



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, ASTMB117-18, ASTM F519-18, BAC5854M, DPS9.89P & PS 13113F.

Product Code	2023
Product Description	Cadmium No-Bake
Batch Number	2110165
Test Requirement	Actual Value
Specimen Type	1a1 Notch Bars per ASTM F519 Lot # 53G Sensitivity Pass Date: 06/23/2021 Notched Specimens per BAC5144 Lot # 068327N Sensitivity Pass Date: 11/12/2020 2a rings per ASTM F519 Lot # 93115 Sensitivity Pass Date: 04/10/2021
pH	10.82 pH
Specific Gravity	1.161 Specific Gravity
Metal Content	100.10 Metal Content
Hydrogen Embrittlement	CONFORMS – Lab Report #21-71432
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# 2110-19-0921
Solution Appearance	Clear
Solution Manufacturing Date	October 14, 2021
HE Certification Pass Date	October 23, 2021
Recommended Shelf Life	MIL-STD-865E and AMS2451/4 Expires: October 14, 2025 BAC 5854, DPS 9.89 & PS 13113 Retest before: October 23, 2022

Quality Systems Engineer

11/9/2021
Date

"Specialists in Embrittlement Testing"

Date: November 02 2021
To: **SIFCO OH**
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 21-71432
Reference P.O.: PO00008021
S/N 1,2,3,4
Test: **NOTCH TENSILE HYDROGEN EMBRITTLEMENT**
Sample Identification: SAMPLES A, B, C, D:
Job / SN: SOLUTION CODE 2023 BATCH 2110165
Process: BRUSH CADMIUM PLATE
PO Specification: MIL-STD-865E, AMS 2451/4D, PS13113F
Test Method Scope: ASTM F519-18
Receive Date: Oct 15, 2021
Test Start Date: Oct 15, 2021
Test End Date: Oct 23, 2021
Sample Lot: 53G **Mfg.:** GREEN
Notched Ultimate Tensile Load: 9280 **Units:** LBS
Test Load: 6960 **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: **Revision Description:**
1 - Original



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

APPROVED

SMB 11/4/2021



"Specialists in Embrittlement Testing"

Date: November 02 2021
To: SIFCO OH
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 21-71432
Reference P.O.: PO00008021
S/N 0879N, 0882N
Test: NOTCH TENSILE HYDROGEN EMBRITTLEMENT
Sample Identification: SAMPLES A, B:
Job / SN: SOLUTION CODE 2023 BATCH 2110165
Process: BRUSH CADMIUM PLATE 1A2
PO Specification: BAC 5854M, BAC 5144
Test Method Scope: ASTM F519-18
Receive Date: Oct 15, 2021
Test Start Date: Oct 15, 2021
Test End Date: Oct 23, 2021
Sample Lot: N **Mfg.:** ONAMAC
Notched Ultimate Tensile Load: 16126 **Units:** LBS
Test Load: 12095 **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:

Revision Description:

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

1 - Original



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**

APPROVED

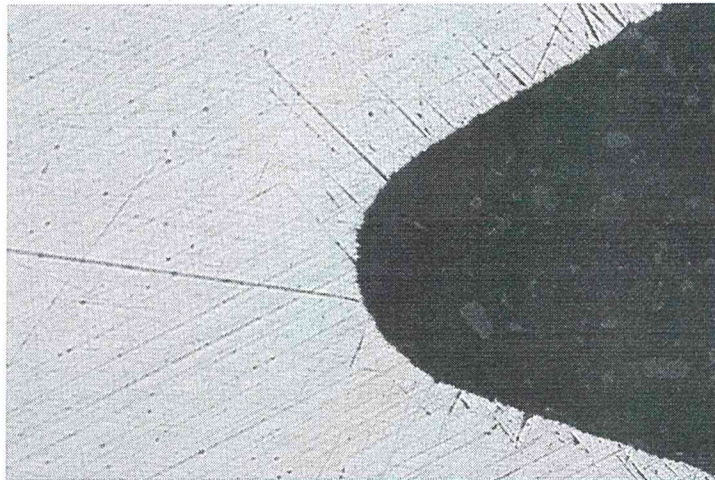
SMB 11/4/2021

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: November 02 2021
To: **SIFCO OH**
5708 Schaaf Road
INDEPENDENCE, OH 44131
Test Report: 21-71432
Reference P.O.: PO00008021
Test: **PHOTOMICROGRAPH**
Sample Identification: SAMPLE A:
Job / SN: SOLUTION CODE 2023 BATCH 2110165
Process: BRUSH CADMIUM PLATE 1A2
PO Specification: BAC 5854M, BAC 5144
Test Method Scope: ASTM E3-11(2017)
Receive Date: Oct 15, 2021



S/N 0879N, Photographic evidence of complete plating coverage not obtainable

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 **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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CERTIFIED TEST REPORT

Sifco ASC
5708 E Schaaf Rd
Independence OH 44131

Job No.: 2110-19-0921
Date: 11-3-2021
Cust. PO#: PO00008022

Description: 1 sample Ref# 2023-2110165 Solution Code: 2023
Batch# 2110165
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 corrosion products.

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

(See attached photo)

The above **conforms** to requirements listed.

APPROVED

SMB 11.4.2021

Authorized Agent



CERTIFIED TEST REPORT

Job No.: 2110-19-0921



Figure No. 1