



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, AMS2451/4E, ASTM B117-19, ASTM F519-18, BAC5854M, DPS9.89P & PS 13113F.

Product Code	2023
Product Description	Cadmium No-Bake
Batch Number	2302169
Test Requirement	Actual Value
Specimen Type	1a1 Notch Bars per ASTM F519 Lot # 79H Sensitivity Pass Date: 08/23/2022 Notched Specimens per BAC5144 Lot # 164439-1-1 P Sensitivity Pass Date: 11/01/2021 2a rings per ASTM F519 Lot # 93117 Sensitivity Pass Date: 01/06/2022
pH	10.87 pH
Specific Gravity	1.166 Specific Gravity
Metal Content	99.61 Metal Content
Hydrogen Embrittlement	CONFORMS – Lab Report #23-77902
200 Hour Fracture Test	Pass AMS2451/4, PS13113 and BAC5854
168 Hour Fracture Test	Pass DPS 9.89
250 Hour Salt Spray Test	ASTMB117 and AMS2451/4 Lab Report# 2303-06-0324
Solution Appearance	Clear
Solution Manufacturing Date	March 2, 2023
HE Certification Pass Date	March 15, 2023
Recommended Shelf Life	MIL-STD-865E and AMS2451/4 Expires: March 2, 2027 BAC 5854, DPS 9.89 & PS 13113 Retest before: March 15, 2024

Quality Technician

03/29/2023

Date



"Specialists in Embrittlement Testing"

Date: March 15 2023

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

Test Report: 23-77902

Reference P.O.: PO00009524

Test: **NOTCH TENSILE HYDROGEN EMBRITTLEMENT**

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

Job / SN: SOLUTION 2023 BATCH 2302169

Process: BRUSH CADMIUM PLATE

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

Test Method Scope: ASTM F519-18

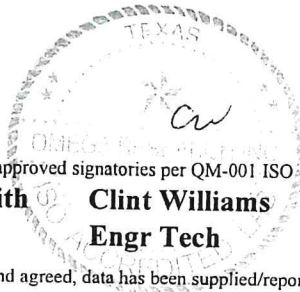
Receive Date: Mar 06, 2023
Test Start Date: Mar 06, 2023
Test End Date: Mar 15, 2023

Sample Lot: 79H **Mfg.:** GREEN
Notched Ultimate Tensile Load: 9245 **Units:** LBS
Test Load: 6934 **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
DS 3/16/23

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

Jeremy Riley **Deborah Smith** **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 15 2023

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

Test Report: 23-77902

Reference P.O.: PO00009524
S/N 0180P, 0181P

Test: **NOTCH TENSILE HYDROGEN EMBRITTLEMENT**

Sample Identification: SAMPLES A, B:

Job / SN: SOLUTION 2023 BATCH 2302169

Process: BRUSH CADMIUM PLATE 1A2

PO Specification: BAC 5854M, BAC 5144

Test Method Scope: ASTM F519-18

Receive Date: Mar 06, 2023
Test Start Date: Mar 06, 2023
Test End Date: Mar 15, 2023

Sample Lot: P
Notched Ultimate Tensile Load: 15860

Test Load: 11895

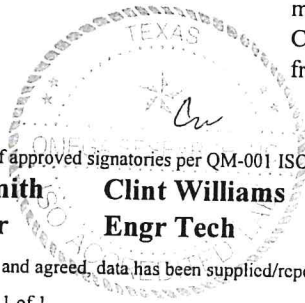
Results: Conforms

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.

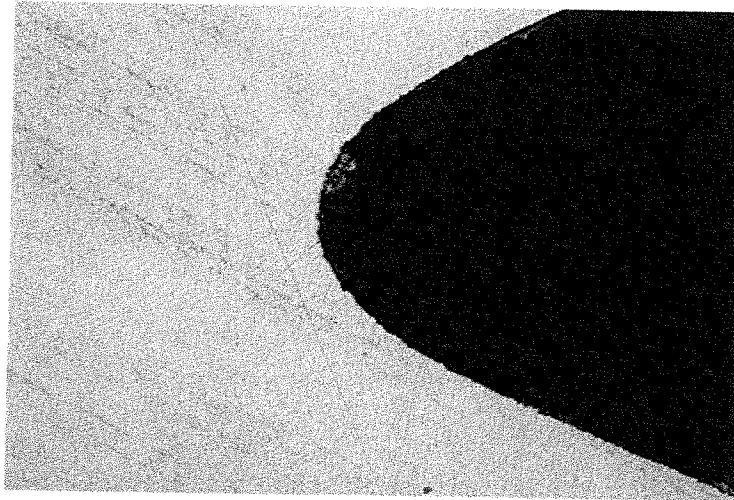
Jeremy Riley **Deborah Smith** **Clint Williams**
Ops Mgr **Quality Mgr** **Engr Tech**

APPROVED
DS 3/16/23

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 15 2023
To: **SIFCO OH**
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 23-77902
Reference P.O.: PO00009524
S/N 0181P
Test: **PHOTOMICROGRAPH**
Sample Identification: SAMPLE A:
Process: BRUSH CADMIUM PLATE 1A2
PO Specification: BAC 5854M, BAC 5144
Test Method Scope: ASTM E3-11(2017)
Receive Date: Mar 06, 2023



Report Revision:

1

Revision Description:

1 - Original

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

Jeremy Riley **Deborah Smith** **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



A DIVISION OF J.T. ADAMS CO., INC.

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CERTIFIED TEST REPORT

Sifco ASC
5708 E Schaaf Rd
Independence OH 44131

Amended Copy: 3-28-2023
Job No.: 2303-06-0324
Date: -3-23-2023
Cust. PO#: PO00009527

Description: 1 sample Solution Code: 2023 Batch# 2302169
Material: Steel with Cadmium Plating with 5005 Conversion Coating
Spec: AMS 2451/4E

TEST RESULTS

250 Hour Salt Spray (ASTM B117-19)

Cust. Req.: Shall show no visual evidence of corrosion of significant surfaces after 250 hours

Sample showed no signs of corrosion products.

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

(See attached photo)

The above **conforms** to requirements listed.

APPROVED
JS 3/29/23

Tracy W. Chapman
Authorized Agent

Amended: Removed Serial#



CERTIFIED TEST REPORT

Job No.: 2301-16-0815



Figure No.: 1

After 250 Hours