



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 1 of 17

Shielding Effectiveness TEST REPORT

Test Specification : MIL-DTL-83528H
Manufacturer : Specialty Silicone Products, Inc.
Test Samples : SSP 502-40V0
SSP 502-60V0

DOCUMENT HISTORY				
REVISION	ISSUE DATE	AFFECTED PAGE(S)	DESCRIPTION OF MODIFICATIONS	REVISED BY
1.0	July 15, 2020		Initial release	



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 2 of 17

**TEST REPORT NO. 25515
from
D.L.S. Electronic Systems,
Test for Specialty Silicone Products, Inc.**

WRITTEN BY Jereme Irwin	REVIEWED BY Jack Prawica	REVIEWED BY Brian Mattson

TEST PERSONNEL	TITLE
Jereme Irwin	EMC Test Engineer

TEST DATE(S)	July 9-10, 2020
---------------------	-----------------

TEST FACILITY ADDRESS CITY, STATE, ZIP CODE PHONE FAX	D.L.S. Electronic Systems, 1250 Peterson Drive Wheeling, IL. 60090 (847) 537-6400 (847) 537-6488
--	--

This report may be reproduced in full, partial reproduction may only be made with the written consent of the laboratory. The results in this report apply only to the equipment tested.



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

Report No.

25515

Issue Date

July 15, 2020

Revision

1.0

Page

3 of 17

ADMINISTRATIVE SUMMARY

REASON FOR TEST:

To test the Shielding Effectiveness of two material types as specified in MIL-DTL-83528H.

TEST SPECIFICATION:

MIL-DTL 83528H GASKET MATERIAL, CONDUCTIVE, SHIELDING GASKET,
ELECTRONIC, ELASTOMER, EMI/RFI
GENERAL SPECIFICATION

DATE(S) OF TEST:

July 9-10, 2020

TEST SAMPLES:

A total of two unique samples were presented for testing. Refer to Section 2 of this report for a description of each test sample along with the manufacturer's designation.

MANUFACTURER: Specialty Silicone Products, Inc.
3 McCrea Hill Road
Ballston Spa, NY 12020

MANUFACTURERS REPRESENTATIVE:

Dominic Testo

DISPOSITION OF TEST SAMPLE:

Samples will be returned to SSP, Inc.

TEST LOCATION:

D.L.S. Electronic Systems,
1250 Peterson Drive
Wheeling, IL. 60090

TEST PERSONNEL:

Jereme Irwin EMC Test Engineer

SUMMARY OF TEST RESULTS:

Test results can be found under Section 6. The EMP Waveforms and Shielding Effectiveness of the test samples can be found in data sheets located in Appendix C of this report.



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 4 of 17

TABLE OF CONTENTS

ADMINISTRATIVE SUMMARY 3

REASON FOR TEST: 3

TEST SPECIFICATION: 3

DATE(S) OF TEST: 3

TEST SAMPLES: 3

MANUFACTURER: 3

MANUFACTURERS REPRESENTATIVE: 3

DISPOSITION OF TEST SAMPLE: 3

TEST LOCATION: 3

TEST PERSONNEL: 3

SUMMARY OF TEST RESULTS: 3

INTRODUCTION 5

SECTIONS 5

SECTION 1 - CLIENT INFORMATION 5

MANUFACTURER: 5

SECTION 2 - PURPOSE OF TEST 6

SECTION 3 - TEST SAMPLE DESCRIPTION 6

SECTION 4 - TEST SITE; FACILITIES, CONDITIONS AND TOLERANCES 7

SECTION 5 - TEST EQUIPMENT 7

SECTION 6 - SUMMARY OF TEST RESULTS 8

APPENDIX A - TEST EQUIPMENT 9

A.1 SPECIFIC EQUIPMENT USED 9

APPENDIX B - TEST EQUIPMENT 10

B.1 SHIELDING EFFECTIVENESS TEST METHODS 10

APPENDIX C - SUPPLEMENTAL DATA 11



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 5 of 17

INTRODUCTION

This report documents the results of a series of EMI/EMC measurements performed on the test samples described in Section 2 of this report. The purpose of this series of tests was to demonstrate compliance of the test sample(s) with the requirements of the MIL-DTL-83528H Specification for comparison data of one test sample using a MIL-DTL-83528H test fixture.

SECTIONS

SECTION 1 - CLIENT INFORMATION

<i>COMPANY NAME</i> <i>ADDRESS</i> <i>CITY, STATE ZIP</i>	Specialty Silicone Products, Inc. 3 McCrea Hill Road Ballston Spa, NY 12020
<i>CONTACT NAME</i> <i>PHONE</i> <i>EMAIL</i>	Dominic Testo 518-363-5034 dtesto@sspinc.com
<i>MANUFACTURER</i> <i>ADDRESS</i> <i>CITY, STATE ZIP</i>	Specialty Silicone Products, Inc. 3 McCrea Hill Road Ballston Spa, NY 12020



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 6 of 17

SECTION 2 - PURPOSE OF TEST

The purpose of this series of tests was to verify the Shielding Effectiveness of the two ECE samples.

SECTION 3 - TEST SAMPLE DESCRIPTION

The following table provides a list of each type of **Shielding Effectiveness** material tested.

<i>NO.</i>	<i>Material</i>	<i>Batch #</i>
1.	SSP 502-40V0	N/A
2.	SSP 502-60V0	N/A



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 7 of 17

SECTION 4 - TEST SITE; FACILITIES, CONDITIONS AND TOLERANCES

The Shielding Effectiveness measurements were performed through a test fixture designed to the MIL-DTL-83528H test specification. The receive chamber and the control (transmit) chamber meets the applicable requirements of NSA65-6. AC power is supplied to each enclosure from a dedicated isolation transformer through low-pass line filters, which provide a minimum of 120 dB of attenuation from 10 kHz to 10 GHz.

SECTION 5 - TEST EQUIPMENT

A complete test system equipment list is provided in APPENDIX A of this report. The equipment absolute performance calibration, of the equipment requiring calibration, is performed on an as needed basis in accordance with MIL-STD-45662. However, calibration periods do not exceed one (1) year. The test equipment is capable of making measurements within tolerances of at least +/- 2 dB amplitude and +/-2% frequency deviation. Equipment certifications showing traceability to NIST (National Institute of Standards and Technology) are maintained on file at D.L.S. Electronic Systems in Wheeling, IL. All equipment is checked and verified for proper operation before and after each series of tests.



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 8 of 17

SECTION 6 - TEST RESULTS

The following table lists the results for each of the **Shielding Effectiveness** test samples.

<i>NO.</i>	<i>Material</i>	<i>MINIMUM ATTENUATION LEVEL (dB)</i>	<i>BEST-CASE ATTENUATION LEVEL (dB)</i>
1.	SSP 502-40V0	115 @ 20MHz	144 @ 200MHz
2.	SSP 502-60V0	117 @ 20MHz	146 @ 200MHz



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 9 of 17

APPENDIX A - TEST EQUIPMENT

A.1 Specific Equipment Used


TEST INSTRUMENTATION

TABLE 1

Description	Manufacturer	Model Number	Serial Number	Range	Cal On	Cal Due Dates
Antenna, Biconical, 20M-220MHz	Electro-Metrics	BIA-25C	2614	20MHz-300MHz	08/30/2019	08/30/2020
Antenna, Horn, 200M-2GHz	Electro-Metrics	3106	9501-2607	200MHz-2GHz	07/09/2020	07/09/2021
Antenna, Horn, 200M-2GHz	EMCO	3106	2127	200MHz-2GHz	01/17/2020	01/17/2021
Antenna, Horn, 1G-18GHz	ETS-Lindgren	3117	00135193	1GHz-18GHz	07/18/2019	07/18/2020
Antenna, Horn, 1G-18GHz	ETS-Lindgren	3117	00055158	1GHz-18GHz	10/30/2019	10/30/2020
Attenuator, RF, 10dB	JFW Industries	50FH-010-10	012	DC-1GHz	06/02/2020	06/02/2021
Generator, Signal,	Rohde & Schwarz	SML 01	101121	9kHz-1.1GHz	06/22/2020	06/22/2021
Generator, Signal	Rohde & Schwarz	SMR20	100052	1-20GHz	06/24/2020	06/24/2021
Spectrum Analyzer, 44GHz	Agilent Technologies	E4440A	MY46186619	3Hz-26.5GHz	09/13/2019	09/13/2020

TABLE 2

Description	Manufacturer	Model Number	Serial Number	Range
Amplifier, RF, Power, 10K-220M	Amplifier Research	2500LM11	22714	10kHz-220MHz
Amplifier, RF, Power, 80M-1GHz	Amplifier Research	500W1000	309687	80MHz-1000MHz
Antenna, Biconical, 20M-220MHz	EMCO	3109	9803-3163	20MHz-300MHz

 <p style="text-align: center;">Shielding Effectiveness Test Report EMI ECE Gaskets TO MIL-DTL-83528H</p>	<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
	<i>Revision</i> 1.0	<i>Page</i> 10 of 17

APPENDIX B - DESCRIPTION OF TEST METHODS

B.1 – Shielding Effectiveness Test Methods

The shielding effectiveness measurements were made using a spectrum analyzer and a signal generator in conjunction with the appropriate power amplifiers and antennas. The transmitting antenna was located inside of a shielded control chamber located adjacent to the receiving chamber. The test fixture is a 24"x24" opening. References were made with the antennas positioned in horizontal polarity separated by 2 meters for 20-1000MHz and 1 meter for 2-10GHz.

The test levels were then recorded at each frequency and attenuation values were determined by calculating the difference between the reference level and the test level.

Dynamic range is determined by placing a solid plate between the two chambers, measuring the amplitude of each frequency, then subtracting that from the reference level.

Detailed data sheets, which provide the entire shielding effectiveness results across the entire frequency range for each of the five samples, are provided in APPENDIX C of this report. The following information provides a description of the test data sheet information.

All amplitude measurement levels are recorded in dBuV.
Attenuation Levels are recorded in dB.

The data sheets contain the following categories:

- Frequency: Discrete frequency at which measurement was made. Recorded as MHz or GHz.
- Reference Level: Test level with shielding material not in place. This is an amplitude level recorded in dBuV.
- Attenuation: Added attenuation (10dB) to input of receiver when measuring the reference level so not to damage receiver; attenuation removed for testing of gasket. This value is added to the test level.
- Test Level: Measurement made with shielding material in the test fixture. This is an amplitude level recorded in dBuV.
- Shielding Effectiveness: Equal to [Reference Level minus the (Test Level minus the pre-amp)]. The result is in dB units.



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 11 of 17

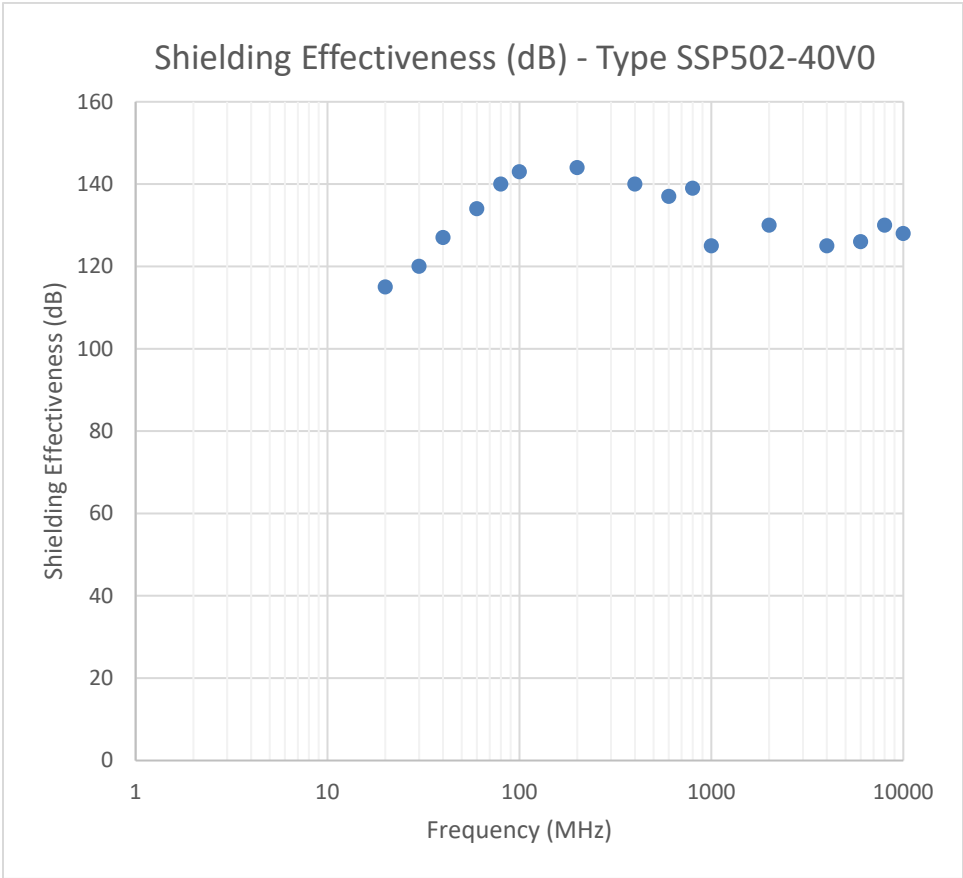
APPENDIX C - Supplemental Data:

Company: Specialty Silicone Products, Inc.				Date: 7/09/20		
Type: SSP 502-40V0						
Frequency MHz	OPEN Amplitude (dBuV)	SOLID PLATE Amplitude (dBuV)	Gasket Amplitude (dBuV)	Signal Generator Setting (dBm)	Shielding Effectiveness (dB)	Dynamic Range (dB)
20	90	-30	-25	-12	115	-120
30	100	-30	-20	-12	120	-130
40	105	-30	-22	-13	127	-135
60	110	-30	-24	-13	134	-140
80	120	-30	-20	-25	140	-150
100	120	-30	-23	-37	143	-150
200	120	-30	-24	-44	144	-150
400	120	-30	-20	-46	140	-150
600	120	-30	-17	-37	137	-150
800	120	-30	-19	-37	139	-150
1000	120	-15	-5	-38	125	-135
2000	120	-15	-10	-38	130	-135
4000	120	-15	-5	-38	125	-135
6000	120	-15	-6	-35	126	-135
8000	120	-15	-10	-35	130	-135
10000	120	-15	-8	-35	128	-135



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 12 of 17





**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

<i>Report No.</i> 25515	<i>Issue Date</i> July 15, 2020
<i>Revision</i> 1.0	<i>Page</i> 13 of 17

Company: Specialty Silicone Products, Inc.				Date: 7/10/20		
Type: SSP 502-60V0						
Frequency MHz	OPEN Amplitude (dBuV)	SOLID PLATE Amplitude (dBuV)	Gasket Amplitude (dBuV)	Signal Generator Setting (dBm)	Shielding Effectiveness (dB)	Dynamic Range (dB)
20	90	-30	-27	-12	117	-120
30	100	-30	-23	-12	123	-130
40	105	-30	-24	-13	129	-135
60	110	-30	-27	-13	137	-140
80	120	-30	-25	-25	145	-150
100	120	-30	-23	-37	143	-150
200	120	-30	-26	-44	146	-150
400	120	-30	-24	-46	144	-150
600	120	-30	-20	-37	140	-150
800	120	-30	-25	-37	145	-150
1000	120	-15	-2	-38	122	-135
2000	120	-15	-4	-38	124	-135
4000	120	-15	-3	-38	123	-135
6000	120	-15	-10	-35	130	-135
8000	120	-15	-11	-35	131	-135
10000	120	-15	-9	-35	129	-135



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

Report No.

25515

Issue Date

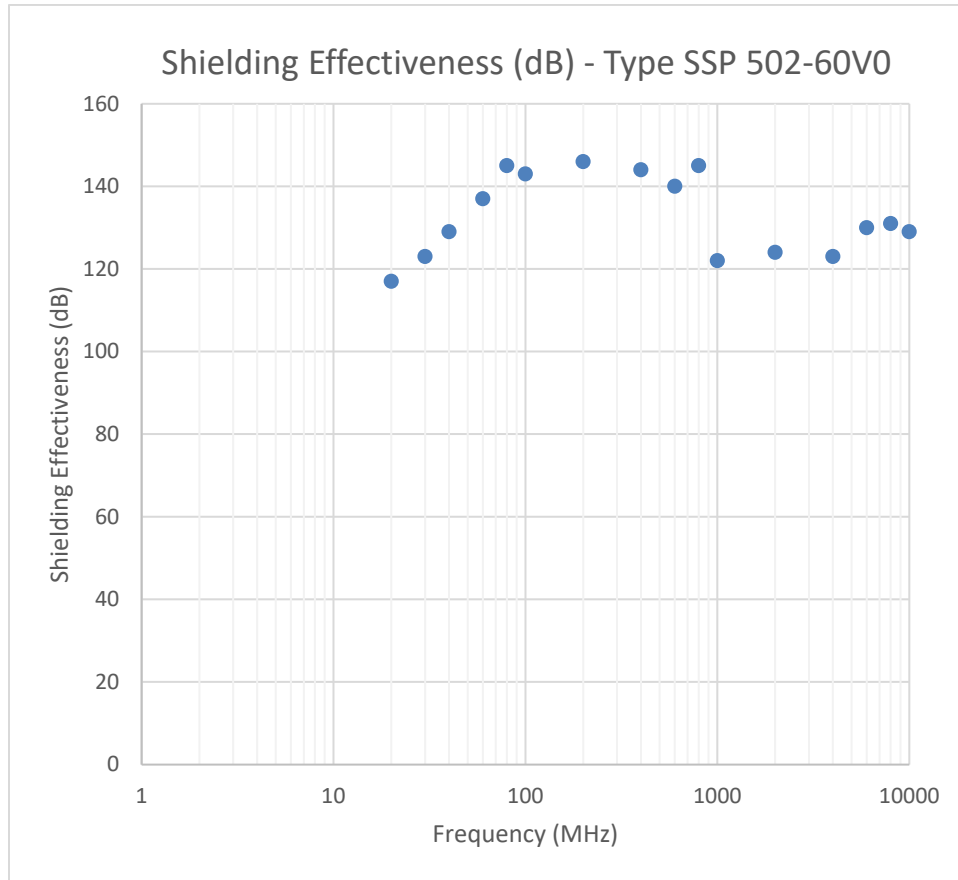
July 15, 2020

Revision

1.0

Page

14 of 17



**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

Report No.

25515

Issue Date

July 15, 2020

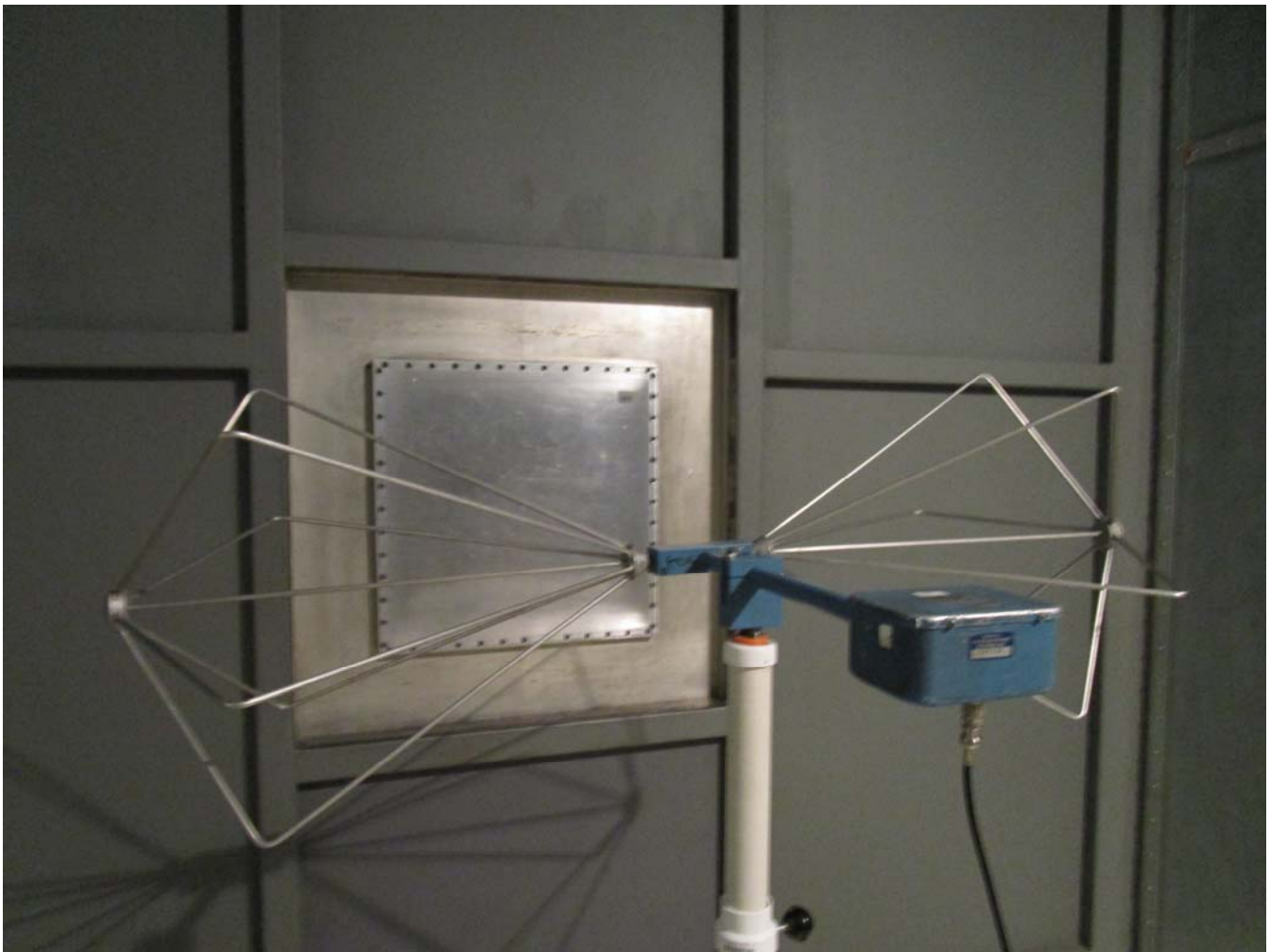
Revision

1.0

Page

15 of 17

Photos:



Shielding Effectiveness 20-100MHz

**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

Report No.

25515

Issue Date

July 15, 2020

Revision

1.0

Page

16 of 17



Shielding Effectiveness 400-800MHz

**Shielding Effectiveness Test Report
EMI ECE Gaskets
TO MIL-DTL-83528H**

Report No.

25515

Issue Date

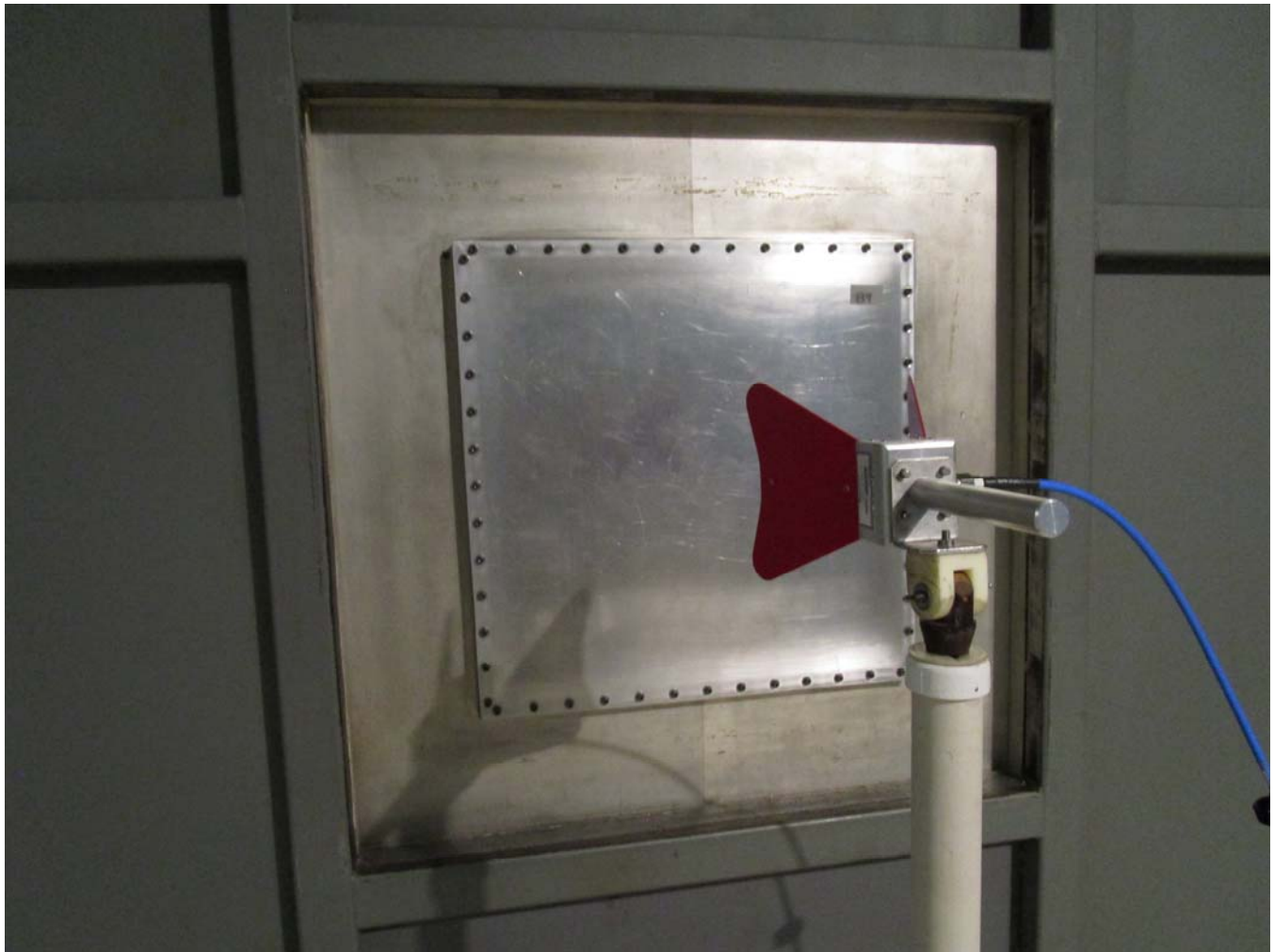
July 15, 2020

Revision

1.0

Page

17 of 17



Shielding Effectiveness 1-10GHz