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E&E

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November 4, 2024

Covertch Fabricating Inc.
Harshpreet Kaur
279 Humberline Drive
Toronto, Ontario
Canada M9W 5T6

Dear Harshpreet Kaur,

Enclosed is the Electromagnetic Compatibility for the Covertch Fabricating Inc., Solid Foil Sheet, tested to the requirements of IEEE-299: 2006 – IEEE Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures.

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, LLC. Please contact me if you have any questions regarding these results or if Eurofins E&E can be of further service to you.

Sincerely,

Michelle Tawmging

Documentation Department
Eurofins Electrical and Electronic Testing NA, LLC

Reference: EMC133864-IEEE Rev. 1



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Report: EMC133864-IEEE Rev. 1

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DOC-EMC TEMP-1 (IEEE 299) 10-7-2021– Rev. 1 - Approved by DOC Manager

Electromagnetic Compatibility Criteria Test Report

for the

**Coverttech Fabricating Inc.
Solid Foil Sheet**

To be evaluated under the Requirements of
IEEE-299

Eurofins Report: EMC133864-IEEE Rev. 1

November 4, 2024

Prepared For:

**Coverttech Fabricating Inc.
279 Humberline Drive
Toronto, Ontario Canada M9W 5T6**

Prepared By:
Eurofins Electrical and Electronic Testing NA, LLC
914 West Patapsco Avenue,
Baltimore, MD 21230

Electromagnetic Compatibility Criteria Test Report

for the

**Coverttech Fabricating Inc.
Solid Foil Sheet**

To be evaluated under the Requirements of
IEEE-299

Eurofins Report: EMC133864-IEEE Rev. 1



Brandon Tracy
EMC Laboratory Engineer



Michael Griffiths
Manager, Electromagnetic Compatibility Lab

A. Overview

Model(s) Tested:	Solid Foil Sheet
Model(s) Covered:	Solid Foil Sheet
EUT Specifications:	Primary Power Tested: N/A
Analysis:	The results obtained relate only to the item(s) tested.
Prepared by:	Michelle Tawmging

B. References

IEEE-299: 2006	Measuring the Effectiveness of Electromagnetic Shielded Enclosures
ISO/IEC 17025: 2017	General Requirements for the Competence of Testing and Calibration Laboratories

A. Shielding Effectiveness Measurement Data

Test Results: Testing was completed by Brandon Tracy on October 8 - 9, 2024
Retesting was completed by Michael Griffiths on October 31, 2024

Environmental Conditions: **Temperature:** 18°C
Relative Humidity: 47%

Test date:	10/8/2024 - 10/9/2024 and 10/31/2024	Customer:	Covertch Fabricating Inc.	Temperature:	18°C
Engineer:	Brandon Tracy / Michael Griffiths	METrak #:	133864	Rel. Humidity:	47%
Specification Yr:	IEEE 299-2006	EUT Name:	Solid Foil Sheet	Setup Photo File Name: Dynamic Range (Various) Test Sample (Various)	
Calibration/Detection System/EUT Setup verified by/Date:	BT 10/8/2024	Mode/Config:	1 Mode/1 Config		
		Pass Date:	Completed 10/9/2024		

Table 1. Shielding Effectiveness Test Information

Frequency (MHz)	Noise Floor Measurement		Direct Measurement (dBm)		Dynamic Range (dB)		RBW	Sig Gen Drive Level (dBm)
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical		
20.00	-111.09	-114.20	-23.48	-19.78	87.61	94.42	1 kHz	20
30.00	-111.00	-112.99	-22.38	-4.16	88.62	108.83	1 kHz	20
100.00	-103.75	-100.62	-1.97	-3.13	101.78	97.49	1 kHz	9.9
200.00	-108.48	-108.63	-5.31	-6.45	103.17	102.18	1 kHz	9.9
400.00	-95.22	-96.88	-2.88	1.31	92.34	98.19	10 kHz	20
800.00	-92.92	-97.42	-2.98	-3.59	89.94	93.83	10 kHz	20
1000.00	-90.17	-96.76	-3.28	-4.35	86.89	92.41	10 kHz	20
2000.00	-76.25	-75.27	12.94	12.69	89.19	87.96	100 kHz	9.9
4000.00	-76.42	-76.44	10.52	10.25	86.94	86.69	100 kHz	9.9
8000.00	-120.29	-120.13	-26.20	-26.42	94.09	93.71	10 Hz	14
10000.00	-119.80	-120.41	-27.47	-27.26	92.33	93.15	10 Hz	14
18000.00	-121.92	-121.11	-35.39	-35.40	86.53	85.71	10 Hz	14
40000.00	-71.01	-71.43	-14.48	-14.85	56.53	56.58	100 kHz	9.9

Table 2. Noise Floor and Direct Measurement Data

Frequency (MHz)	Foil Sheet Wallpaper Measurement (dBm)		Foil Sheet Wallpaper Shielding Effectiveness (dB)		Minimum SE (dB)
	Horizontal	Vertical	Horizontal	Vertical	
20.00	-93.32	-93.32	69.84	73.54	69.84
30.00	-94.47	-95.80	72.09	91.64	72.09
100.00	-83.86	-88.60	81.89	85.47	81.89
200.00	-101.55	-95.95	96.24	89.50	89.50
400.00	-89.82	-87.35	86.94	88.66	86.94
800.00	-94.00	-93.26	91.02	89.67	89.67
1000.00	-85.38	-88.36	82.10	84.01	82.10
2000.00	-75.82	-74.95	88.76	87.64	87.64
4000.00	-76.33	-76.41	86.85	86.66	86.66
8000.00	-118.19	-111.81	91.99	85.39	85.39
10000.00	-119.54	-118.64	92.07	91.38	91.38
18000.00	-120.45	-119.71	85.06	84.31	84.31
40000.00	-70.61	-69.83	56.13	54.98	54.98

Table 3. Shielding Effectiveness Data

Frequency (GHz)	Foil Sheet Wallpaper Shielding Effectiveness Summary		
	Horizontal (dB)	Vertical (dB)	Minimum SE (dB)
0.02	69.84	73.54	69.84
0.03	72.09	91.64	72.09
0.10	81.89	85.47	81.89
0.20	96.24	89.50	89.50
0.40	86.94	88.66	86.94
0.80	91.02	89.67	89.67
1.00	82.10	84.01	82.10
2.00	88.76	87.64	87.64
4.00	86.85	86.66	86.66
8.00	91.99	85.39	85.39
10.00	92.07	91.38	91.38
18.00	85.06	84.31	84.31
40.00	56.13	54.98	54.98

Table 4. Shielding Effectiveness Summary

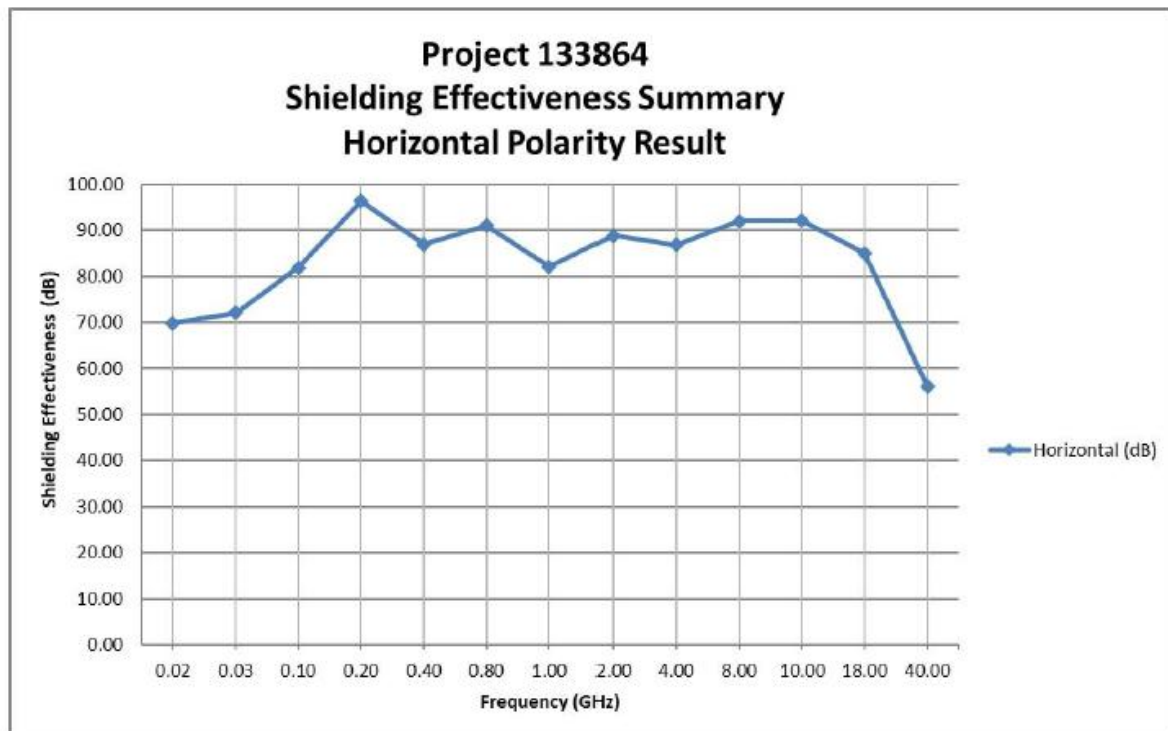


Figure 1. Shielding Effectiveness (Horizontal)

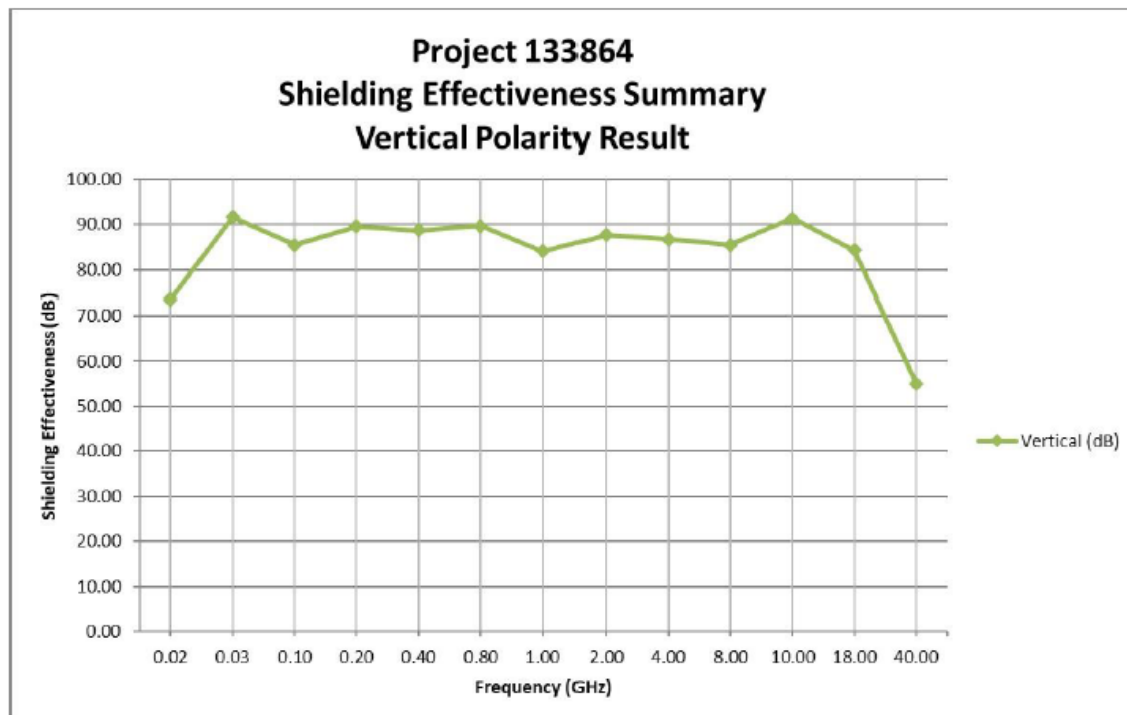


Figure 2. Shielding Effectiveness (Vertical)

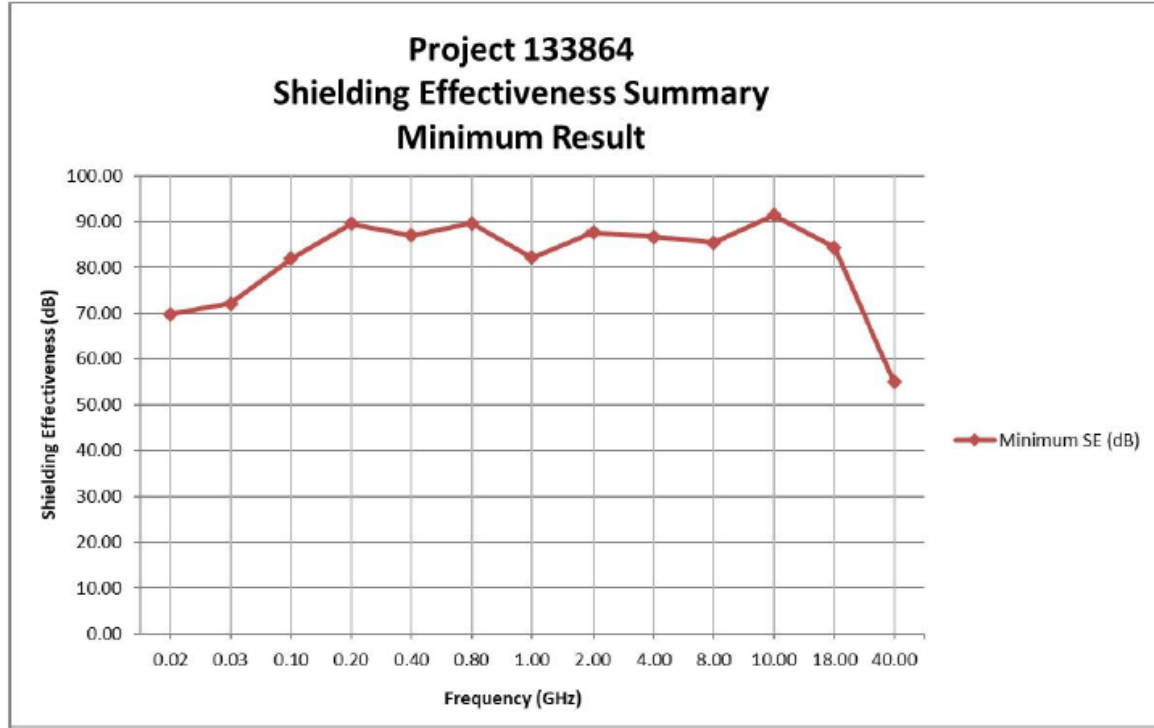


Figure 3. Shielding Effectiveness (Minimum)

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

	Test Date	10/9/2024			
MET #	Equipment	Manufacturer	Model#	Cal Date	Cal Due
1T2658	Antenna, Bicon	EMCO	3109	Functionally Verified	
1T4701	Antenna, Biconical	EMCO	3109	09/18/2024	03/18/2026
1T8372	Log Periodic Antenna	A.H. Systems, Inc.	SAS-517	Functionally Verified	
1T8373	Log Periodic Antenna	A.H. Systems, Inc.	SAS-517	Functionally Verified	
1T4905	Horn Antenna	Com-Power	AH-118	Functionally Verified	
1T2665	Antenna, Horn	EMCO	3115	Functionally Verified	
1T4745	Antenna, Horn	ETS-Lindgren	3116	Functionally Verified	
1T4744	Antenna, Horn	ETS-Lindgren	3116	07/18/2024	01/18/2026
1T4414	Microwave Pre-Amplifier	A.H. Systems, Inc.	PAM-0118	Functionally Verified	
1T4752	Pre-Amplifier	Miteq	JS44-18004000-35-8P	Functionally Verified	
1T4739	Signal Generator	Agilent Technologies	N5183A	10/02/2024	04/30/2026
1T4771	Spectrum Analyzer (PSA)	Agilent Technologies	E4446A	11/02/2023	05/31/2025
1T8804	RF Cable	Megaphase	TM40-K1K1-120	Not Required	
1T8805	RF Cable	Megaphase	TM40-K1K1-120	Not Required	
1T10002	Thermometer/Hygrometer/Barometer	Fisher Scientific	14-650-118	03/06/2024	03/06/2026

Table 5. Shielding Effectiveness Equipment Table

Note: Functionally verified test equipment is verified using calibrated instrumentation at time of testing.