SuperGlaze®

ALUMINUM WELDING WIRES

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LINCOLN ELECTRIC

SUPERGLAZE® ALUMINUM WIRES

SuperGlaze® products help prevent the common issues associated with aluminium wire feeding such as birdnesting, tangling, and burnbacks. The key lies with a smooth surface finish and consistent alloying chemical composition. The result is a stable arc, improved feedability, and exceptional control with every weld!

THREE UNIQUE FEATURES:

- A proprietary process which gives SuperGlaze®.
- A manufacturing process that precisely controls the alloy.
- State of the art testing equipment to evaluate the composition, surface condition, and feedability of the wire to help achieve problem-free welding

HERE'S HOW OUR PROCESS WORKS

MELTING AND ALLOYING AT OUR FACILITY

Unlike other manufacturers, Lincoln Electric is the only one fully integrated facility in the world that starts at the source with pure aluminium ingots and the right alloying components. With this process, we are able to hold tight tolerances in the composition and low levels of impurities which will lead to consistent weld quality and low porosities.

ROD CASTING

Our continuous casting keeps the rod surface free from imperfections and impurities creating world-class rod for our wire drawing process.

WIRE MILL DRAWING

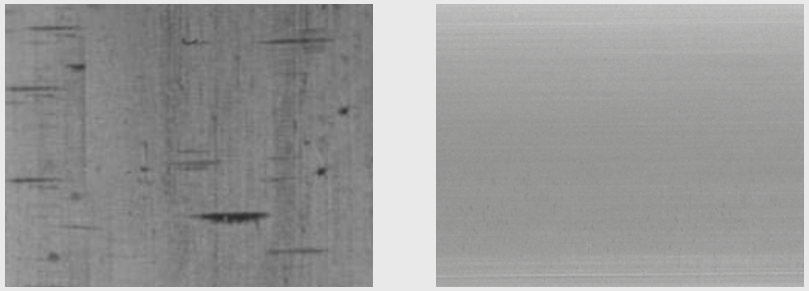
We use advanced wire drawing technology to preserve both surface integrity and internal soundness.

SPOOLING & PACKAGING

We put the highest care into spooling and our GEM-PAK to guarantee the best feeding performance. To help ensure superior quality of welding wire, continuous finished product inspection is done. Surface quality is evaluated along with feedability and welding performance.

The SuperGlaze® Advantage

5356 Wire Surfaces, Magnified 60x



Poor performing product | **SuperGlaze® "Best in Class"**

ALLOYS AND PRODUCT OVERVIEW

Process	Product name	Classifications		General Description	Typical applications
		AWS A5.10	EN ISO 18273		
MIG/TIG	**SuperGlaze® 4043**	ER4043	S Al 4043 (AlSi5)	4043 is a great choice for the welding of heat-treatable base alloys and more specifically the 6XXX series alloys. It has a lower melting point and more fluidity than the 5XXX series filler alloys and is preferred by welders because of its favorable operating characteristics. ER4043 type wires may reduce crack sensitivity with the 6XXX series base alloys. 4043 is suitable for sustained elevated temperature service, i.e. above 65°C.	6XXX alloys, and most casting alloys Automotive components such as frame and drive shafts Bicycle frames
MIG/TIG	**SuperGlaze® 4047**	ER4047	S Al 4047 (AlSi12)	A lower melting point and higher fluidity are possible advantages 4047 has over 4043. 4047 produces very clean weld deposits and possesses excellent operator appeal. It can be used as a substitute for an ER4043 type wire to minimize hot cracking, and produce higher fillet weld shear strength and leak-free welds. 4047 is suitable for sustained elevated temperature service, i.e. above 65°C.	Automotive components Heat Exchangers Body panels Brazing of aluminium sheets, extrusions and castings
MIG/TIG	**SuperGlaze® 5183**	ER5183	S Al 5183 (AlMg4,5Mn07(A)	5183 is designed to weld high magnesium alloys to meet higher tensile strength requirements. Use on 5083 and 5654 base materials when required tensile strengths are 40,000 psi (276 MPa) or greater. Typical applications are in the marine and cryogenic industries, and high strength structural aluminium fabrication.	Marine fabrication and repair Cryogenic tanks Shipbuilding and other high strength structural aluminum applications Railcars Offshore industry
MIG	**SuperGlaze® 5183 PLUS**				
MIG/TIG	**SuperGlaze® 5356**	ER5356	S Al 5356 (AlMg5Cr(A)	5356 is our most popular aluminium MIG wire. It is a great general purpose filler alloy designed for the welding of 5XXX series alloys when 40,000 psi (276 MPa) tensile strength is not required.	Trailer Manufacturing Formed truck panels Structural frames in the shipbuilding industry
MIG	**SuperGlaze® 5356 PLUS**				
MIG/TIG	**SuperGlaze® 5556A**	ER5556A	S Al 5556A (AlMg5Mn)	5556A is commonly used for welding high strength base materials like 5083 and provides good strength on 6XXX base materials. The elements are controlled to obtain increased weld strength over the 5356 alloy. It shows high corrosion resistance, making it suitable for marine applications. Good ductility and improved crack resistance	Marine Aircraft Military Industry

Lincoln Electric produces a variety of alloys in its globally unique vertically integrated aluminium welding wire facility. The ability to manufacture alloy and cast rods internally allows Lincoln Electric to produce many alloy chemical compositions not listed in this brochure. Additionally, tailored alloy and product requirements can be met for specific applications. Please contact your local Lincoln Electric sales representative for more information.

CHEMICAL COMPOSITION

Product name	Shielding gas (ACC. EN ISO 14175	Approvals*	Approvals*	Typical chemical composition									
		MIG	TIG	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Be
SuperGlaze® 4043	I1 : Inert gas Ar (100%) I3 : Inert gas Ar+ 0.5-95% He Flow rate: 16-35 l/min	TŰV, DB, CE, CWB		bal.	5.26	0.15	0.01	0.01	0.03	-	0.001	0.01	<0.0002
SuperGlaze® 4047		-		bal.	11-13	max. 0.8	max. 0.30	max. 0.15	max. 0.10	-	max. 0.20	-	0.0003
SuperGlaze® 5183		TŰV, DB, CWB, ABS, DNV, KR, LR, RINA, CCS, BV, CE	TŰV, DB, CWB, ABS, CE	bal.	0.03	0.13	0.001	0.65	4.99	0.10	0.02	0.07	0.0002
SuperGlaze® 5183 PLUS			-										
SuperGlaze® 5356		TŰV, DB, CWB, ABS, DNV, KR, LR, RINA, CCS, BV, CE	TŰV, DB, ABS, CE	bal.	0.05	0.09	0.03	0.12	4.90	0.08	<0.01	0.15	0.0002
SuperGlaze® 5356 PLUS			-										
SuperGlaze® 5556A		CE		bal.	0.05	0.11	-	0.6	5.1	0.08	-	0.09	0.0002

MECHANICAL PROPERTIES, TYPICAL, ALL WELD METAL

Product name	Mechanical properties, typical, all weld metal			
	Shielding gas	Condition	Tensile Strength (MPa)	Elongation (%)
SuperGlaze® 4043	I1	AW	165-195	16-22
SuperGlaze® 4047			170-260	5-15
SuperGlaze® 5183 PLUS			275-310	25-35
SuperGlaze® 5356			240-290	25-33
SuperGlaze® 5356 PLUS			290-300	23-30
SuperGlaze® 5556A			290-310	23-30

* Approvals may vary depending on product type

TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

PACKAGING AND ACCESSORIES

Gem-Pak® Aluminum Wire Bulk Packaging System

The patented Gem-Pak system consists of a unique core structure and glass gems that are weighted based on alloy and wire diameter, which lay on top of the wire as it unreels during use.

This allows for a smooth tangle-free performance and controlled feed system unlike any other aluminum wire bulk packaging system in the market.

SOLUTION BENEFITS

The patented Gem-Pak aluminium wire bulk packaging system minimizes feeding issues and tangling resulting in **minimal arc-flaring and contact tip burnbacks.**

- Achieve **consistent and reliable welds** with dependable wire feeding.
- Reduce your non-productive downtime and maximize your uptime with SuperGlaze® Gem-Pak today!

TANGLE-FREE GUARANTEED

ADD UP TO **90 MINS**

Gem-Pak Glass Gems

Standard Aluminum Packages

50%
Reduction In Contact Tips

+54 Mins
Time Saved on Tip Changeover

30%
Repair Rate Reduciton

+36 Mins
Time Saved on Repairing Parts

Production Time Disclosure

The production and down time information provided above is merely an estimate. Customer results may very, and may be less than the information provided above based on the unique characteristics of each customer's welding environment. Up time calculated by subtracting un-productive time per robot from total time. Additional uptime calculated by subtracting repair time per part per robot. Specific automotive customer case study comparing 3/64" (1.2mm) 4043 wire on different drum package vs. SuperGlaze® 4043 Gem-Pak™, using 27k lbs of wire per year.

Gem-Pak™ Bulk Packaging

» Simple design, no complex external pay-off systems
» Wire travels straight up in one layer with least resistance
» Patented design helps minimize arc-flaring and tip burnback

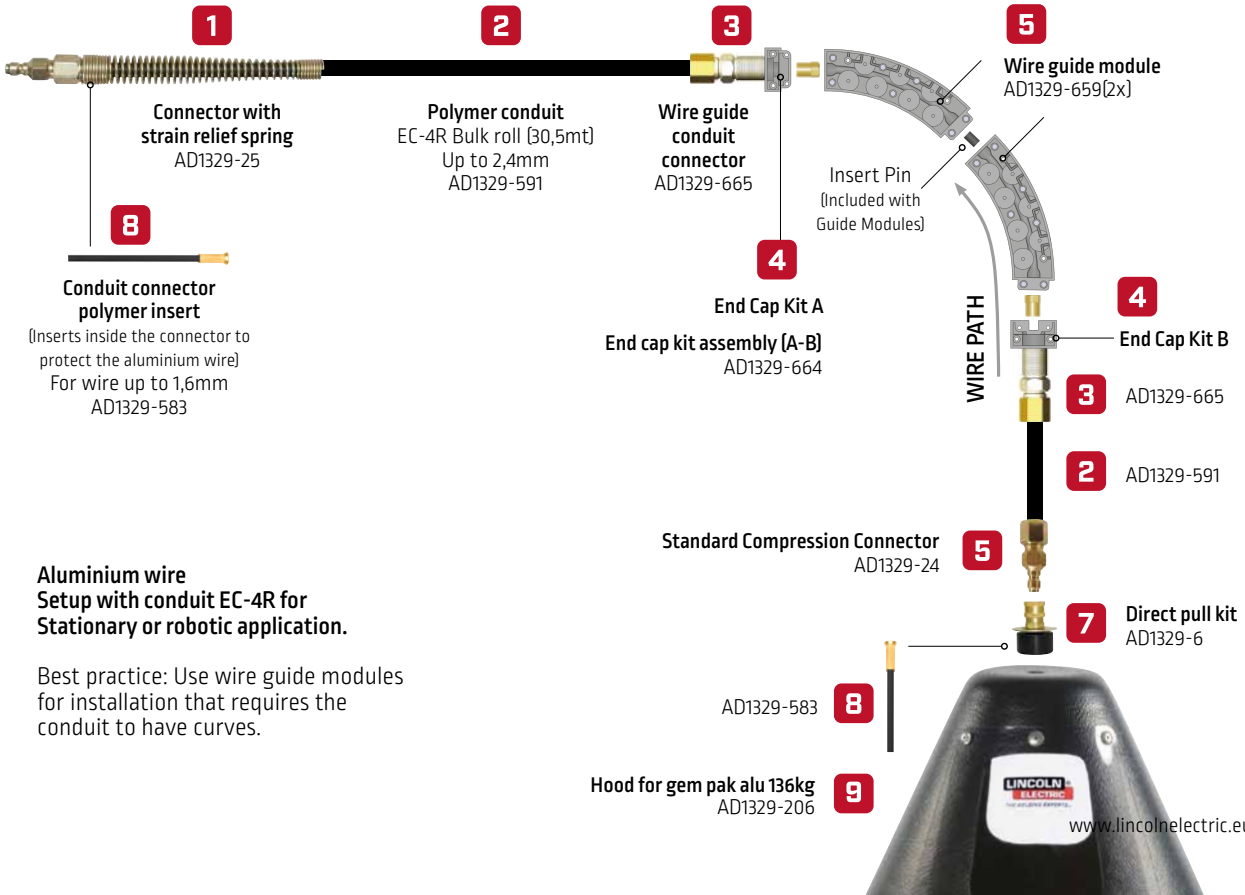
VS

Competition

» Complex and expensive mechanical spinners
» Plastic rings create resistance at different levels
» Wire loops tangle inside the drum creating burn-backs

GEM-PAK® PAYOFF ACCESSORIES

Autodrive 4R220
or **Autodrive SA**



To order

Description	Reference
1 – Polymer compression fitting w/strain relief connector	**AD1329-25**
2 – 300 Id x .460 Od polymer conduit, 30.5m	**AD1329-591**
3 – Wire guide conduit connector	**AD1329-665**
4 – Male and female end caps kit	**AD1329-664**
5 – Wire guide module, 45-degree	**AD1329-659**
6 – Polymer compression (ferrule)	**AD1329-24**
7 – Direct pull kit	**ADd1329-6**
8 – Connector liner 2.3mm id, polymer	**AD1329-583**
9 – Square hood chimeless	**AD1329-206**

Aluminium wire
Setup with conduit EC-4R for
Stationary or robotic application.

Best practice: Use wire guide modules for installation that requires the conduit to have curves.

SUPERGLAZE® PLUS NEW

Experience the next generation of aluminum arc stability and welding performance with **SuperGlaze® 5356 Plus** & **SuperGlaze® 5183 Plus** spooled products from Lincoln Electric.

- Cosmetic Welds.
- Easier Puddle Control
- Optimal feeding

ALUMINUM WELDING WIRE

SUPERGLAZE® PLUS

Table 3-4: Aluminum Filler Alloy Chart

BASE ALLOYS	FILLER ALLOYS	Characteristics	W	S	D	C	T	M
319.0 333.0 354.0 355.0 C355.0 380.0	2319							
	4043/4047		B	A	A	A	A	A
413.0 443.0 444.0 356.0 A356.0 A357.0 359.0	4043/4047		A	A	A	A	A	A
7005 7021 7039 7046 7146 710.0 711.0	4043/4047		A	A	C	A	A	
	5087		B	A	B	A		A
	5183		B	A	B	A		A
	5356		B	A	A	A		A
	5554							
	5556		B	A	B	A		A
	5556A		B	A	B	A		A
	5754							
6061 6070	4043/4047		A	A	C	A	A	
	4643 [1]							
	5087		B	A	B		A	
	5183		B	A	B		A	
	5356		B	A	A		A	
	5554							
	5556		B	A	B		A	
	5556A		B	A	B		A	
	5754							
6005, 6005A, 6063, 6082 6101, 6151, 6201, 6351, 6951	4043/4047		A	A	C	A	A	
	4643 [1]							
	5087		B	A	B		A	
	5183		B	A	B		A	
	5356		B	A	A		A	
	5554							
	5556		B	A	B		A	
	5556A		B	A	B		A	
	5754							
5454 5754	5087		B	A	B	B		A
	5183		B	A	B	B		A
	5356		B	A	A	B		A
	5554		C	A	A	A	A	A
	5556		B	A	B	B		A
	5556A		B	A	B	B		A
	5754		C	A	A	A	A	A
511.0, 512.0, 513.0, 514.0, 535.0 5154, 5254	5087		B	A	B	B		A
	5183		B	A	B	B		A
	5356		B	A	A	B		A
	5554		C	A	A	A		A
	5556		B	A	B	B		A
	5556A		B	A	B	B		A
	5754		C	A	A	A		A
5086, 5056	5087		A	A	B	A		A
	5183		A	A	B	A		A
	5356		A	A	A	A		A
	5554							
	5556		A	A	B	A		A
	5556A		A	A	B	A		A
	5754							
5083, 5456	5087		A	A	B	A		A
	5183		A	A	B	A		A
	5356		A	A	A	A		A
	5554							
	5556		A	A	B	A		A
	5556A		A	A	B	A		A
	5754							
5052, 5652	4043/4047		A	B	C	A	A	
	5087		B	A	B			A
	5183		B	A	B			A
	5356		B	A	A			A
	5554							
	5556		B	A	B			A
	5556A		B	A	B			A
	5754							
5005, 5050	1100		C	B	A	A	A	A
	4043/4047		A	A	C	A	A	
	5087		C	A	B			B
	5183		C	A	B			B
	5356		C	A	B			B
	5556		C	A	B			B
	5556A		C	A	B			B
3004	1100		D	B	A	A	A	A
	4043/4047		A	A	C	A	A	
	5087		C	A	B			B
	5183		C	A	B			B
	5356		C	A	B			B
	5554							
	5556		C	A	B			B
	5556A		C	A	B			B
	5754							
3003 ALCLAD 3003	1100		B	B	A	A	A	A
	4043/4047		A	B	B	A	A	
2219 2519	2319							
	4043/4047		B	A	A	A	A	
2014 2036	2319							
	4043/4047		B	A	A	A	A	
1100	1100		B	B	A	A	A	A
	4043/4047		A	A	B	A	A	
1060 1070 1080 1350	1100		B	B	A	A	A	B
	4043/4047		B	A	B	A	A	

Aluminum Filler Alloy Chart

How to Use

1. Select base alloys to be joined.
2. Find the block where the column and row intersect.
3. This block contains horizontal rows of letters (A, B, C or D) representative of the alloy directly across from them in the filler alloy box at the end of each row. The letters in each line give the A-to-D rating of the characteristics listed at the top of each column – W, S, D, C, T and M (see Legend at right for explanation of each letter).
4. Analyze the weld characteristics afforded by each filler alloy. You will find that you can "trade off" one characteristic for another until you find the filler that best meets your needs.

Example

When joining base alloys 3003 and 1100, find the intersecting block. Note that filler alloy 1100 provides an (A) rating for ductility (D), corrosion resistance (C), performance at elevated temperatures (T), and color match after anodizing (M), and a (B) rating for ease of welding (W) and strength (S). However, if ease of welding and shear strength are important, and ductility and color match can be sacrificed slightly, then filler alloy 4043 can be used.

SYMBOL	CHARCTERISTIC
W	Propensity for weld cracking. "A" indicates little tendency for weld cracking. "D" indicates severe tendency for weld cracking
S	Shear strength - applicable particularly to fillet welds.
D	Ductility of the finished weld
C	Resistance to corrosion in ambient temperature fresh or salt water
T	Recommended for service at Suitability for long term expoure to temperatures above 150 degrees F
M	Color match between the weld and the parent material after anodizing
A, B, C, & D are relative ratings in decreasing order of merit. The ratings have relative meaning only within a given block.	

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PRODUCTS AVAILABILITIES

ALLOY	Material description			
	MIG		TIG	
4043	ED702748	1.2 mm - 7.26 KG spool (S300)	ED701957	1.6 x 1000 mm - 5 KG carton box
	ED701753	1.0 mm - 7 KG spool (BS300)	ED702537	2.0 x 1000 mm - 5 KG carton box
	ED701754	1.2 mm - 7 KG spool (BS300)	ED701958	2.4 x 1000 mm - 5 KG carton box
	ED701755	1.6 mm - 7 KG spool (BS300)	ED701959	3.2 x 1000 mm - 5 KG carton box
	ED036610	1.2 mm - 136 KG GEM-PAK		
	ED036611	1.6 mm - 136 KG GEM-PAK		
4047	ED036613	1.2 mm - 136 KG GEM-PAK		
	ED036612	1.6 mm - 136 KG GEM-PAK		
5183	ED034791	1.2 mm - 136 KG GEM-PAK	ED701963	1.6 x 1000 mm - 5 KG carton box
			ED702566	2.0 x 1000 mm - 5 KG carton box
			ED701965	2.4 x 1000 mm - 5 KG carton box
	ED034792	1.6 mm - 136 KG GEM-PAK	ED701964	3.2 x 1000 mm - 5 KG carton box
			ED702517	4.0 x 1000 mm - 5 KG carton box
5183 PLUS	ED704127	1.2 mm - 7 KG spool (BS300)		
	ED704128	1.2 mm - 7.26 KG spool (S300)		
	ED704129	1.6 mm - 7 KG spool (BS300)		

ALLOY	Material description			
	MIG		TIG	
5356	ED034550	1.2 mm - 136 KG GEM-PAK	ED701966	1.6 x 1000 mm - 5 KG carton box
			ED702518	2.0 x 1000 mm - 5 KG carton box
			ED702387	2.4 x 1000 mm - 5 KG carton box
			ED701967	3.2 x 1000 mm - 5 KG carton box
			ED702585	4.0 x 1000 mm - 5 KG carton box
	ED034551	1.6 mm - 136 KG GEM-PAK		
5356 PLUS	ED704123	1.2 mm - 7 KG spool (BS300)		
	ED704124	1.2 mm - 7.26 KG spool (S300)		
	ED704125	1.6 mm - 7 KG spool (BS300)		
5556A	ED703762	1.0 mm - 7.26 KG spool (S300)	ED703764	3.2 x 1000 mm - 5 KG carton box
	ED703763	1.2 mm - 7.26 KG spool (S300)	ED703765	4.0 x 1000 mm - 5 KG carton box
	ED702986	1.6 mm - 7.26 KG spool (S300)		

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company® is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment.

Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of tness for any customers' particular purpose, is specially disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric act the results obtained in applying these types of fabrication methods and service requirements.

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