

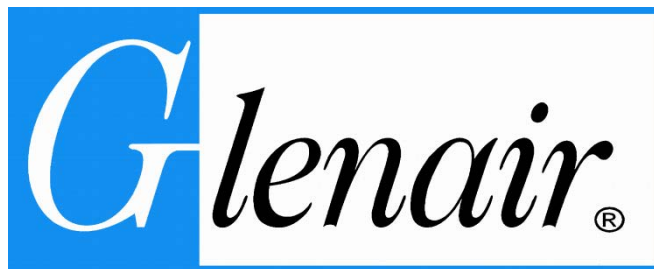
Glenair Test Report

Fluid Immersion;
ArmorLite Braid (103-051)

GT-11-28 (ARM-106)

Revision 1

2/16/22



Glenair, Inc.

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TEST REPORT

Cage Code: 06324	Fluid Immersion; ArmorLite Braid (103-051)	Document #: GT-11-28 (ARM-106) Revision: 1 Page 2 of 27
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Revision Status	Description of Change	Date	Approval
1	Reformatting; cover page	02/16/22	JNN

ARM-106

January 19, 2011

Report No. 32792 - 1219727 Rev. B

GLENAIR, INC.
1211 Air Way
Glendale, CA 91201



ENVIRONMENT ASSOCIATES, Inc.

9604 Variel Avenue
Chatsworth, CA 91311

Phone: (818) 709-0568
Fax: (818) 709-8914

www.eatest.com

Attention: Eydi Palacios

- Reference: (1) GLENAIR, INC.
Purchase Order No. E103816-1211
- (2) Environment Associates Job No. 32792 - 1219727 Rev. B
- (3) Environment Associates Shipper No. 38658
- (4) Specification Table 15, IAW AS 4373C Method 601.

CERTIFICATION

Environment Associates, Inc. hereby certifies that Thirty-four (34) Cable Sections (Stainless Steel) P/N(s) 103-051-016 were subjected to Fluids Immersion testing in accordance with the above references as evidenced by and reported in the accompanying data.

The original of this report is on file at Environment Associates, Inc. under the above referenced job number for review by authorized persons. The results of the testing reported herein relate only to the actual items tested.

Respectfully submitted,

ENVIRONMENT ASSOCIATES, INC.

Robert Coiteux,
Laboratory Director

RC/dl

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maintains laboratory accreditation to ISO/IEC 17025 and ISO 9001

TEST DATA

DATE STARTED <i>1-03-11</i>	CUSTOMER GLENAIR, INC.	TECHNICIAN (SIGNATURE) <i>[Signature]</i>
DATE COMPLETED <i>1-10-11</i>	SPECIMEN DESCRIPTION STAINLESS STEEL CABLE SECTIONS (Polymer Braid)	ENGINEER (SIGNATURE) <i>[Signature]</i>
TEMPERATURE (LAB) <i>+11.7 °C</i>	TYPE OF TEST FLUID IMMERSION	ENGINEER <i>[Signature]</i>
HUMIDITY (LAB) <i>~35 %</i>	TEST SPECIFICATION CUSTOMER SPECIFICATION	PARAGRAPH NO. <i>Table 15 Sec 4</i> AS4373C Method 601
SPECIMEN NUMBER <i>PIN 103-051-016</i>	<i>16 SAMPLES</i>	JOB NUMBER 32792-1219727
<i>PHOTO (1) BY BERNHOLZ</i>		

FLUID TABLE 15

NO.	CLASS	SPECIFIED	TEST FLUID	TEMP-C
D.	FUELS	JP8, MIL-T-83133	JP8 JET FUEL	20-25
M.		TT-S-735, STD TEST FLUID I	HC TEST FLUID, TYPE I	
N.		TT-S-735, STD TEST FLUID II	HC TEST FLUID, TYPE II	
O.		TT-S-735, STD TEST FLUID III	HC TEST FLUID, TYPE III	
P.		TT-S-735, STD TEST FLUID VII	HC TEST FLUID, TYPE VII	
R.		ASTM D4814 COMBAT GASOLINE	DELETED BY CUSTOMER	
Q.		SOLVENTS	ISOPROPYL ALCOHOL, TT-1-735	ISOPROPANOL
H.	MIBK, ASTM D1163		METHYL ISIBUTYL KETONE	
Q.	COOLANTS	SILICATE ESTER FLUID MIL-PRF-25	DELETED *	
S.		DIELECTRIC, MIL-PRF-87252	ROYCO 802 (P.A.O.)	

* Specification CXL'd - Fluid no longer being produced. (Replaced by MIL-PRF-87252 (Fluid "S"))

TWO SAMPLES TO BE IMMERSSED IN EACH FLUID, FROM TABLE ABOVE, AT +20 to +25C, FOR A PERIOD OF 168 HOURS (minimum).

<i>1-03-11</i>	<i>FLUIDS PREPARED FOR TEST AS REQUIRED.</i>
	<i>SAMPLES WEIGHTED TO PREVENT FLOTATION AND IMMERSSED IN ASSIGNED FLUID FROM TABLE ABOVE.</i>
<i>1050</i>	<i>VESSELS PLACED IN CHAMBER AND PHOTO TAKEN</i>
	<i>CHAMBER ADJUSTED TO +22°C - STABILIZING.</i>
<i>1145</i>	<i>FLUID TEMPERATURE STABILIZED, BEGINNING 7-DAY EXPOSURE.</i>
<i>114</i>	
<i>0730</i>	<i>TEMPERATURE SETPOINT ADJUSTED, CHAMBER VENTED AND CHART CHANGED - EXPOSURE CONTINUES.</i>
<i>1530</i>	<i>CHAMBER DRAINING OUT OF GASE - MADE SETPOINT ADJUSTMENTS.</i>
<i>1-5</i>	
<i>0720</i>	<i>CHAMBER AT +23°C - CHANGED CHART. 7-DAY EXPOSURE CONTINUES.</i>
<i>1530</i>	<i>CHAMBER MAINTAINING +23°C - EXPOSURE CONTINUES.</i>

TEST DATA

STAINLESS
STEEL
4/5



Environment Associates

DATE STARTED 1-03-11	CUSTOMER GLENVAIR, INC.	TECHNICIAN (SIGNATURE) <i>[Signature]</i>
DATE COMPLETED 1-10-11	SPECIMEN DESCRIPTION CABLE SECTIONS (ANCHOR BOND)	ENGINEER (SIGNATURE) <i>[Signature]</i>
TEMPERATURE (LAB) + 21.7 °C	TYPE OF TEST FLUID IMMERSION	ENGINEER <i>[Signature]</i>
HUMIDITY (LAB) ~ 35 %	TEST SPECIFICATION CUSTOMER SPECIFICATION	JOB NUMBER 32792-1219727
SPECIMEN NUMBER PIN 103-051-016	16 SAMPLES	

PARAGRAPH NO. TABLE 15, IAW AS 4373C Rev 1001

PHOTO TAKEN BY

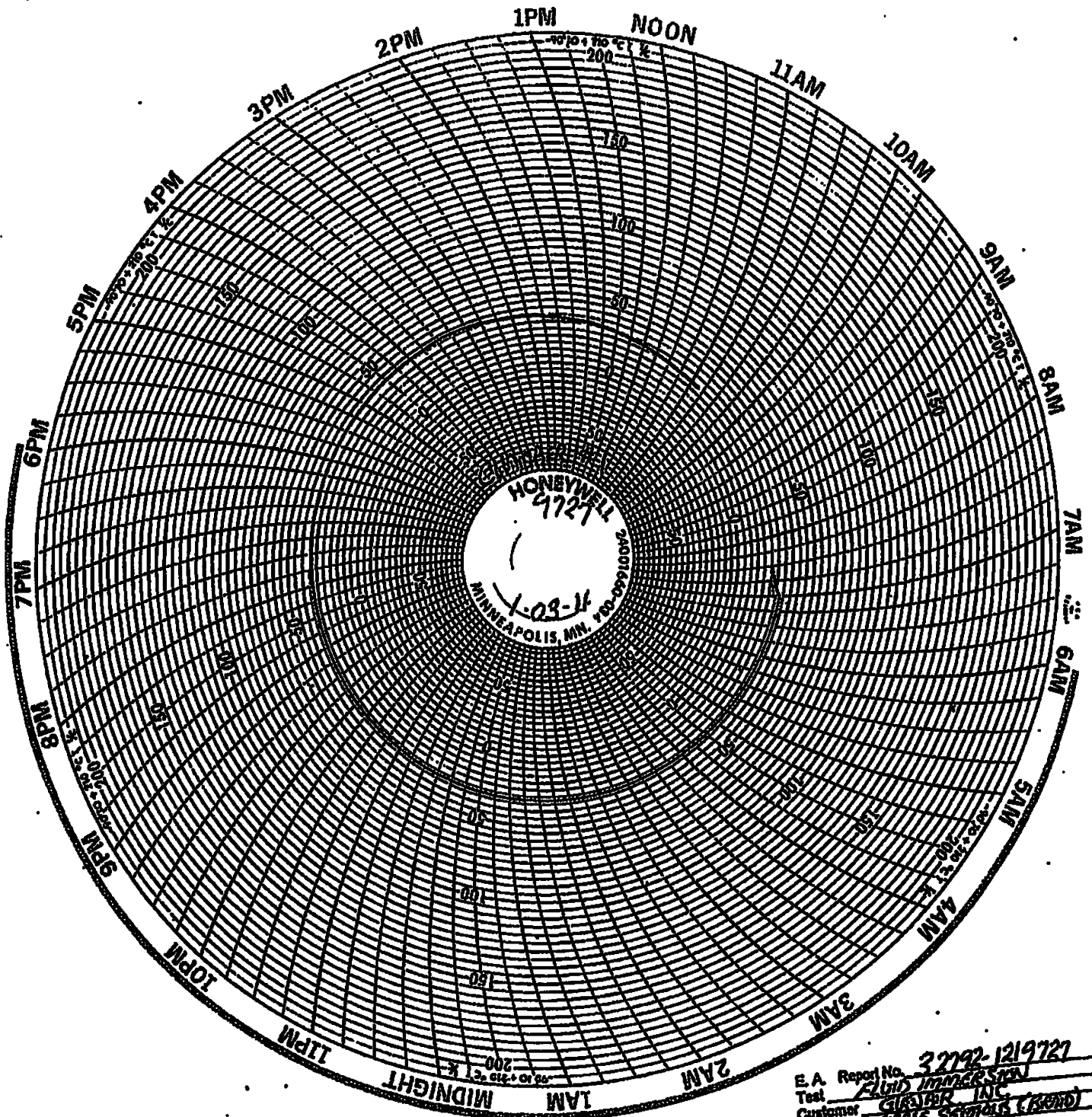
1/06/11	
0800	CHART CHANGED, CHAMBER AT + 23°C - 7 DAY EXPOSURE CONTINUES
1-07	
0800	CHAMBER AT + 23°C, FLUID LEVELS CHECKED AND TOPPED OFF AS NEEDED. CHART CHANGED - EXPOSURE CONTINUES.
P.M. 1-8-11	
A.M. 0820	CHAMBER AT + 23°C, CHANGED CHART.
1-9-11	
REF 0805	CHAMBER AT + 23°C, CHANGED CHART.
1/10	
0710	CHAMBER OPERATING PROPERLY AT + 23°C FLUID LEVELS OK CHART CHANGED - COMPLETING 7-DAY EXPOSURE.
1145	168-HR EXPOSURE COMPLETED - SAMPLES REMOVED FROM FLUIDS AND PACKAGED FOR RETURN TO CUSTOMER.

EQUIPMENT LIST

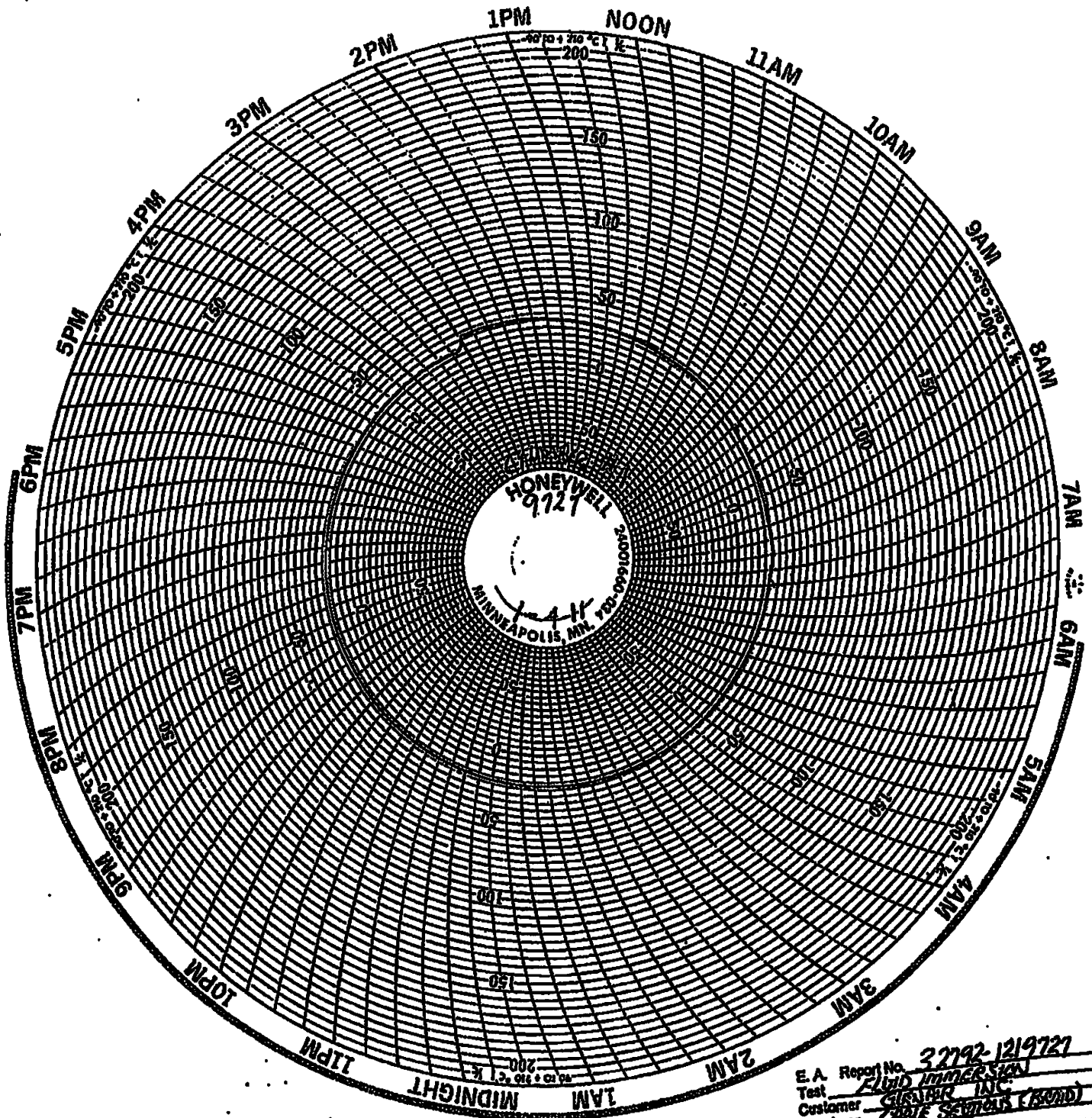
JOB NUMBER 32792-1219727

TEST DESCRIPTION: Fluids Immersion

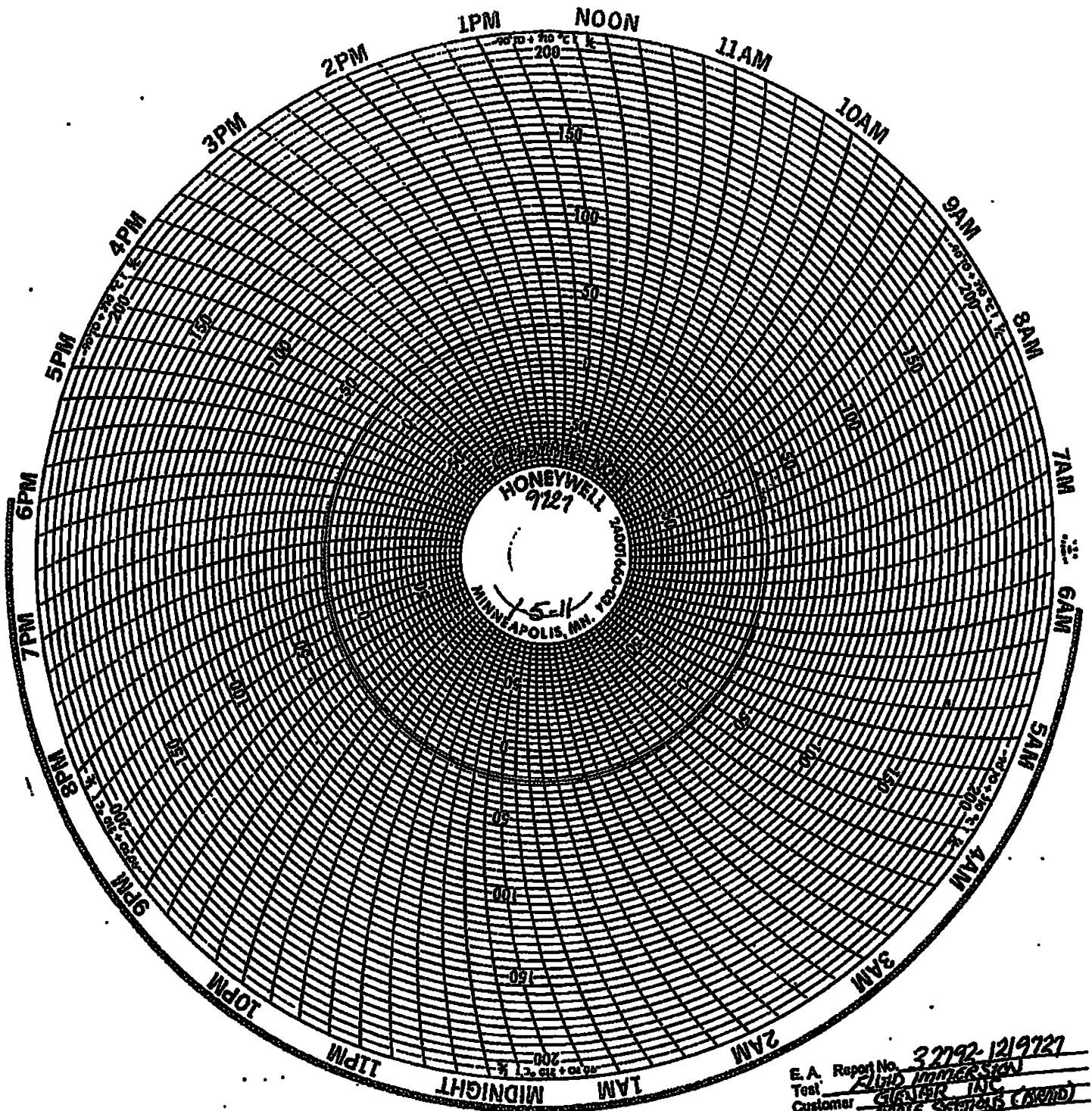
EQUIPMENT DESCRIPTION	MANUFACTURER	MODEL NUMBER	I.D. NUMBER	CALIBRATED LAST: REFERENCE	CALIBRATION DUE
CHAMBER	BLUE M	OV 500-2	0037		
DIGITAL THERMOMETER	OMEGA	<u>HH-21</u>	<u>1398</u>	<u>1/18/10</u>	<u>5/10/11</u>
IMMERSION VESSELS	R.J.REYNOLDS	3" X 5" MINI LOAFPANS			
CHART RECORDER	HONEYWELL	DR-4300	<u>1296</u>	<u>8/6/10</u>	<u>2/10/11</u>



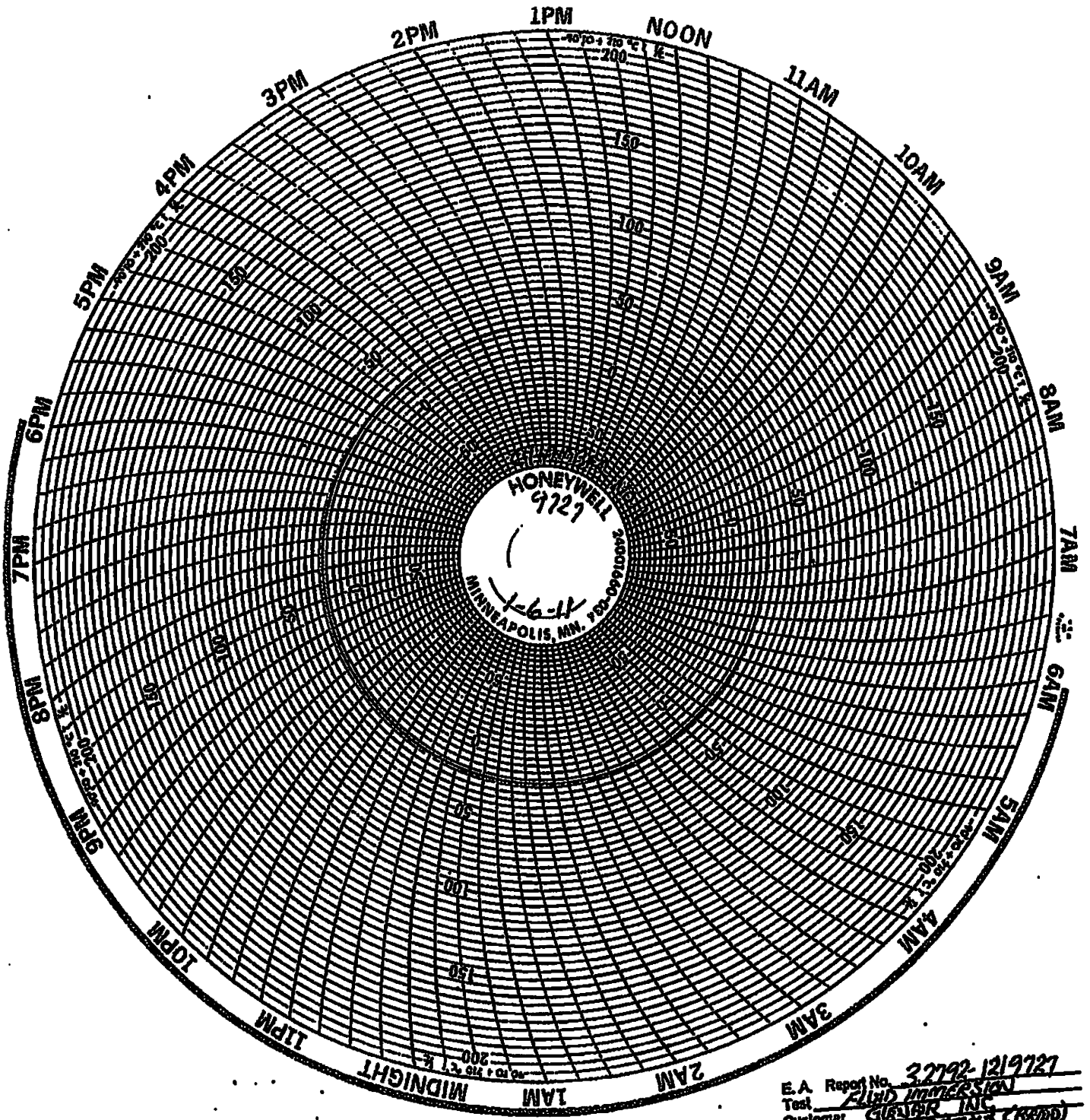
E.A. Report No. 32792-1219727
 Test Fluid Immersion
 Customer GRUBER INC
 Specimen 2016 SENSORS (ROND)
 PIN 103-051-016
 SN 16 PGS



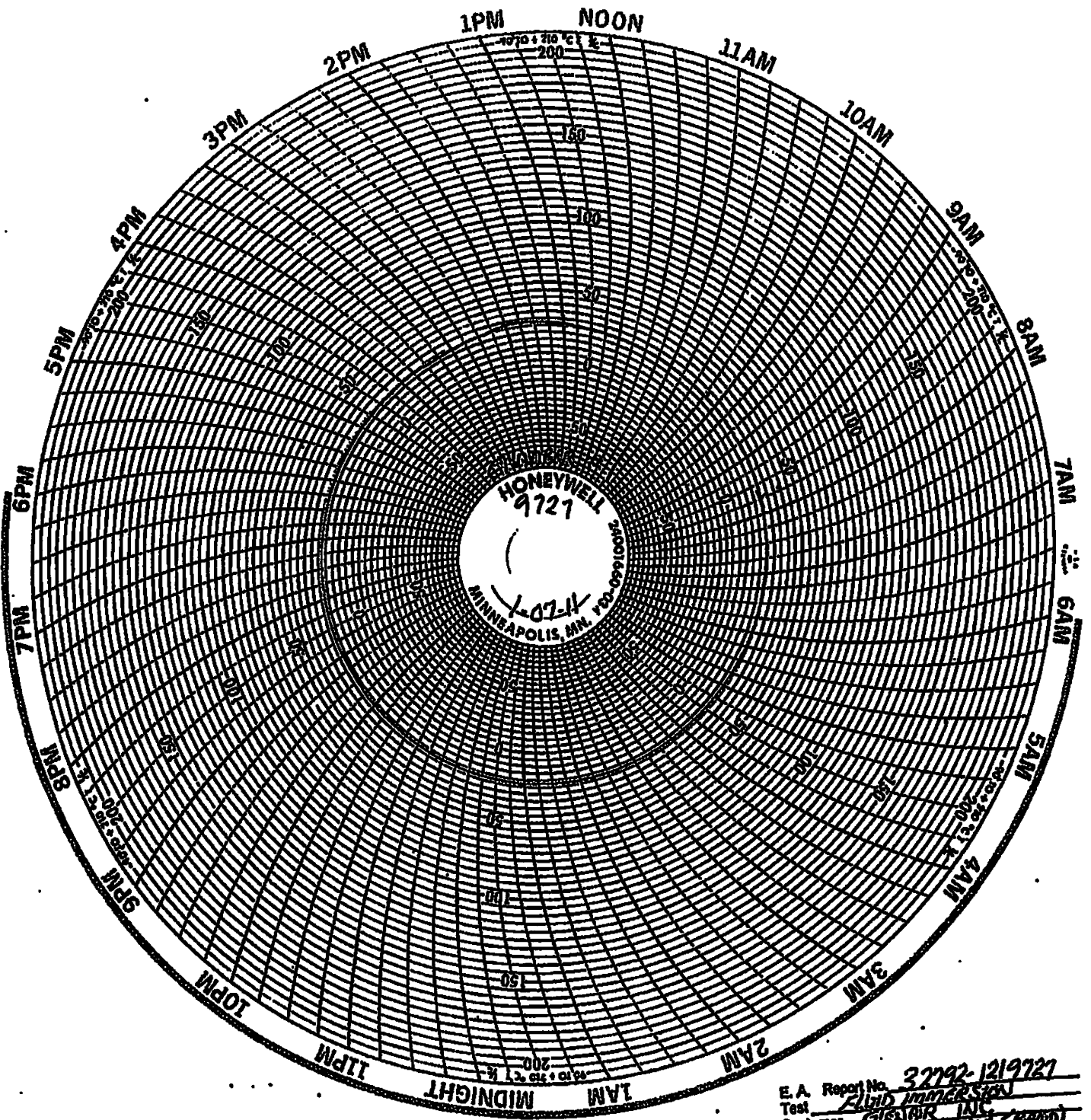
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 Test FLUID IMMERSION
 Customer GENERAL INC
 Specimen CABLE SEWING (BOND)
 PIN 107-051-016
 SN 16 Pcs



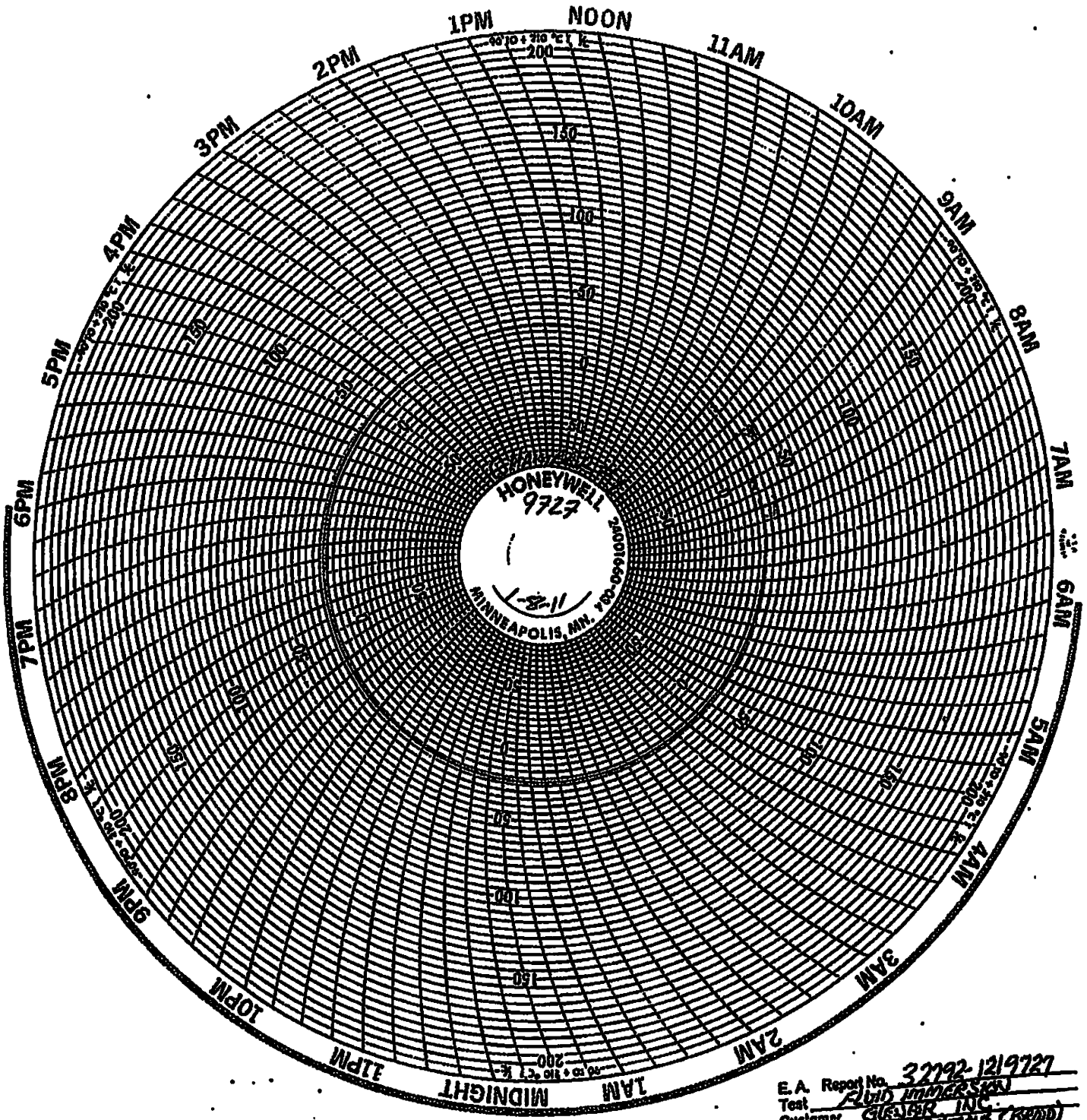
E. A. Report No. 32792-1219727
 Test FLUID IMMERSION
 Customer CHRYSLER INC
 Specimen CRUISE SECTORS (RWD)
 PIN 103-001-016
 SRN 16 PGS



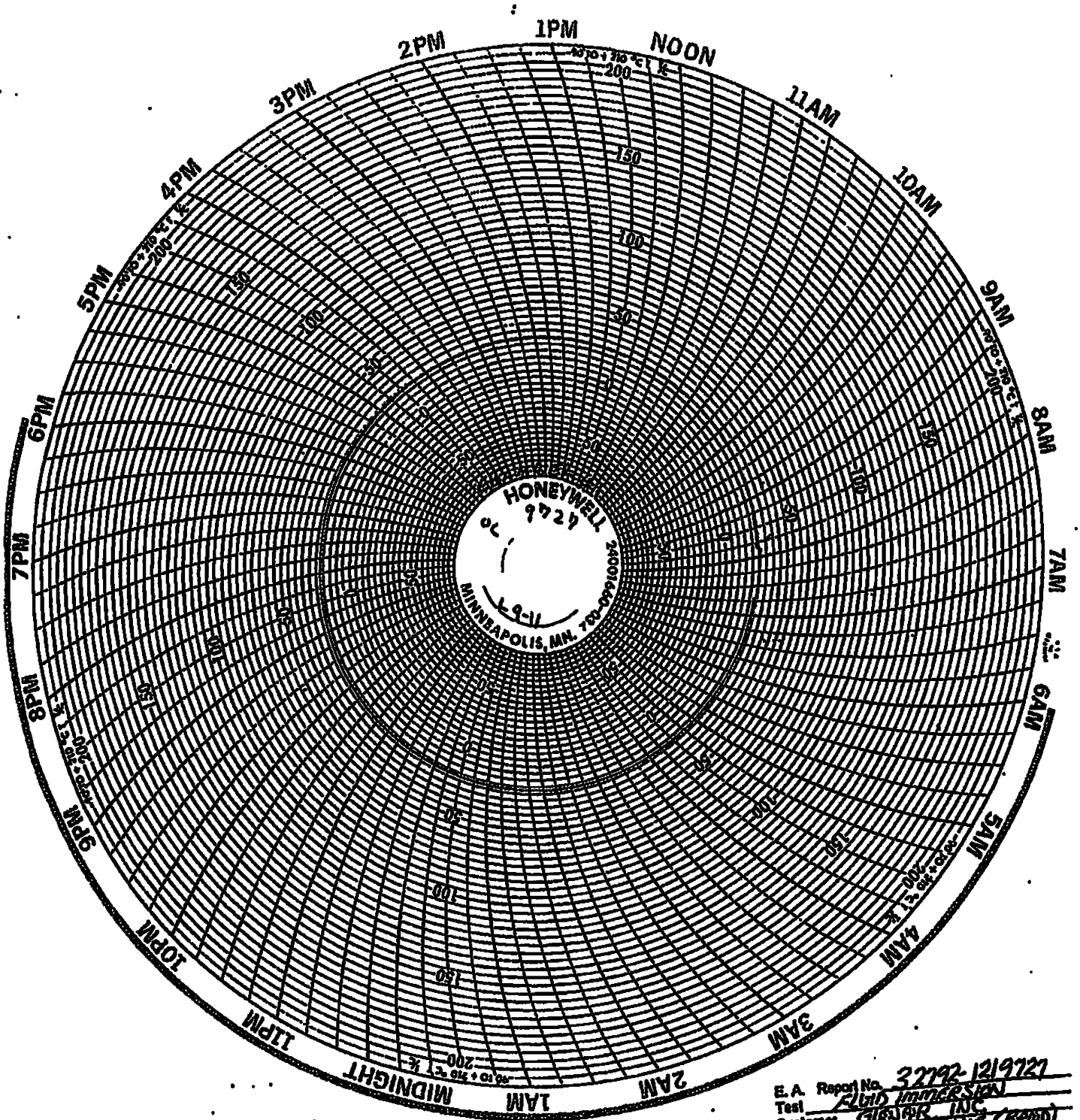
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 Customer GUNBAR INC
 Specimen 27416 SERIALS (BRND)
 PN 103-051-010
 SN 16 PGS



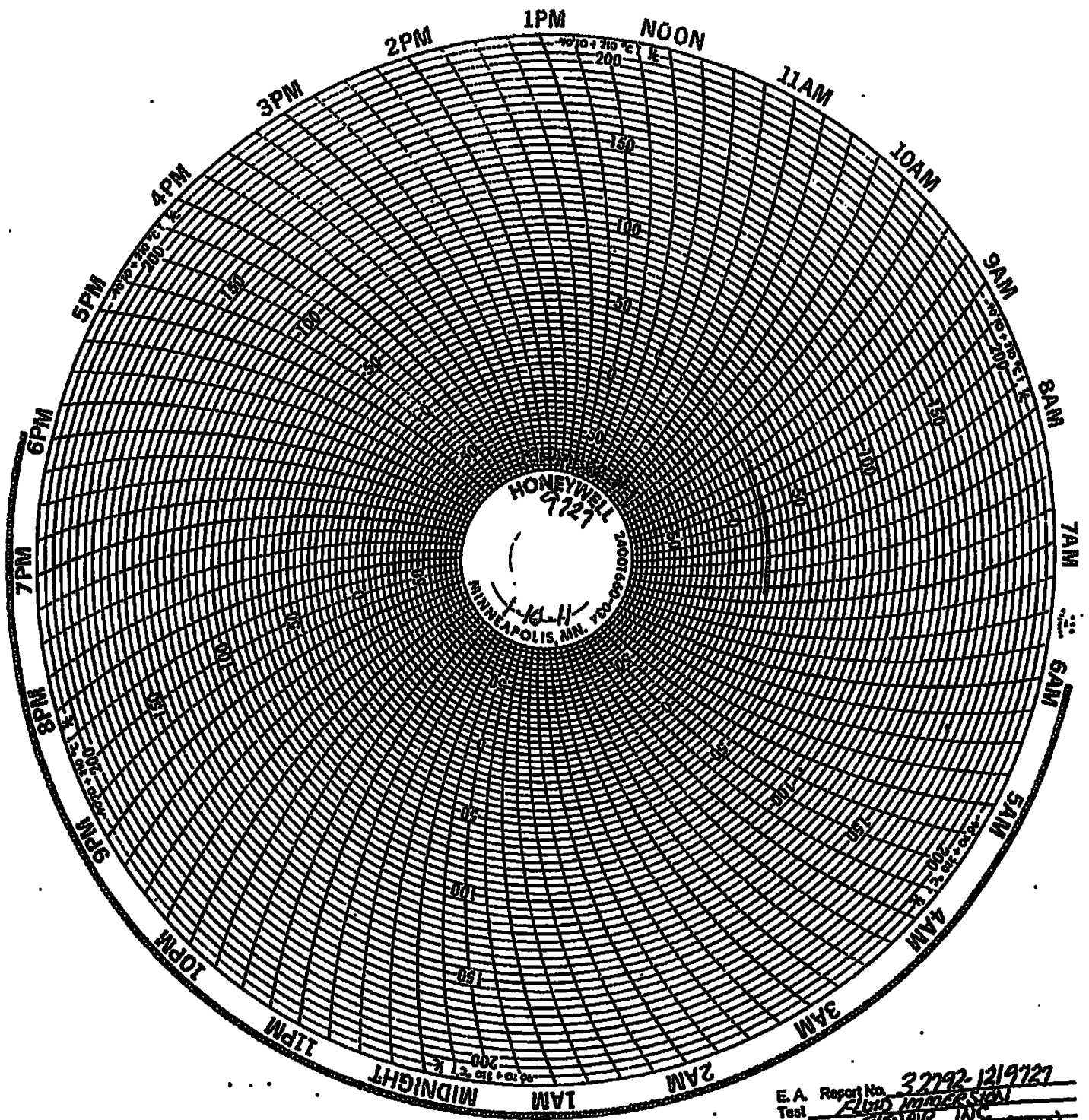
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 Test Fluid Immersion
 Customer GLS/BIR INC.
 Specimen CRUISE SERVICES (BAND)
 P/N 103-251-016
 SN 16 PGS.



E. A. Report No. 32792-1219727
 Test FLUID IMMERSION
 Customer GILBAR INC.
 Specimen CABLE SECTIONS (BOND)
 PN 103-251-016
 SN 16 Pcs.



E. A. Report No. 32792-1219721
 Test Fluid Immersion
 Customer SHIBUYA INC
 Specimen CABLE SECTIONS (BROAD)
 PIN 103-251-016
 SN 16 PCS.



E. A. Report No. 32792-1219727
 Test Fluid Immersion
 Customer GLS/BIR INC
 Specimen CABLE SECTIONS (BRND)
 PIN 103-251-016
 SN 16 PGS.



Environment
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JOB # 32792-1219727

TEST SET UP



IMMERSED SAMPLES IN CHAMBER

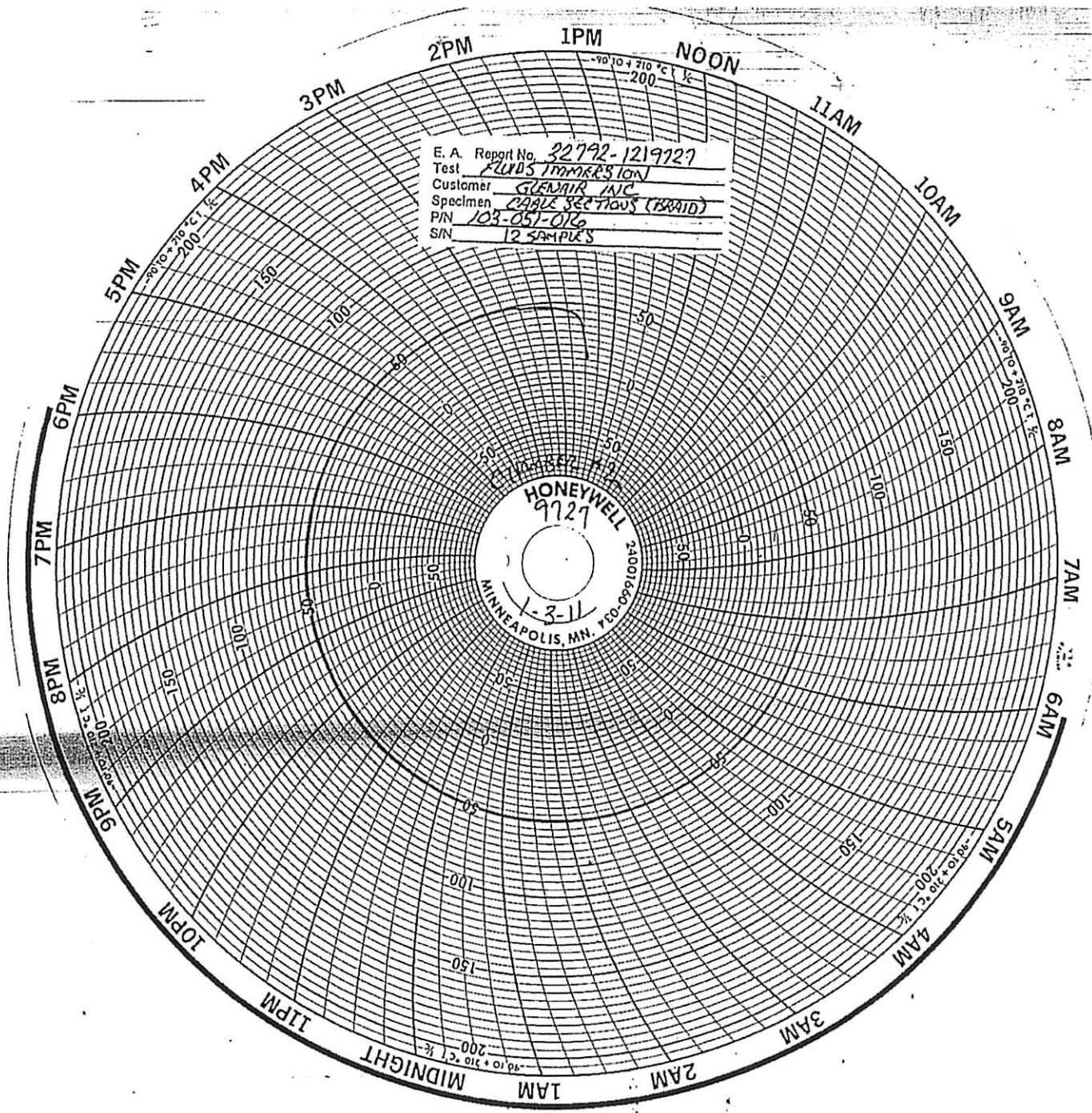
EQUIPMENT LIST

JOB NUMBER 32792-1219727

TEST DESCRIPTION	<u>Fluids Immersion</u>				
EQUIPMENT DESCRIPTION	MANUFACTURER	MODEL NUMBER	I.D. NUMBER	CALIBRATED LAST: REFERENCE	CALIBRATION DATE
CHAMBER	AMERICAN	DN-41	EES-2248		
DIGITAL THERMOMETER	OMEGA	<u>HH-21</u>	<u>1398</u>	<u>1/18/10</u>	<u>5/10/11</u>
IMMERSION VESSELS	R.J.REYNOLDS	3" X 5" MINI LOAFPANS			
CHART RECORDER	HONEYWELL	DR-4300	<u>1272</u>	<u>8/5/10</u>	<u>2/10/11</u>

E. A. Report No. 22792-1219727
Test FLUIDS THAMES 10M
Customer GLENAIR INC
Specimen CABLE SECTIONS (BRAID)
PIN 103-051-016
SIN 12 SAMPLES

HONEYWELL
9727
MINNEAPOLIS, MN. 55402
1-3-11

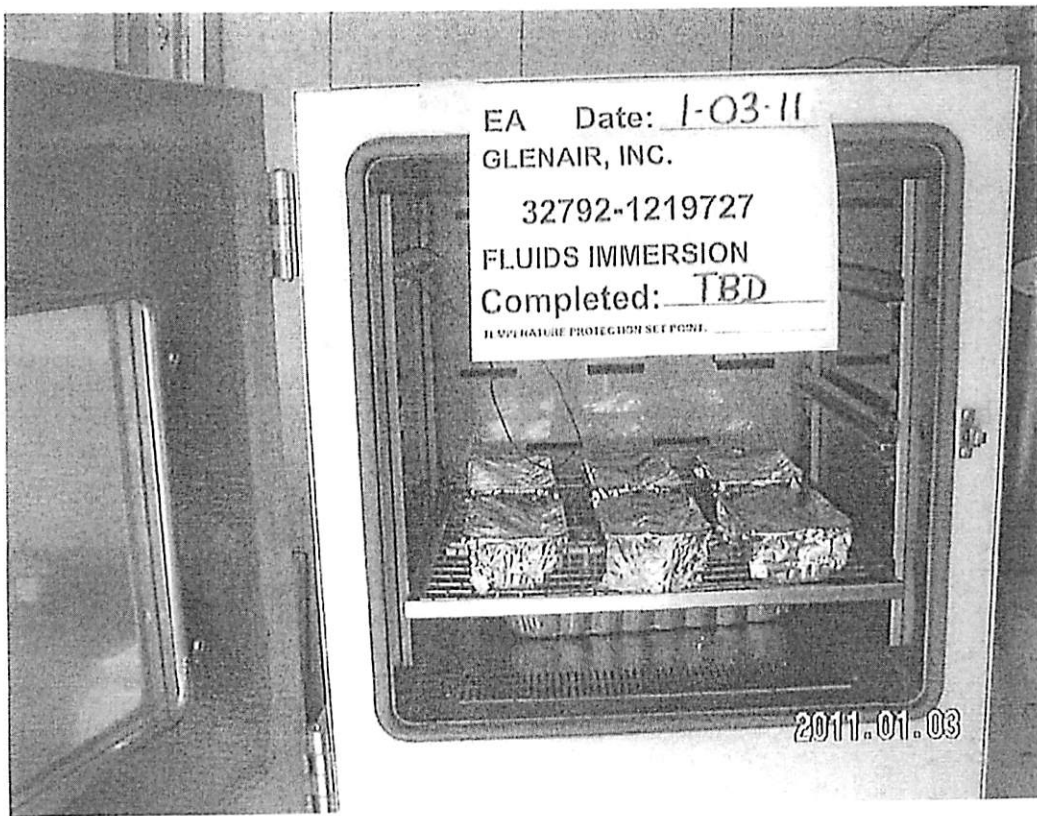




Environment
Associates

JOB # 32792-1219727

TEST SET UP



IMMERSED SAMPLES IN CHAMBER No.2

TEST DATA

DATE STARTED <i>1/04/11</i>	CUSTOMER GLENAIR, INC.	TECHNICIAN (SIGNATURE) <i>[Signature]</i>
DATE COMPLETED <i>1/06/11</i>	SPECIMEN DESCRIPTION STAINLESS STEEL CABLE SECTIONS (Polymer Braid)	ENGINEER (SIGNATURE) <i>[Signature]</i>
TEMPERATURE (LAB) + 21 °C	TYPE OF TEST FLUIDS IMMERSION	ENGINEER <i>[Signature]</i>
HUMIDITY (LAB) ~ 35 %	TEST SPECIFICATION CUSTOMER SPECIFICATION & AS4373C Method 601	PARAGRAPH NO. TABLE 15 - A
SPECIMEN NUMBER PIN 103-051-016	6 SAMPLES	JOB NUMBER 32792-1219727
		PHOTO (1)

FLUID TABLE 15

NO.	CLASS:	SPEC:	TEST FLUID:	TEMP-C
J.	LUBE OIL	MIL-L-7808	ROYCO 808 (Royal Lubes Co)	118-121
K.	CLEANERS	MIL-C-87937 (Undiluted)	ZI 500 (Zelman, Int'l)	63-68
L.		MIL-C-87937 (Diluted: 25/75:H2O)	" "	"

TWO SELECTED SAMPLES TO BE IMMersed EACH FLUID FROM TABLE 15 ABOVE:
 30 HOURS (minimum) IN 7808 AIRCRAFT LUBE OIL AT +118 to +121C
 20 HOURS (minimum) IN AIRCRAFT CLEANER AT +63 to +68C.

<i>1/04</i>	
<i>1130</i>	<i>AIRCRAFT FLUIDS (CLEANER) PREPARED AND SAMPLES IMMersed</i>
<i>1140</i>	<i>VESSELS PLACED IN CHAMBER NO. 2 - HEATING TO +66°C</i>
<i>1230</i>	<i>FLUID TEMP STABILIZED, BEGINNING 20-HOUR EXPOSURE</i>
<i>1/5-1030</i>	<i>EXPOSURE COMPLETED.</i>
<i>1/05</i>	
<i>0710</i>	<i>TWO SAMPLES IMMersed IN LUBE OIL MIL-PRF-7808, AND PLACED IN CHAMBER NO. 3 - PHOTO TAKEN. HEATING TO +120°C</i>
<i>0830</i>	<i>FLUID TEMP STABILIZED, BEGINNING 30-HOUR EXPOSURE.</i>
<i>1530</i>	<i>CHAMBER MAINTAINING +120°C, EXPOSURE CONTINUES.</i>
<i>1-6</i>	
<i>0715</i>	<i>CHAMBER AT +120.6°C, CHANGED CHART 30-HOUR EXPOSURE CONTINUES</i>
<i>1430</i>	<i>EXPOSURE COMPLETED, CHAMBER SHUT DOWN - SAMPLES COOLING</i>
<i>1505</i>	<i>SAMPLES PACKAGED FOR RETURN TO CUSTOMER.</i>

EQUIPMENT LIST

JOB NUMBER 32792-1219727

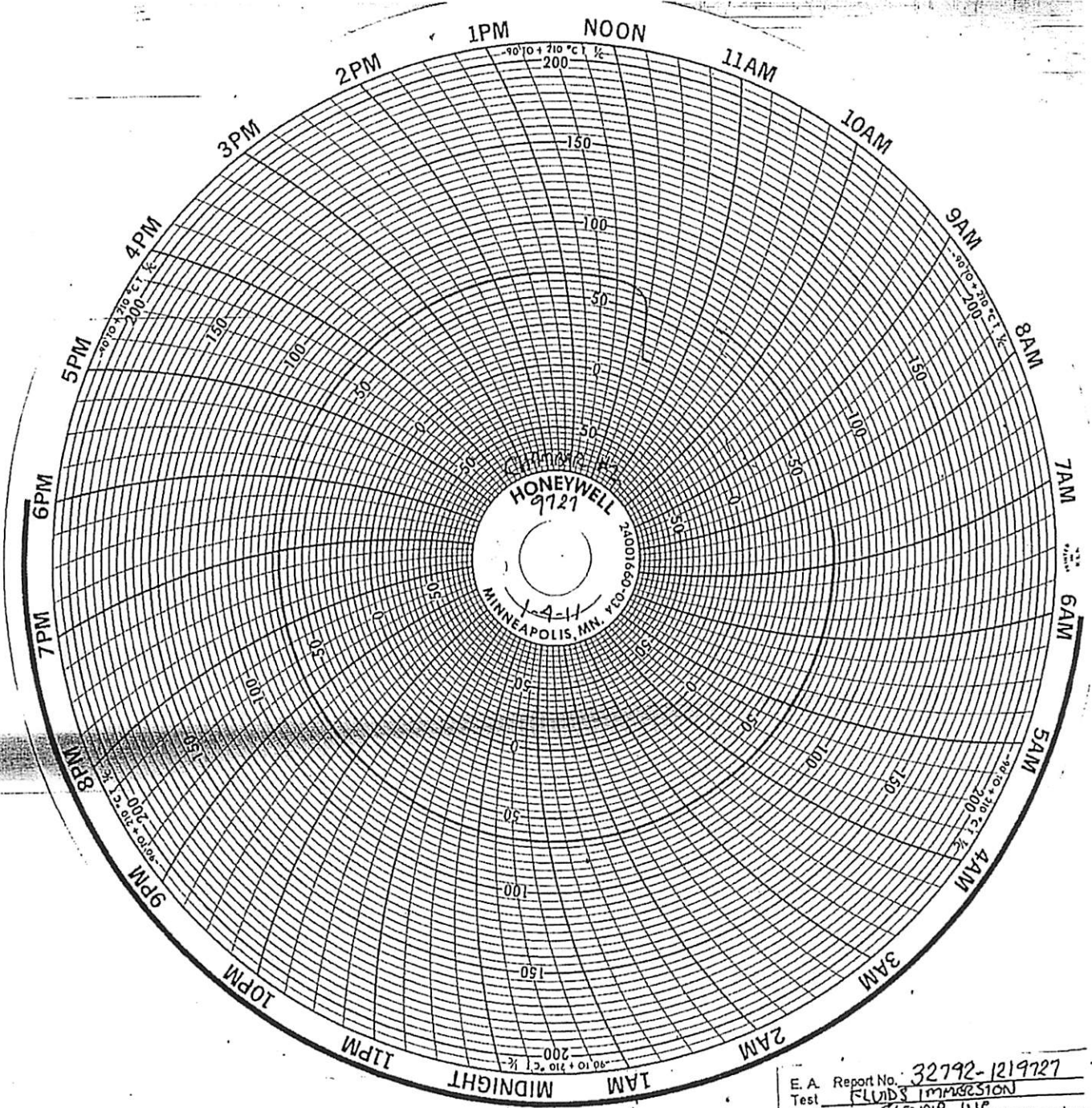
TEST DESCRIPTION:	<u>Fluids Immersion</u>				
EQUIPMENT DESCRIPTION	MANUFACTURER	MODEL NUMBER	I.D. NUMBER	CALIBRATED LAST:	CALIBRATION DUE:
CHAMBER	RANSCO	917-1-4	0312	<u>11/8/10</u>	<u>5/10/11</u>
DIGITAL THERMOMETER	OMEGA	<u>4H-21</u>	<u>1398</u>		
IMMERSION VESSELS	R.J.REYNOLDS	3" X 5" MINI LOAPPANS			
CHART RECORDER	PARTLOW	MRC-5000	<u>1408</u>	<u>8/5/10</u>	<u>2/10/11</u>

EQUIPMENT LIST

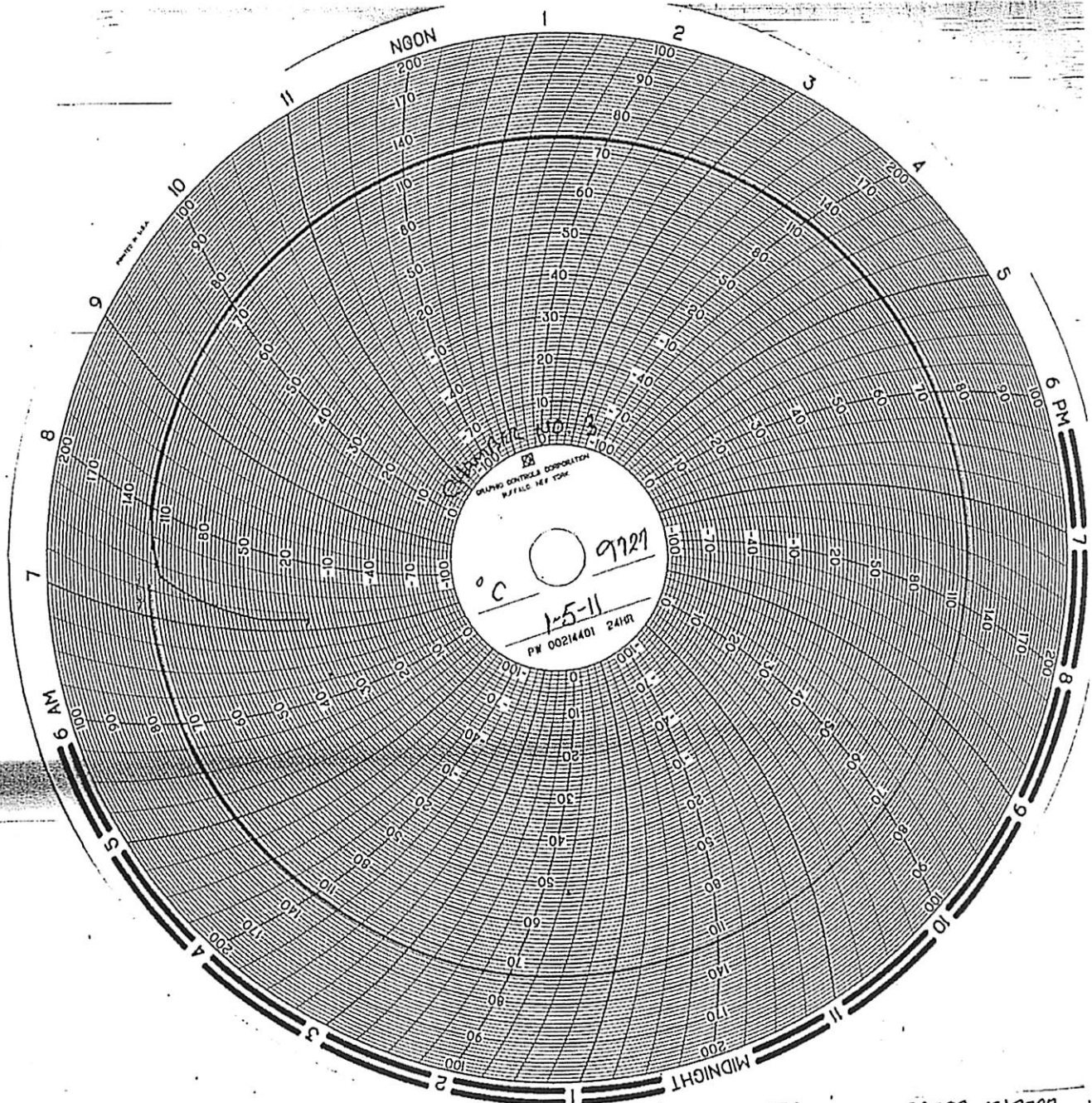
JOB NUMBER 32792-1219727

TEST DESCRIPTION: Fluids Immersion

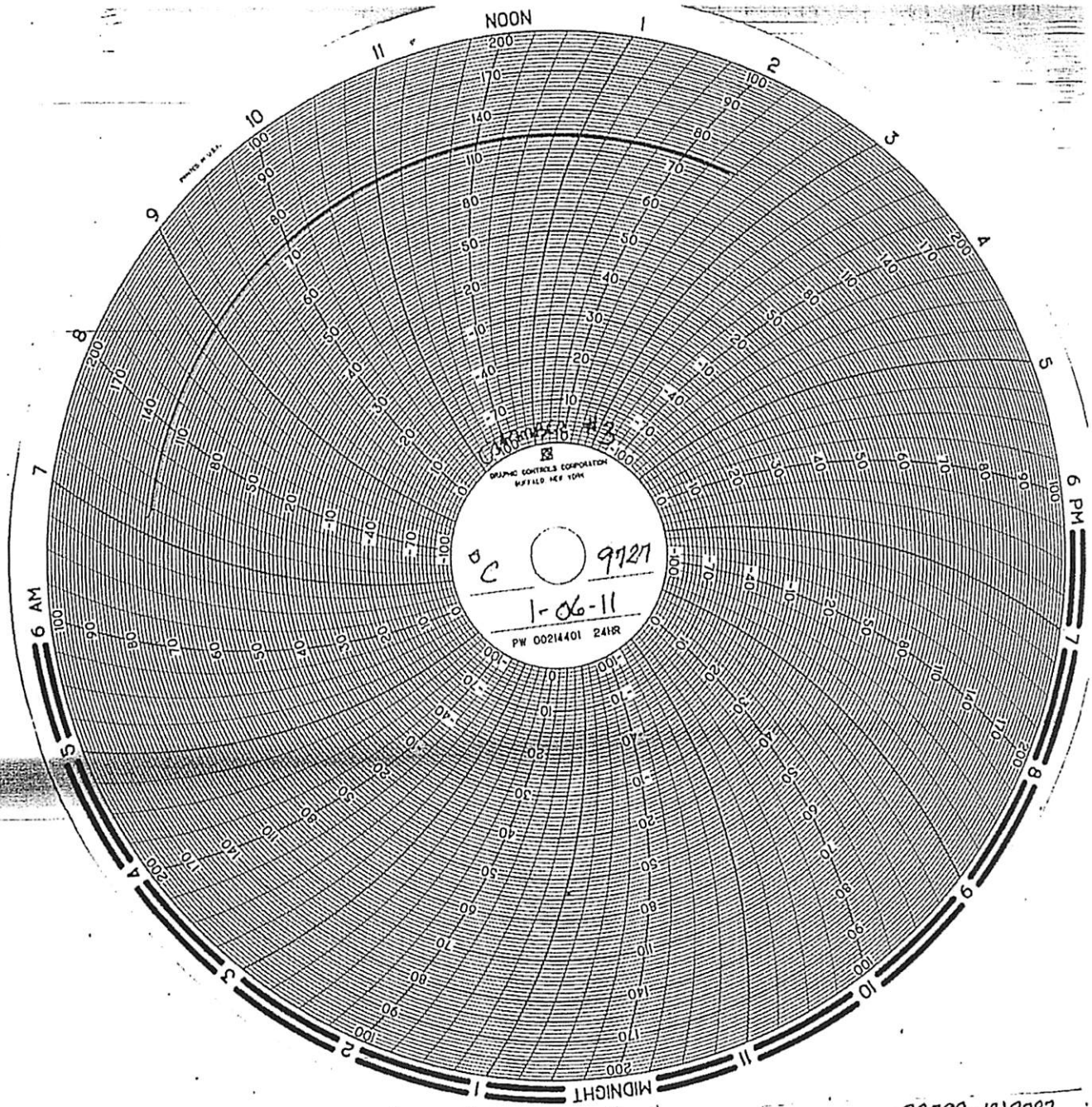
EQUIPMENT DESCRIPTION	MANUFACTURER	MODEL NUMBER	I.D. NUMBER	EES-2246	CALIBRATED LAST: REFERENCE	CALIBRATION DUE
CHAMBER	AMERICAN	DN-41				
DIGITAL THERMOMETER	OMEGA	<u>44-21</u>	<u>1398</u>		<u>11/8/10</u>	<u>5/10/11</u>
IMMERSION VESSELS	R.J.REYNOLDS	3" X 6" MINI LOAFPANS				
CHART RECORDER	HONEYWELL	DR-4300	<u>1272</u>		<u>8/5/10</u>	<u>2/10/11</u>



E. A. Report No. 32792-1219727
 Test FLUIDS IMMERSION
 Customer GLENAIR, INC.
 Specimen CABLE SECTIONS (STRANDS)
 P/N 103-051-016
 Q/N 6 SAMPLES



E. A. Report No.	32792-1219727
Test	FLUIDS IMMERSION
Customer	GLENAIR INC
Specimen	CABLE SECTIONS (3BANDS)
P/N	103-051-016
S/N	6 SAMPLES



E. A. Report No.	32792-1219727
Test	FLUIDS IMMERSION
Customer	GLENAIR, INC.
Specimen	CABLE SECTIONS (STRANDS)
P/N	103-051-016
S/N	6 SAMPLES



Environment
Associates

JOB # 32792-1219727

TEST SET UP



IMMERSED SAMPLE IN CHAMBER No.3

4.8.4.3 Test Equipment

See Section 14.4 of ASTM D 3032 for the equipment necessary to perform this test.

4.8.4.4 Test Procedure

See Section 14.7 of ASTM D 3032 for the procedures necessary to perform this test.

4.8.4.5 Results

The results shall be reported in accordance with Section 14.10 of ASTM D 3032.

4.8.4.6 Information Required in the Detail Specification

Number and wire size of specimens to be tested as given in Section 14.5 of ASTM D 3032.

4.8.4.7 Precision Bias

The Precision Bias shall be as stated in Section 14.11 of ASTM D 3032.

4.8.5 Method 805, Thermal Shock Resistance

4.8.5.1 Scope

This test is to be used to evaluate short-term shrinkage or expansion of the finished wire insulation after thermal shock.

4.8.5.2 Specimen *(WHICH THERE IS NONE - TESTED SST BRAID W/ NICKEL PLATED THAT HAS AN OPERATING TEMP. OF -65°C TO 260°C.)*

A 5 ft (1.52 m) length of finished wire shall be used for this test, with a minimum coil diameter of 1 ft (0.305 m). See Section 21.4 of ASTM D 3032.

4.8.5.3 Test Equipment

See Section 21.3 of ASTM D 3032 for the equipment necessary to perform this test.

4.8.5.4 Test Procedures

This test shall be performed in accordance with Section 21.5 of ASTM D 3032 except that the oven temperature shall be the rated temperature of the insulated wire specimen and the low temperature shall be $-55\text{ °C} \pm 3\text{ °C}$ ($-67\text{ °F} \pm 5\text{ °F}$). Also, the exposure time at each temperature shall be 30 min. *(EXCEEDING ALL RANGES)*

4.8.5.5 Results

See Section 21.6 of ASTM D 3032 for the data to be reported. Also, the specimens shall have no flaring of the insulation layers. *(NO DAMAGE TO BRAID)*

4.8.5.6 Information Required in the Detail Specification

Number and wire size of specimens to be tested and temperature rating of the insulated wire. *N/A*

4.8.5.7 Precision Bias

See Section 21.7 of ASTM D 3032. Also see the recommended values in Table 19. *N/A*

TABLE 19 - MAXIMUM RECOMMENDED VALUES

Wire Size	Inches	mm
30 - 12	0.0625	1.6
10 - 8	0.1	2.5
6 - 0000	0.125	3.2