



# CLEAROSTA RANGE

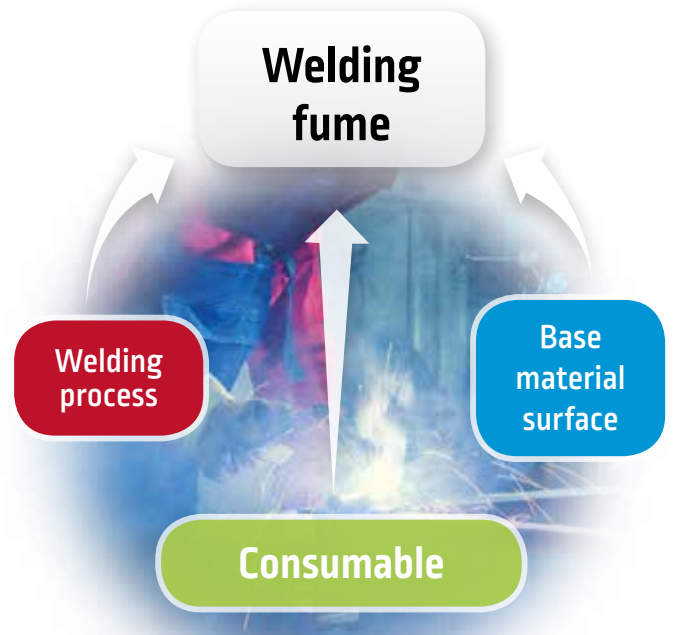
LOW HEXAVALENT CHROMIUM EMISSION CONSUMABLES

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**LINCOLN**<sup>®</sup>  
**ELECTRIC**  
THE WELDING EXPERTS<sup>®</sup>

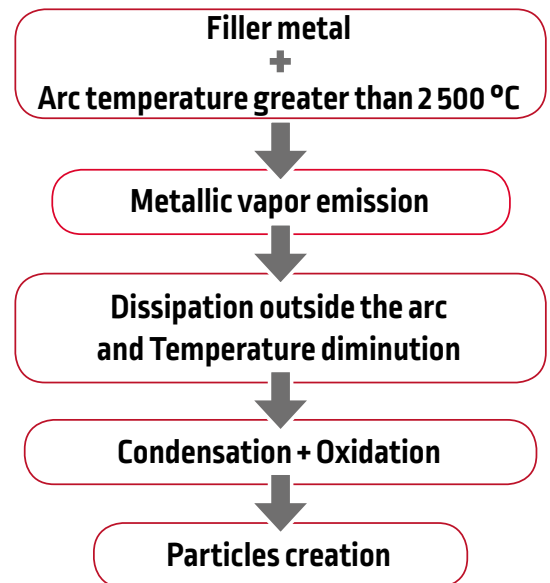
# HELP EMPLOYERS TO CREATE A SAFER WELDING ENVIRONMENT IS A PRIORITY

Welding fume emission rates are influenced by different factors such as welding consumables, welding process selection & parameters and base materials. It is important to understand each factor and their influence in fume emission rate in order to reduce generation of CrVI in the fume. Ensure the base material is clean, optimize your welding parameters for the application and use the CLEAROSTA product range, one of the most advanced consumables in reducing overall fume emission rates and the concentration of CrVI in the welding fume



## How can I reduce CrVI in welding fume ?

CLEAROSTA consumables reduce the CrVI emission rate. Use of CLEAROSTA products **in conjunction with a fume control strategy** to minimize worker exposure to CrVI in welding fume.



# LOWER HEXAVALENT CHROMIUM CONCENTRATION

# MMA RANGE CLEAROSTA E AVAILABLE IN 308L, 316L AND 309L

## DOUBLE COATED STICK ELECTRODES

High operator appeal and control due to the more stable and focused arc transfer:

- Suitable for root pass
- Lower porosity
- Good striking and restriking
- Excellent slag removal

## BEAD APPEARANCE AFTER WELDING

- Excellent behaviour in flat position
- Low fumes residues along bead line thus less cleaning

## AVAILABLE IN PROTECH™ VACUUM PACK

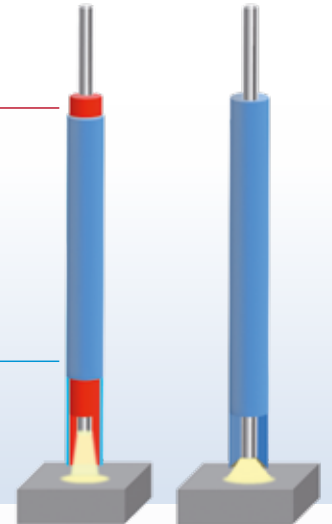
- No rebaking, no holding oven and no quiver
- Can be used right after opening and during 8h

## UNDERSTANDING DOUBLE-COATED TECHNOLOGY

Inside coat provides:

- deep crater at the arc section
- high arc "stiffness" and burning stability
- stable and low-spatter drop transition

Outside coat provides a slag-metallurgically effective



## SPECIFICATIONS

PRODUCT NAME	AWS (A5.4)	EN ISO (ISO 3581-A)	CHEMISTRY									TYPICAL FERRITE	MECHANICAL PROPERTIES			
			C	Mn	Si	Cr	Ni	Mo	S	P	WRC -92	RP0.2	RM	ELONGATION (%)	IMPACT TOUGHNESS (J)	
CLEAROSTA E 304L	E308L-17	E 19 9 L R 22	0.03	0.8	1	19.5	10	-	0.01	0.025	5-10 (6)	450	570	40	60J @+20°C	
CLEAROSTA E 316L	E316L-17	E 19 12 3 L R 22	0.03	0.8	1	19.5	10	2.7	0.01	0.025	5-10 (8)	450	570	40	60J @+20°C	
CLEAROSTA E 309L	E309L-17	E 23 12 L R 22	0.03	0.9	1	24.0	13	-	0.01	0.025	8-15 (11)	480	580	40	55J @+20°C	

## ORDERING INFORMATION

PRODUCT NAME	Ø (MM)	LENGTH (MM)	QUANTITY		REFERENCE
			PER PACK	PER CARTON	
CLEAROSTA E 304L	2.5	300	90	540	710001
	3.2	350	55	330	710002
	4	350	40	240	710003
	5	350	20	120	710004
CLEAROSTA E 316L	2.5	300	90	540	710009
	3.2	350	55	330	710010
	4	350	40	240	710011
	5	350	20	120	710012
CLEAROSTA E 309L	2.5	300	90	540	710005
	3.2	350	55	330	710006
	4	350	40	240	710007
	5	350	20	120	710008



**PROTECH™**  
**VACUUM PACK**

# FCAW RANGE CLEAROSTA F AVAILABLE IN 308L, 316L AND 309L

## FEATURES

- As unparalleled consistency in weldability and mechanical properties as standard grades
- Eliminates typical disadvantages of GMAW and SMAW welding (lack of penetration, cold laps, slag inclusions)
- Reduced welding cost compared to GMAW, standard M21 shielding gas is used
- Works better than GMAW both on standard CV and LE pulse welding modes
- Very good weld appearance and regularity
- Optimal slag system helps to achieve best results

## SPECIFICATIONS

PRODUCT NAME	CHEMISTRY								TYPICAL FERRITE	MECHANICAL PROPERTIES						
	C	Mn	Si	Cr	Ni	Mo	S	P	WRC -92	RP0.2	RM	ELONGATION [%]	IMPACT TOUGHNESS (J)			
													-20°C	-60°C	-110°C	-196°C
<b>CLEAROSTA F 304L</b>	0.03	1.3	0.7	19.5	10	-	0.01	0.02	3-12 (7)	400	570	45	50	-	-	30
<b>CLEAROSTA F 316L</b>	0.03	1.3	0.7	18.5	12	2.7	0.01	0.02	3-12 (7)	470	580	35	50	-	38	-
<b>CLEAROSTA F 309L</b>	0.03	0.8	0.7	23.0	13	-	0.01	0.02	10-30 (14)	400	550	40	45	40	-	-

## ORDERING INFORMATION

TYPE	AWS (A5.22)	EN ISO (ISO 17633)	Ø (MM)	WEIGHT (KG)	REFERENCE
<b>CLEAROSTA F 304L</b>	E308LT1-1 E308LT1-4	17633-A: T 19 9 L P C 1 17633-A: T 19 9 L P M 1 17633-B: TS308L-FB1	1.2	15	710013
<b>CLEAROSTA F 316L</b>	E316LT1-1 E316LT1-4	17633-A: T 19 12 3 L P C 1 17633-A: T 19 12 3 L P M 1 17633-B: TS316L-FB1	1.2	15	710015
<b>CLEAROSTA F 309L</b>	E309LT1-1 E309LT1-4	17633-A: T 23 12 L P C 1 17633-A: T 23 12 L P M 1 17633-B: TS309L-FB1	1.2	15	710014



## RECOMMENDED STARTING PARAMETERS

WELDING POSITION	WFS (M/MIN)	CURRENT (A)	VOLTAGE (V)	TRAVEL SPEED (CM/MIN)
<b>PF</b>	7 - 9	160 - 180	25.5 - 26.5	12 - 16

EXPOSURE TO  
CrVI REDUCED



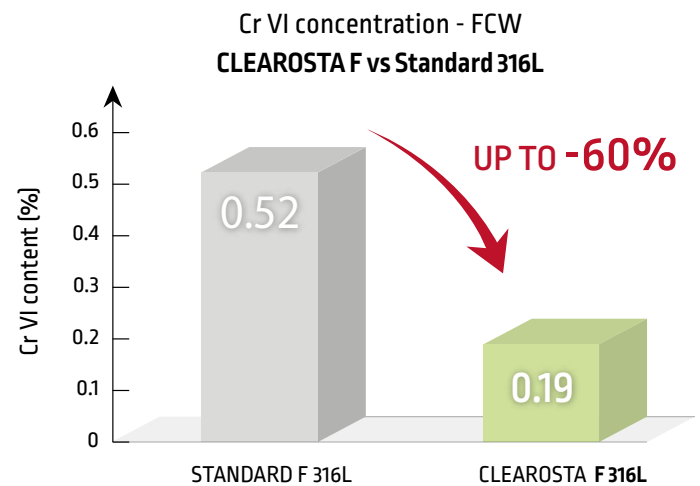
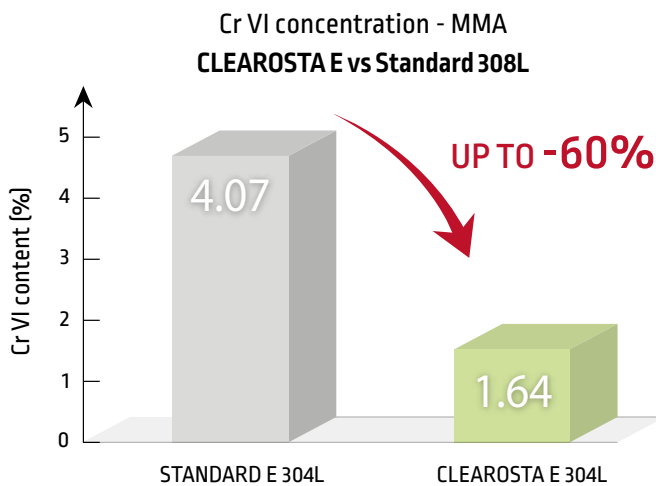
# CLEAROSTA

Innovative range of stick electrodes and flux-cored wires which significantly reduce your welding fume and emission of CrVI.

## Comparative fume characteristics

Results generated by TWI (The Welding Institute Ltd), Cambridge UK, June 2016.

- Emission rate testing according to EN ISO 15011-1,4
- Fumes analysis according to BS ISO 16740:2005
- Welding performed with an inverter on degreased stainless steel (AISI 304)
- Welding conditions:
  - > Electrode: 115 A - 29V
  - > Flux cored wire: 200 A - 28V
  - > Shielding gas: M21
- A reduction up to -40% is also observed for fume rate using CLEAROSTA range
- Comparable results in fume emission and CrVI concentration between 308L, 316L and 309L



REDUCED FUME  
EMISSION RATE  
(UP TO -40%)

# BEING PRESENT LOCALLY MAKES US MORE AWARE GLOBALLY



**2.6** BILLION USD REVENUE      **160** ACTIVE IN 160 COUNTRIES WORLDWIDE      **11 000** EMPLOYEES WORLDWIDE      **120** YEARS OF EXPERIENCE

The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable PEL and ACGIH TLV limits.

**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 fitness for any customers' particular purpose is specifically disclaimed.

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