



**FINAL COMPREHENSIVE TEST REPORT  
GAS CERENKOV COUNTER**

Alexander I. Baron

February 15, 1972

Abstract

Pressure tests have been completed on a Cerenkov Counter in accordance with NAL Standard SD-24. These tests included the vessel itself as well as quartz and aluminum windows. The test results are described herein.

Subject

Gas Cerenkov Counter  
Job No. 24  
Assembly drawing No. 3063.138-ME-13121  
Ordered by: Dr. James Johnston

Design

The counter as a pressure vessel was designed pursuant to NAL Standard SD-24 and ASME Boiler and Pressure Vessel Code, Section VIII - 1971 respectively, by the Technical Services Department (Alexander I. Baron, Engineer).

See: Stress Calculations from 10-18-1971 3063.138-SC-27302



Fabrication

Body, drawing #3063.138-ME-13113		
Window Mount, "	MD-13115	By: Atomic Weld & Machine Co., Lyons, Ill.
Guard, "	MD-13118	
Al Windows, "	MD-13119	
Quartz Window, "	MD-13116	
Relief Valve: M5159B-2MP(L)-315		By: G. Behm & Sons Co. Dayton, Ohio
Pressure Gage: 410, 4½		By: Norman Engineering Chicago, Ill.
Rupture Disc Assembly: ½-305A3000		By: " "
		By: Fike Metal Chicago, Ill.

Inspection and tests

The vessel, having a nominal inside diameter of 6 inches, legally and strictly speaking, is not covered by the rules of the ASME-Code, since it is stated in paragraph U-1 (d) (5):

(d) "The following classifications are not considered to be within the jurisdiction of this Division of Section VIII:

(5) Vessels having an inside diameter not exceeding 6 inches with no limitation on pressure."

Still, for safety reasons, the vessel was designed, fabricated, and tested according to all relevant rules of the said Code.

1. Body

1.1 Leak test: Performed by: Magnetic Inspection Laboratory, Chicago, Illinois, November 24, 1971. Register No. 57973.

(See attached Test Report) Acceptable for use.

1.2 Pressure test: Performed by NAL, Technical Services Testing Station, January 28, 1972. Test No. 10. (See Log Book) Acceptable for use.

## 2. Aluminum Windows

Five windows were fabricated, for testing purposes and for selection.

2.1 Strain measurements: Performed by NAL, Technical Services Testing Station. January 18-21, 1972. Tests No. 3,4,5,6 and 7. (See Log Book). Results are shown on attached diagram. Acceptable for use: specimens No. 4 and 5.

2.2 Pressure test: Test No. 8. Specimen No. 2, the worst from stress point of view, was pressurized up to six times the operating pressure, and deflections measured at the center.

## 3. Quartz Window

Due to its sensitive polished surface, the Quartz window was replaced by dummy windows for strain measurements. Three DOW CORNING PYREX #7740 glass windows were subjected to strain measurements.

3.1 Tests No. 1, 2 and 9. Results are shown on attached diagram.

3.2 Pressure test on real Quartz window. Test No. 11. Acceptable for use.

## 4. Counter Assembly

Pressure test: One and a half times operating pressure. Test No. 10. Acceptable for use.

5. Marking

Test pressure: 450 psi

Working pressure: 300 psi

Working Temp.: max. 200°F

Drawing No.: 3063.138-ME-13121

Date: 2-15-72

shall be permanently affixed to the vessel.

# MAGNETIC INSPECTION LABORATORY

9536 W. Foster Avenue • Phone Area Code 312-625-0933 • Chicago, Illinois 60656

## TEST REPORT

FOR

Atomic Weld & Machine Co.  
7933 W. 39th St.  
Lyons, IL. 60534

Date Nov. 24, 1971  
Order No. C-423  
Register No. 57973  
Contractors P.O. No. --

THE FOLLOWING PARTS HAVE BEEN CAREFULLY HELIUM LEAK TESTED ON A CONSOLIDATED ELECTRO DYNAMIC MASS SPECTROMETER, MODEL 24-120A. THE SENSITIVITY OF THE INSTRUMENT IS  $2.8 \times 10^{-10}$  ATM CC/SEC.

NO. PCS.	DESCRIPTION
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1000	6" pipe weldments
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Serial NOS.

SPECIFICATION:

PARAGRAPH

PRESSURE OF HELIUM ATM PSIG. TIME UNDER PRESSURE \_\_\_\_\_ HRS. 15 MIN.

ADDITIONAL DATA

Allowable leakage  $1 \times 10^{-9}$  cc/sec

CONCLUSION

1 PARTS ACCEPTABLE FOR USE.

0 PARTS REJECTED FOR LEAKAGE AND SO MARKED.

LEAKAGE ON ACCEPTABLE PARTS, IF ANY, IS LESS THAN  $1 \times 10^{-9}$  ATM/CC/SEC.

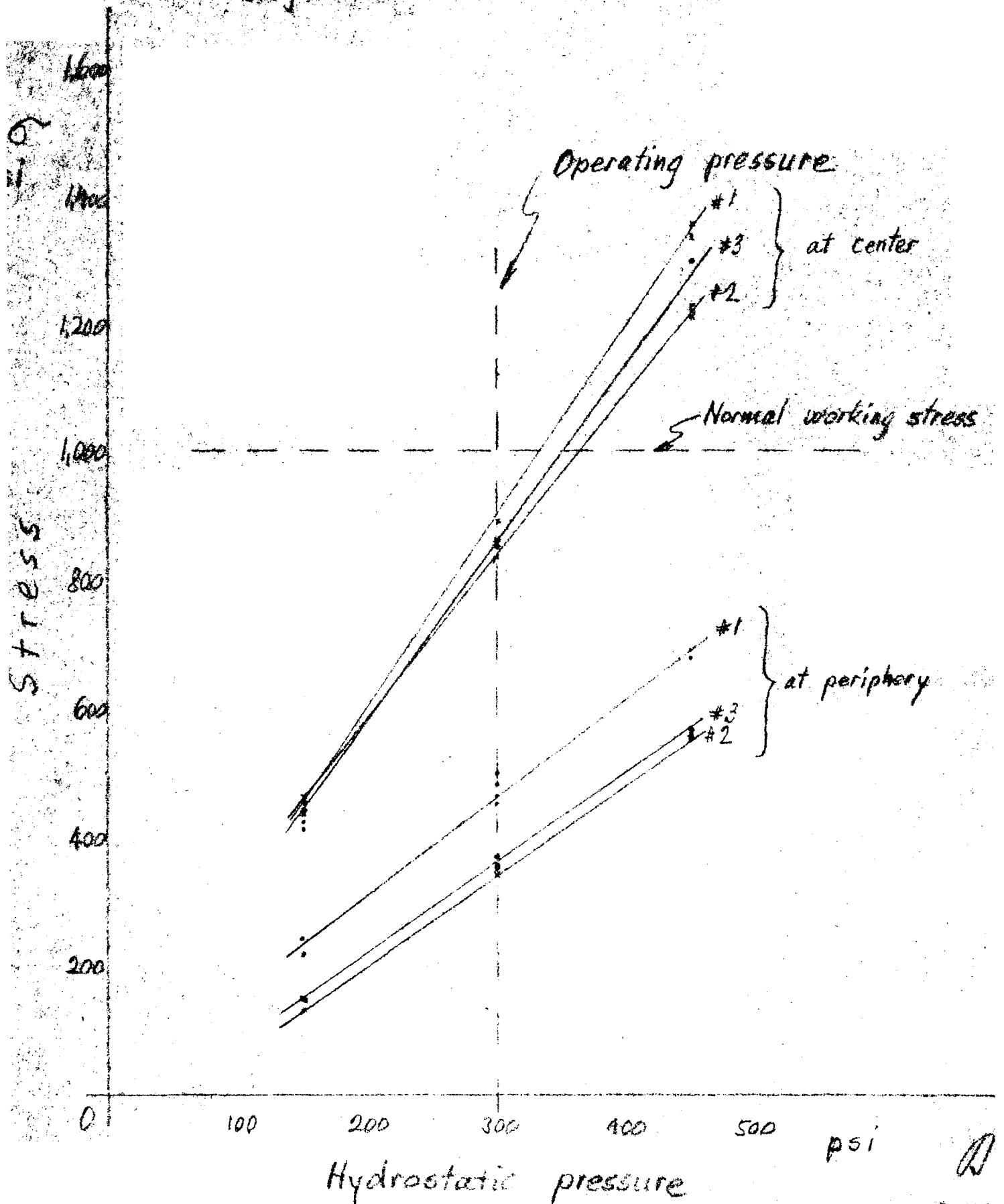
MAGNETIC INSPECTION LABORATORY

*W. L. Johnson*

INSPECTOR.

# GLASS WINDOWS

Dwg # 3063.132 - MC-13116.



1-18-72

# ALUMINUM WINDOWS

Dwg # 3063.132-HD-13119.

