OXYGEN EQUIVALENT (OE) & SUPERARC CERTIFICATION

NEW CERTIFICATION CHANGES HELP SAVE END-USERS TIME AND MONEY

Shielding gas is a critical choice for any welding operation. A recent certification update supported by Lincoln Electric enables end users to make shielding gas adjustments without the heavy burden of a costly and time-intensive requalification.

Two important changes were recently made to the AWS and ASME codes.

1 AWS A5.18 now includes the option to classify products with an Oxygen Equivalent (OE) designator. Previously, a product would have to be certified to each different shielding gas composition. The new OE designator system enables a product to be certified for a range of shielding gas compositions. The OE values represent the full range of shielding gas with which the product has been tested under and produced conforming results.

2 ASME Section IX has updated the requirements for essential variables to accommodate the new OE designators. Shielding gas composition will still be an essential variable; however, requalification is not necessary as long as the OE value of the new shielding gas is within the range of OE represented on the filler metal certificate.

What does this mean for me?

This new update allows for a change in shielding gas without the need for requalification, which will save time and money and allow for more flexibility to change shielding gas. This will help navigate concerns like being locked into a particular shielding gas due to an initial qualification, limited availability of a particular shielding gas, or making a general weld process change.

How are SuperArc products being affected?

Lincoln Electric is proud to announce that many SuperArc® GMAW wires have been tested and the certificates of conformance now include the OE shielding gas designator representing the widest possible range of shielding gas composition (100% CO_2 to 98% Ar / 2% O_2). This will allow users of SuperArc products to take maximum advantage of the flexibility provided by the AWS and ASME code updates. Updated certificates of conformance for many SuperArc products can already be found on the Certificate Center on the Lincoln Electric website.

This certification update further adds to the value of the SuperArc brand – Lincoln Electric's premium copper coated GMAW wires, made from the highest quality steel, available in a wide array of convenient and easy-to-use packaging, offering industry leading consistency, feedability, and arc performance.

Please go to the Lincoln Electric Certificate Center to learn more about Lincoln Electric's consumable certifications.

What is OE?

OE, or Oxygen Equivalent, is a measure of the oxidation potential of a shielding gas which helps to predict the weld metal composition and properties for a given filler metal. The OE value of a shielding gas is calculated with a simple formula:

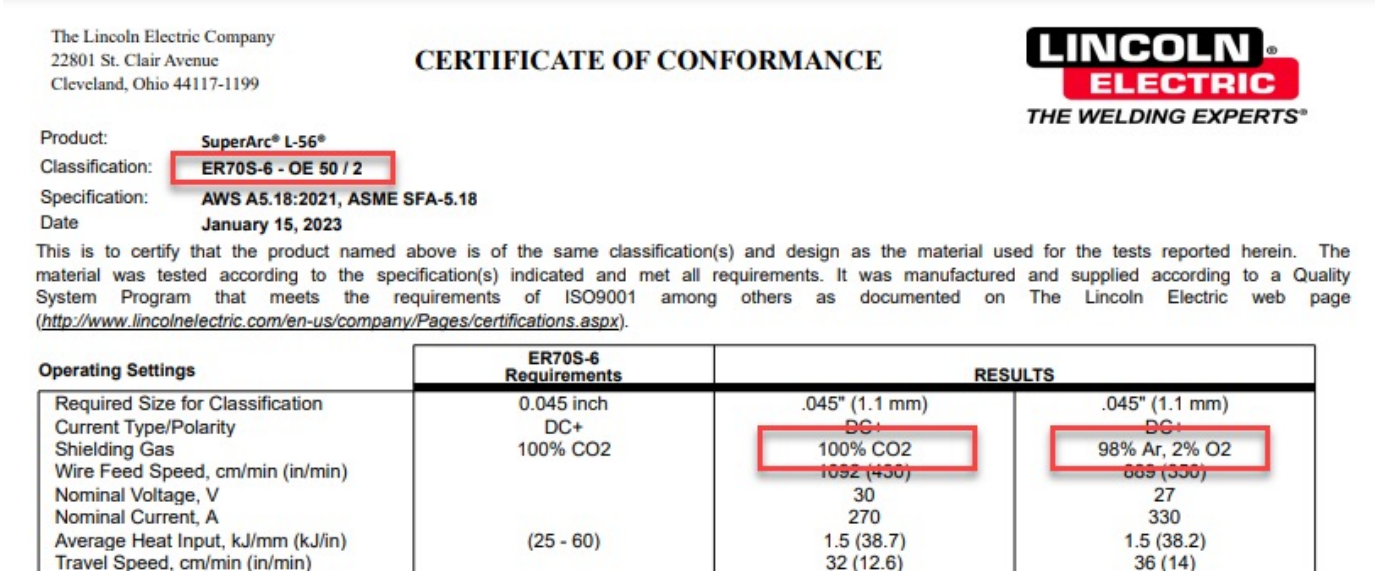
OE = % Oxygen + (0.5 x % Carbon Dioxide)

Tri-blends and any other gas blend still follow the same formula, but only oxygen and carbon dioxide content are considered. The table below shows the OE value for several common shielding gases.

Shielding Gas	100% CO_2	75% Ar, balance (25%) CO_2	85% Ar, balance (15%) CO_2	92% Ar, balance (8%) CO_2	98% Ar, balance (2%) O_2
Oxygen Equivalent Value	50	12.5 (12)	7.5 (7)	4	2

How will the new SuperArc certificates show OE?

The Certificate of Conformance for SuperArc L-56® is shown below as an example. The product is tested under 100% CO2 shielding gas (OE value 50), and also tested under 98% Ar, 2% O2 shielding gas (OE value 2), so any shielding gas with an OE value within the range of 50 and 2 is covered by this Certificate of Conformance.



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CERTIFICATE OF CONFORMANCE

LINCOLN ELECTRIC
THE WELDING EXPERTS

Product: SuperArc® L-56®
Classification: ER70S-6 - OE 50 / 2
Specification: AWS A5.18:2021, ASME SFA-5.18
Date January 15, 2023

This is to certify that the product named above is of the same classification(s) and design as the material used for the tests reported herein. The material was tested according to the specification(s) indicated and met all requirements. It was manufactured and supplied according to a Quality System Program that meets the requirements of ISO9001 among others as documented on The Lincoln Electric web page (http://www.lincolnelectric.com/en-us/company/Pages/certifications.aspx).

Operating Settings	ER70S-6 Requirements	RESULTS	
Required Size for Classification	0.045 inch	.045" (1.1 mm)	.045" (1.1 mm)
Current Type/Polarity	DC+	DC+	DC+
Shielding Gas	100% CO2	100% CO2	98% Ar, 2% O2
Wire Feed Speed, cm/min (in/min)		1092 (430)	889 (350)
Nominal Voltage, V		30	27
Nominal Current, A		270	330
Average Heat Input, kJ/mm (kJ/in)	(25 - 60)	1.5 (38.7)	1.5 (38.2)
Travel Speed, cm/min (in/min)		32 (12.6)	36 (14)

