



A QUAKER HOUGHTON COMPANY

Certificate of Conformance
SIFCO Process Solution

The solution identified below has been tested under controlled conditions and found to meet SIFCO Applied Surface Concepts specifications and Quality Assurance standards. This product does not contain, nor has it been contaminated with metallic mercury or mercury compounds. SIFCO ASC, LLC is a mercury free facility.

This product is free from all foreign materials that could result in foreign object damage to the equipment or process.

Capability of Meeting Specifications

When properly selected and applied, this solution will meet LGPS1102. This solution meets the requirements for: MIL-STD-865E, AMS2451/4D, ASTM B117-18, ASTM F519-18, BAC5854M, DPS9.89P & PS 13113F.

Product Code	5070
Product Description	Cadmium LHE®
Batch Number	2203097
Test Requirement	Actual Value
Specimen Type	1a1 Notch Bars per ASTM F519 Lot # 12H Sensitivity Pass Date: 01/21/2022 Notched Specimens per BAC5144 Lot # 164439 Sensitivity Pass Date: 11/01/2021 2a rings per ASTM F519 Lot # 93115 Sensitivity Pass Date: 04/10/2021
pH	7.70 @ 20°C
Specific Gravity	1.250 @ 20°C
Metal Content	100.30 g/l
Hydrogen Embrittlement	CONFORMS
200 Hour Fracture Test	Pass AMS2451/4, MIL-STD-865, PS13113 and BAC5854 Report Numbers 22-73810, 22-73804
168 Hour Fracture Test	Pass DPS 9.89
250 Hour Corrosion Test	AMS 2451/4 and ASTM B117 / Lab Report #2204-04-0160
Solution Appearance	Yellow
Solution Manufacturing Date	March 29, 2022
HE Certification Pass Date	April 9, 2022
Recommended Shelf Life	MIL-STD-865 and AMS2451/4: March 29, 2026 BAC 5854, DPS 9.89 and PS 13113 Retest Before: April 9, 2023

Quality Technician

04/26/2022

Date

1205 Texas Star Pkwy.
Suite 100
Euless, Texas 76040



OMEGA RESEARCH
i n c o r p o r a t e d

Phone: 940-648-5828
OmegaResearchInc.com

"Specialists in Embrittlement Testing"

Date: April 11 2022
To: SIFCO OH
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 22-73804
Reference P.O.: PO00008517
S/N: 1, 2, 3, 4
Test: NOTCH TENSILE HYDROGEN EMBRITTLEMENT
Sample Identification: SAMPLES A, B, C, D:
Job / SN: SOLUTION CODE: 5070, BATCH #2203097
Process: BRUSH CADMIUM PLATE
PO Specification: MIL-STD-865E, AMS 2451/4D, PS13113F
Test Method Scope: ASTM F519-18
Receive Date: Apr 01, 2022
Test Start Date: Apr 01, 2022
Test End Date: Apr 09, 2022
Sample Lot: 12H
Notched Ultimate Tensile Load: 9370
Test Load: 7028
Mfg.: GREEN
Units: LBS
Units: LBS
Results: Conforms

The above identified notched tensile samples were subjected to a 200-hour sustained load test at a load of 75% of the Notch Ultimate Tensile Load (NUTL). Results above are applicable to submitted purchase order specifications. Additionally, results apply to the samples as received. Variances as applicable are noted at bottom right of report:

Report Revision:
1

Revision Description:

1 - Original



APPROVED

JS 4/12/22

Testing performed under direct supervision of approved signatories per OM-2014 ISO 17025 Quality Manual PARA 7.8.

Jeremy Riley **Joshua Cox** **Clint Williams**
Ops Mgr **Quality Mgr** **Eng Tech**

Decision Rule: Per previously communicated and agreed, data has been supplied/reported as observed without accounting for measurement uncertainty.

Report invalid unless color seal present. Page 1 of 1



"Specialists in Embrittlement Testing"

Date: April 11 2022
To: SIFCO OH
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 22-73810
Reference P.O.: PO00008518
S/N: 0048P, 0049P
Test: NOTCH TENSILE HYDROGEN EMBRITTLEMENT
Sample Identification: SAMPLES A, B:
Job / SN: SOLUTION CODE: 5070, BATCH #2203097
Process: BRUSH CADMIUM PLATE 1A2
PO Specification: BAC 5854M, BAC 5144
Test Method Scope: ASTM F519-18
Receive Date: Apr 01, 2022
Test Start Date: Apr 01, 2022
Test End Date: Apr 09, 2022
Sample Lot: P
Notched Ultimate Tensile Load: 15860
Test Load: 11895
Results: Conforms

APPROVED
JS 4/12/22

Mfg.: ONAMAC
Units: LBS
Units: LBS

The above identified notched tensile samples were subjected to a 200-hour sustained load test at a load of 75% of the Notch Ultimate Tensile Load (NUTL). Results above are applicable to submitted purchase order specifications. Additionally, results apply to the samples as received. Variances as applicable are noted at bottom right of report:

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One sample was metallographically cross-sectioned longitudinally across the notch and evaluated at 80-100X magnification for complete plating coverage of the notch. Conforms. Photo attached. Samples Loaded on individual frames.

Testing performed under direct supervision of approved signatories per QM-001 ISO 17025 Quality Manual PARA 7.8.

Jeremy Riley **Joshua Cox** **Clint Williams**
Ops Mgr **Quality Mgr** **Engr Tech**

Decision Rule: Per previously communicated and agreed, data has been supplied/reported as observed without accounting for measurement uncertainty.

Report invalid unless color seal present. Page 1 of 1

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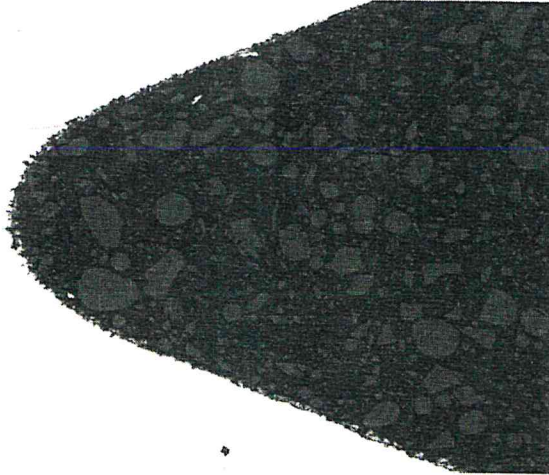


OMEGA RESEARCH
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Phone: 940-648-5828
OmegaResearchInc.com

"Specialists in Embrittlement Testing"

Date: April 11 2022
To: SIFCO OH
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 22-73810
Reference P.O.: PO00008518
S/N:
Test: PHOTOMICROGRAPH
Sample Identification: SAMPLE A:
Job / SN: SOLUTION CODE: 5070, BATCH #2203097
Process: BRUSH CADMIUM PLATE 1A2
PO Specification: BAC 5854M, BAC 5144
Test Method Scope: ASTM E3-11(2017)
Receive Date: Apr 01, 2022



Report Revision:

Revision Description:
1 - Original

APPROVED

DS 4/12/22



Testing performed under direct supervision of approved signatories per QM-001 ISO 17025 Quality Manual PARA 7.8.

Jeremy Riley Joshua Cox Clint Williams
Ops Mgr Quality Mgr Engr Tech

Decision Rule: Per previously communicated and agreed, data has been supplied/reported as observed without accounting for measurement uncertainty.

Report invalid unless color seal present. Page 1 of 1

A2LA
ISO 17025
Cert. #1252.01

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A2LA
Accredited Lab
Mechanical, Metallurgical &
Corrosion Testing



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CERTIFIED TEST REPORT

Sifco ASC
5708 E Schaaf Rd
Independence OH 44131

Job No.: 2204-04-0160
Date: 4-21-2022
Cust. PO#: PO00008519

Description: 1 sample Solution Code: 5070 Batch# 2203097

Material: Steel with Cadmium Plating with 3002 Conversion Coating

Spec: AMS 2451/4D

TEST RESULTS

250 Hour Salt Spray (ASTM B117-19)

Cust. Reqs.: No evidence of corrosion on significant surfaces after 250 hours ± 1 .

Test panel showed no base metal corrosion on significant surface.

Note: Panels exposed at 15 to 30° from vertical.

(See attached photo)

The above **conforms** to requirements listed.

APPROVED
DS 4/26/22


Authorized Agent



CERTIFIED TEST REPORT

Job No.: 2204-04-0160

Sifco ASC – 250 Hr. Salt Spray
#2204-04-0160
Batch # 2203097



Figure No.: 1