

# IMR TEST LABS

A Curtiss-Wright Business Unit  
www.imrtest.com

131 Woodsedge Drive  
Lansing, NY 14882  
T: 1.607.533.7000 | F: 1.607.533.9210

## TEST REPORT

February 24, 2021

IMR Report Number 202101966K

Malcolm MacDougall  
Servometer  
501 Little Falls Road  
Cedar Grove, NJ 07009

### SUMMARY

cc Joe Madonna

One sample was received for chemical analysis.

The results are below.

**PO Number**  
SVP210602

### CHEMISTRY

**Date Received**  
February 18, 2021

**Description**  
Low Sulfur Nickel  
Type 2

**Reference Date**  
February 2021

Element	Sample
Ni Alloy	99.71
Ni <sup>1</sup>	96.41
S <sup>2</sup>	0.017

<sup>1</sup>Determined by difference.

<sup>2</sup>Determined by combustion-infrared absorbance.

Results in weight percent unless otherwise indicated.

Method(s): CAP-017R (ICP-AES) and ASTM E 1019-18 (Comb./IGF)



Reviewed by

Jeremy Bean  
Chemist

Reviewed by

Pete Lockard  
Supervisor Chemistry Department

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the PWA MCL Manual F-23 and related procedures. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by A2LA, certificates #1140.01 and #1140.02. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the services provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code 69805).

Servometer

## TEST REPORT

February 24, 2021

IMR Report Number 202101966B

Malcolm MacDougall  
Servometer  
501 Little Falls Road  
Cedar Grove, NJ 07009

### SUMMARY

cc Joe Madonna

Two samples were received for tensile testing.

PO Number  
SVP210602

The results are below.

Date Received  
February 18, 2021

### TENSILE PROPERTIES – ROOM TEMPERATURE<sup>1</sup>

Description  
Low Sulfur Nickel  
Type 2

	Tensile Strength (ksi)	Yield Strength (ksi)	Elongation (%)
Sample	178	157	1.6*

<sup>1</sup>Average of two replicates

\*One replicate failed on gauge

The width of the samples was 0.37 inches; gauge length was 2.00 inches.  
Yield strength was determined by the 0.2% offset method. Crosshead  
speed was 0.01 in./min. to yield and 0.1 in./min. to fracture.

Method(s): ASTM E 8-16a

Reference Date  
February 2021



Reviewed by



Molly Adams  
Engineer, Assoc.

Reviewed by

Matt LePage  
Operations Project Manager

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the PWA MCL Manual F-23 and related procedures. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by A2LA, certificates #1140.01 and #1140.02. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the services provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code 69805).

# IMR TEST LABS

A Curtiss-Wright Business Unit  
www.imrtest.com

131 Woodsedge Drive  
Lansing, NY 14882  
T: 1.607.533.7000 | F: 1.607.533.9210

February 24, 2021

Malcolm MacDougall  
Servometer  
501 Little Falls Road  
Cedar Grove, NJ 07009

cc Joe Madonna

**PO Number**  
SVP210602

**Date Received**  
February 18, 2021

**Description**  
Low Sulfur Nickel  
Type 2

**Reference Date**  
February 2021

## TEST REPORT

**IMR Report Number 202101966F**

### SUMMARY

One sample was received for micro-hardness testing.

The results are below.

### MICRO-HARDNESS

	HV <sub>100</sub> <sup>1</sup>
Sample	486

<sup>1</sup>Average of three readings.  
Method(s): ASTM E 384-17



Reviewed by

*Cheryl Downey*



Cheryl Downey  
Senior Metallurgical Specialist

Reviewed by

*Travis Willhard*

Travis Willhard  
Metallurgical Engineer

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the PWA MCL Manual F-23 and related procedures. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by A2LA, certificates #1140.01 and #1140.02. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the services provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code 69805).