MANUAL, KIT, HI-903 PRO/HI-913 SHAKER CALIBRATION



HI-903 PRO Hardy Shaker



HI-913 Hardy Shaker

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Introduction

The 9105D field verification system allows users of Metrix's models HI-903 PRO and HI-913 portable vibration calibrators (PVC) to duplicate the original factory calibration of the portable calibrators, thereby re-certifying the device's accuracy without returning it to Metrix. The 9105D system includes the following:

- Model 353B04 quartz accelerometer from PCB Piezotronics
- Model 482A21 ICP® signal conditioner from PCB Piezotronics
- Model 003C05 10-32 to BNC male 5 ft. cable from PCB Piezotronics
- BNC male to BNC male cable (Quantity 2)
- BNC T-connector
- BNC jack to banana plug connector for digital volt meter
- 10-32 male to ¼-28 male BeCu mounting stud
- Silicone Grease & Syringe
- USB memory stick pre-loaded with:
    - Microsoft Excel® PVC Field Validation Workbook (MD-0289)
    - System calibration certificate showing reference sensitivity and deviations at various frequencies for models 353B04 accelerometer and 482A21 signal conditioner tested as a system by Metrix. A printed copy of this calibration certificate is also included.

Users will need to provide the following equipment to perform the test:

- Torque wrench
- Calibrated volt meter
- Model HI-903 PRO or HI-913 portable vibration calibrator

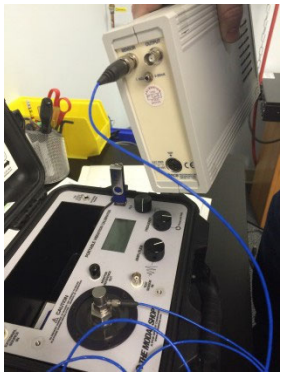
Metrix understands it is not always possible for users to return their equipment to our ISO 17025 accredited calibration lab in the United States for re-certification. The 9105D allows users to re-certify their equipment without returning it to our lab. Most countries and regions do not have access to a calibration lab that includes portable vibration shakers/calibrators on its "scope of accreditation". However labs accredited for accelerometer calibration are much more prevalent. Hence, the accelerometer and signal conditioner included with 9105D can be sent to these accredited labs for re-calibration at the user's discretion. These calibrated devices can then be used to verify output of the portable vibration calibrator.

Test Setup



1. Apply a thin film of silicone grease to the top of the armature on the portable vibratio calibrator.

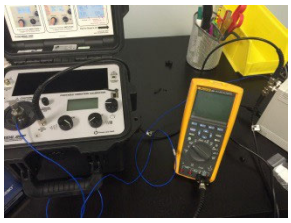
2. Use the 10-32 to ¼-28 mounting stud to mount the 353B04 accelerometer to the shaker armature
    a. **Warning**: if testing models HI-903 PRO or HI-913 portable vibration calibrator
    (PVC) use the supplied mounting wrench to hold the armature while mounting the accelerometer. Detailed instructions and diagrams are found inside the PVC manual and on the quick-start guide attached to the lid.
    b. Use a torque wrench to tighten the accelerometer to 113-225 Newton-Centimeters (10-20 inch-pounds).



3. Connect the 353B04 accelerometer to the SENSOR BNC jack of the 482A21 signal conditioner using the supplied 10-32 to BNC male cable.

4. Connect the OUTPUT BNC jack of the 482A21 to the BNC T-connector.
    a. NOTE: the BNC T-connector is not needed when testing model HI-903 PRO Portable Shaker Table, it is only used for model HI-913 Portable VibrationCalibrator

5. Connect the OUTPUT of the 482A21 signal conditioner to calibrated digital volt meter using the supplied BNC male to male cable and supplied BNC to banana plug. If testing HI-913 use one side of the BNC T-connector.
    a. NOTE: the banana plug with the tab on its side connects to ground on the volt meter



6. If testing HI-913, connect the OUTPUT of 482A21 to TEST SENSOR INPUT onmodel HI-913 using the BNC T-connector. If testing HI-903 PRO skip this step.

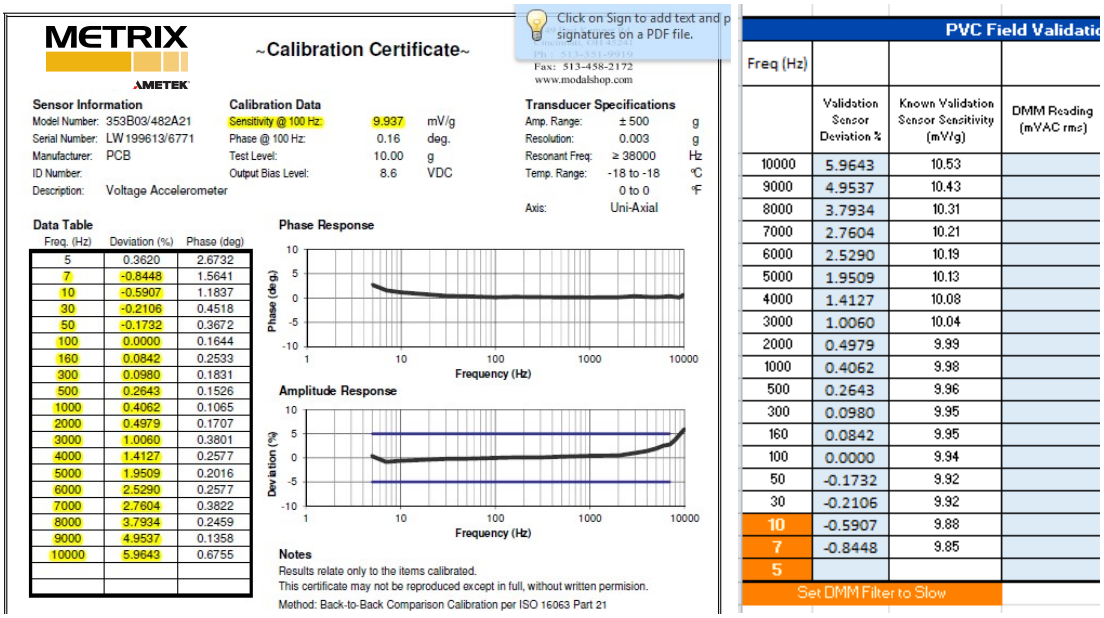
7. Connect 482A21 signal conditioner to line power via DC INPUT and power it on

8. Turn on the digital voltmeter and set to measure mV AC.

Entry of Known Calibrated Values

1. Referencing the system calibration certificate for the 353B04/482A21, enter the sensitivity of the system at 100 Hz into cell D12 on the PVC Field Verification Workbook.

2. Referencing the system calibration certificate for the 353B04/482A21, enter the deviation percentages into cells B17 to B35 next to the corresponding frequency in the “Validation Sensor Deviation %” column on the PVC Field Verification Workbook.
    a. The PVC Field Verification Workbook will calculate and display the sensitivity of the validation sensor (353B04/482A21 system) at each frequency based upon the sensitivity at 100 Hz and % deviations at each frequency.



METRIX
AMETEK

~Calibration Certificate~

Click on Sign to add text and p
signatures on a PDF file.

Fax: 513-458-2172
www.modalshop.com

Sensor Information

Model Number:	353B03/482A21
Serial Number:	LW199613/6771
Manufacturer:	PCB
ID Number:	
Description:	Voltage Accelerometer

Calibration Data

Sensitivity @ 100 Hz:	9.937	mV/g
Phase @ 100 Hz:	0.16	deg.
Test Level:	10.00	g
Output Bias Level:	8.6	VDC

Transducer Specifications

Amp. Range:	± 500	g
Resolution:	0.003	g
Resonant Freq:	≥ 38000	Hz
Temp. Range:	-18 to -18	°C
	0 to 0	°F
Axis:	Uni-Axial	

Data Table

Freq. (Hz)	Deviation (%)	Phase (deg)
5	0.3620	2.6732
7	-0.8448	1.5641
10	-0.5907	1.1837
30	-0.2106	0.4518
50	-0.1732	0.3672
100	0.0000	0.1644
160	0.0842	0.2533
300	0.0980	0.1831
500	0.2643	0.1526
1000	0.4062	0.1065
2000	0.4979	0.1707
3000	1.0060	0.3801
4000	1.4127	0.2577
5000	1.9509	0.2016
6000	2.5290	0.2577
7000	2.7604	0.3822
8000	3.7934	0.2459
9000	4.9537	0.1358
10000	5.9643	0.6755

Phase Response

Amplitude Response

Notes

Results relate only to the items calibrated.
This certificate may not be reproduced except in full, without written permision.
Method: Back-to-Back Comparison Calibration per ISO 16063 Part 21

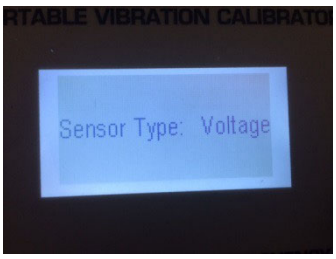
PVC Field Validatio

Freq (Hz)	Validation Sensor Deviation %	Known Validation Sensor Sensitivity (mV/g)	DMM Reading (mVAC rms)
10000	5.9643	10.53	
9000	4.9537	10.43	
8000	3.7934	10.31	
7000	2.7604	10.21	
6000	2.5290	10.19	
5000	1.9509	10.13	
4000	1.4127	10.08	
3000	1.0060	10.04	
2000	0.4979	9.99	
1000	0.4062	9.98	
500	0.2643	9.96	
300	0.0980	9.95	
160	0.0842	9.95	
100	0.0000	9.94	
50	-0.1732	9.92	
30	-0.2106	9.92	
10	-0.5907	9.88	
7	-0.8448	9.85	
5			

Set DMM Filter to Slow

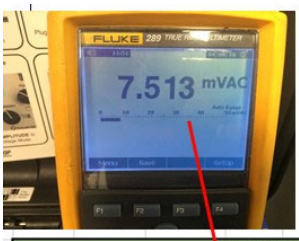
Performing the Validation

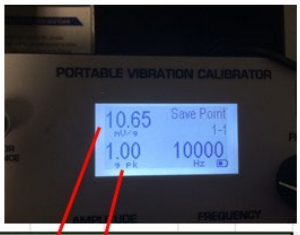
3. Turn on the portable vibration calibrator and press and hold the amplitude button to change the sensor input type to voltage.
    a. NOTE: Metrix recommends portable calibrators betested while operating on battery power. Disconnect the charging cable when testing.



4. Begin the test by setting the frequency to 10,000 Hz and the amplitude to 1.0 g pk. Record the volt meter reading in cell D17 and record the displayed amplitude on the PVC in cell F17. If testing HI-913 record thedisplayed sensitivity in cell E17.
    a. Note: the amplitude value is per the discretion of the user. One may use a value other than 1 g pk if desired as long as the correct value is input to the workbook. Metrix recommends 1.0 g pk for frequencies greater than 10 Hz.

    b. Note: allow for settling time at each test point, 3-5 seconds is sufficient for most frequencies. Note that at low frequencies the settling time may be increased.



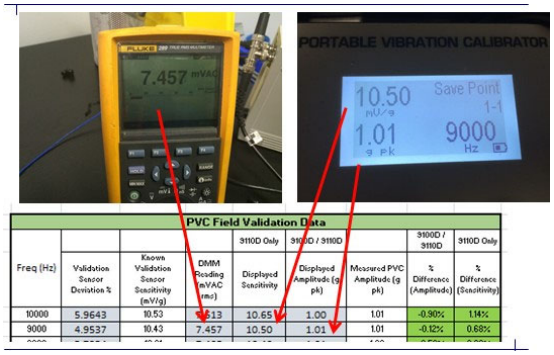


PVC Field Validation Data

Freq (Hz)	Validation Sensor Deviation %	Known Validation Sensor Sensitivity (mV/g)	DMM Reading (mVAC rms)	3110D Only: Displayed Sensitivity	3100D / 3110D: Displayed Amplitude (g pk)	Measured PVC Amplitude (g pk)	3100D / 3110D: % Difference (Amplitude)	3110D Only: % Difference (Sensitivity)
10000	5.9643	10.53	7.513	10.65	1.00	1.01	-0.90%	1.14%

5. Repeat step 4 for all other frequencies until 10 Hz (9 kHz, 8 kHz, 7 kHz, 6 kHz, 5 kHz, 4 kHz, 3 kHz, 2 kHz, 1 kHz, 500 Hz, 300 Hz, 160 Hz, 100 Hz, 50 Hz and 30 Hz). Record the volt meter reading, displayed amplitude and displayed sensitivity (if testing HI-913) in the corresponding row in the workbook for each frequency.

6. Before testing at 10 Hz and below, set the volt meter filter to slow if possible. Or in lieu of this use the averaging feature on the volt meter to get a stable reading.
    a. Metrix uses Agilent model 34401A 6.5 digit digital volt meters when testing portable shakers. To set the filter to slow:
        i. Press Shift then on/off
        ii. Press the down arrow twice
        iii. Press the < arrow, display will read “Slow: 3 Hz”
        iv. Press Auto/Man (Enter) to save changes



PVC Field Validation Data

Freq (Hz)	Validation Sensor Deviation %	Known Validation Sensor Sensitivity (mV/g)	DMM Reading (mVAC rms)	3110D Only Displayed Sensitivity	9100D / 3110D Displayed Amplitude (g pk)	Measured PVC Amplitude (g pk)	9100D / 3110D % Difference (Amplitude)	3110D Only % Difference (Sensitivity)
10000	5.9643	10.53	7.413	10.65	1.00	1.01	-0.90%	1.14%
9000	4.9537	10.43	7.457	10.50	1.01	1.01	-0.12%	0.68%

7. Set the frequency of the portable vibration calibrator to 10 Hz. 1.0 g pk is not possible at this speed, use lower amplitude such as 0.8 g’s pk. Record the volt meter reading and displayed amplitude in the corresponding row in the workbook for each frequency.

8. Repeat step 7 for 7 Hz using 0.4 g’s pk for the amplitude.
    a. Note: if using a calibrator with 9100-LF5 firmware, repeat step 6 at 5 Hz as well using 0.2 g’s pk as the amplitude.

Reviewing the Test

The Field Validation Workbook will calculate the measured PVC amplitude and % difference between known amplitude and measured. Once the % difference is calculated the cell turns green, yellow or red:

- Green cell: indicates the tested value passes specification for accuracy
- Yellow cell: indicates the tested value passes specification for accuracy but is more inaccurate than typical
- Red cell: indicates the tested value is outside the acceptable error bounds per specification

For test points with “yellow” or “red” indication Metrix recommends checking the mounting of the accelerometer and re-testing. Clean the armature surface, re-apply silicone grease and re-torque the sensor. Then test again to be sure shaker is inaccurate. If problems persist, contact Metrix. The portable vibration calibrator may need to be adjusted, although adjustments are very rare due to the stability of the device’s quartz reference accelerometer.

PVC Field Validation Data								
Freq (Hz)				9110D Only	9100D / 9110D		9100D / 9110D	9110D Only
	Validation Sensor Deviation %	Known Validation Sensor Sensitivity (mV/g)	DMM Reading (mVAC rms)	Displayed Sensitivity	Displayed Amplitude (g pk)	Measured PVC Amplitude (g pk)	% Difference (Amplitude)	% Difference (Sensitivity)
10000	5.9643	10.53	7.513	10.65	1.00	1.01	-0.90%	1.14%
9000	4.9537	10.43	7.457	10.50	1.01	1.01	-0.12%	0.68%
8000	3.7934	10.31	7.405	10.40	1.01	1.02	-0.53%	0.83%
7000	2.7604	10.21	7.269	10.26	1.00	1.01	-0.67%	0.48%
6000	2.5290	10.19	7.196	10.20	1.00	1.00	0.11%	0.11%
5000	1.9509	10.13	7.166	10.15	1.00	1.00	-0.03%	0.19%
4000	1.4127	10.08	7.115	10.08	1.00	1.00	0.15%	0.03%
3000	1.0060	10.04	7.106	10.08	1.00	1.00	-0.12%	0.43%
2000	0.4979	9.99	7.085	10.03	1.00	1.00	-0.33%	0.44%
1000	0.4062	9.98	7.039	9.97	1.00	1.00	0.23%	-0.07%
500	0.2643	9.96	7.042	9.97	1.00	1.00	0.04%	0.07%
300	0.0980	9.95	7.038	9.94	1.00	1.00	-0.07%	-0.07%
160	0.0842	9.95	7.033	9.93	1.00	1.00	-0.01%	-0.15%
100	0.0000	9.94	7.024	9.93	1.00	1.00	0.04%	-0.07%
50	-0.1732	9.92	7.044	9.96	1.00	1.00	-0.42%	0.41%
30	-0.2106	9.92	7.063	10.00	1.00	1.01	-0.73%	0.85%
10	-0.5907	9.88	5.071	10.32	0.70	0.73	-3.58%	4.47%
7	-0.8448	9.85	2.945	10.72	0.40	0.42	-5.37%	8.80%
5								
Set DMM Filter to Slow								

Entry of Equipment & Conditions

Metrix recommends that the manufacturer, model, serial number, calibration date and calibrationdue date of all test equipment be documented on the test report. In cells C40 through F44 users can enterthis data for the accelerometer, signal conditioner and volt meter.

It is also good practice to note the name of the technician, date and laboratory conditions if possible. This data can be entered into cells H7 through H10.

Verification Equipment			
	Accelerometer	Signal Conditioner	Volt Meter
Manufactuer:	PCB	PCB	Agilent
Model:	353B04	482A21	34401A
Serial Number:	LW199613	6771	MY47055366
Calibration Date:	3/29/2016	3/29/2016	6/25/2015
Due Date:	3/29/2017	3/29/2017	6/25/2016

Completed Report

Manufacturer:	The Modal Shop
Model Number:	9110D
Serial Number:	10313
Firmware Version:	5.0.3
Description:	Portable Vibration Calibrator

Technician:	Mike Scott
Date:	4/26/2016
Temperature:	72.1 F
Humidity:	36.10%

Customer:	Sales Demo

Validation Sensor Sensitivity (100Hz):	9.937

PVC Field Validation Data

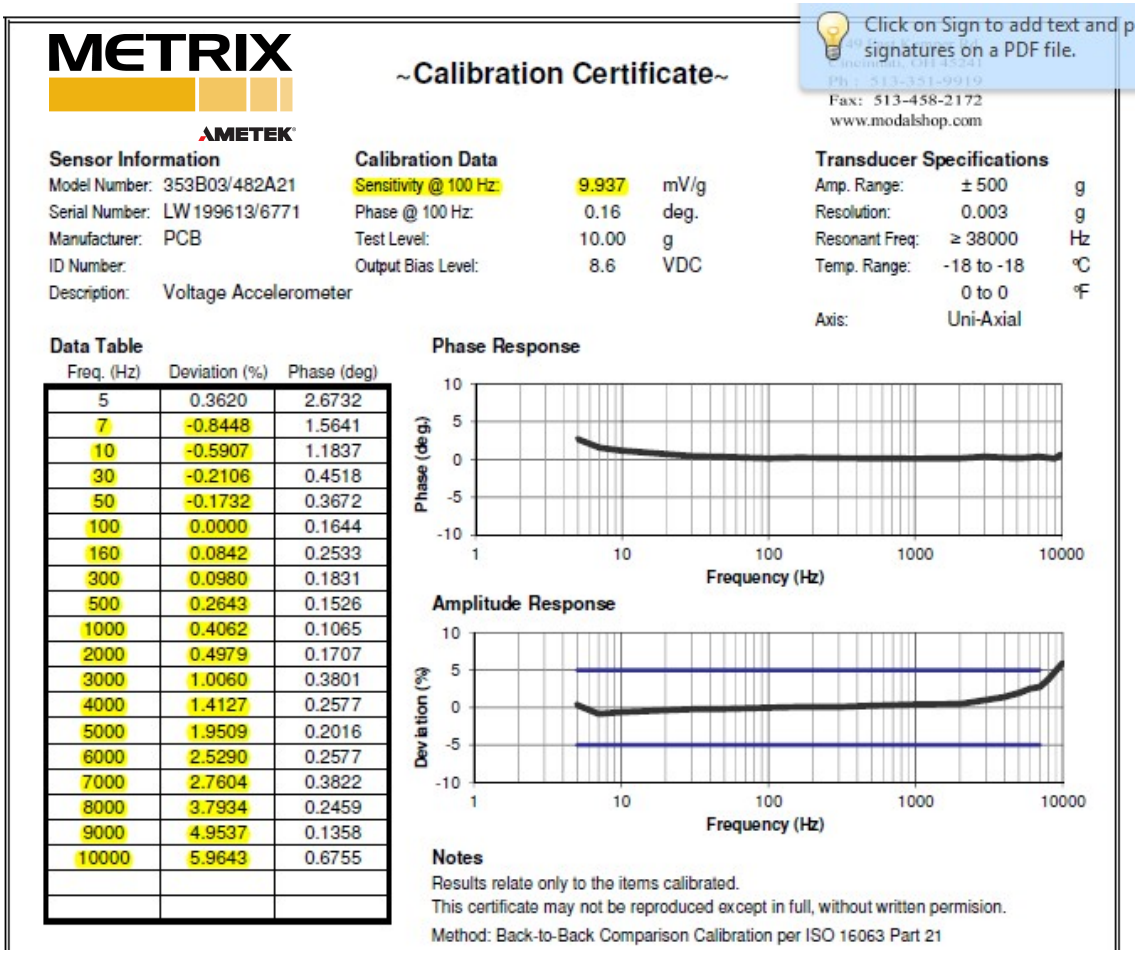
Freq (Hz)				9110D Only	9100D / 9110D		9100D / 9110D	9110D Only
	Validation Sensor Deviation %	Known Validation Sensor Sensitivity (mV/g)	DMM Reading (mVAC rms)	Displayed Sensitivity	Displayed Amplitude (g pk)	Measured PVC Amplitude (g pk)	% Difference (Amplitude)	% Difference (Sensitivity)
10000	5.9643	10.53	7.513	10.65	1.00	1.01	-0.90%	1.14%
9000	4.9537	10.43	7.457	10.50	1.01	1.01	-0.12%	0.68%
8000	3.7934	10.31	7.405	10.40	1.01	1.02	-0.53%	0.83%
7000	2.7604	10.21	7.269	10.26	1.00	1.01	-0.67%	0.48%
6000	2.5290	10.19	7.196	10.20	1.00	1.00	0.11%	0.11%
5000	1.9509	10.13	7.166	10.15	1.00	1.00	-0.03%	0.19%
4000	1.4127	10.08	7.115	10.08	1.00	1.00	0.15%	0.03%
3000	1.0060	10.04	7.106	10.08	1.00	1.00	-0.12%	0.43%
2000	0.4979	9.99	7.085	10.03	1.00	1.00	-0.33%	0.44%
1000	0.4062	9.98	7.039	9.97	1.00	1.00	0.23%	-0.07%
500	0.2643	9.96	7.042	9.97	1.00	1.00	0.04%	0.07%
300	0.0980	9.95	7.038	9.94	1.00	1.00	-0.07%	-0.07%
160	0.0842	9.95	7.033	9.93	1.00	1.00	-0.01%	-0.15%
100	0.0000	9.94	7.024	9.93	1.00	1.00	0.04%	-0.07%
50	-0.1732	9.92	7.044	9.96	1.00	1.00	-0.42%	0.41%
30	-0.2106	9.92	7.063	10.00	1.00	1.01	-0.73%	0.85%
10	-0.5907	9.88	5.071	10.32	0.70	0.73	-3.58%	4.47%
7	-0.8448	9.85	2.945	10.72	0.40	0.42	-5.37%	8.80%
5								

Set DMM Filter to Slow

Verification Equipment

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Serial Number:	LW199613	6771	MY47055366
Calibration Date:	3/29/2016	3/29/2016	6/25/2015
Due Date:	3/29/2017	3/29/2017	6/25/2016

System Calibration Certificate for Accelerometer & Signal Conditioner



METRIX
AMETEK

~Calibration Certificate~

Click on Sign to add text and p
signatures on a PDF file.

Fax: 513-458-2172
www.modalshop.com

Sensor Information

Model Number:	353B03/482A21
Serial Number:	LW199613/6771
Manufacturer:	PCB
ID Number:	
Description:	Voltage Accelerometer

Calibration Data

Sensitivity @ 100 Hz:	9.937	mV/g
Phase @ 100 Hz:	0.16	deg.
Test Level:	10.00	g
Output Bias Level:	8.6	VDC

Transducer Specifications

Amp. Range:	± 500	g
Resolution:	0.003	g
Resonant Freq:	≥ 38000	Hz
Temp. Range:	-18 to -18	°C
	0 to 0	°F
Axis:	Uni-Axial	

Data Table

Freq. (Hz)	Deviation (%)	Phase (deg)
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160	0.0842	0.2533
300	0.0980	0.1831
500	0.2643	0.1526
1000	0.4062	0.1065
2000	0.4979	0.1707
3000	1.0060	0.3801
4000	1.4127	0.2577
5000	1.9509	0.2016
6000	2.5290	0.2577
7000	2.7604	0.3822
8000	3.7934	0.2459
9000	4.9537	0.1358
10000	5.9643	0.6755

Phase Response

Amplitude Response

Notes

Results relate only to the items calibrated.
This certificate may not be reproduced except in full, without written permision.
Method: Back-to-Back Comparison Calibration per ISO 16063 Part 21

How to Turn Off the Displayed Calibration Date

For version 5.0.3 and later of PVC firmware:

Metrix models HI-903 PRO and HI-913 portable vibration calibrators display the date on which the calibrator was last calibrated at Metrix during start-up. Users who have calibrated their calibrators by following the procedures described in this manual may wish to turn off the displayed date and affix their own proof of calibration (typically a calibration sticker).

Contact Metrix to obtain access to the HI-903 PRO and HI-913 portable vibration calibrator's "secret menu". From here, the displayed calibration date can be turned off.

Note, earlier versions of models HI-903 PRO and HI-913 firmware do not offer this capability. Units must be returned to Metrix for firmware upgrade or to a local, capable representative.

SECTION 1. IDENTIFICATION

Product name : DOW CORNING(R) 4 ELECTRICAL INSULATING COMPOUND

Product code : 000000000001903128

Manufacturer or supplier's details

Company name of supplier : Dow Corning Corporation

Address : South Saginaw Road
Midland Michigan 48686

Telephone : (989) 496-6000

Emergency telephone : 24 Hour Emergency Telephone : (989) 496-5900
CHEMTREC : (800) 424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Lubricants and lubricant additives

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS label elements

Not a hazardous substance or mixture.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Inorganic compound

Hazardous ingredients

Chemical name	CAS-No.	Concentration (% w/w)
Silicon dioxide	7631-86-9	>= 5 - < 10

SECTION 4. FIRST AID MEASURES

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact : Wash with water and soap as a precaution.

Get medical attention if symptoms occur.

In case of eye contact	:	Flush eyes with water as a precaution. Get medical attention if irritation develops and persists.
If swallowed	:	If swallowed, DO NOT induce vomiting. Get medical attention if symptoms occur. Rinse mouth thoroughly with water.
Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	No special precautions are necessary for first aid responders.
Notes to physician	:	Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Silicon oxides Formaldehyde Boron oxides
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions	:	Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation	:	Use only with adequate ventilation.
Advice on safe handling	:	Handle in accordance with good industrial hygiene and safety practice. Take care to prevent spills, waste and minimize release to the environment.
Conditions for safe storage	:	Keep in properly labeled containers. Store in accordance with the particular national regulations.
Materials to avoid	:	Do not store with the following product types: Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Silicon dioxide	7631-86-9	TWA (Dust)	20 Million particles per cubic foot (Silica)	OSHA Z-3
		TWA (Dust)	80 mg/m3 / %SiO2 (Silica)	OSHA Z-3

		TWA	6 mg/m3 (Silica)	NIOSH REL

Engineering measures : Processing may form hazardous compounds (see section 10).
Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.

Hand protection

Remarks : Wash hands before breaks and at the end of workday.

Eye protection : Wear the following personal protective equipment:
Safety glasses

Skin and body protection : Skin should be washed after contact.

Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Grease
Color	:	white, translucent
Odor	:	slight
Odor Threshold	:	No data available
pH	:	Not applicable
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	Not applicable
Flash point	:	> 300 °C Method: closed cup
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Not classified as a flammability hazard

Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapor pressure	:	Not applicable
Relative vapor density	:	No data available
Relative density	:	> 1
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Use at elevated temperatures may form highly hazardous compounds. Can react with strong oxidizing agents. Hazardous decomposition products will be formed at elevated temperatures.
Conditions to avoid	:	None known.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products		
Thermal decomposition	:	Formaldehyde

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Skin contact
Ingestion
Eye contact

Acute toxicity

Not classified based on available information.

Ingredients:

Silicon dioxide:

Acute oral toxicity	:	LD50 (Rat): > 3,300 mg/kg Assessment: The substance or mixture has no acute oral toxicity Remarks: Information taken from reference works and the literature.
Acute inhalation toxicity	:	LC50 (Rat): > 2.08 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity Remarks: Information taken from reference works and the literature.
Acute dermal toxicity	:	LD50 (Rabbit): > 5,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity Remarks: Information taken from reference works and the literature.

Skin corrosion/irritation

Not classified based on available information.

Ingredients:

Silicon dioxide:
Result: No skin irritation
Remarks: Information taken from reference works and the literature.

Serious eye damage/eye irritation

Not classified based on available information.

Ingredients:

Silicon dioxide:
Result: No eye irritation
Remarks: Information taken from reference works and the literature.

Respiratory or skin sensitization

Skin sensitization: Not classified based on available information.
Respiratory sensitization: Not classified based on available information.

Ingredients:

Silicon dioxide:
Assessment: Does not cause skin sensitization.

Test Type: Skin: test type not specified
Species: Guinea pig
Remarks: Information taken from reference works and the literature.

Germ cell mutagenicity

Not classified based on available information.

Ingredients:

Silicon dioxide:

Genotoxicity in vitro	:	Result: negative Remarks: Information taken from reference works and the literature.
Genotoxicity in vivo	:	Application Route: Ingestion Result: negative Remarks: Information taken from reference works and the literature.
Germ cell mutagenicity - Assessment	:	Animal testing did not show any mutagenic effects.

Carcinogenicity

Not classified based on available information.

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Not classified based on available information.

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
No data available

Persistence and degradability
No data available

Bioaccumulative potential
No data available

Mobility in soil
No data available

Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Resource Conservation and Recovery Act (RCRA)	:	This product has been evaluated for RCRA characteristics and does not meet the criteria of hazardous waste if discarded in its purchased form.
Waste from residues	:	Dispose of in accordance with local regulations.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulation

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

Domestic regulation

49 CFR
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

Dimethyl Siloxane, polymers with Methyl Silsesquioxanes	68037-74-1	70 - 90 %
Silicon dioxide	7631-86-9	5 - 10 %
Silicone Metalloid Complex	Proprietary Ingredient	5 - 10 %

New Jersey Right To Know

Dimethyl Siloxane, polymers with Methyl Silsesquioxanes	68037-74-1	70 - 90 %
Silicon dioxide	7631-86-9	5 - 10 %
Silicone Metalloid Complex	Proprietary Ingredient	5 - 10 %

California Prop. 65 This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

The ingredients of this product are reported in the following inventories:

NZIoC : All ingredients listed or exempt.

REACH : All ingredients (pre-)registered or exempt.

TSCA : All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

AICS : All ingredients listed or exempt.

IECSC : All ingredients listed or exempt.

ENCS/ISHL	:	All components are listed on ENCS/ISHL or exempted from inventory listing.
KECI	:	All ingredients listed, exempt or notified.
PICCS	:	All ingredients listed or exempt.
DSL	:	This product contains one or more substances which are not on the Canadian Domestic Substances List (DSL). Import of this product into Canada has volume limitations. For volume limits please consult Dow Corning Regulatory Compliance.
TCSI	:	All ingredients listed or exempt.

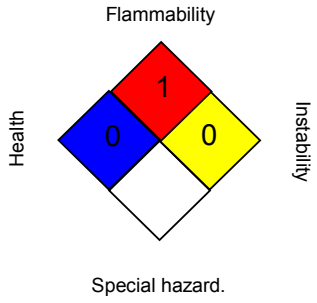
Registration: Trade Secret

Component	Registration number
Silicone Metalloid Complex	NJ TSRN 14962700-8471P

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	0
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Full text of other abbreviations

NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-3 / TWA	:	8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Sub-

stances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/
Revision Date	:	10/17/2015

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

US / Z8

ENVIRONMENTAL INFORMATION



This electronic equipment was manufactured according to high quality standards to ensure safe and reliable operation when used as intended. Due to its nature, this equipment may contain small quantities of substances known to be hazardous to the environment or to human health if released into the environment. For this reason, Waste Electrical and Electronic Equipment (commonly known as WEEE) should never be disposed of in the public waste stream. The "Crossed-Out Waste Bin" label affixed to this product is a reminder to dispose of this product in accordance with local WEEE regulations. If you have questions about the disposal process, please contact Metrix Customer Services.

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