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# TEST REPORT

N°: 13296653-775120-G

Version : 01

<b>Subject</b>	<b>Measurement of electromagnetic shielding effectiveness</b> <b>EN 61000-5-7 (2001)</b>
<b>Issued to</b>	<b>SCHROFF SAS</b> <b>4 rue du Marais</b> <b>67600 BETSCHDORF</b> <b>France</b>
<b>Apparatus under test</b>	
↳ Product	VARISTAR CP
↳ Trade mark	SCHROFF
↳ Manufacturer	nVent / SCHROFF
↳ Model under test	Varistar CP EMC Cabinet
↳ Serial number	CAB 1
<b>Test date</b>	July 25, 2022 to August 1, 2022
<b>Test location</b>	PULVERSHEIM
<b>Composition of document</b>	11 pages
<b>Document issued on</b>	August 12, 2022

**Test operator :**  
Thomas SUTTER  
**Tests operator**

**Approved by :**  
Thomas SUTTER  
**Technical manager**



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**LCIE**

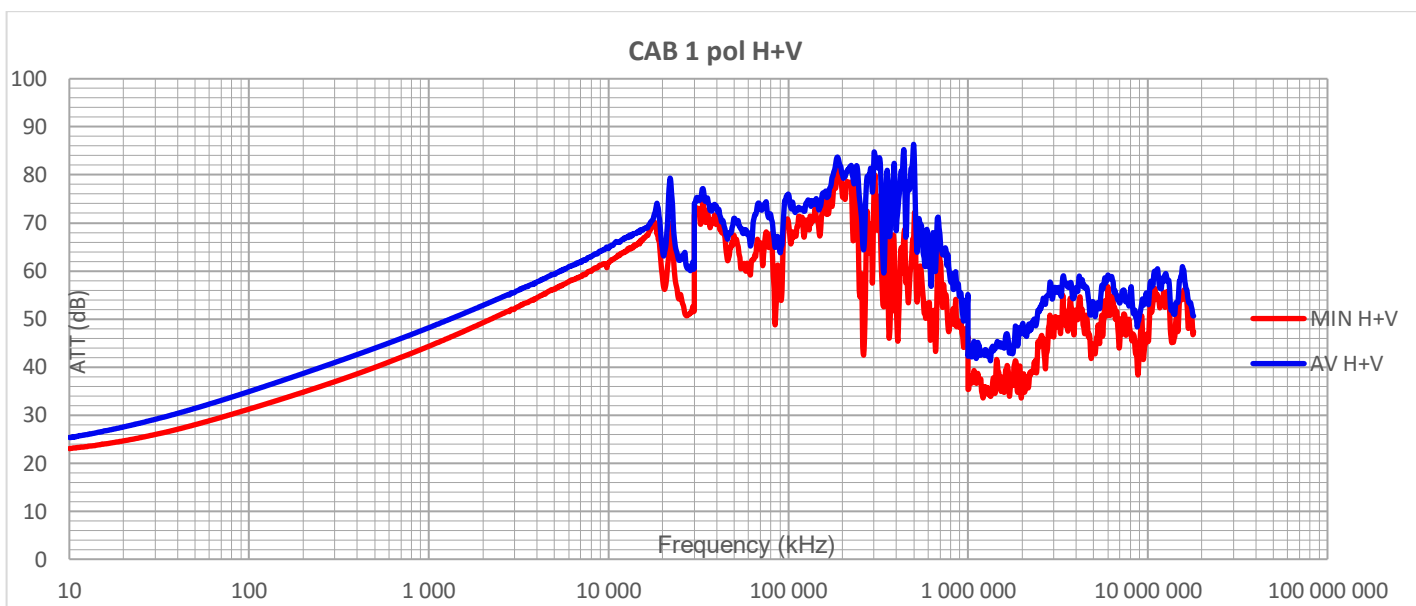
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## PUBLICATION HISTORY

Version	Date	Author	Modification
01	August 12, 2022	Thomas SUTTER	Creation of the document



**Result table (dB)**

F (Hz)	MIN pol H (dB)	MIN pol V (dB)	<b>MIN (dB)</b>	AV pol H (dB)	AV pol V (dB)	<b>AV (dB)</b>
10k 100k	23,0	24,4	<b>23,0</b>	27,2	32,0	<b>29,6</b>
100k 1M	31,3	37,4	<b>31,3</b>	38,3	44,4	<b>41,3</b>
1M 30M	44,4	50,1	<b>44,4</b>	58,3	61,1	<b>59,7</b>
30M 1G	42,5	44,1	<b>42,5</b>	71,9	71,6	<b>71,8</b>
1G 10G	33,6	35,3	<b>33,6</b>	48,7	53,6	<b>51,2</b>
10G 18G	45,1	47,4	<b>45,1</b>	55,9	56,4	<b>56,1</b>

**CAB 1 EM shielding code is : EM23443X**



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## 1. EQUIPMENT UNDER TEST: CONFIGURATION

### 1.1. INFORMATIONS

**Customer:**

Name	Company
Daniel THOMAS	SCHROFF SAS
Christophe MARCINKOWSKI	SCHROFF SAS

### 1.2. HARDWARE IDENTIFICATION (EUT):

**Equipment under test (EUT):**

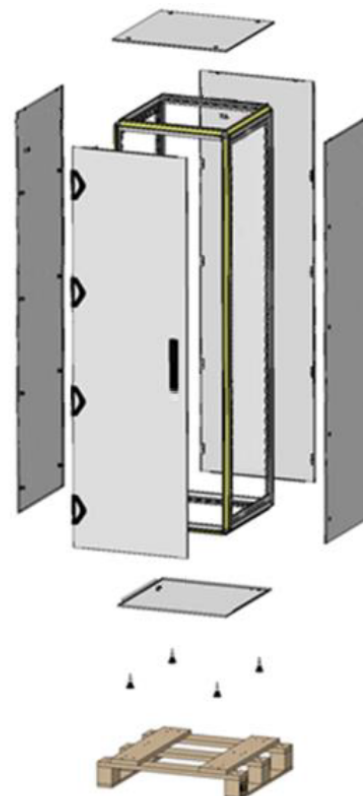
Varistar CP EMC Cabinet

Serial Number: **CAB 1**

## CAB 1 : Varistar CP EMC cabinet

2000H600x600 cabinet as following :

- 20630-099 : Frame 2000H600x600
- 24630-016 : Levelling feet
- 21630-464 : EMC gasket kit
- 21630-474 : Side panels
- 21630-529 : Steel door
- 21630-553 : Rear panel
- 21630-558 : Flat top cover
- 21630-629 : Base plate



Equipment Under Test



## 2. MEASUREMENT

### 2.1. TEST SETUP

The measurements are carried out in a 3 meters half-anechoic chamber.  
The distance between the 2 antennas is 0.5 m for band 1; 3 m for band 2 and 2 m for band 3.

The analysis bands are :  
Band 1 : 10 kHz to 30 MHz      Magnetic field in dB $\mu$ A/m  
Band 2 : 30Hz to 1000 MHz      Electric field in dB $\mu$ V/m  
Band 3 : 1 to 18 GHz      Electric field in dB $\mu$ V/m

The EUT are set on isolating support, 0.15 m over the ground floor.

The frequency step is :      Log n° pts for each frequency band (see table)  
The angular position of the cabinet is :      0° (front of the door)  
Emission antenna high :      1.3 m  
Receiving antenna high :      1.3 m

The shielding effectiveness is measured in Electric field for the frequencies 10 KHz to 18 GHz.

It is equal to (EUT measurements) – (reference)

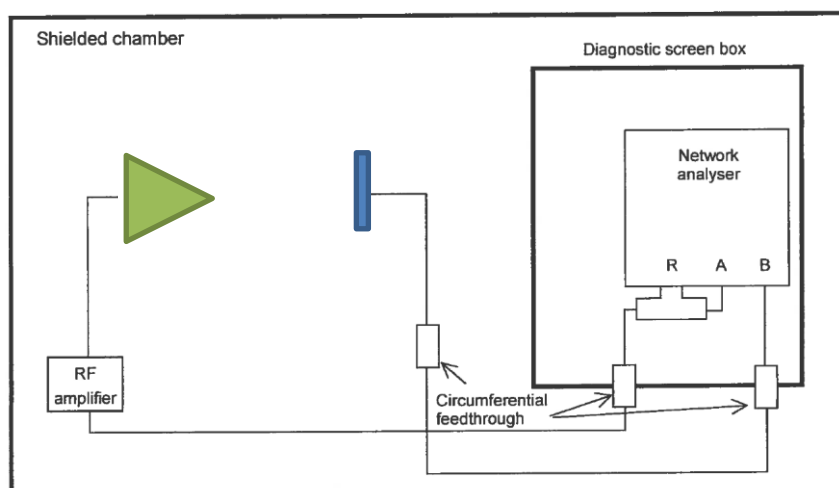
N°	F start	F stop	sweeper	span	N° points	detector	RBW	TX	RX
1	10 kHz	30 MHz	SMY02 : 13 dBm	LOG	801	AV	1 k	Loop 9T 0.3m	6205 0.5 m
2	30 MHz	1000 MHz	SMY02 : 13 dBm	LOG	313	MIN	120 k	PSD	CBL6143
3	1 GHz	18 GHz	HP85630B : 10 dBm -4dBm	LOG	301	RMS	1 M	Horn 3115	Horn 3115

## 2.2. TEST EQUIPMENT LIST

Apparatus	Trade Mark	Type	Registration number	Used in
Semi-Anechoic room	SIEPEL	--	D3044020	All
VNA	R&S	FSU26 B10	A4040063	All
HF sweeper	R&S	SMY02	A5400034	Band 12
HF sweeper	HP	HP85630B	A5400035	Band 3
loop Antenna	LCIE	30 cm / 9t	-	Band 1
loop Antenna	EMCO	6205	C2040159	Band 1
POD	SEIBERSDORFF	PSD	C2040204	Band 2
BILOG antenna	TESEQ	CBL6143	C2040217	Band 2
horn antenna	EMCO	3115	C2042044	Band 3
horn antenna	EMCO	3115	C2042045	Band 3
RF Preamplifier	Mitec	0.01-6 GHz	A7085019	Band 2
RF Preamplifier	Mitec	1-18 GHz	A7085011	Band 3
Cable	POD	N SMA 5 m	C2040204	1 2
Cable	Rohde & Schwarz	N 7m	A5329474	1 2
Cable	brun	SMA 1.5m	A5329954	1 2 3
Cable	Flex	SMA 2m	A5329567	3
Cable	Orange	SMA 2m	A5329567	3
Cable	3.5MD TDINOX	SMA 7m	A5329458	3

## 2.3. TEST METHOD

### 2.3.1. REFERENCE POINT (ZERO)





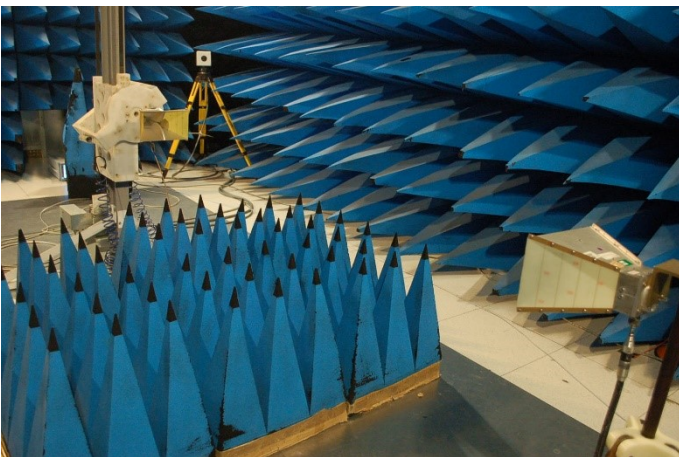
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Band 1 D= 0.5 m

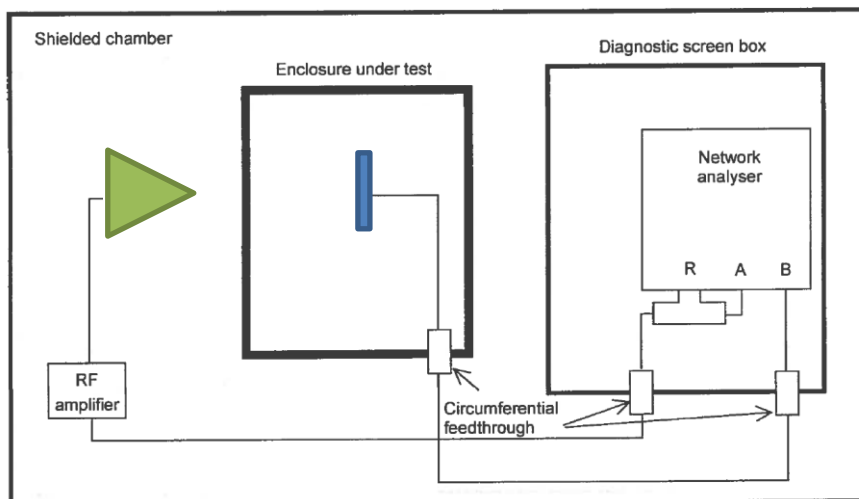


Band 2 D = 3 m



Band 3 D = 2.2 m

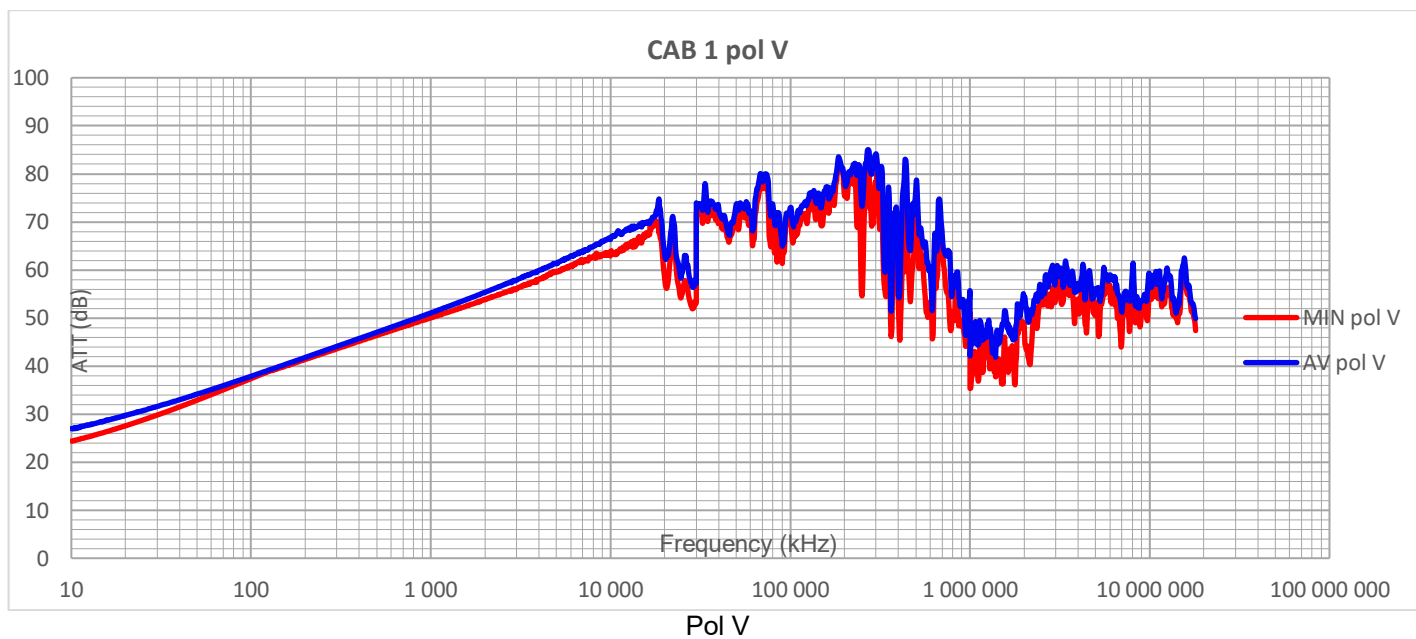
### 2.3.2. ATTENUATION VALUES (EUT effectiveness)



4 sides of the cabinet are tested

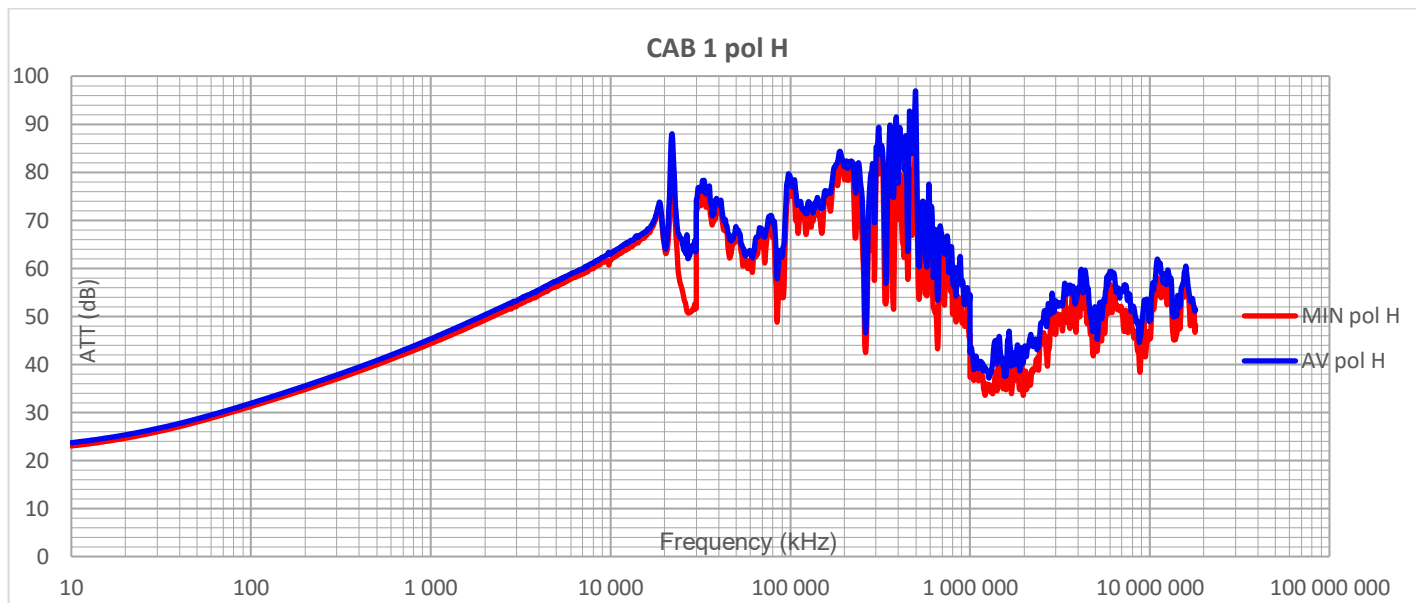


**2.4. TEST RESULTS : POL V**



FREQ (Hz)	CAB 1 MIN V (dB)	CAB 1 AV V (dB)
10k-100k	24,4	32,0
100k-1M	37,4	44,4
1M-30M	50,1	61,1
30M-1000M	44,1	71,6
1G-10G	35,3	53,6
10G-18G	47,4	56,4

**2.5. TEST RESULTS : POL H**



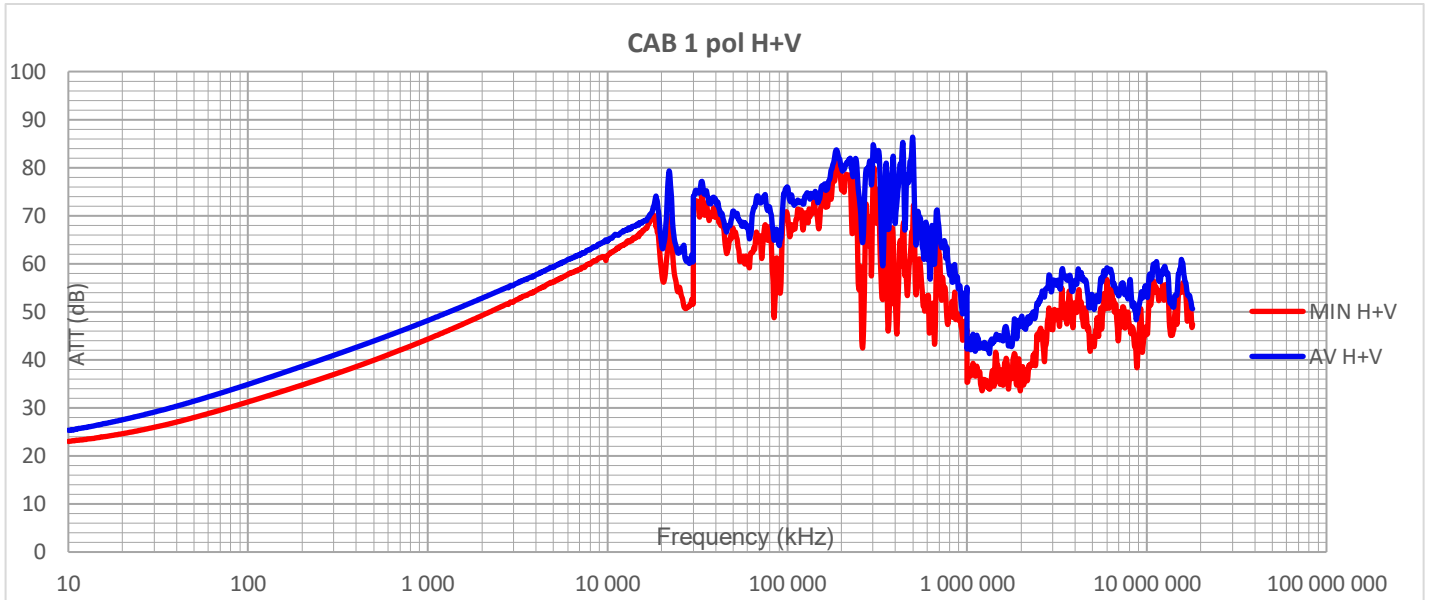
Pol H

FREQ (Hz)	CAB 1 MIN H (dB)	CAB 1 AV H (dB)
10k-100k	23,0	27,2
100k-1M	31,3	38,3
1M-30M	44,4	58,3
30M-1000M	42,5	71,9
1G-10G	33,6	48,7
10G-18G	45,1	55,9



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### 3. CONCLUSION



**Result table (dB)**

F (Hz)	MIN pol H (dB)	MIN pol V (dB)	<b>MIN (dB)</b>	AV pol H (dB)	AV pol V (dB)	<b>AV (dB)</b>
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