

# INDALCO

ALUMINUM WELDING WIRE



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# INDALCO ALUMINUM WIRES

Indalco® 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 Indalco.
- 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, the Aluminum Solutions facility 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

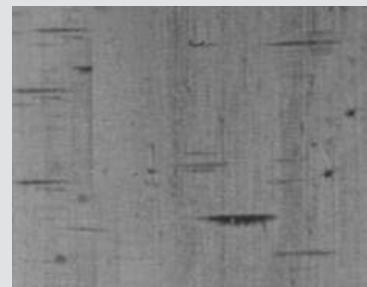
We use advanced wire drawing technology to preserve both surface integrity and internal soundness.

## SPOOLING & PACKAGING

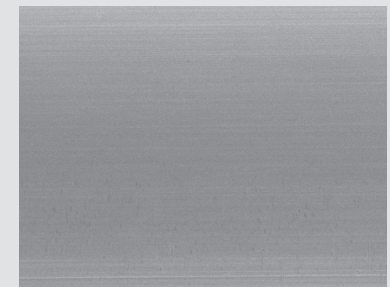
We put the highest care into spooling and our Gem-Pak® to guarantee the best feeding performance. To help ensure superior quality of welding wire, continuous finished product inspection is done. Surface quality is evaluated along with feedability and welding performance.

## The Indalco Advantage

5356 Wire Surfaces, Magnified 60x



Poor performing product



Indalco "Best in Class"

## ALLOYS AND PRODUCT OVERVIEW

Process	Product name	Classifications		General Description	Typical applications
		AWS A5.10	EN ISO 18273		
MIG/TIG	<b>Indalco 4043</b>	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	<b>Indalco 4047</b>	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	<b>Indalco 5183</b>	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/TIG	<b>Indalco 5356</b>	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/TIG	<b>Indalco 5556A</b>	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*		Typical chemical composition									
		MIG	TIG	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Be
Indalco 4043	I1 : Inert gas Ar (100%) I3 : Inert gas Ar+ 0.5-95% He Flow rate: 16-35 l/min	TÜV, DB, CE, CWB		bal.	5.26	0.15	0.01	0.01	0.03	-	0.001	0.01	<0.0002
Indalco 4047		-		bal.	11-13	max. 0.8	max. 0.30	max. 0.15	max. 0.10	-	max. 0.20	-	0.0003
Indalco 5183		TÜV, DB, CWB, ABS, DNV, KR, LR, RINA, CCS, BV, CE	TÜV, DB, ABS, CE	bal.	0.03	0.13	0.001	0.65	4.99	0.10	0.02	0.07	0.0002
Indalco 5183 PLUS		-											
Indalco 5356		TÜV, DB, CWB, ABS, DNV, KR, LR, RINA, CCS, BV, CE	TÜV, DB, ABS, CE	bal.	0.05	0.09	0.03	0.12	4.90	0.08	<0.01	0.15	0.0002
Indalco 5356 PLUS		-											
Indalco 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 (%)
Indalco 4043	I1	AW	165-195	16-22
Indalco 4047			170-260	5-15
Indalco 5183 PLUS			275-310	25-35
Indalco 5356			240-290	25-33
Indalco 5356 PLUS			290-300	23-30
Indalco 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.

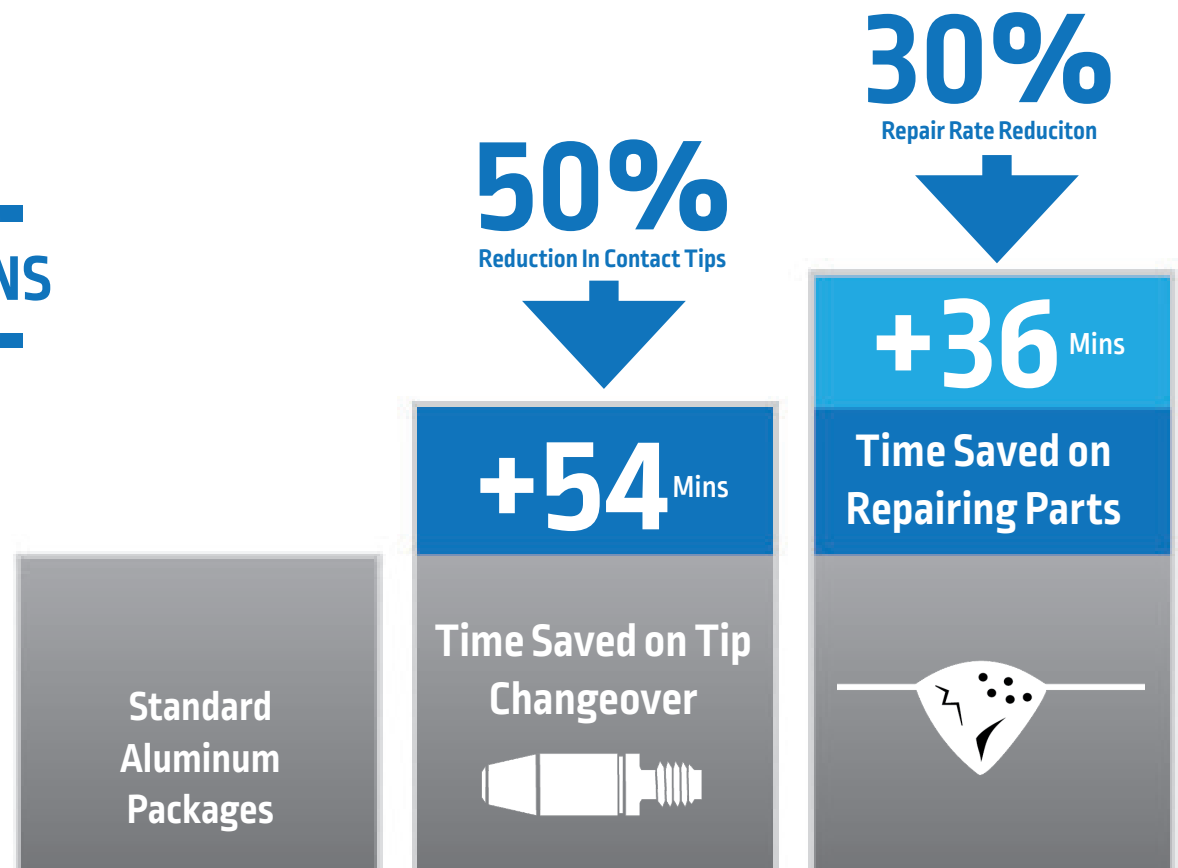
### TANGLE-FREE GUARANTEED



### 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 Indalco Gem-Pak® today!



#### Production Time Disclosure

The production and down time information provided above is merely an estimate. Customer results may vary, 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



VS

## Competition



- » 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

- » 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	AD1329-6
8 – Connector liner 2.3mm id, polymer	AD1329-583
9 – Square hood chimeless	AD1329-206

