



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	2023
Product Description	Cadmium No-Bake
Batch Number	2202166
Test Requirement	Actual Value
Specimen Type	1a1 Notch Bars per ASTM F519 Lot # 82G Sensitivity Pass Date: 11/30/2021 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	10.87 @ 20°C
Specific Gravity	1.161 @ 20°C
Metal Content	99.79 g/l
Hydrogen Embrittlement	CONFORMS – Lab Report #22-73522, 22-73523
200 Hour Fracture Test	Pass AMS2451/4, PS13113 and BAC5854
168 Hour Fracture Test	Pass DPS 9.89
Solution Appearance	Clear
Solution Manufacturing Date	February 25, 2022
HE Certification Pass Date	March 16, 2022
Recommended Shelf Life	MIL-STD-865E and AMS2451/4 Expires: February 25, 2026 BAC 5854, DPS 9.89 & PS 13113 Retest before: March 16, 2023

Quality Technician

03/21/2022

Date



"Specialists in Embrittlement Testing"

Date: March 16 2022
To: SIFCO OH
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 22-73523
Reference P.O.: PO00008406
S/N 0054P, 0057P
Test: NOTCH TENSILE HYDROGEN EMBRITTLEMENT
Sample Identification: SAMPLES A, B:
Job / SN: SOLUTION CODE 2023, BATCH 2202166
Process: BRUSH CADMIUM PLATE 1A2
PO Specification: BAC 5854M, BAC 5144
Test Method Scope: ASTM F519-18
Receive Date: Mar 07, 2022
Test Start Date: Mar 07, 2022
Test End Date: Mar 16, 2022
Sample Lot: P
Notched Ultimate Tensile Load: 15860
Test Load: 11895
Results: Conforms

APPROVED
DS 3/21/22

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:

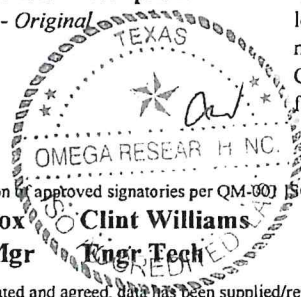
Report Revision: 1
Revision Description: 1 - Original
One sample was metallographically cross-sectioned longitudinally across the notch and evaluated at 80-100X magnification for complete plating coverage of the notch. Conforms. Photo attached. Samples Loaded on individual frames.

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.

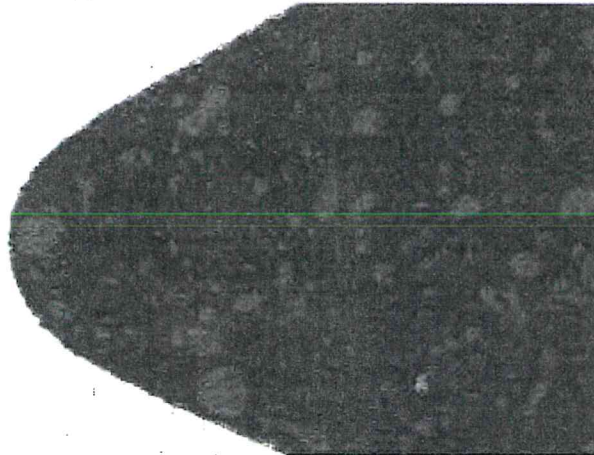
Report invalid unless color seal present. Page 1 of 1



"Specialists in Embrittlement Testing"

Date: March 16 2022
To: SIFCO OH
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 22-73523
Reference P.O.: PO00008406
S/N 0057P
Test: PHOTOMICROGRAPH
Sample Identification: SAMPLE A:
Job / SN: SOLUTION CODE 2023, BATCH 2202166
Process: BRUSH CADMIUM PLATE 1A2
PO Specification: BAC 5854M, BAC 5144
Test Method Scope: ASTM E3-11(2017)
Receive Date: Mar 07, 2022

APPROVED
DS 3/21/22



Report Revision:
1



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



"Specialists in Embrittlement Testing"

Date: March 16 2022

To: **SIFCO OH**
5708 Schaaf Road
INDEPENDENCE, OH 44131

Test Report: 22-73522

Reference P.O.: PO00008405
S/N 1,2,3,4

Test: **NOTCH TENSILE HYDROGEN EMBRITTLEMENT**

Sample Identification: SAMPLES A, B, C, D:

Job / SN: SOLUTION CODE 2023, BATCH #2202166

Process: BRUSH CADMIUM PLATE

PO Specification: MIL-STD-865E, AMS 2451/4D, PS13113F

Test Method Scope: ASTM F519-18

Receive Date: Mar 07, 2022

Test Start Date: Mar 07, 2022

Test End Date: Mar 16, 2022

Sample Lot: 82G

Notched Ultimate Tensile Load: 9244

Test Load: 6933

Results: Conforms

APPROVED
DS 3/16/22

Mfg.: GREEN
Units: LBS
Units: LBS

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Report Revision:	Revision Description:
1	1 - Original



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

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Ops Mgr	Quality Mgr	Engr Tech

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