Title
HYCAR AND MYVASEAL PRESSURE - DEFLECTION CHARACTERISTICS

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ENGINEERING NOTE

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SUBJECT: HYCAR AND MYVASEAL
PRESSURE - DEFLECTION CHARACTERISTICS

NAME: Reichhold / Hernandez
DATE: May 1951

Tests were made to obtain pressure-deflection data for Myvaseal synthetic rubber. These data provide a basis for estimating the static loads required to deform gaskets of the same cross section and durometer hardness as those tested.

Hycar was used to provide known reference data to check the experimental procedures and to give addition information on Hycar at temperatures of 100 and 200°C and Hysterisis.

TESTING PROCEDURE

All gaskets tested were made from extruded stock.

Two gaskets were tested for each test condition.

Gaskets were compressed between two steel plates. The lower plate contained the gasket grooves when grooves were used.

For the temperature tests both plates were heated. The temperature were measured with thermocouples with the junction inserted under the gasket.

All loads were recorded after 30 seconds at each deflection.

TEST OBSERVATIONS

1. Very little cold flow occurs after the first minute.
2. It is believed that the unlubricated groove tests more nearly approximate actual continuous gasket conditions since lubrication caused elongation of the specimen and lower loads at given deflections.
3. Myvaseal showed a marked increase in permanent deformation at 100° and 150°C with complete failure at 200°C.
4. Hycar showed a slight permanent deformation and some splitting at 200°C.
5. The pressure-deflection characteristics of the extruded Myvaseal may be slightly lower than those out from sheet stock.
6. At 200°C the Myvaseal swelled to about three times normal size and was very soft and cracked. Myvaseal could not be tested at this temperature.
7. Hycar at 200°C showed good gasket pressure-deflection characteristics, but no life tests were performed.

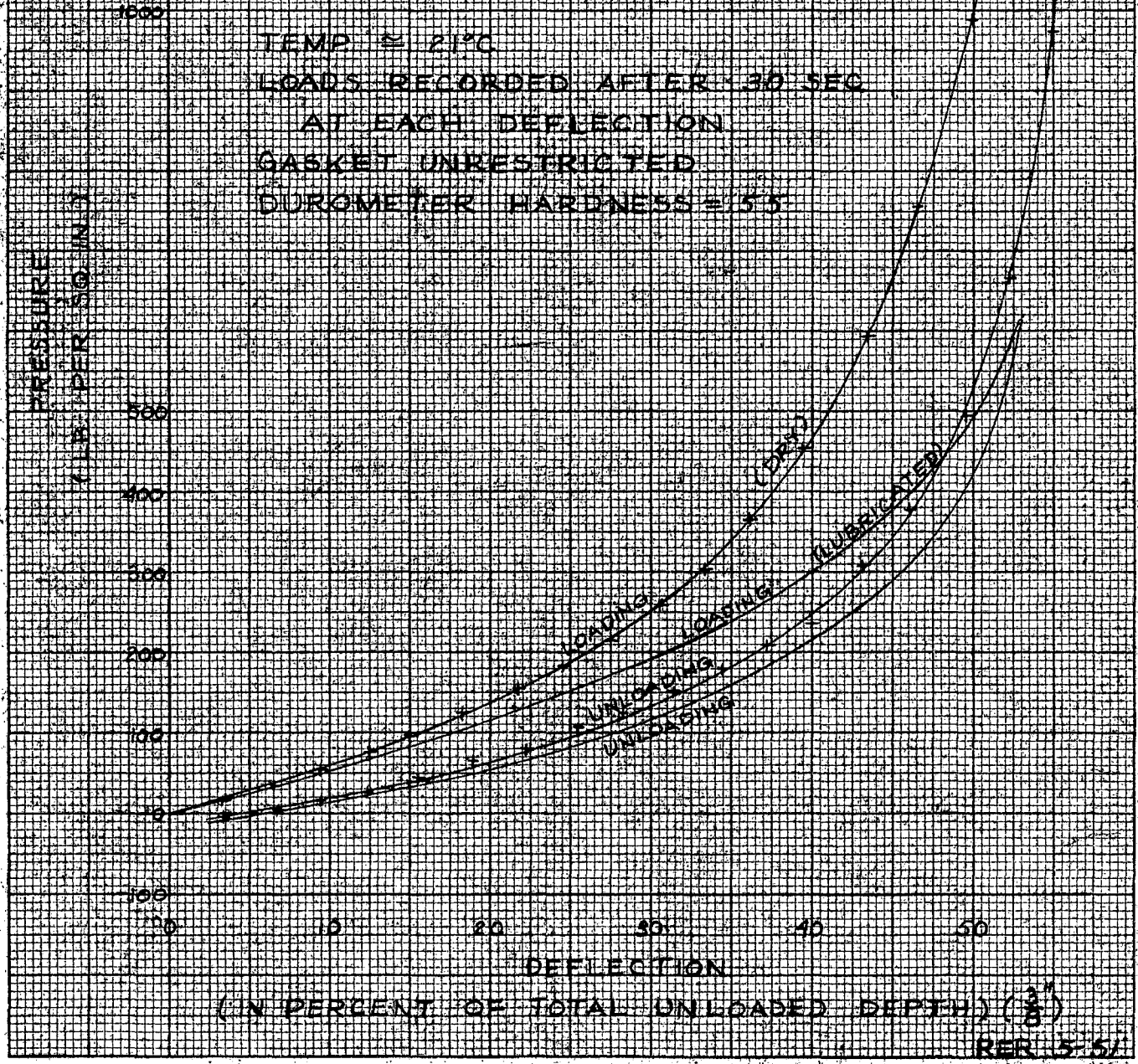
nw

PRESSURE-DEFLECTION CURVES FOR HYCAR

+ NOMINAL $\frac{3}{8} \times \frac{3}{8}$ HYCAR GASKET
LENGTH = 8.44 IN.
UNLUBRICATED

- NOMINAL $\frac{3}{8} \times \frac{3}{8}$ HYCAR GASKET
LENGTH = 8.30 IN.
LUBRICATED ~ APIEZON L

TEMP ≈ 21°C
LOADS RECORDED AFTER 30 SEC
AT EACH DEFLECTION
GASKET UNRESTRICTED
DUROMETER HARDNESS = 55



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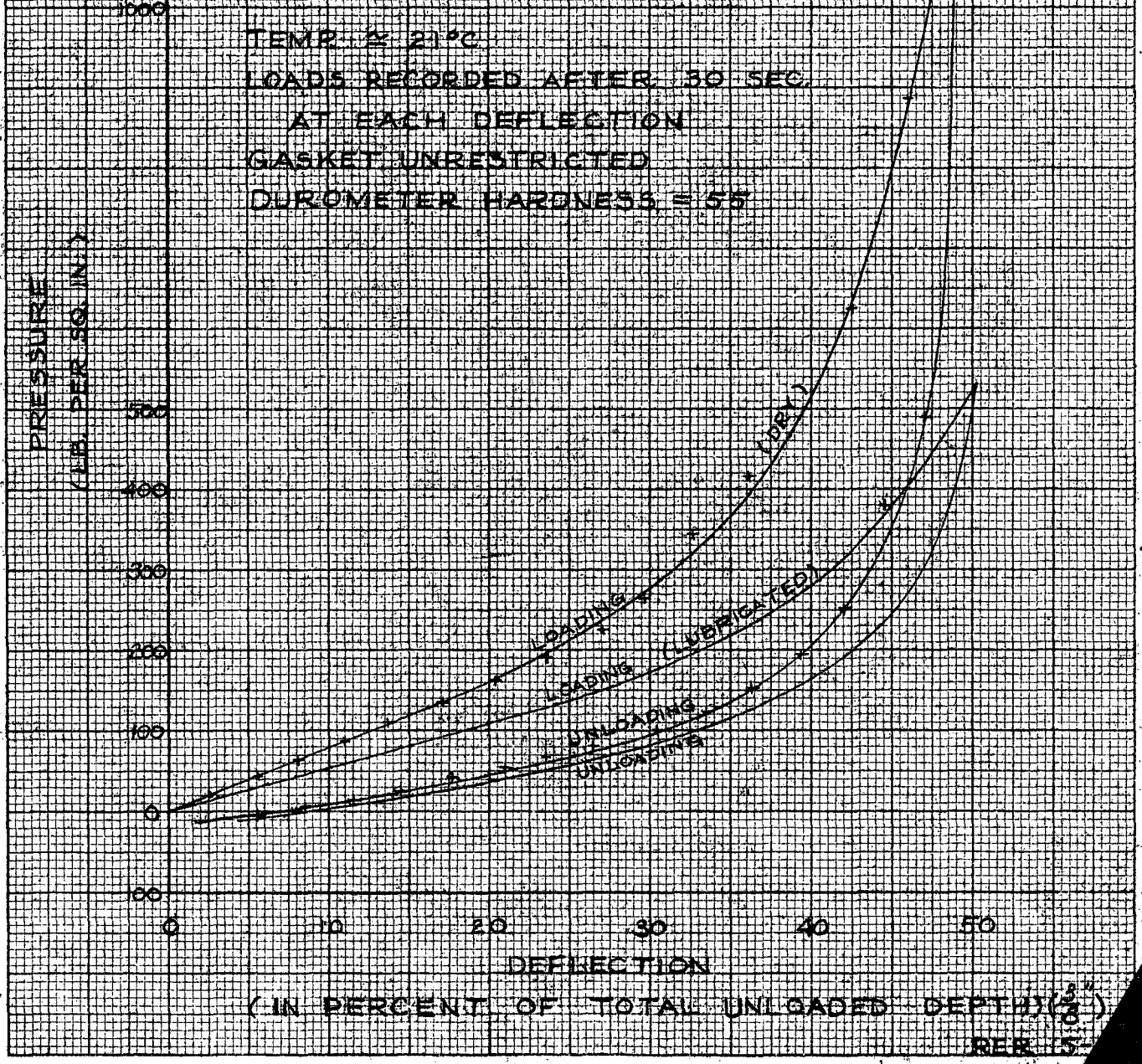
PRESSURE - DEFLECTION CURVES FOR MYVASEAL

+ - NOMINAL $\frac{3}{8} \times \frac{3}{8}$ MYVASEAL GASKET
LENGTH = 8.89 IN.
UNLUBRICATED

• - NOMINAL $\frac{3}{8} \times \frac{3}{8}$ MYVASEAL GASKET
LENGTH = 6.46 IN.
LUBRICATED ~ APIEZON L

TEMP. ≅ 21°C
LOADS RECORDED AFTER 30 SEC.
AT EACH DEFLECTION
GASKET UNRESTRICTED
DUROMETER HARDNESS = 55



359-FIG KEUFFEL & ESSER CO. MADE IN U.S.A.
10 X 10 to the ½ inch, 5th lines accented.

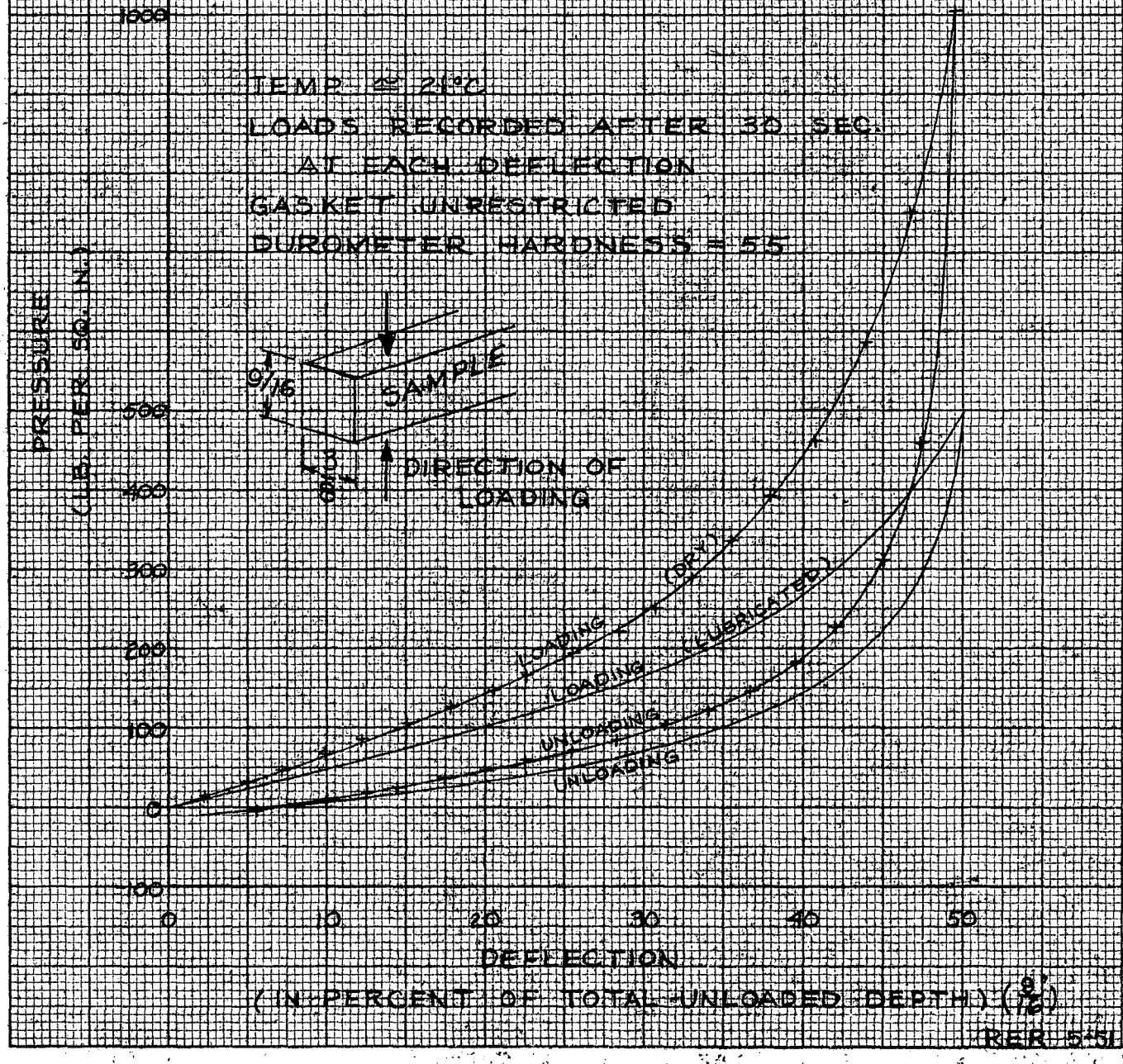
REF. (5)

PRESSURE - DEFLECTION CURVES FOR MYVASEAL

+ - NOMINAL $\frac{9}{16} \times \frac{3}{8}$ MYVASEAL GASKET
LENGTH = 8.35 IN.
UNLUBRICATED

- - NOMINAL $\frac{9}{16} \times \frac{3}{8}$ MYVSEAL GASKET
LENGTH = 8.43 IN.
LUBRICATED ~ APIEZON L

TEMP ≅ 21°C
LOADS RECORDED AFTER 30 SEC.
AT EACH DEFLECTION
GASKET UNRESTRICTED
DUROMETER HARDNESS = 55



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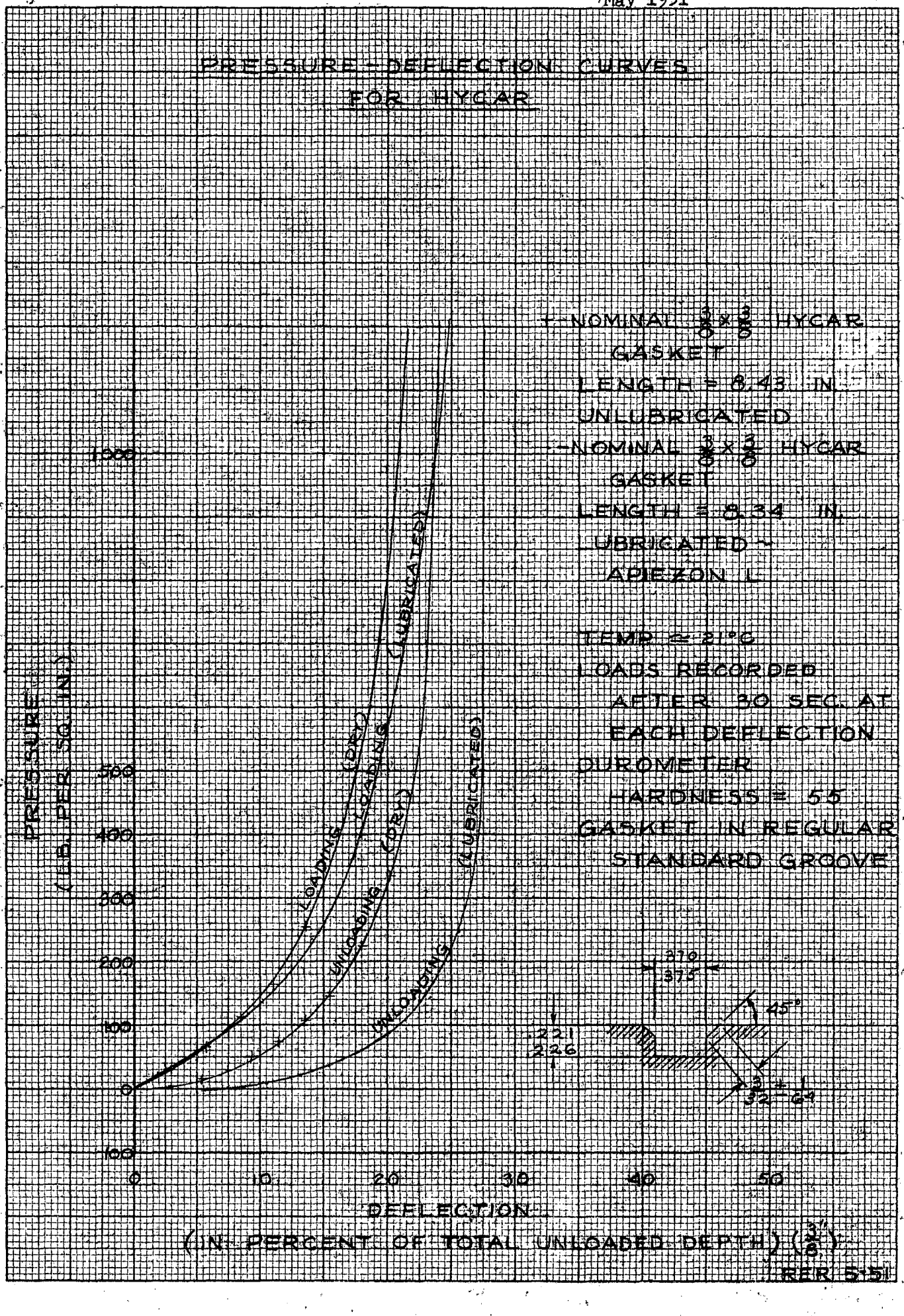
PRESSURE-DEFLECTION CURVES FOR HYCAR

T-NOMINAL $\frac{3}{8} \times \frac{3}{8}$ HYCAR GASKET
LENGTH = 8.43 IN.
UNLUBRICATED
-NOMINAL $\frac{3}{8} \times \frac{3}{8}$ HYCAR GASKET
LENGTH = 8.34 IN.
LUBRICATED ~ APIEZON L

TEMP ≃ 21°C
LOADS RECORDED AFTER 30 SEC. AT EACH DEFLECTION
DUROMETER HARDNESS = 55
GASKET IN REGULAR STANDARD GROOVE



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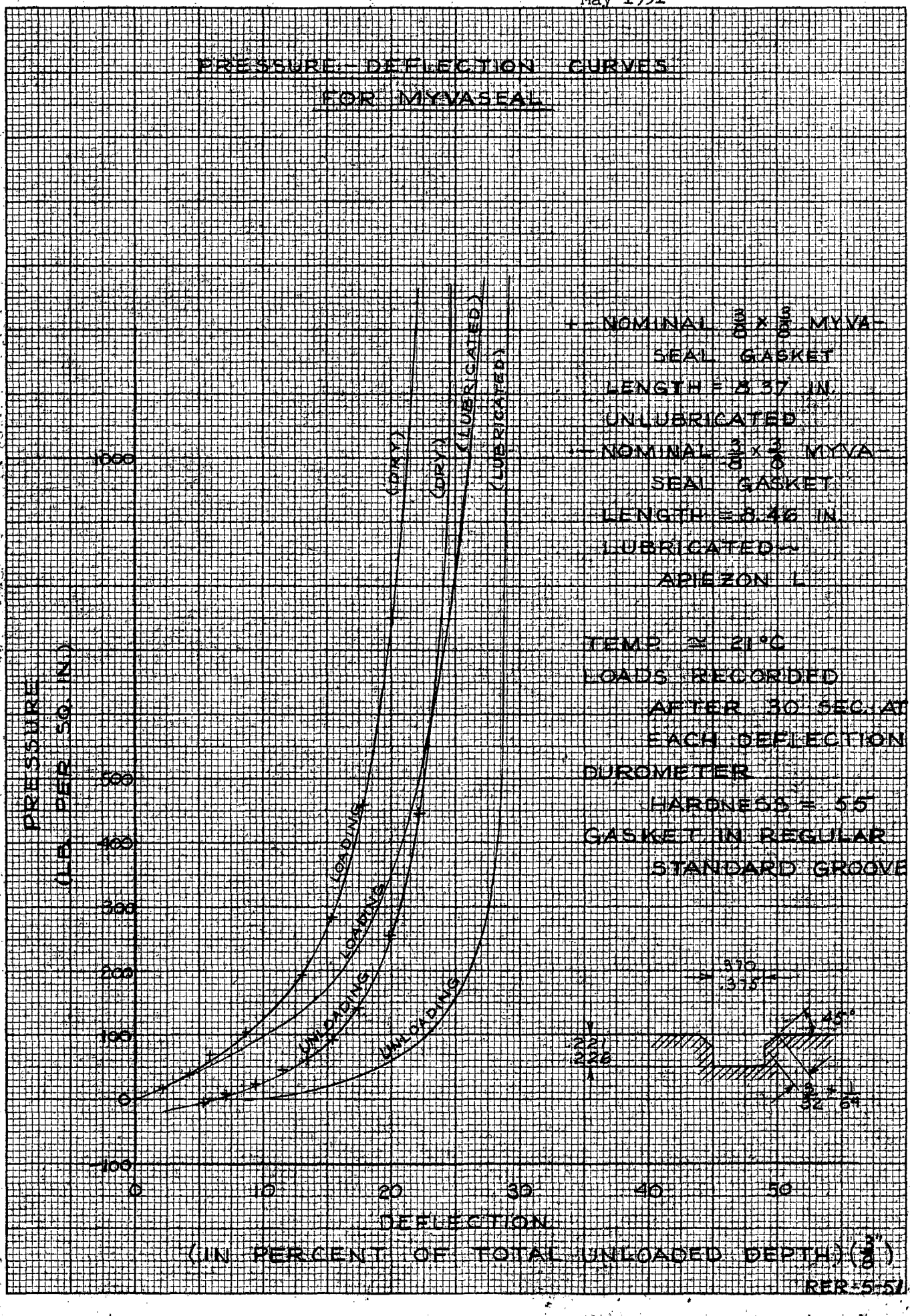

359-11C KEUFFEL & ESSER CO.
10 X 10 to the ½ inch, 5th lines accented.
MADE IN U.S.A.

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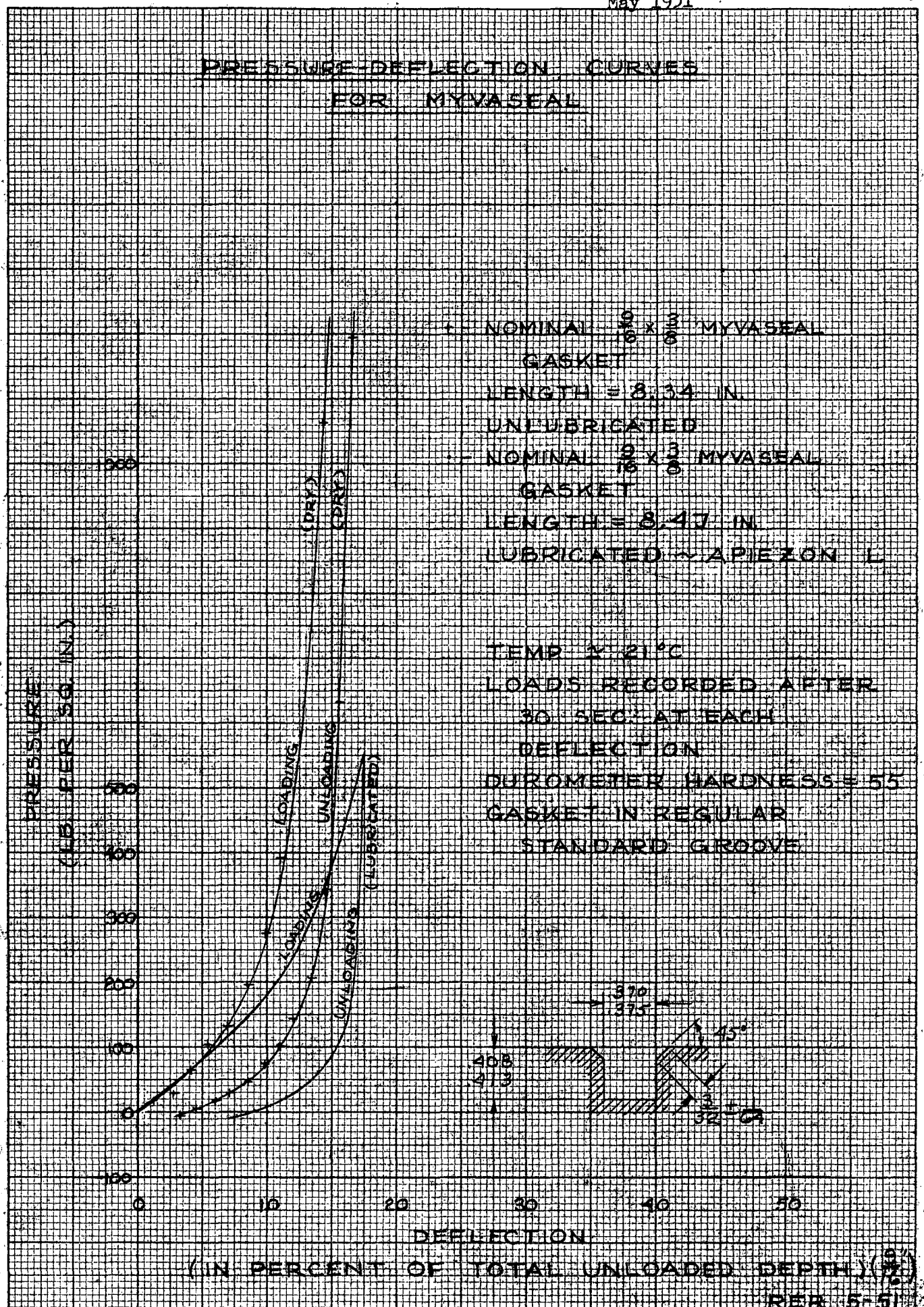
PRESSURE-DEFLECTION CURVES FOR MYVASEAL



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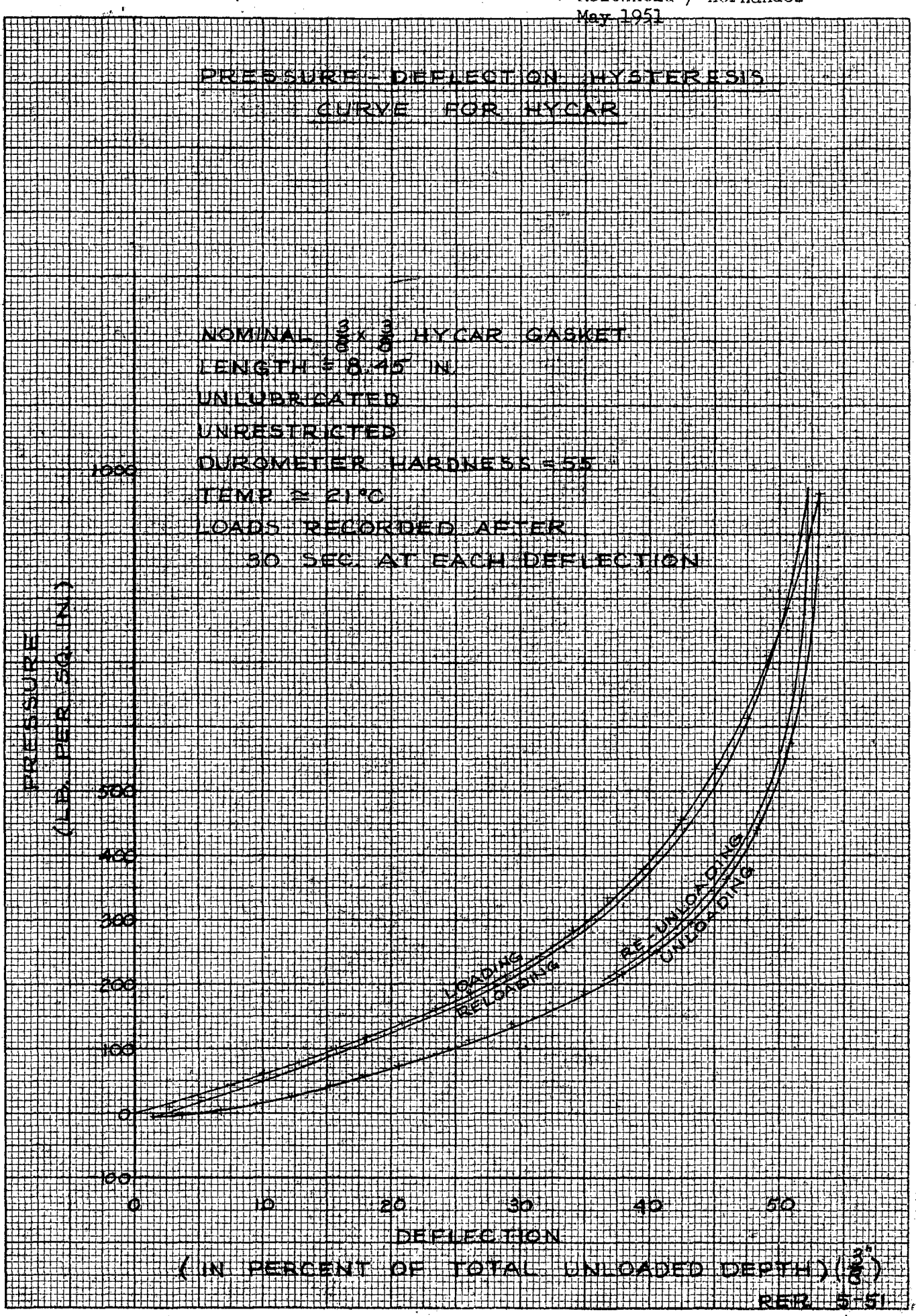
PRESSURE - DEFLECTION HYSTERESIS CURVE FOR HYCAR

NOMINAL $\frac{3}{8} \times \frac{3}{8}$ HYCAR GASKET
LENGTH = 8.45" IN.
UNLUBRICATED
UNRESTRICTED
DUROMETER HARDNESS = 55
TEMP ≅ 21°C
LOADS RECORDED AFTER
30 SEC. AT EACH DEFLECTION



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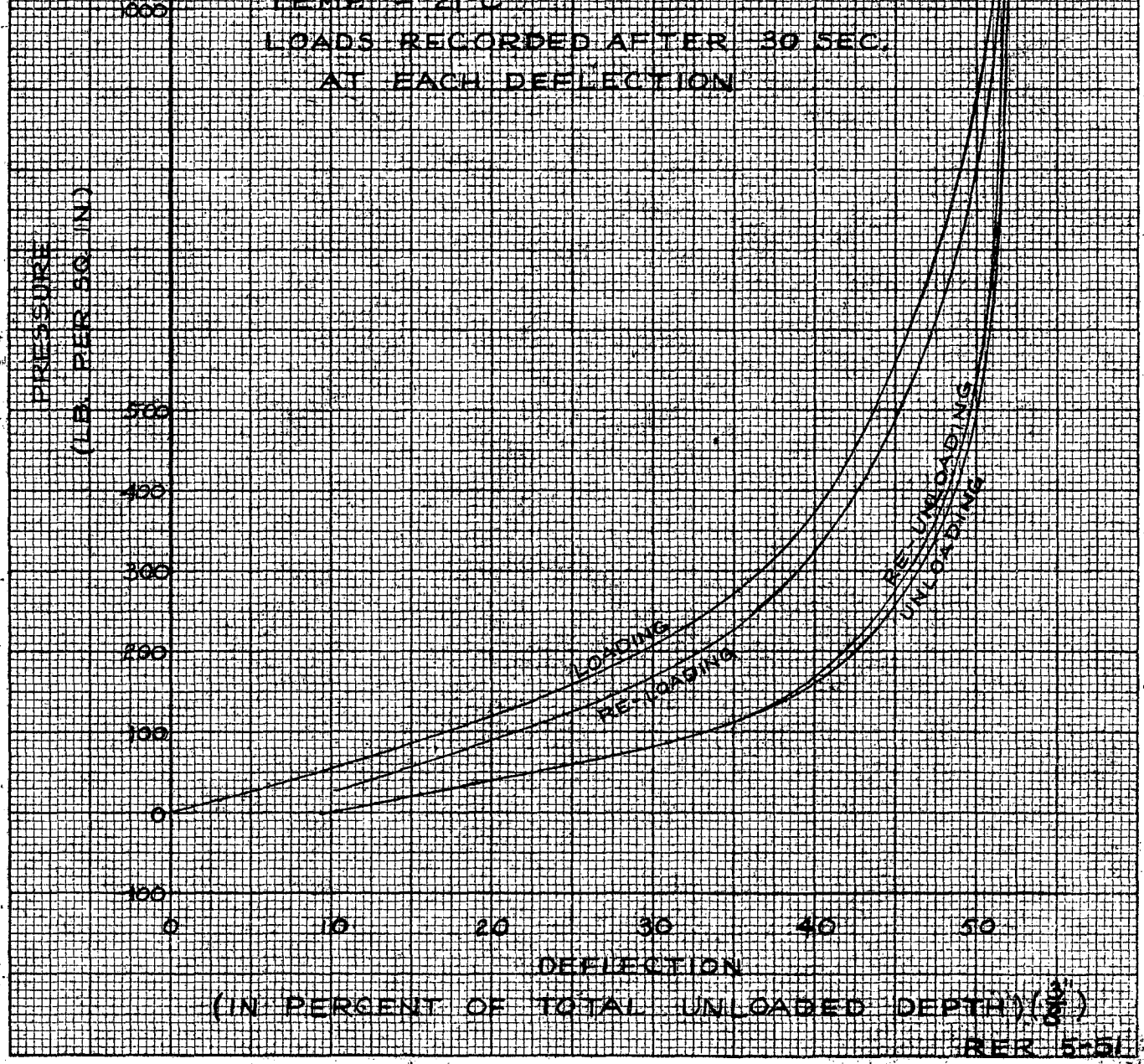
PRESSURE DEFLECTION HYSTERESIS CURVE FOR MYVASEAL

NOMINAL $\frac{3}{8}$ x $\frac{3}{8}$ MYVASEAL GASKET
LENGTH = 8.41 IN.
UNLUBRICATED
UNRESTRICTED
DUROMETER HARDNESS = 55
TEMP ≅ 21°C
LOADS RECORDED AFTER 30 SEC.
AT EACH DEFLECTION



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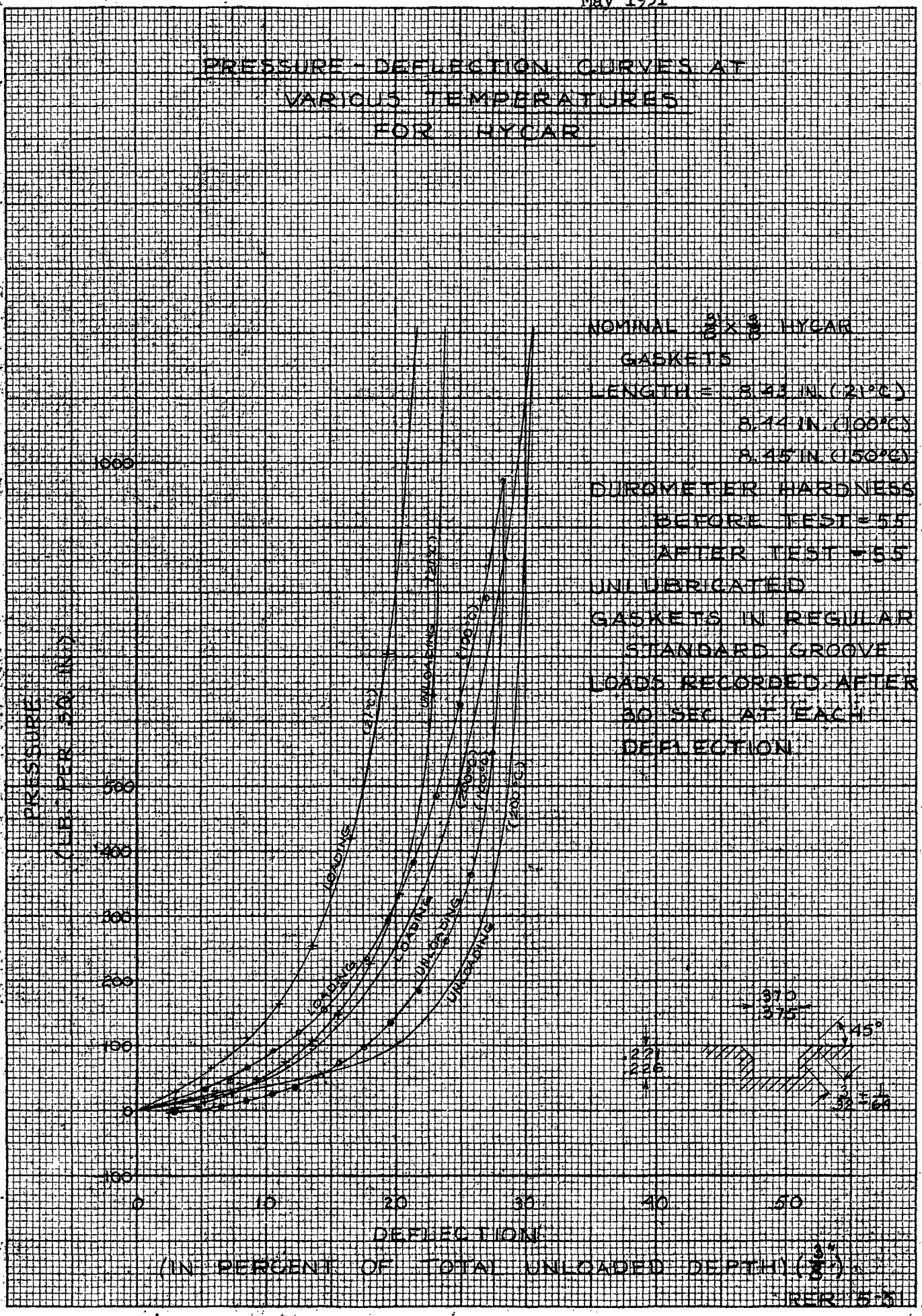
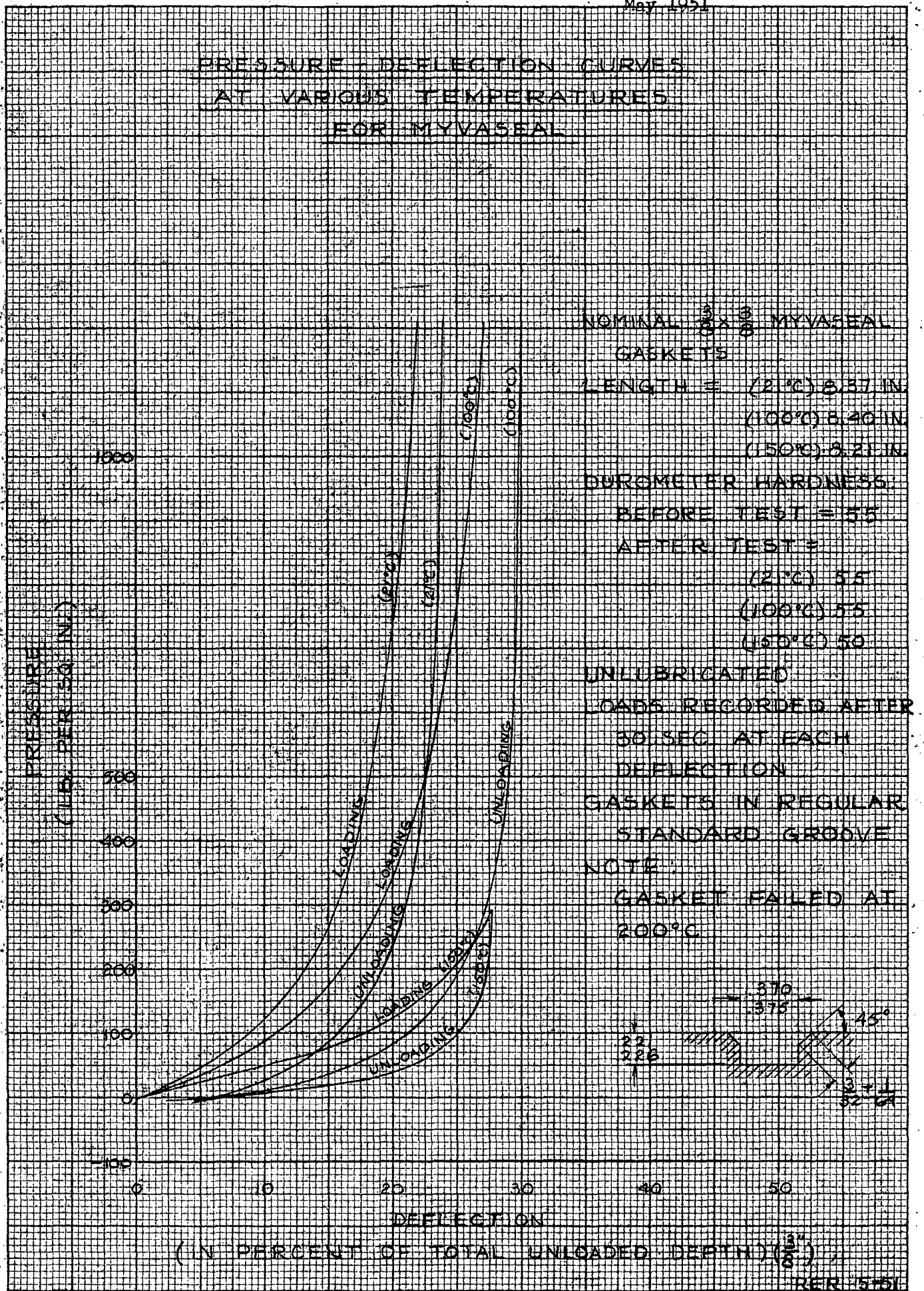
PRESSURE - DEFLECTION CURVES AT VARIOUS TEMPERATURES FOR HYCAR



PRESSURE - DEFLECTION CURVES AT VARIOUS TEMPERATURES FOR MYVASEAL



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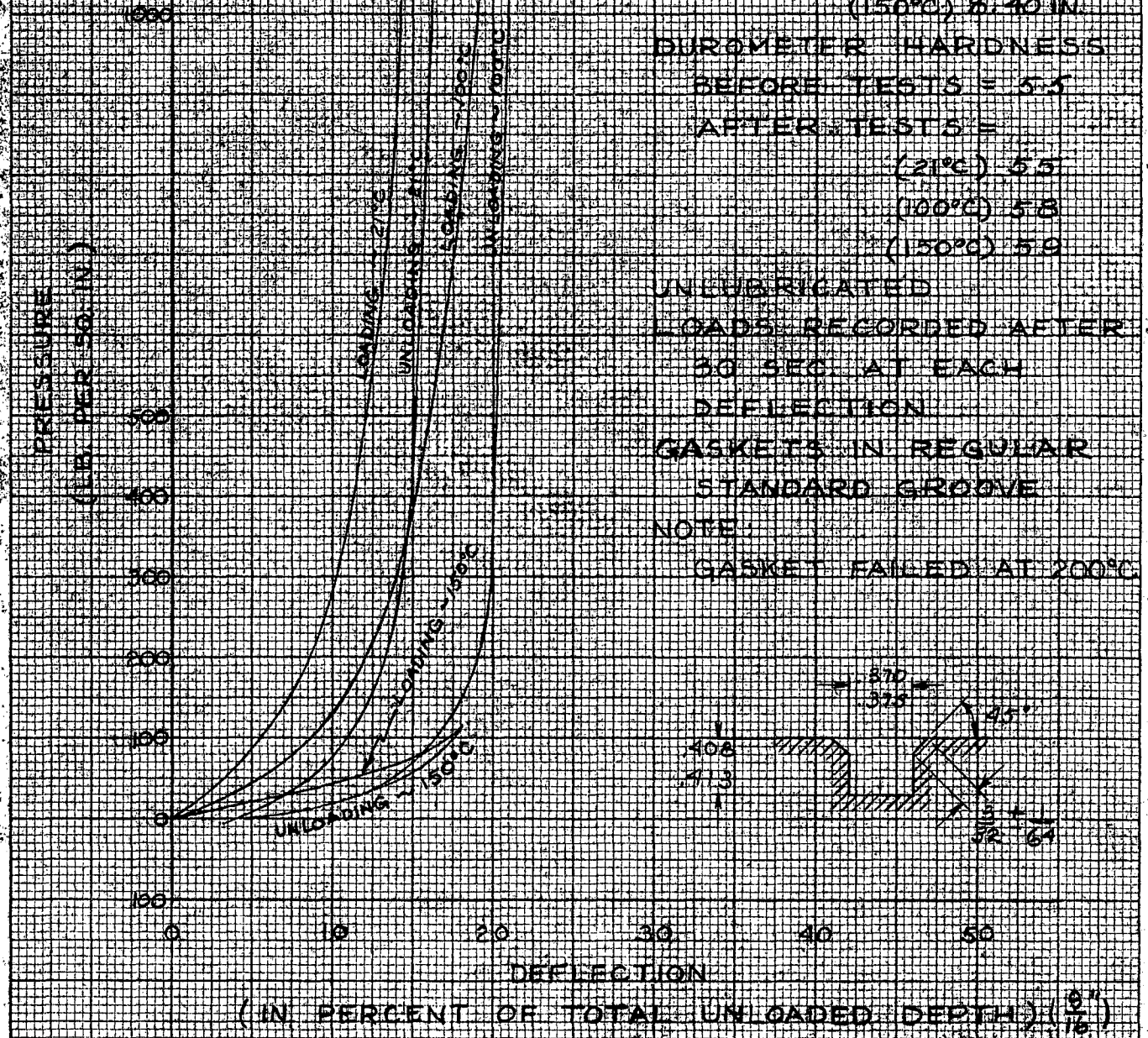
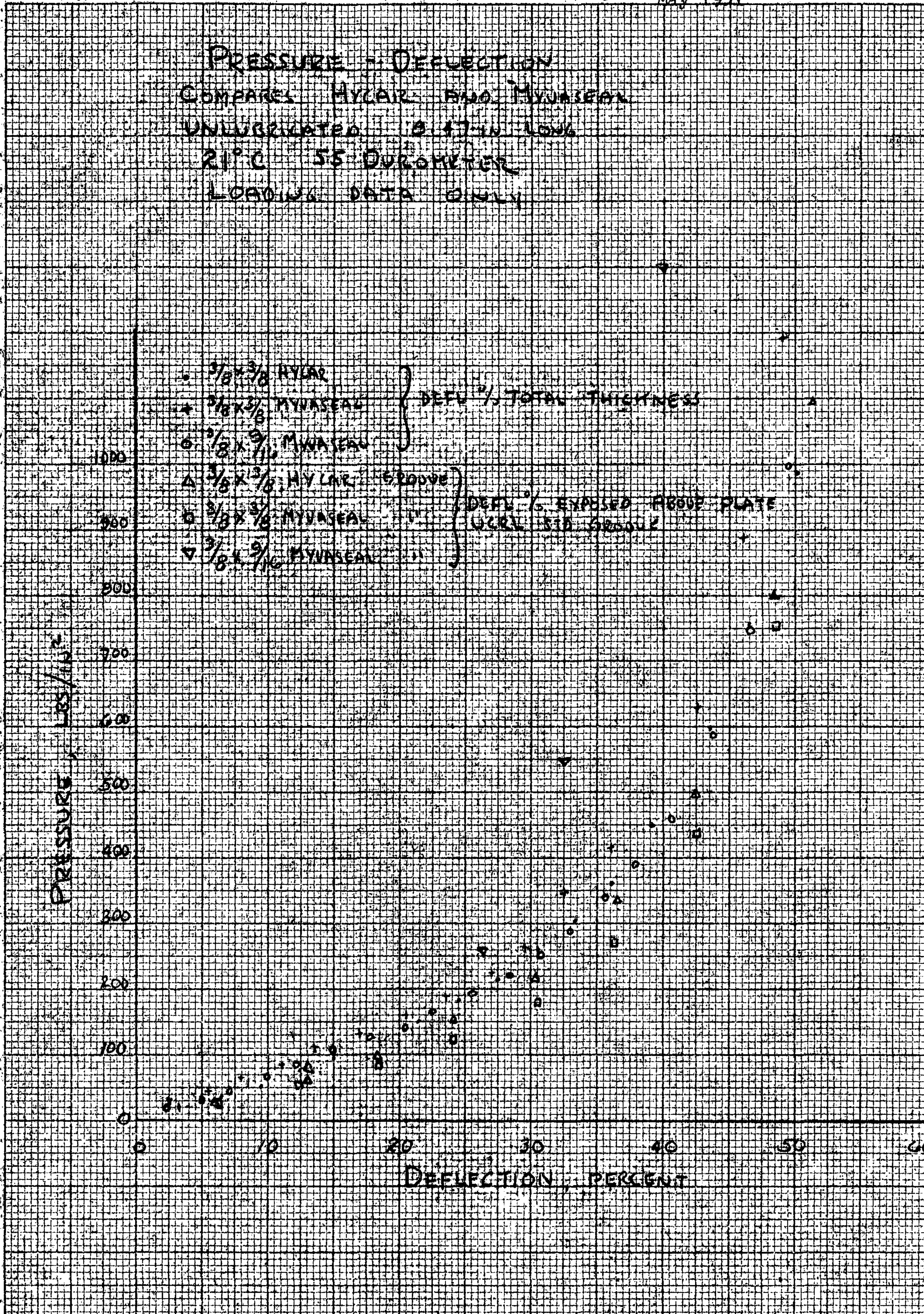
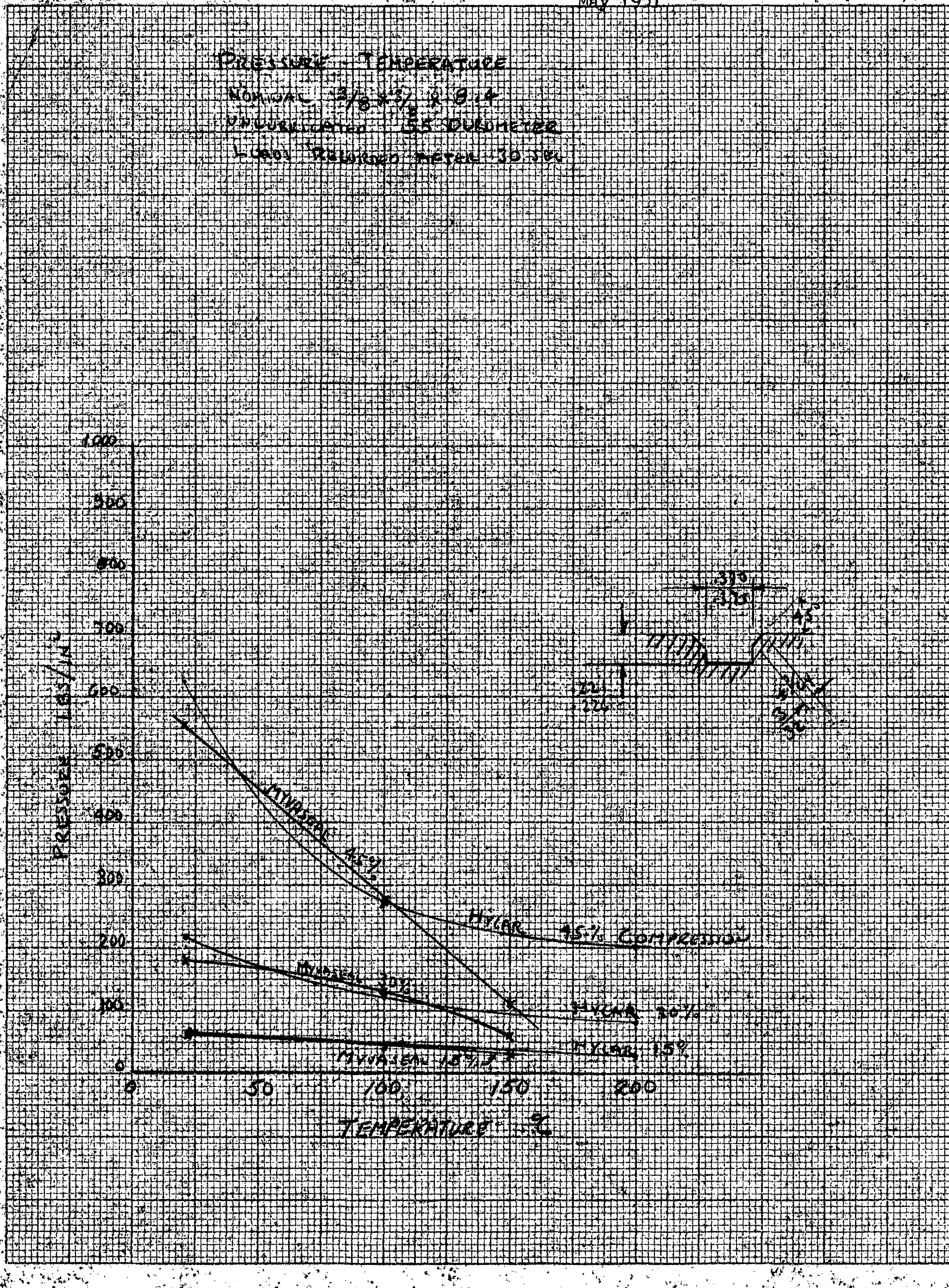
PRESSURE - DEFLECTION CURVES AT DIFFERENT TEMPERATURES FOR MYVASEAL




PRESSURE - DEFLECTION
COMPARES HYCAR AND MYVASEAL
UNLUBRICATED 8.47-IN LONG
21°C 55 DUROMETER
LOADING DATA ONLY
• 3/8 x 3/8 HYCAR
+ 3/8 x 3/8 MYVASEAL
o 3/8 x 9/16 MYVASEAL
DEFL % TOTAL THICKNESS
Δ 3/8 x 3/8 HYCAR GROOVE
□ 3/8 x 3/8 MYVASEAL "
∇ 3/8 x 9/16 MYVASEAL "
DEFL % EXPOSED ABOVE PLATE
UCRL STD GROOVE
PRESSURE, LBS/IN²
DEFLECTION, PERCENT
0
100
200
300
400
500
600
700
800
900
1000
10
20
30
40
50
60


PRESSURE - TEMPERATURE
55 DUROMETER
PRESSURE LBS/IN²
1000
900
800
700
600
500
400
300
200
100
0
0
50
100
150
200
TEMPERATURE °C
MYVASEAL 45%
MYLAR 45% COMPRESSION
MYVASEAL 30%
MYLAR 30%
MYLAR 15%
MYVASEAL 15%
45°