13.50	≤ 0.50	≤ 0.75		Nb 10XC/0.75					
17.00/19.00	≤ 0.50	≤ 0.75		Ti 10XC/1.10					
21.50/23.50	2.50/3.50	≤ 0.50	0.10/0.20	--		Mig & Tig	--	--	
24.00/27.00	2.50/4.50	≤ 1.50	0.20/0.30	W ≤ 1.00		--	--	--	
20.00/23.00	8.00/10.00	≤ 0.50	--	"Fe 5.0max, Al 0.40max, Ti 0.40max, Nb+Ta 3.15/4.15, Others 0.50max"		--	--	--	
18.00/22.00	--	≤ 0.50	--	"Fe 3.0max, Ti 0.75max, Nb+Ta 2.0/3.0, Others 0.50max"		--	--	--	
Cr	Mo	Cu	N	Others		--	--	--	
19.50/20.50	≤ 0.20	≤ 0.20	≤ 0.08	--		--	--	--	
18.00/19.00	≤ 0.20	≤ 0.20	≤ 0.06						
23.00/24.00	≤ 0.30	≤ 0.20	≤ 0.09						
16.50/19.50	0.20/0.50	0.30/0.70	--	Nb 0.30/0.70		--	--	--	
17.50/19.50	≤ 0.50	≤ 0.50	≤ 0.02	"Nb 8xC/0.80 Ti 10XC/0.50"					



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