

Laboratory Scope - Olin Brass, East Alton, IL

8/8/2019

Page 1 of 1

Quality means 100% conformance to customer requirements 100% of the time. Quality is built in our products; not just inspected in prior to shipment. Olin Brass processes have been designed to control the quality of incoming supplies and materials, maintain the repeatability and reproducibility of our measuring, testing and inspection systems, investigate nonconforming products and take corrective action to continually improve our products. Quality performance is measured on a weekly and monthly basis and managers and their groups are evaluated quarterly to insure that progress toward objectives is accomplished.

Our Spectrometer Laboratory and two Metallurgical Laboratories exist to insure product quality through established testing procedures, calibration programs, and equipment maintenance schedules, with zero harm to the environment.

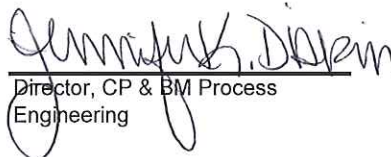
All devices are directly or indirectly verified by or calibrated through an OEM or Laboratory that is ISO 17025 accredited where applicable.

The above mentioned laboratories at Olin Brass, East Alton have the equipment, capability and documented procedures to perform the following tests:

<u>Chemical and Analytical</u>	<u>Location</u>	<u>Equipment</u>	<u>Procedure</u>	<u>ASTM Specification</u>
Spectrophotometer	Met Lab	Genesys 10S	ML SOP 84	E275 & E958
Titration	Met Lab	Burets	ML SOP 16, 17, 18, 19, 30, 52, 63, 69, 86	
Hydrogen / Oxygen Determinator	Spec Lab	LECO OH 836	CP 9.38 SL	B170, E1019, E1409
Hydrogen/Oxygen Determinator	Spec Lab	LECO ROH 600	CP 9.34 SL	B170, E1019, E1409
Carbon/Sulfur Determinator	Spec Lab	ELTRA Csi	CP 9.40 SL	B170, B249, B248
Carbon/Sulfur Determinator	Spec Lab	LECO CS 600	CP 9.39 SL	B170, B249, B248
X-ray fluorescence	Spec Lab	AXIOS	CP 9.7 SL	SM 5-31
X-ray fluorescence	Spec Lab	PANalytical PW 2640 Model MAGIXFAST	CP 9.32 SL	SM 5-31
Optical emission	Spec Lab	Spectro OES Spectrolax X7	CP 9.23 SL	SM 5-32
Optical emission	Spec Lab	OBLF OES	CP 9.33 SL	SM 5-32

<u>Mechanical Testing</u>	<u>Location</u>	<u>Equipment</u>	<u>Procedure</u>	<u>ASTM Specification</u>
Bend Testing 90 degree	Met & Plt 3 Lab	90 bend tester	ML SOP 10	B820
Bend Testing 180 degree	Met & Plt 3 Lab	180 bend tester	ML SOP 75	B820
Hardness	Met & Plt 3 Lab	Wilson Rockwell testers	ML SOP 3	E18
Hardness	Met Lab	Pace Rockwell testers	ML SOP 3.1	E18
Micro hardness	Met & Plt 3 Lab	Buehler 1600	ML SOP 4.1	E384
Macro hardness	Met Lab	Pace Omega 5000	ML SOP 4.2	E384
Tensile, Yield and Elongation	Met Lab	Tinius Olsen, 5000lb	ML SOP 1	E345 and E8
Tensile, Yield and Elongation	Met Lab	Satec, 25000lb	ML SOP 1	E345 and E8
Tensile, Yield and Elongation	Plt 3 Lab	Instron 5567	ML P3 8.8	E345 and E8

<u>Additional Testing</u>	<u>Location</u>	<u>Equipment</u>	<u>Procedure</u>	<u>ASTM Specification</u>
Elec. Conductivity & Resistivity	Met & Plt 3 Lab	Yokogawa double bridge	ML SOP 6	B193
Elec. Conductivity & Resistivity	Met Lab	Foerster Sigma	ML SOP 100	E1004
Surface Roughness	Met & Plt 3 Lab	Federal Pocket Surf	ML SOP 13.1	ANSI B46.1
Grain Size Determination	Met Lab	Zeiss IM35	ML SOP 2	E112
Grain Size Determination	Plt 3 Lab	Nikon Measurement Microscope	ML P3 8.7	E112
Tool Wear Test	Met & Plt 3 Lab	Tool Wear Tester	ML SOP 5	G133
Solderability-Dip Test	Met Lab	Electrovert 256-17	ML SOP 70	D1867


 Director, CP & BM Process
 Engineering