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Technical Report No.
713208883 Rev.1
dated
2021-03-31

Client:	nVent Schroff SAS 4 Rue du Marais 67660 Betschdorf / France
Manufacturer and / or location of manufacturing:	see client
Unit under test (UUT):	Varistar CP Onboard Rack / Part No 10630-031
Test specification:	The relevant tests required in the above specification were carried out according to the following listed standards: Vibration test to DIN EN 61373 : 04.2011, Kategorie 1, Klasse B (EN 50155, 4.1.3 / 12.2.11) Vibration test to DIN EN 60068-2-64: 2009Shock test to DIN EN 60068-2-27: 2010
Test scope:	Stress of the UUT according to the under position 3 detailed test specification and check of the condition respectively the functional capability during and after the test.
Test result:	The unit under test was not opened. The visual inspection showed no deficiencies or damages. The presented unit met the requirements of DIN EN 61373: 4.2011, Kategorie 1 Klasse B.

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-11321-02-00

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1 Unit under test (UUT)

The unit under test was a Onboard Rack (1800H x 600W x 400D) with Dummy loads 3U (Total load 120kg). Part-Number : 10630-031.

Parts of the System / Serial-Number : 01/03/2021 / Test Sample REV01

Description	Item Number	Qty
DOOR 1800H 600W IP55 3PTS 7021	25630217300	1,00
HANDLE IP55-CEM	25630318	1,00
IP55 COVER FOR HANDLE	60630166	1,00
DIN CYLINDER INSERT 333	60114121	1,00
UP ROD 1800H	61130198	1,00
BOTTOM ROD 1800H	61130203	1,00
ROD GUIDE A24	61130090	2,00
DOOR BAR PROFILE 600W	33130529	2,00
PROFILE DOOR BAR 1800H	61130193	2,00
SCR FLTHD MAC M 5 X10SN69-Z	65600210	6,00
HINGE MOBILE PART VARISTAR	60130115	3,00
HEX NUT M5 WITH FLANGE	60130441	2,00
EARTHING NUT M5	60130890	1,00
WELD. FRAME 1800H600X400 RAILWAY 7021	20630264300	1,00
CORNER BUTTED HF	60130026	8,00
GASKET IP55 EN45545-2	60130057	16,00
NUT M5 LONG	60130924	12,00
DEPHT MEMBER 400 CP	30630399	4,00
SCREW TAPTITE M6X10+NOMELWASH.	60130008	16,00
PANEL MOUNT 19" 1800H	30130287	4,00
SCREW TAPTITE M6X10+NOMELWASH.	60130008	32,00
SLIDE RAIL 400	30130461	24,00
SCREW TAPTITE M6X10+NOMELWASH.	60130008	48,00
TOPCOVER 600W400D IP55	25630317300	1,00
HIGH FIXING BAR 600W 7021	30630363300	1,00
EYE,LIFTING,PLT,M12 PLT	50612100	4,00
WASHER D12D30 EP3 PA6 BLACK	60630099	4,00
BOTTOM PLATE 600W400D IP55	25630321300	1,00
SCREW COUNTER.HEAD.TAPT.M6X12	60130013	4,00
SCREW COUNTER.HEAD.TAPT.M6X12	60130013	4,00
FIXED HINGE FOR LEFT HINGED DOOR	6063007301	3,00
SCREW COUNTER.HEAD.TAPT.M6X12	60130013	6,00
R/P 1800H600W IP55	25630204300	1,00
BRACKET REAR PANEL 600 IP55 RAL7021	30630365300	1,00
REAR PANEL FIXATION BRACKET	31130586	6,00
SCREW COUNTER.HEAD.TAPT.M6X12	60130013	6,00
SCREW M5X18 BLACK TORX30	60630162	6,00
SIDE PANEL 1800H400D IP55	25630316300	1,00
SIDE PANEL 1800H400D IP55	25630316300	1,00
SIDE PANEL BRACKET 400	30630403300	2,00
SCREW M5X18 BLACK TORX30	60130009	12,00

The UUT was mounted on a fixture supplied by the customer.

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2 Order

2.1 Date of order, client

Company nVent-Schroff SAS orders from TÜV SÜD Product Service GmbH with order sheet dated 18.02.2021 order No. 4502451117 to test a.m. UUT.

2.2 Receipt of UUT

The sample was delivered by forwarding agent on 12.03.2021.

2.3 Reconsignment of UUT

The sample was sent back by forwarding agent on 22.03.2021.

3 Test specification

3.1 Vertical direction

3.1.1 Vibration test random 1 / Initial measurement

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,964 $(m/s^2)^2/Hz$
	20 Hz	0,964 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,018 $(m/s^2)^2/Hz$
Acceleration:	5,72 m/s^2_{rms}	
Test duration:	5min	

3.1.2 Vibration test random 2 / simulated long-life testing

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,964 $(m/s^2)^2/Hz$
	20 Hz	0,964 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,018 $(m/s^2)^2/Hz$
Acceleration:	5,72 m/s^2_{rms}	
Test duration:	5h	

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3.1.3 Shock test 1

Type of shock:	halfsine
Acceleration:	30 m/s^2
Shock duration:	30 ms
Number of Shocks	3 each direction

3.1.4 Vibration test random 3 / functional test

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,0301 $(m/s^2)^2/Hz$
	20 Hz	0,0301 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,00546 $(m/s^2)^2/Hz$
Acceleration:	1,01 m/s^2_{rms}	
Test duration:	10min	

3.1.5 Vibration test random 4 / final measurement

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,964 $(m/s^2)^2/Hz$
	20 Hz	0,964 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,018 $(m/s^2)^2/Hz$
Acceleration:	5,72 m/s^2_{rms}	
Test duration:	5min	

3.2 Horizontal direction / longitudinal and transversal

3.2.1 Vibration test random 5 / Initial measurement

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,461 $(m/s^2)^2/Hz$
	20 Hz	0,461 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,00867 $(m/s^2)^2/Hz$
Acceleration:	3,96 m/s^2_{rms}	
Test duration:	5min	

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3.2.2 Vibration test random 6 / simulated long-life testing

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,461 $(m/s^2)^2/Hz$
	20 Hz	0,461 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,00867 $(m/s^2)^2/Hz$
Acceleration:	3,96 m/s^2_{rms}	
Test duration:	5h	

3.2.3 Shock test 2

Type of shock:	halfsine
Acceleration:	50 m/s^2
Shock duration:	30 ms
Number of Shocks	3 each direction

3.2.4 Vibration test random 7 / functional test

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,0144 $(m/s^2)^2/Hz$
	20 Hz	0,0144 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,000271 $(m/s^2)^2/Hz$
Acceleration:	0,7 m/s^2_{rms}	
Test duration:	10min	

3.2.5 Vibration test random 8 / final measurement

Frequency range:	5 Hz to 150 Hz	
Spectral acceleration density:	5 Hz	0,461 $(m/s^2)^2/Hz$
	20 Hz	0,461 $(m/s^2)^2/Hz$ / -6dB/Oct
	150 Hz	0,00867 $(m/s^2)^2/Hz$
Acceleration:	3,96 m/s^2_{rms}	
Test duration:	5min	

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4 Test equipment

Equipment	Type	Ser. No.	Manufacturer	Calibrated until
Shaker S4	V9-440 HPT 1500 CSP	182/11	Ling Dynamic Systems	—
Vibration control system 7M Ch.1 - 4	VR 9500	95262D85	Vibration Research	08/2021
Vibration control system 8S Ch.5 - 8	VR 9500	95261089	Corporation	08/2021
Accelerometer	4526	30080; 07-10/10-08-014	Brüel & Kjaer	01/2023
Accelerometer	4526	30079; 07-10/10-08-013	Brüel & Kjaer	01/2023
Accelerometer	4526	30082; 07-10/10-09-016	Brüel & Kjaer	01/2023

All measuring equipment is calibrated regularly according the calibration instructions of TÜV SÜD PRODUCT SERVICE GmbH. All calibrations are traced back to national standards.

5 Test sequence

Test date: from 15.03.-18.03.2021

No.	Test specification	Run	Axis	Notes
1	Vibration, random 1	2111-01	vertical	Initial measurement
2	Vibration, random 2	2111-02		simulated long-life testing. No deficiencies or damages detected.
3	Shock 1	2111-03		mechanical shock No deficiencies or damages detected.
4	Vibration, random 3	2111-04		functional test
5	Vibration, random 4	2111-05		final measurement

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No.	Test specification	Run	Axis	Notes
6	Vibration, random 5	2111-06	transversal	Initial measurement
7	Vibration, random 6	2111-07		simulated long-life testing. No deficiencies or damages detected.
8	Shock 2	2111-08		mechanical shock No deficiencies or damages detected.
9	Vibration, random 7	2111-09		functional test
10	Vibration, random 8	2111-10		final measurement
11	Vibration, random 5	2111-11	longitudinal	Initial measurement
12	Vibration, random 6	2111-12		simulated long-life testing. No deficiencies or damages detected.
13	Shock 1	2111-13		mechanical shock No deficiencies or damages detected.
14	Vibration, random 7	2111-14		functional test
15	Vibration, random 8	2111-15		final measurement

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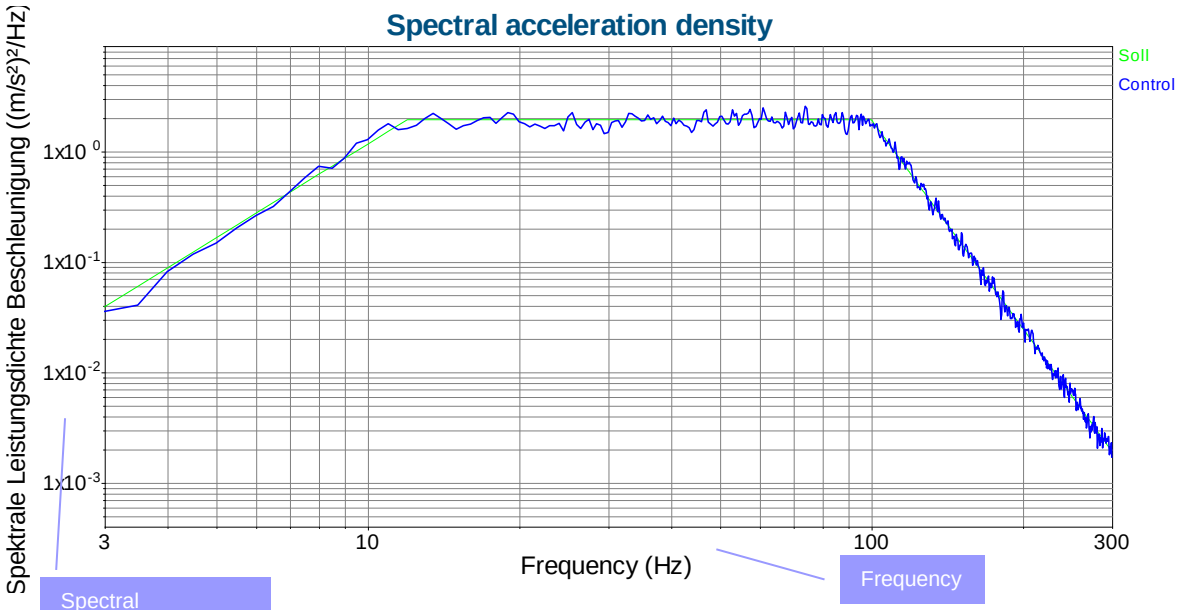
6 Legend of measuring diagrams

6.1 Vibration test, random



Test level schedule:

	Duration	Level	
1)	0:00:30	-6 dB	
2)	0:00:15	-3 dB	(MD)
3)	0:10:00	100 %	(MD)

Measurements:

Demand: 127,8 m/s² RMS	6,32 mm pk-pk
Control: 127,2 m/s² RMS	6,501 mm pk-pk

Measured value (m/s² RMS)

Reference value (m/s² RMS)

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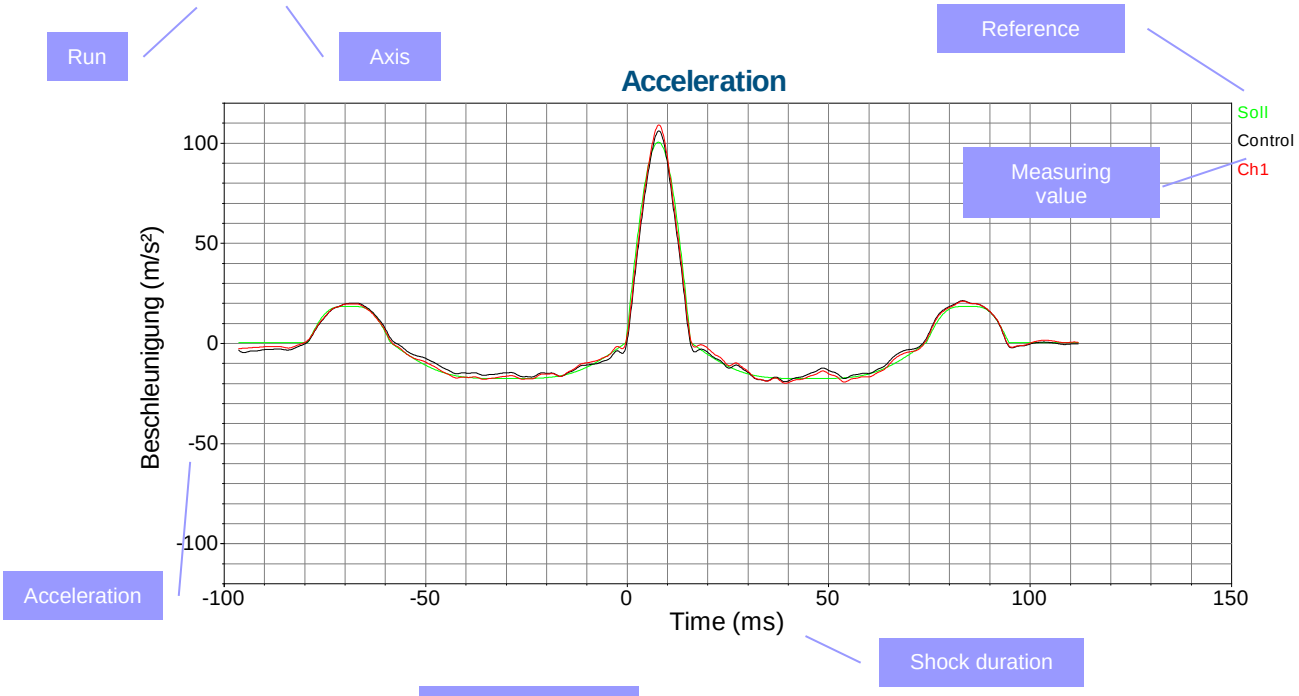
6.2 Shock test

Customer: Mustermann
Job#: 1816-5 / X-Achse / DUT



Number of shocks

Test level schedule:

Pulses	**Level**
10	100 %

Note: Before applying the test shocks several reference shocks of a lower level (-9/-6/-3 dB) were applied as equipment test. This explains the different number of shocks in the measuring diagrams.

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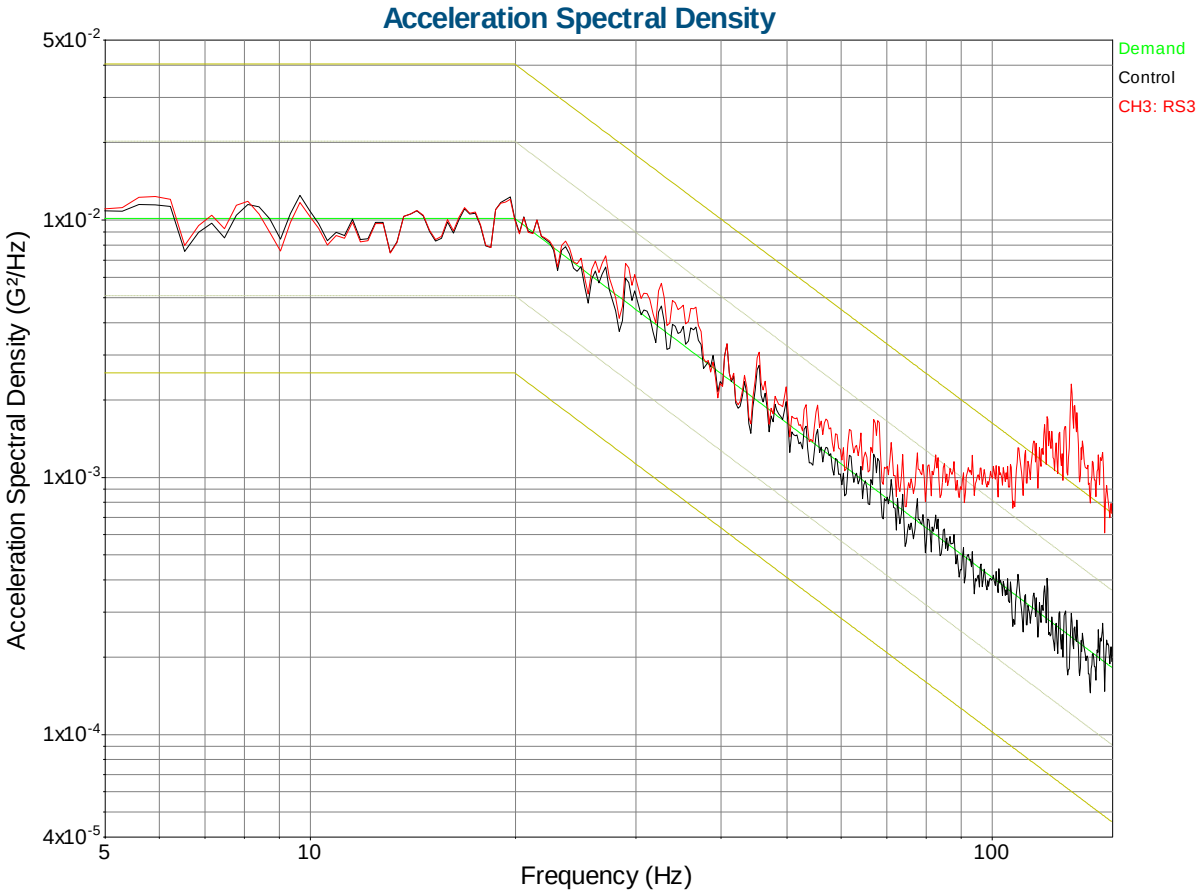
7 Test documentation

7.1 Measuring diagrams of the vibration test, random

Run 2111-01 / vertical-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	0:05:20	100 %	(MD)

Measurements:

Demand: 0,572 G RMS	8,059 mm pk-pk
Control: 0,5716 G RMS	8,995 mm pk-pk

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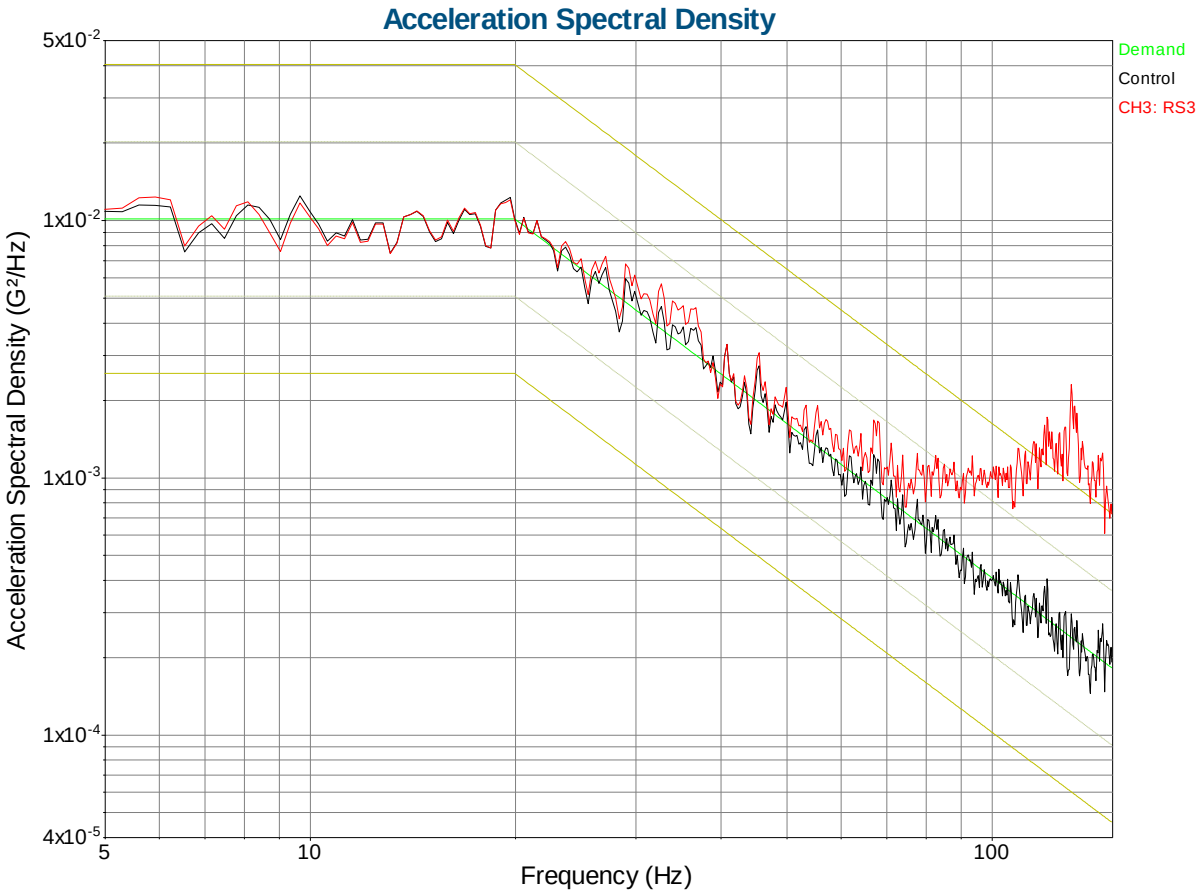
Run 2111-02 / vertical-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	5:00:00	100 %	(MD)

Measurements:

Demand: 0,572 G RMS	8,059 mm pk-pk
Control: 0,5716 G RMS	8,995 mm pk-pk

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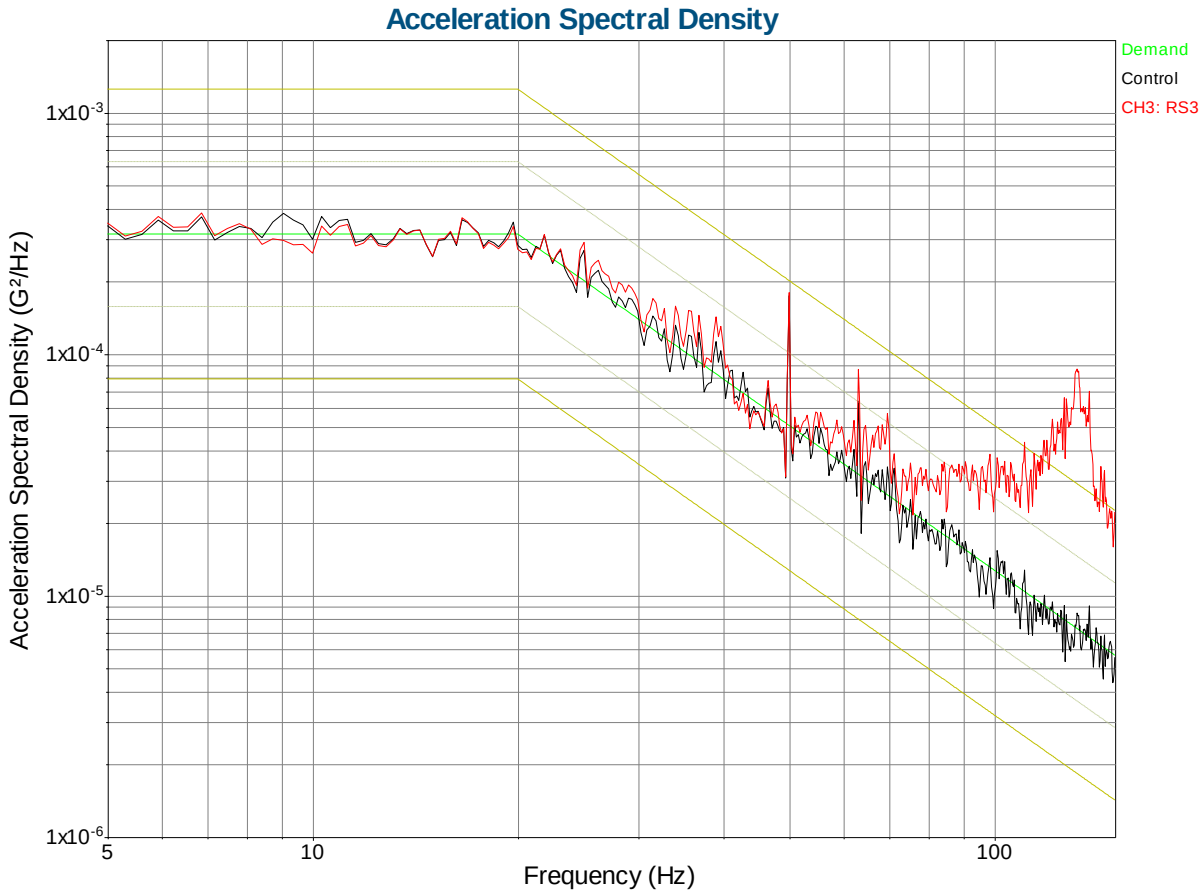
Run 2111-04 / vertical-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-3 dB	(MD)
3)	0:10:00	100 %	(MD)

Measurements:

Demand: 0,101 G RMS	1,423 mm pk-pk
Control: 0,1021 G RMS	1,636 mm pk-pk

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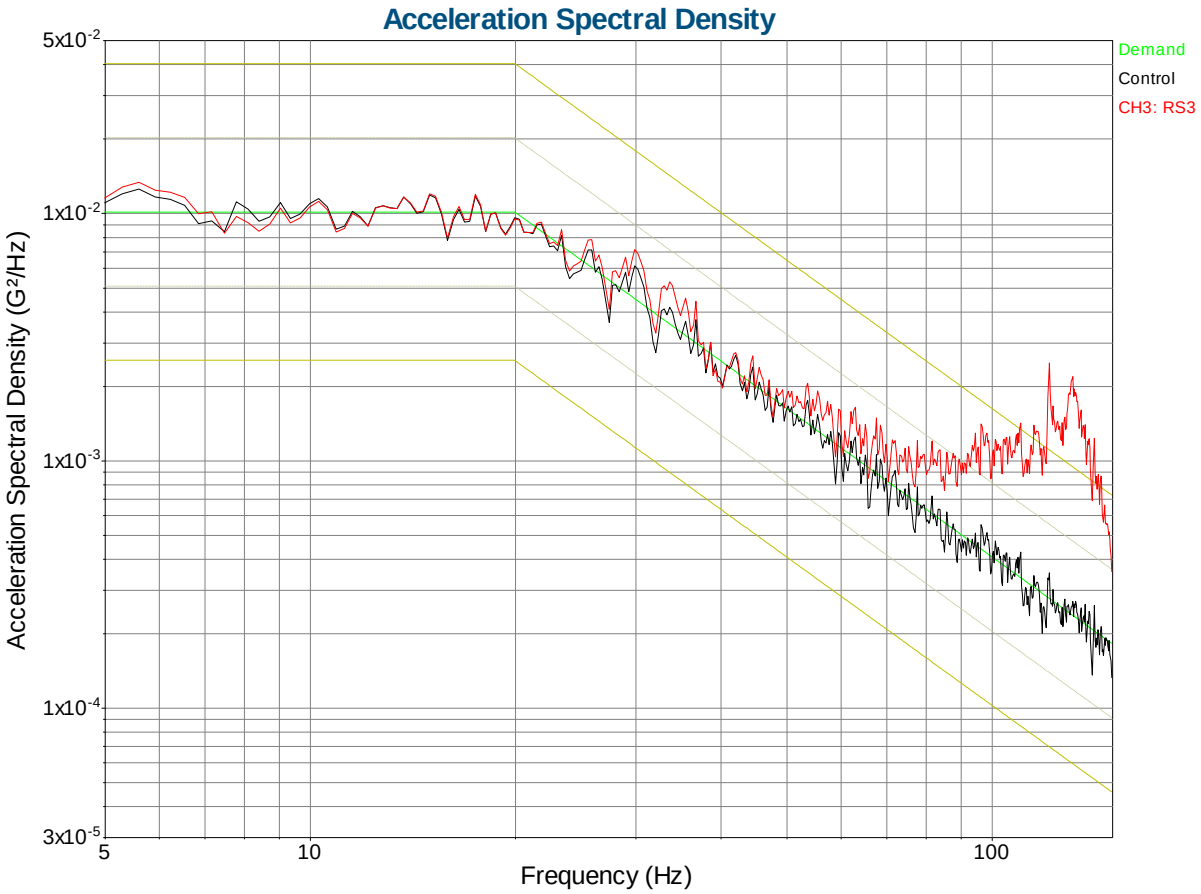
Run 2111-05 / vertical-Axis



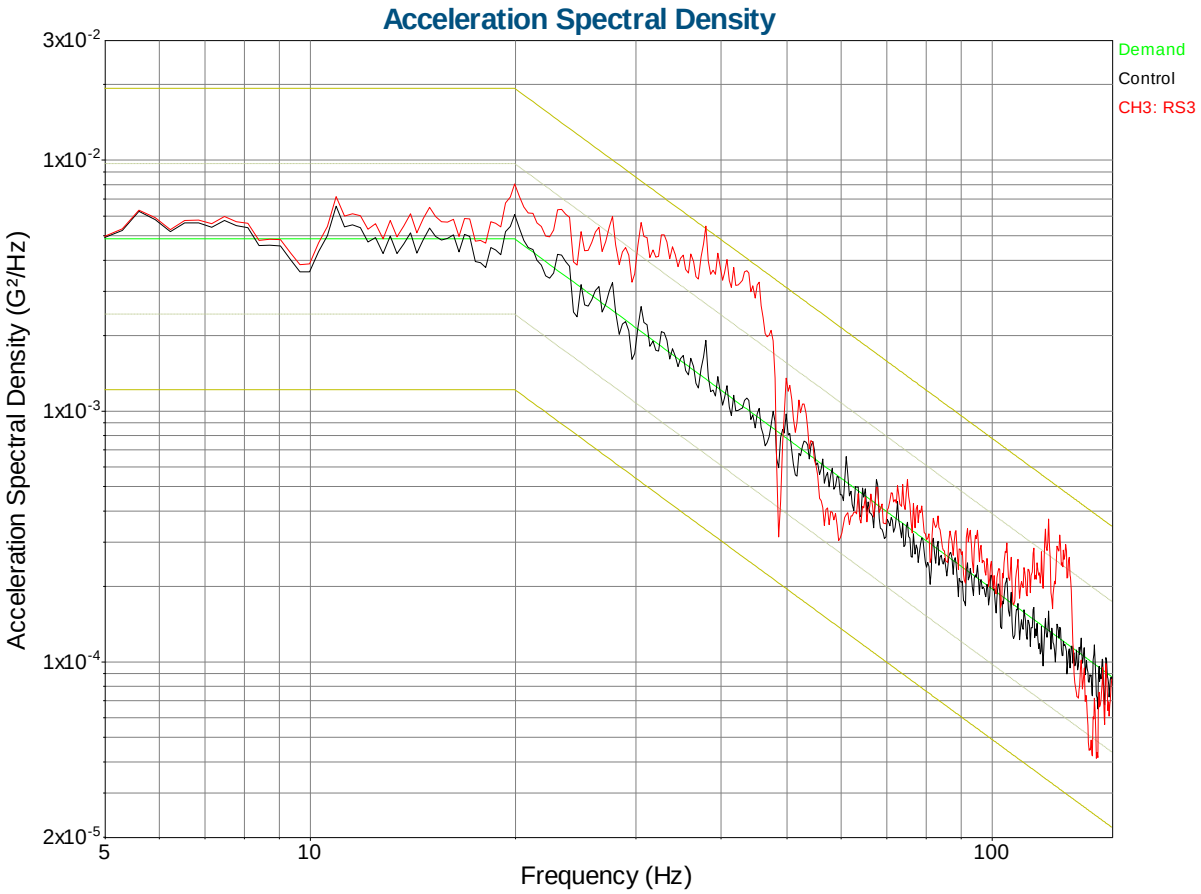
Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	0:05:00	100 %	(MD)

Measurements:

Demand: 0,572 G RMS	8,059 mm pk-pk
Control: 0,5717 G RMS	9,294 mm pk-pk

Run 2111-06 / transversal-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	0:05:00	100 %	(MD)

Measurements:

Demand: 0,396 G RMS	5,579 mm pk-pk
Control: 0,3965 G RMS	6,444 mm pk-pk

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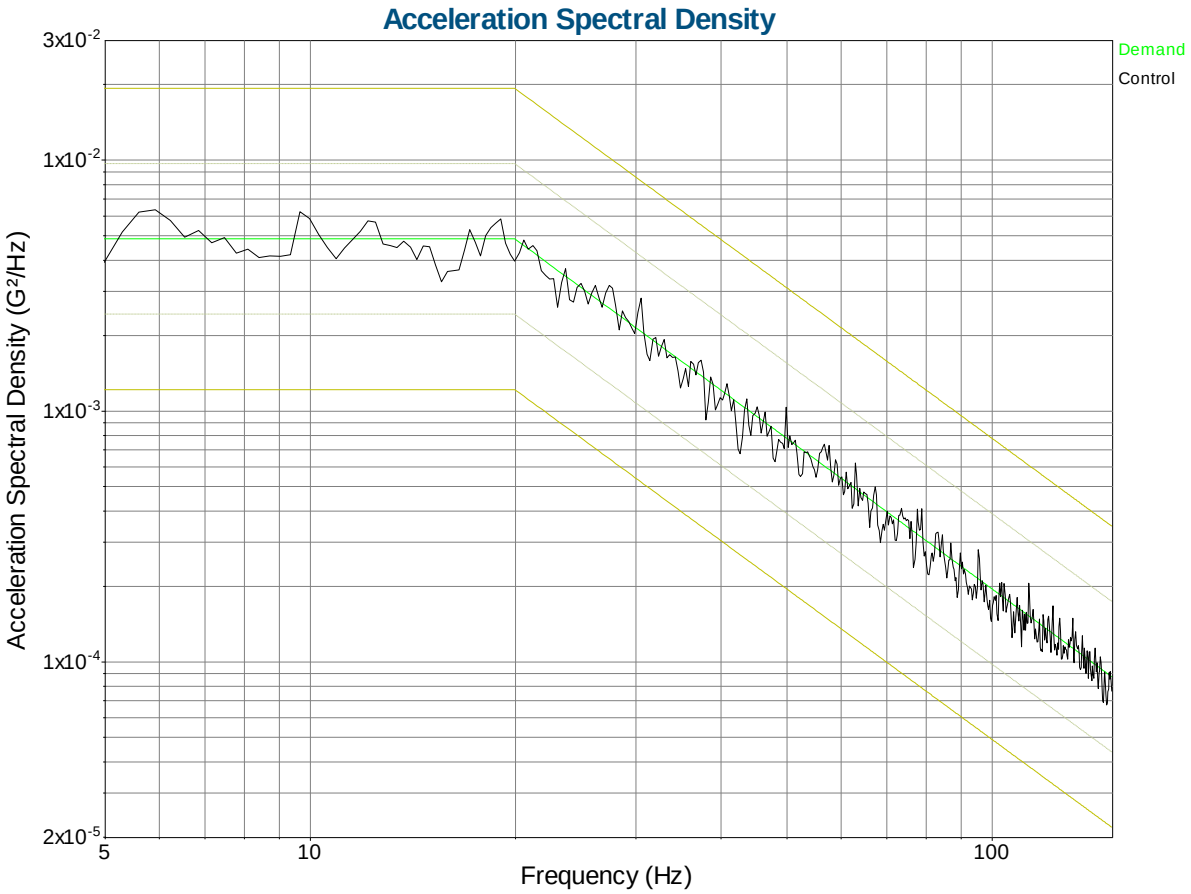
Run 2111-07 / transversal-Axis



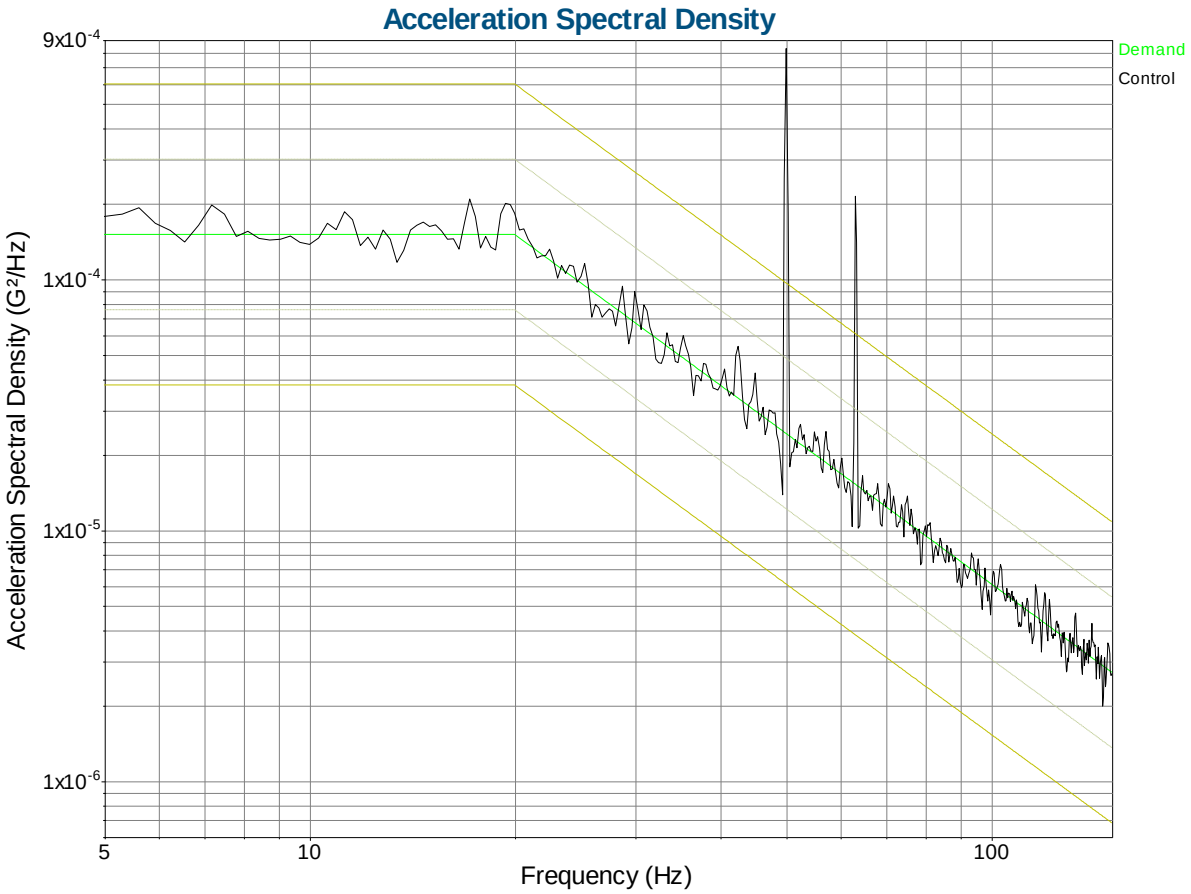
Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	5:00:00	100 %	(MD)

Measurements:

Demand: 0,396 G RMS	5,579 mm pk-pk
Control: 0,3911 G RMS	6,17 mm pk-pk

Run 2111-09 / transversal-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-3 dB	(MD)
3)	0:10:00	100 %	(MD)

Measurements:

Demand: 0,07001 G RMS	0,9862 mm pk-pk
Control: 0,07458 G RMS	1,146 mm pk-pk

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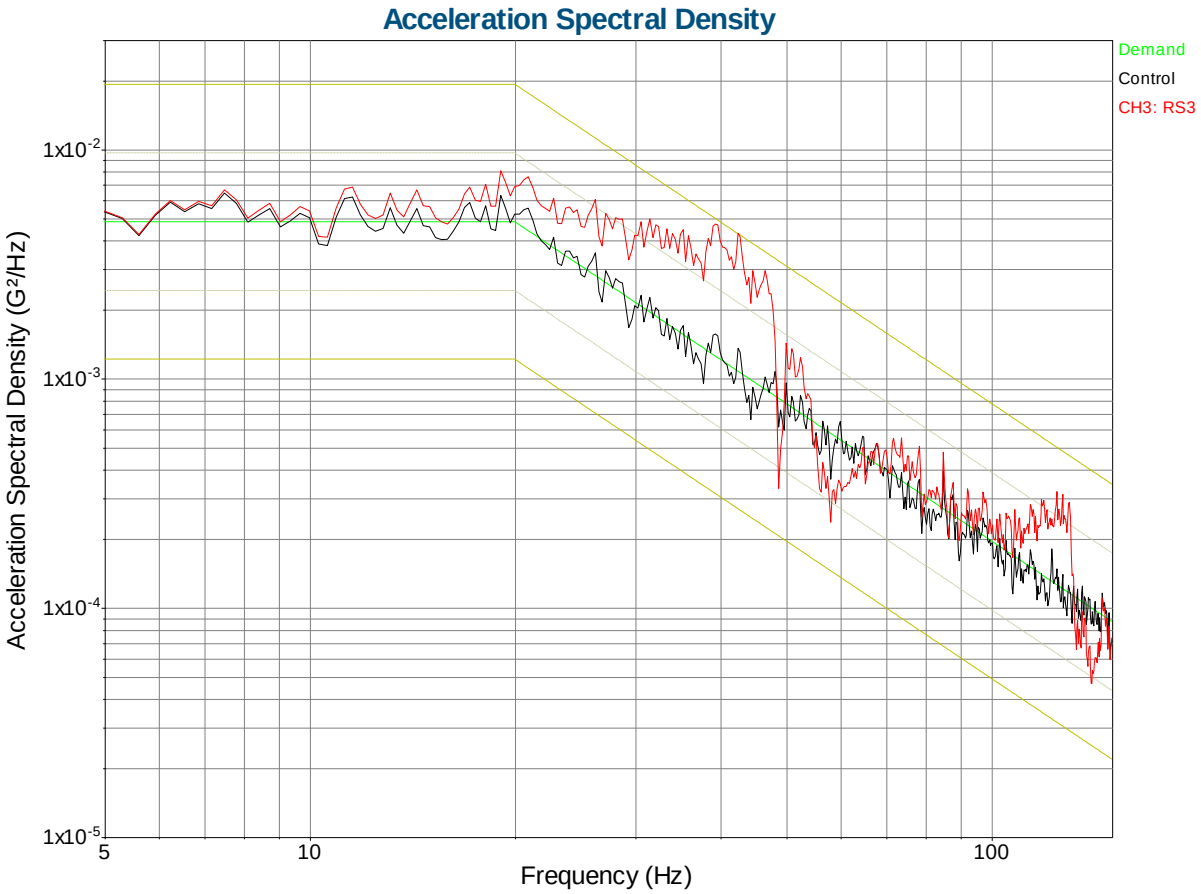
Run 2111-10 / transversal-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	0:05:00	100 %	(MD)

Measurements:

Demand: 0,396 G RMS	5,579 mm pk-pk
Control: 0,4002 G RMS	6,306 mm pk-pk

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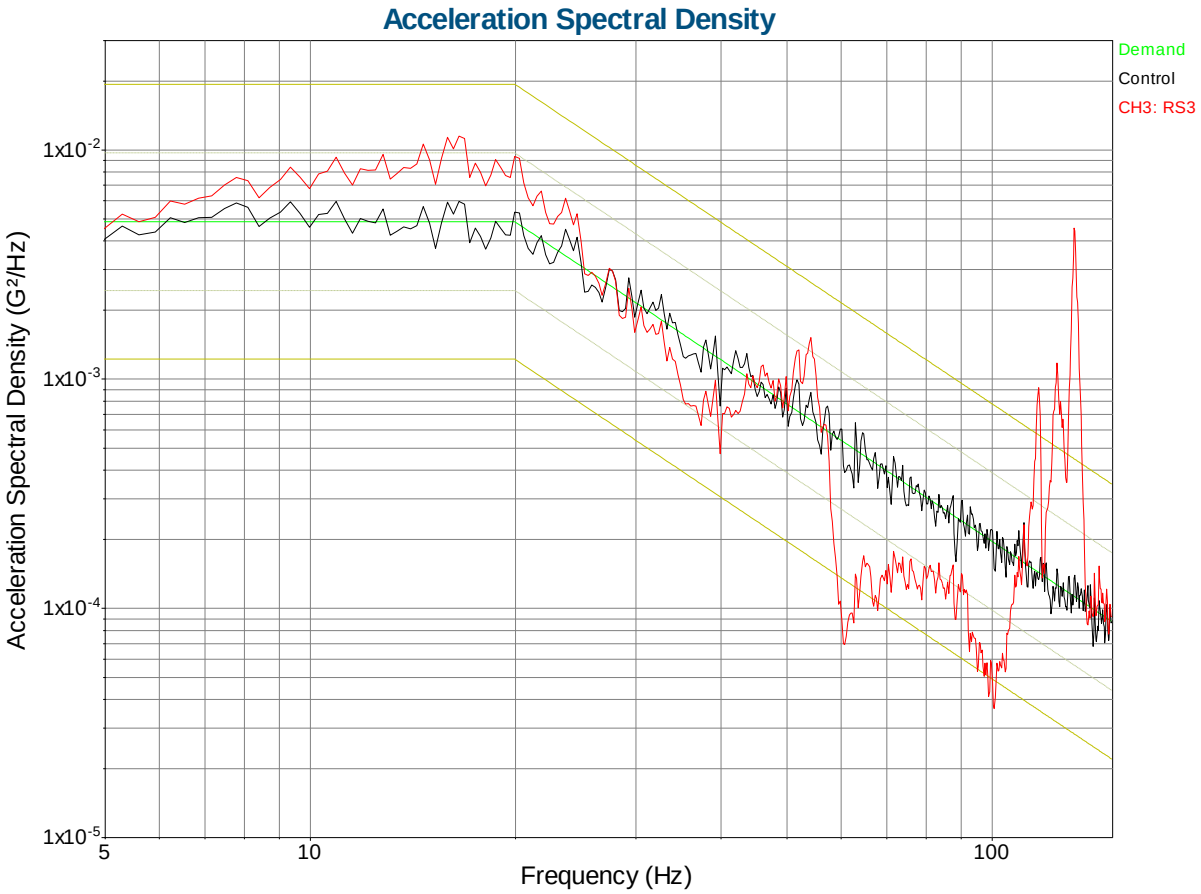
Run 2111-11 / longitudinal-Axis



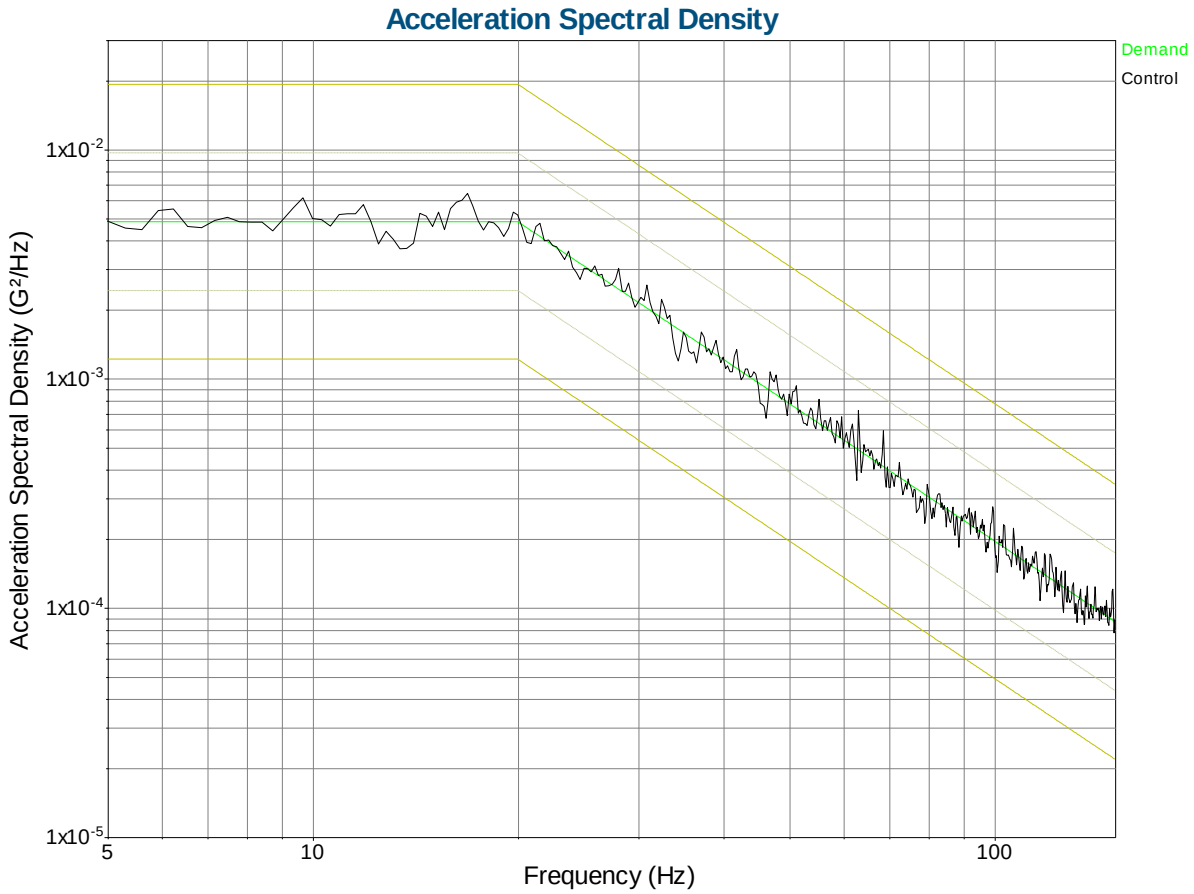
Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	0:05:00	100 %	(MD)

Measurements:

Demand: 0,396 G RMS	5,579 mm pk-pk
Control: 0,397 G RMS	6,276 mm pk-pk

Run 2111-12 / longitudinal-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	5:00:00	100 %	(MD)

Measurements:

Demand: 0,396 G RMS	5,579 mm pk-pk
Control: 0,3989 G RMS	6,216 mm pk-pk

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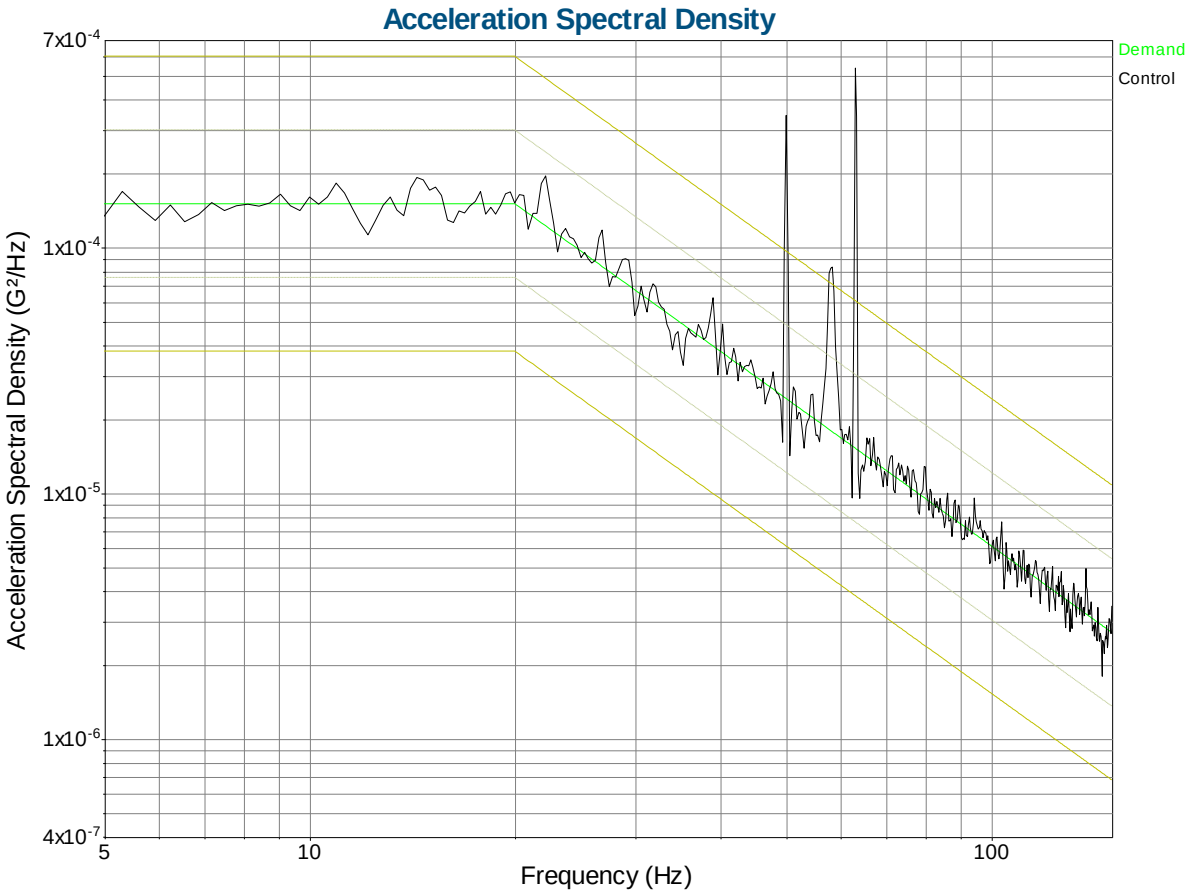
Run 2111-14 / longitudinal-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-3 dB	(MD)
3)	0:10:00	100 %	(MD)

Measurements:

Demand: 0,07001 G RMS	0,9862 mm pk-pk
Control: 0,07449 G RMS	1,1 mm pk-pk

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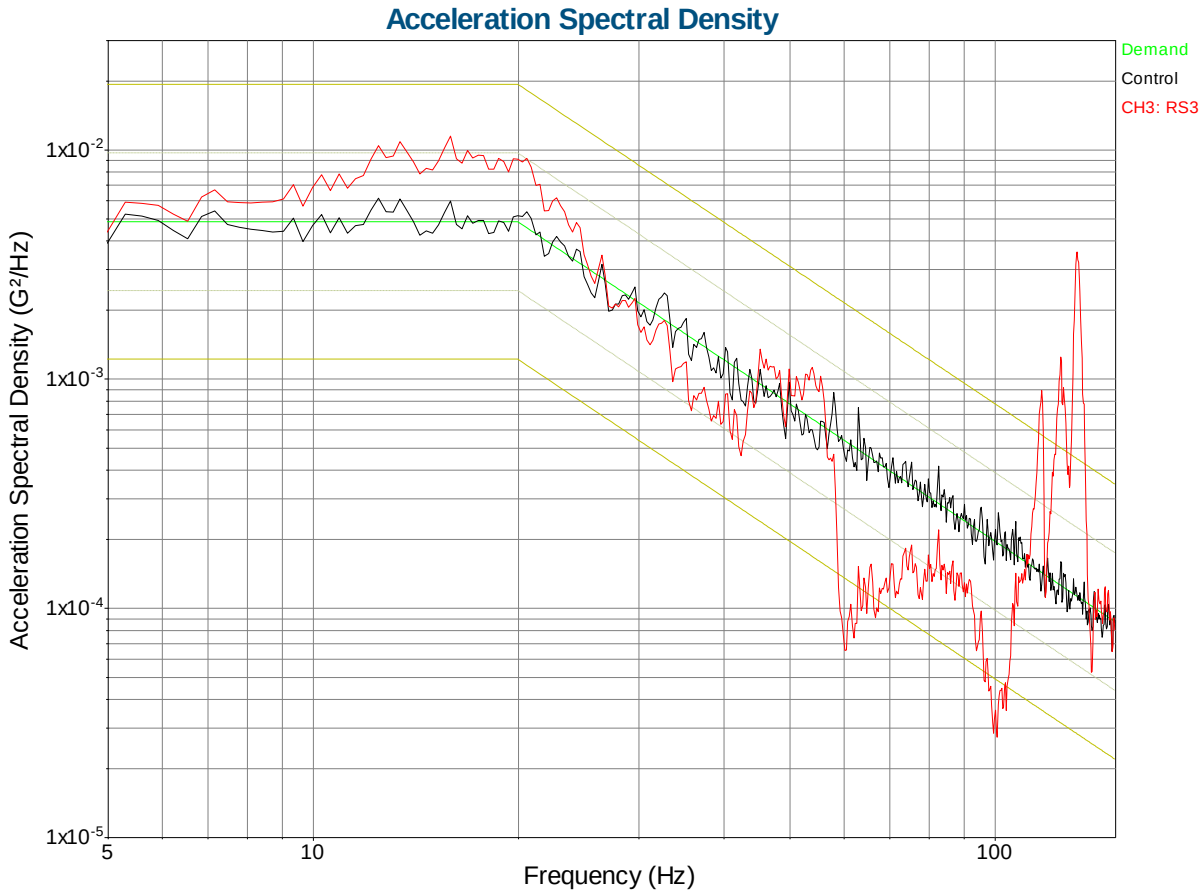
Run 2111-15 / longitudinal-Axis



Test level schedule:

	Duration	Level	
1)	0:00:20	Pause	
2)	0:00:20	-6 dB	
3)	0:00:20	-3 dB	(MD)
4)	0:05:00	100 %	(MD)

Measurements:

Demand: 0,396 G RMS	5,579 mm pk-pk
Control: 0,3955 G RMS	6,007 mm pk-pk

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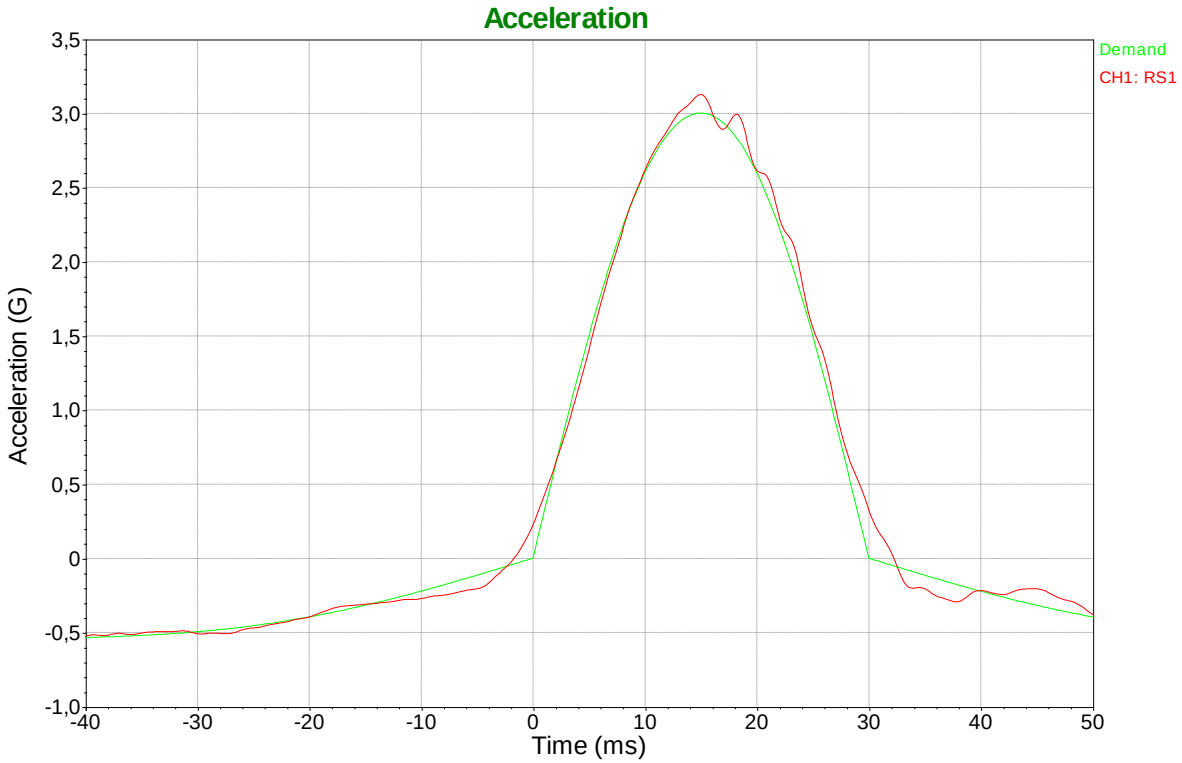
7.2 Measuring diagrams of the shock tests

Run 2111-03 / vertical-Axis / positiv



Test level schedule:

	Pulses	Level	
1)	2	-9 dB	
2)	2	-6 dB	(MD)
3)	1	-3 dB	(MD)
4)	3	100 %	(MD)

Current Measurements:

Control amplitude: 3,042 G
Output voltage: 0,3445 Volts peak

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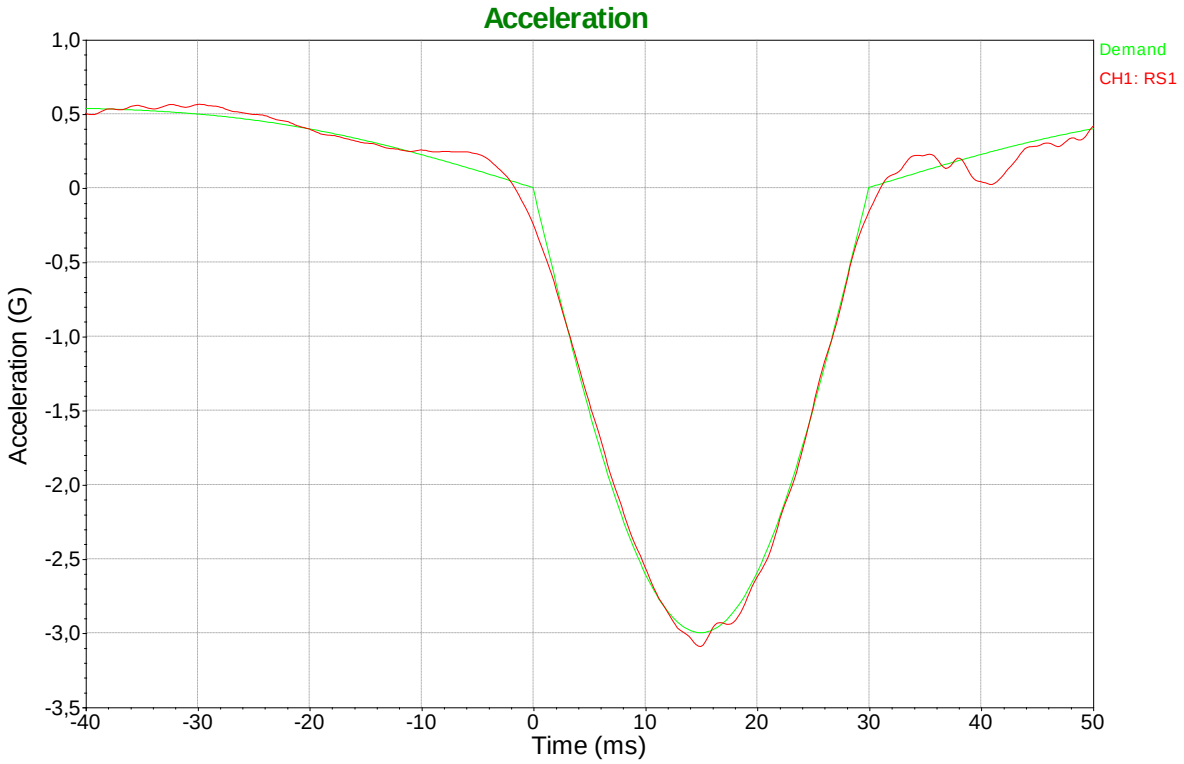
Run 2111-03 / vertical-Axis / negativ



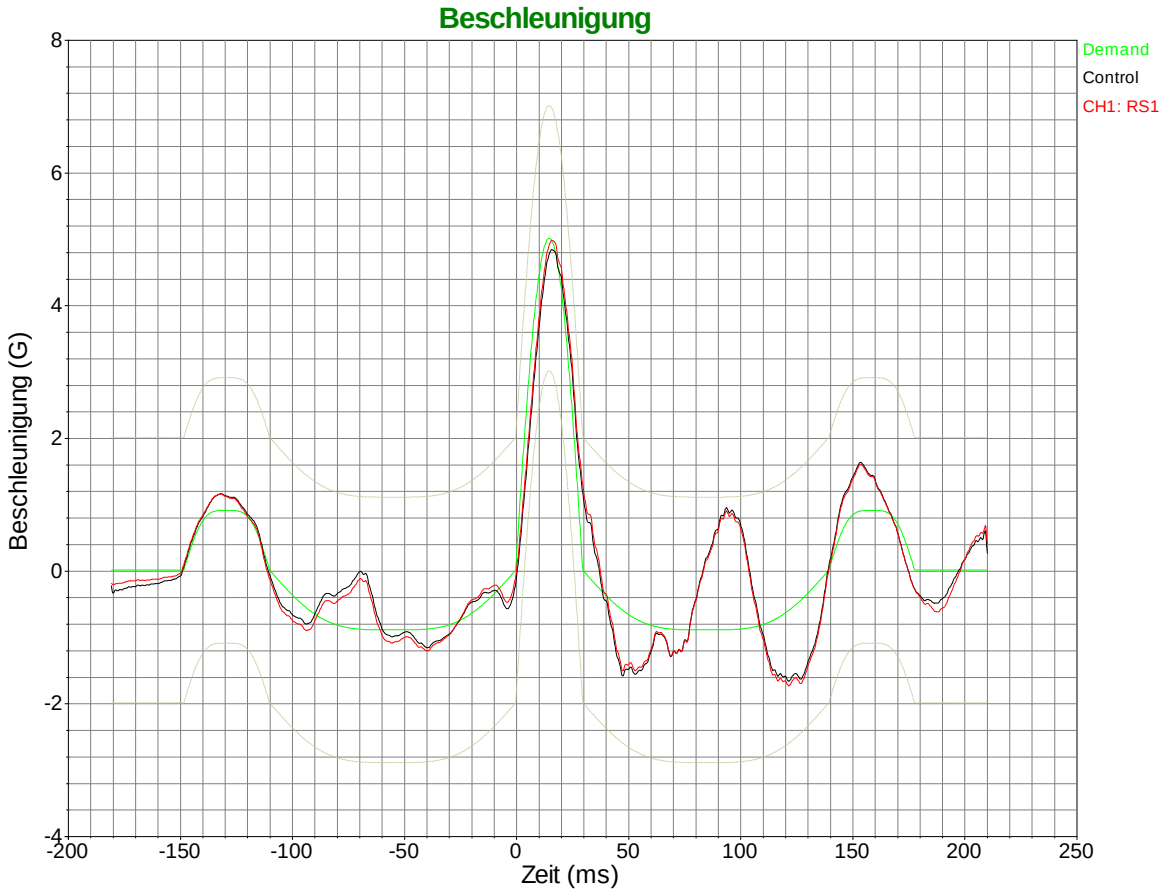
Test level schedule:

	Pulses	**Level**	
1)	2	-9 dB	
2)	2	-6 dB	(MD)
3)	1	-3 dB	(MD)
4)	3	100 %	(MD)

Current Measurements:

Control amplitude: 3,01 G
Output voltage: 0,3518 Volts peak

Run 2111-08 / transversal-Axis / positiv



Test level schedule:

	Pulses	**Level**	
1)	2	-6 dB	
2)	1	-3 dB	(MD)
3)	3	100 %	(MD)

Current Measurements:

Control amplitude: 4,952 G
Output voltage: 0,4371 Volts peak

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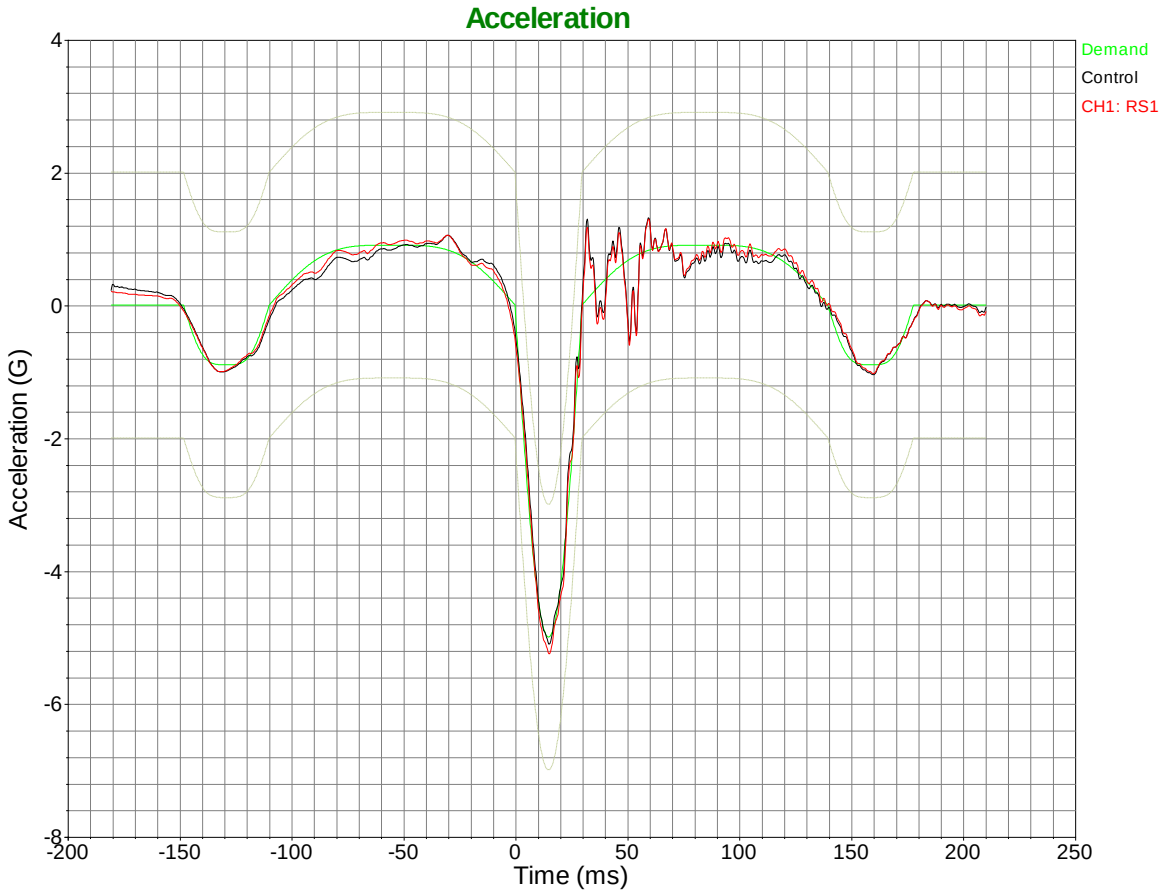
Run 2111-08 / transversal-Axis / negativ



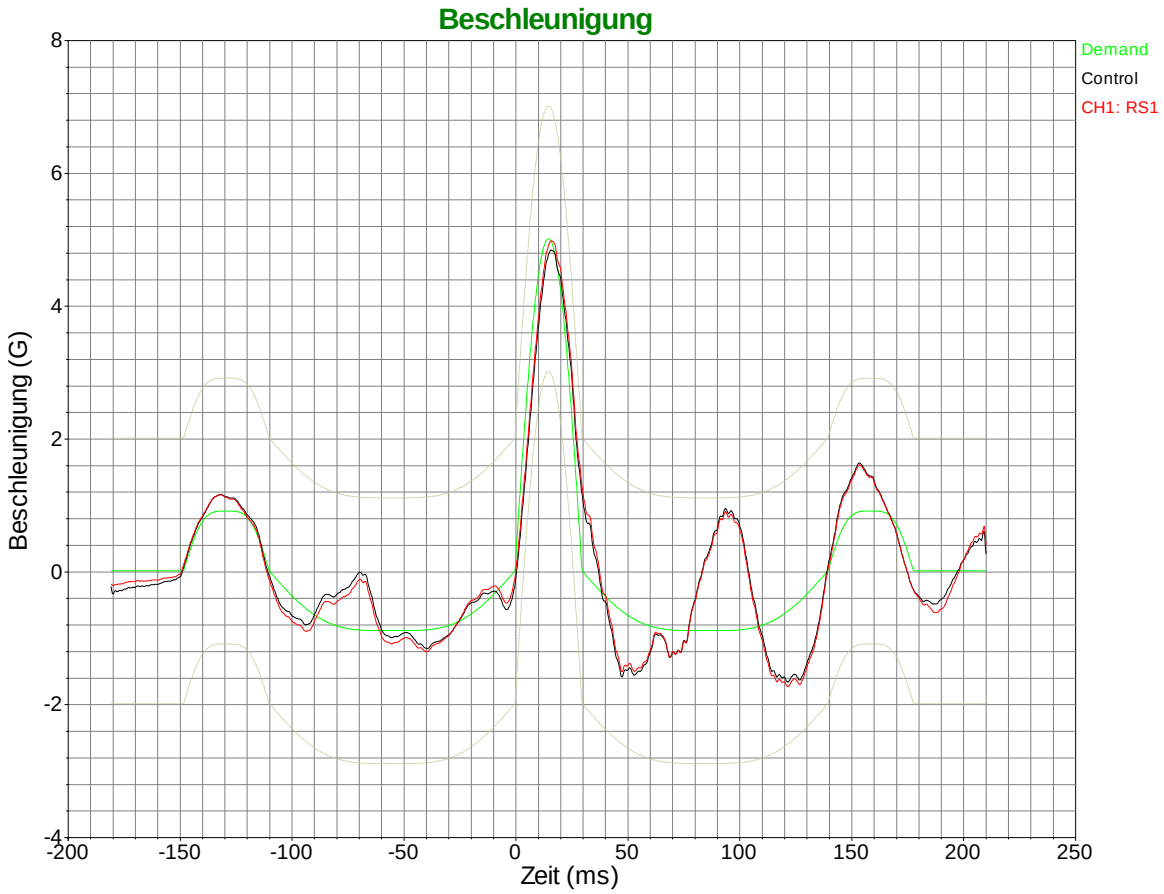
Test level schedule:

	Pulses	**Level**	
1)	2	-6 dB	
2)	1	-3 dB	(MD)
3)	3	100 %	(MD)

Current Measurements:

Control amplitude: 5,105 G
Output voltage: 0,6122 Volts peak

Run 2111-13 / longitudinal-Axis / positiv



Test level schedule:

	Pulses	Level	
1)	2	-3 dB	
2)	3	100 %	(MD)

Current Measurements:

Control amplitude: 4,932 G
Output voltage: 0,4332 Volts peak

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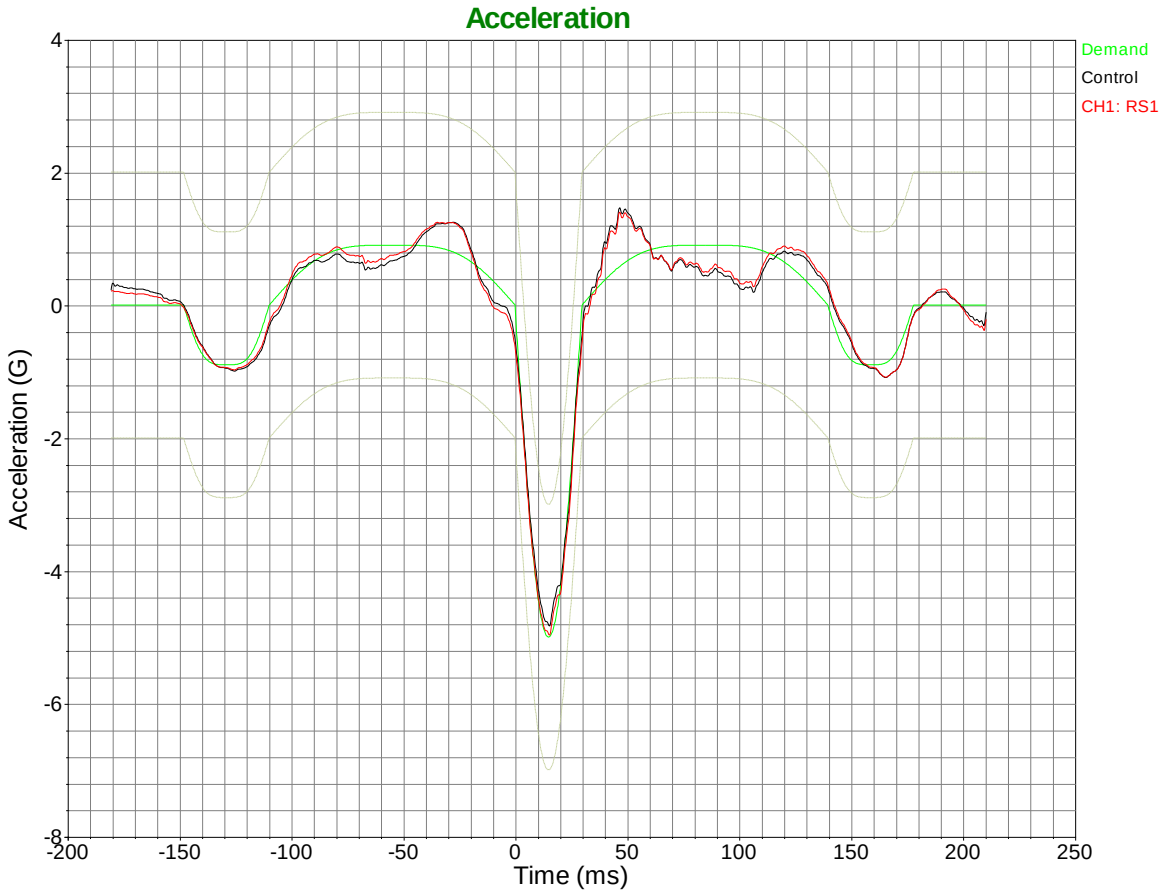
Run 2111-13 / longitudinal-Axis / negativ



Test level schedule:

	Pulses	**Level**	
1)	2	-3 dB	
2)	3	100 %	(MD)

Current Measurements:

Control amplitude: 4,967 G
Output voltage: 0,4732 Volts peak

8 Photo documentation

Photo No.1 / delivery condition

Photo No.2 / delivery condition

Photo No.3 / vertical test setup

Photo No.4 / vertical test setup

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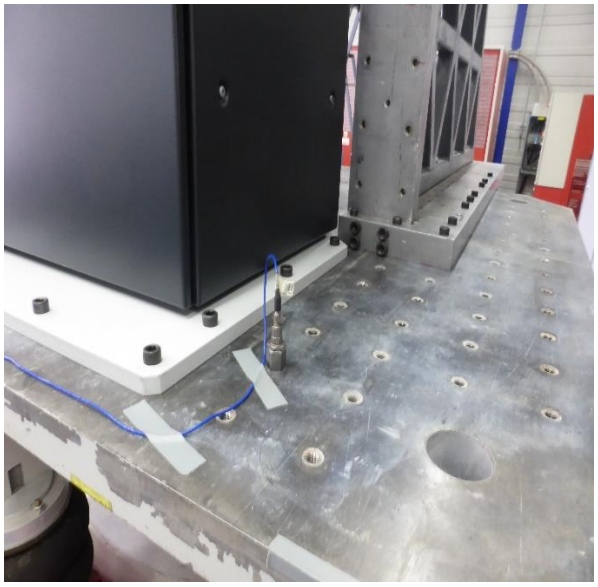

Photo No.5 / control-sensor 1

Photo No.6 / control-sensor 2

Photo No.7 / measuring position and upper mounting

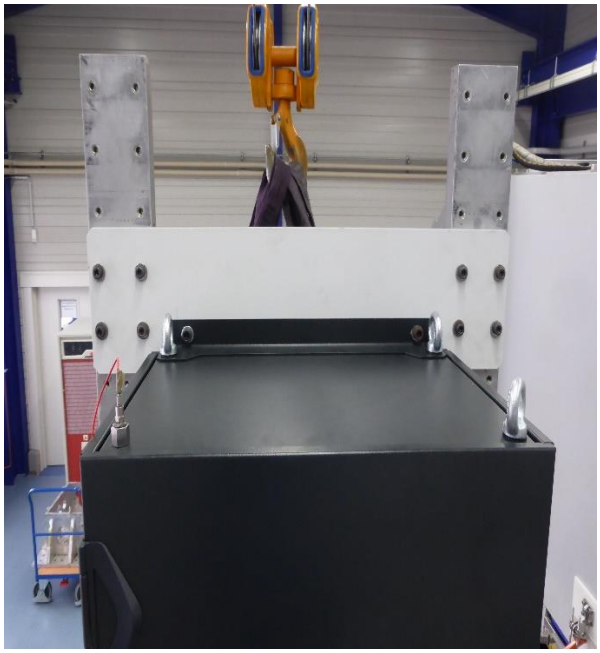

Photo No.8 / measuring position and upper mounting

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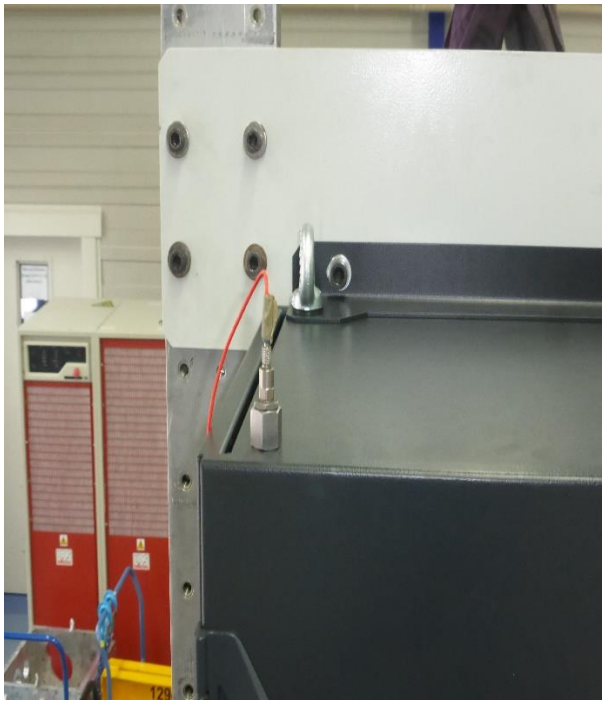

Photo No.9 / measuring position and upper mounting

Photo No.10 / horizontal test-setup transversal

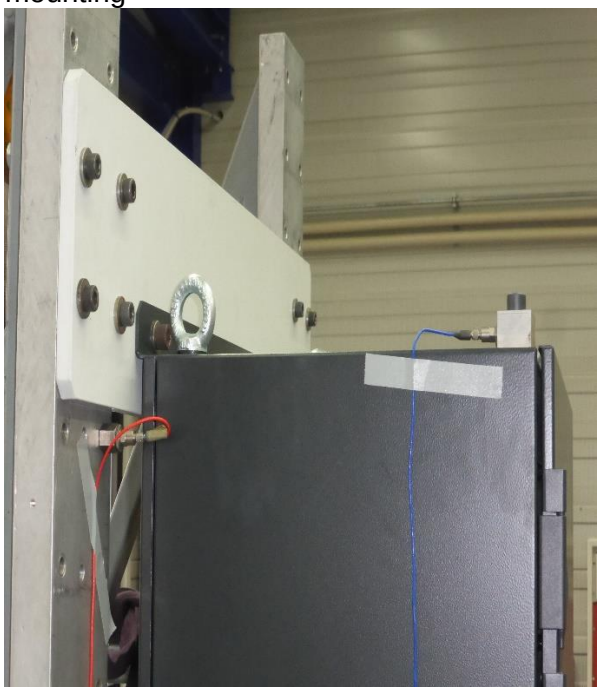

Photo No.11 / measuring sensor (right) and control sensor 1 (left)

Photo No.12 / control sensor 2

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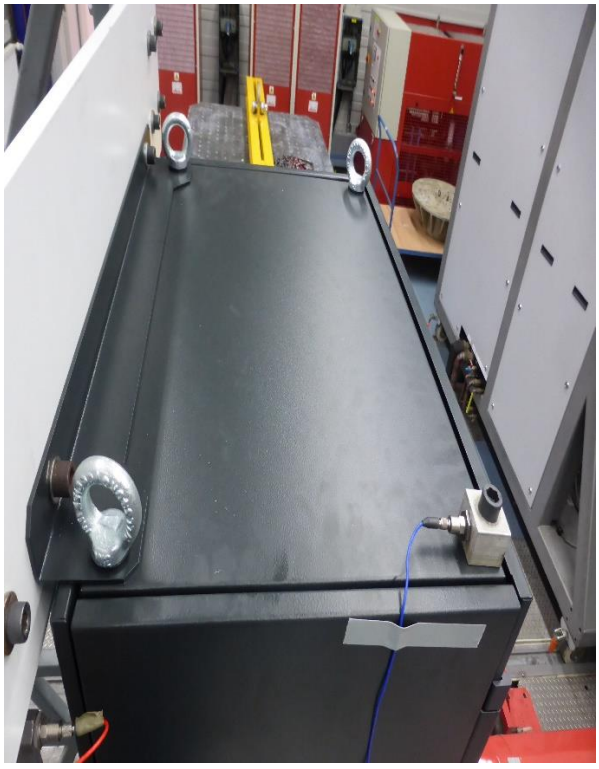

Photo No.13 / measuring sensor

Photo No.14 / test-setup horizontal longitudinal

Photo No.15 / control sensor 1

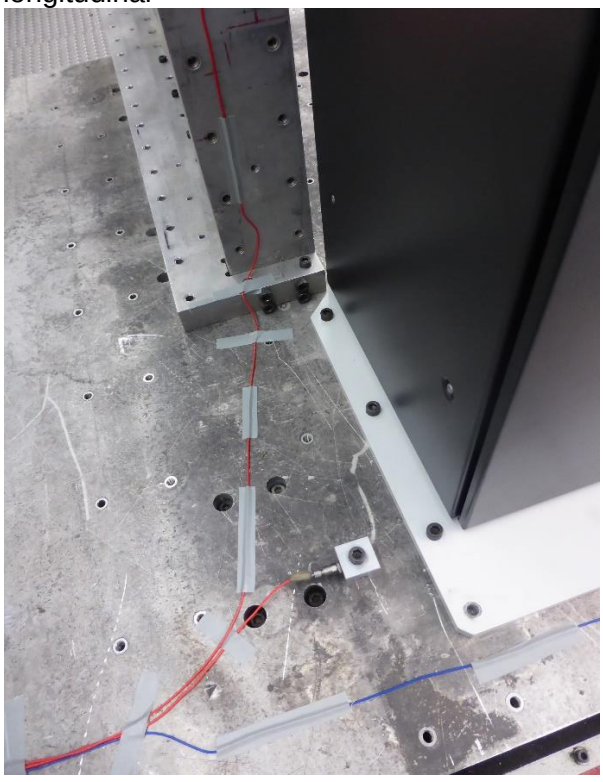

Photo No.16 / control sensor 2

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Photo No.17 / measuring sensor

Photo No.18 / condition after testing

Photo No.19 / condition after testing

Photo No.20 / condition after testing

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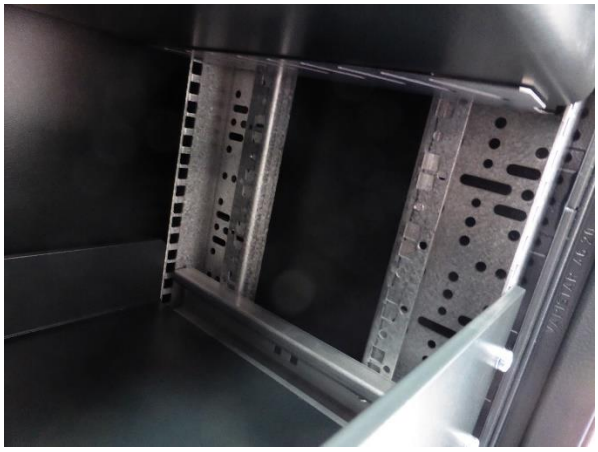

Photo No.21 / condition after testing

Photo No.22 / condition after testing. Jack ring (DIN580) and hexagon socket (M12)

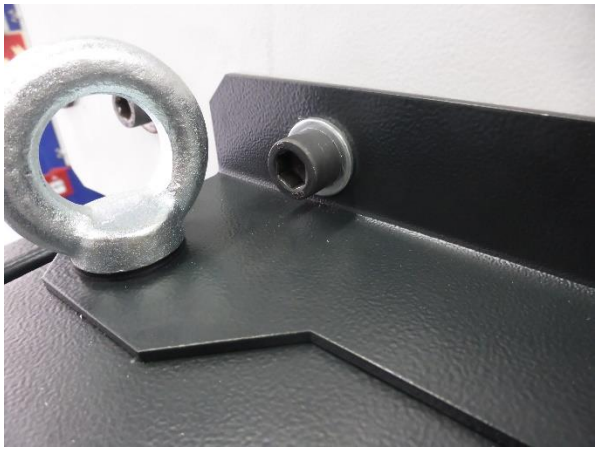

Photo No.23 / condition after testing. Jack ring (DIN580) and hexagon socket (M12)

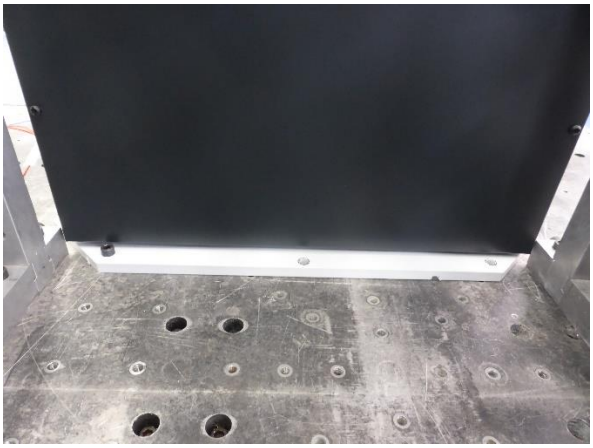

Photo No.24 / condition after testing

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Contact washer M10 / hexagon socket M10 (8.8)

Contact washer M10 / hexagon socket M10 (8.8)

Verified Signature	Edited Signature
SIGN-ID 488084 25.03.2021 **Uwe Marlok**	*SIGN-ID 487076* 24.03.2021 **Rolf Knapp**
Uwe Marlok Laboratory Manager	Test Engineer

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