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ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

DEMO Wireless Vibration Sensor Report For Rotating Machines

MICHELIN
A BETTER WAY FORWARD

Michelin Siam Co., Ltd (Laem Chabang)

Laem Chabang, Chonburi

Report by: Ms. Sirianunta Ruttanapraromya

25th May 2021

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General Data

Job Order No	: DEMO Wireless Vibration	Measured Date	: May 25, 2021
Plant	: Michelin Siam Co., Ltd (Laem Chabang)	Unit	: Blower 1
Equipment	: Blower	Speed	: 1476 rpm.
Motor	: 22 kW	Speed	: 1476 rpm.
Coupling	: DIRECT DRIVE		

Technical Data

Vibration Equipment	: ERBESSD
Vibration Transducer	: WIRELESS PHANTOM
Unit	: mm/s_{rms}
Operation Condition	: On Load

Code Explanation

Position Code	Explanation
MTR-DE	Motor Drive End bearing

Direction Code	Explanation
V	Vertical direction of the vibration detection
H	Horizontal direction of the vibration detection
A	Axial direction of the vibration detection

ISO Code	Explanation
ISO 10816-3	Group 2: Medium sized machine (power 15 - 300 kW)

Severity Code		Explanation
Good	< 2.3 mm/s_{rms}	For new machine condition
Admissible	2.3 – 4.5 mm/s_{rms}	For unlimited long-term operation allowable
Still Admissible	4.5 – 7.1 mm/s_{rms}	For short-term operation allowable
Inadmissible	> 7.1 mm/s_{rms}	Vibration causes damage

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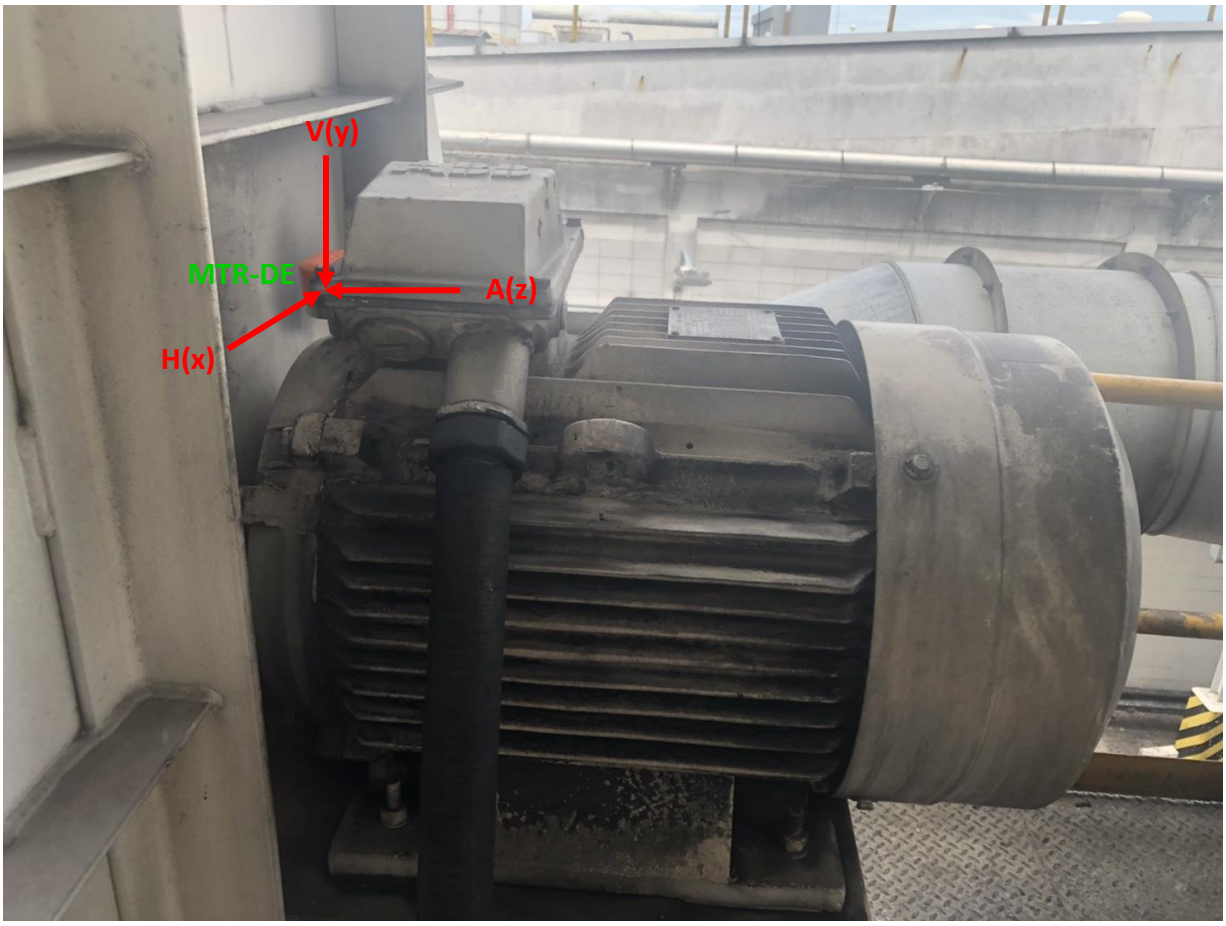
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LAST MAGNITUDE MEASUREMENT REPORT

Blower 1

DATE : 25 May 2021

COLLECT DATA : Every 10 minute



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Vibration Measurement Report

Location	Date & Time	H	V	A	Unit	Severity
MTR-DE	2021-05-25 11:01:55	4.1859	4.7065	6.8893	mm/s	Alarm
	2021-05-25 11:11:54	4.2617	4.7656	7.0898	mm/s	Alarm
	2021-05-25 11:21:53	4.3464	4.7669	7.2802	mm/s	Danger

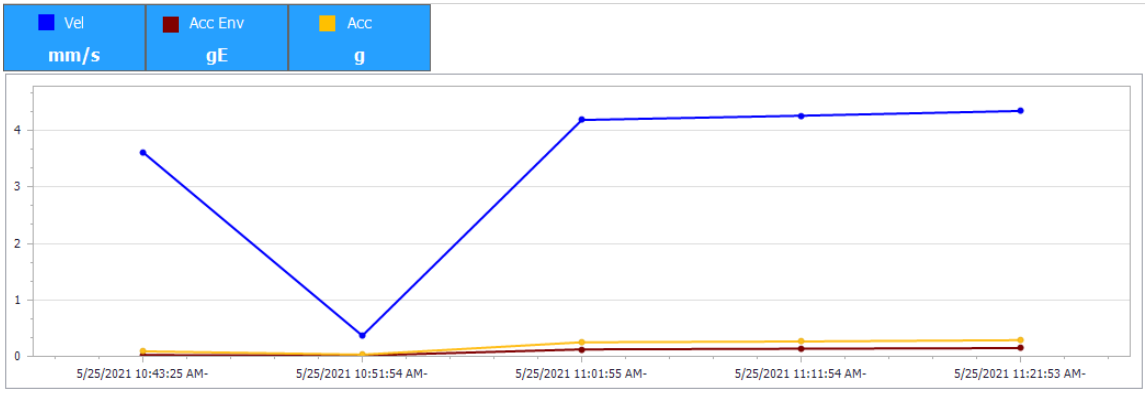
Temperature Measurement Report

Location	Date & Time	Internal Temperature	Unit
MTR-DE	2021-05-25 11:00:08	35	ºC
	2021-05-25 11:01:20	36.25	ºC
	2021-05-25 11:02:34	36.25	ºC
	2021-05-25 11:02:42	38	ºC
	2021-05-25 11:03:29	39.25	ºC
	2021-05-25 11:04:30	39.75	ºC
	2021-05-25 11:05:35	41.25	ºC
	2021-05-25 11:08:31	43	ºC
	2021-05-25 11:09:36	43.75	ºC
	2021-05-25 11:10:30	44.5	ºC
	2021-05-25 11:11:03	45	ºC
	2021-05-25 11:12:30	46	ºC
	2021-05-25 11:13:03	45.75	ºC
	2021-05-25 11:13:43	45.75	ºC
	2021-05-25 11:14:05	46.25	ºC
	2021-05-25 11:15:03	46.75	ºC
	2021-05-25 11:16:03	46.75	ºC
	2021-05-25 11:17:08	47.25	ºC
	2021-05-25 11:18:14	47.25	ºC
	2021-05-25 11:19:03	47.5	ºC
	2021-05-25 11:20:06	48	ºC
	2021-05-25 11:23:11	48.25	ºC
	2021-05-25 11:24:03	48.5	ºC

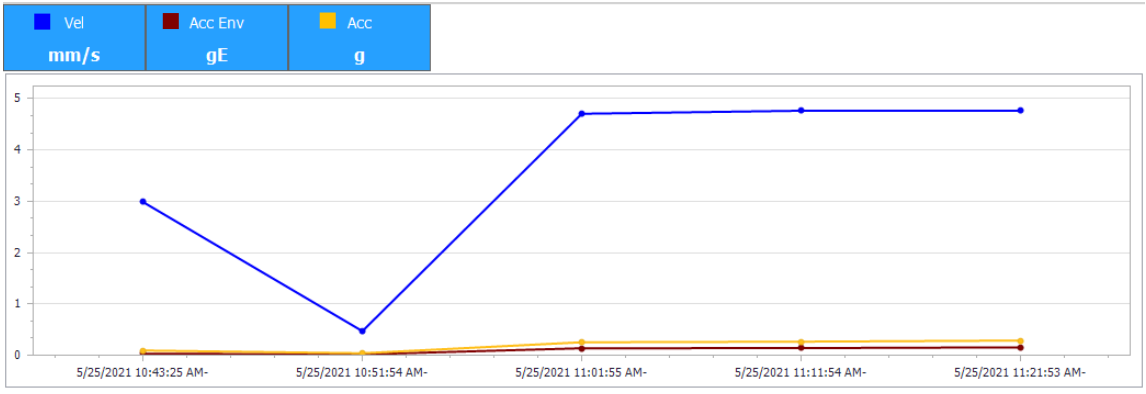
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TREND REPORT

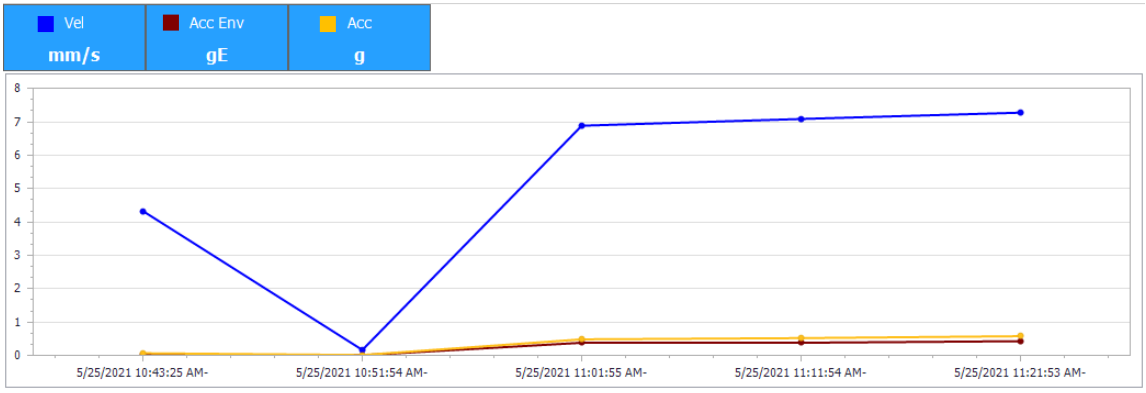
HORIZONTAL



VERTICAL



AXIAL

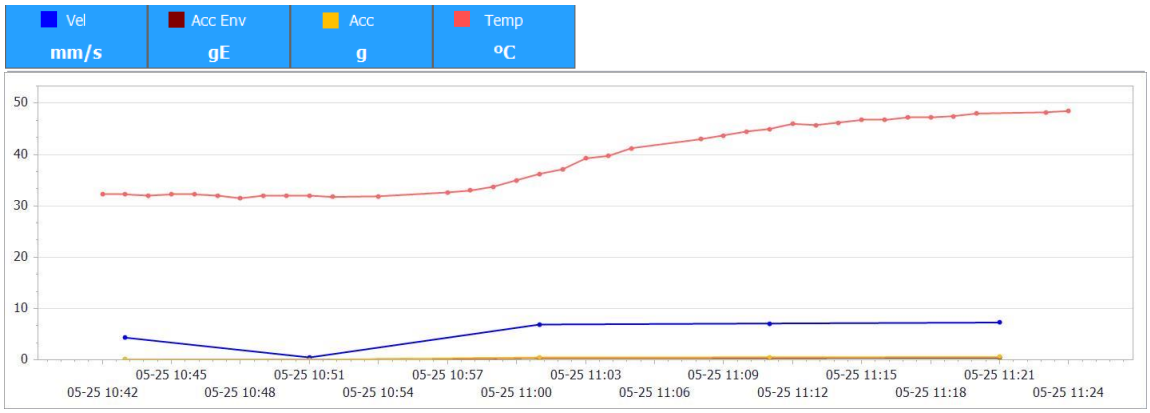


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TREND REPORT

TEMPERATURE (VIBRETION SENSOR)



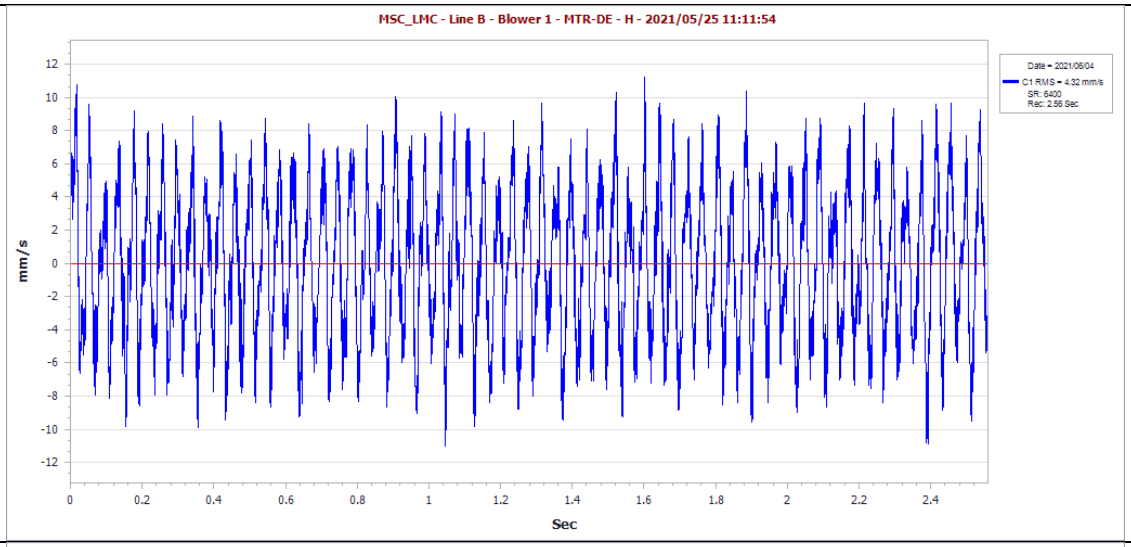
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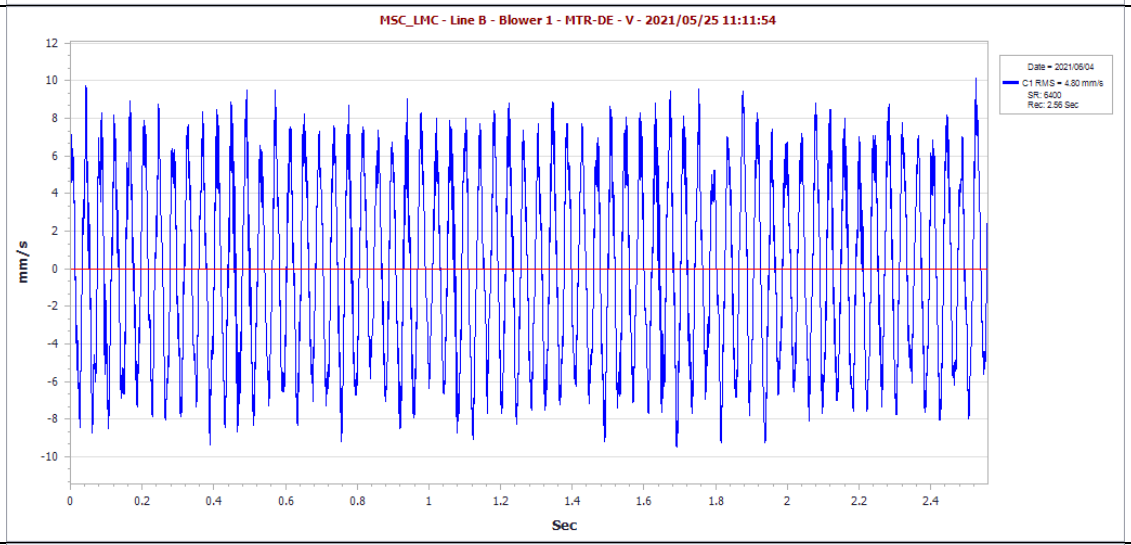
TIME WAVE FORM REPORT

Unit: mm/s

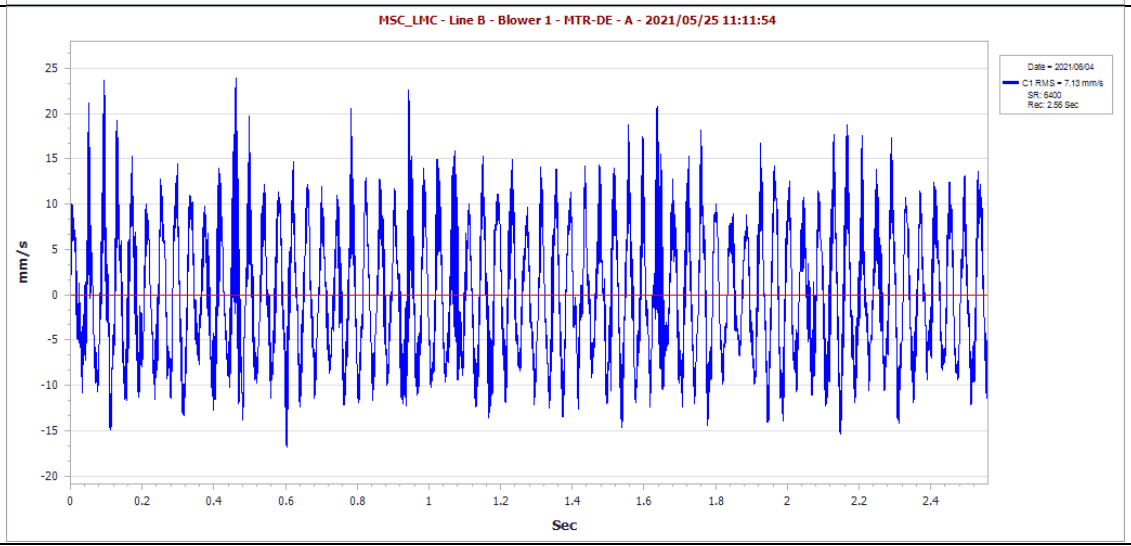
HORIZONTAL



VERTICAL



AXIAL



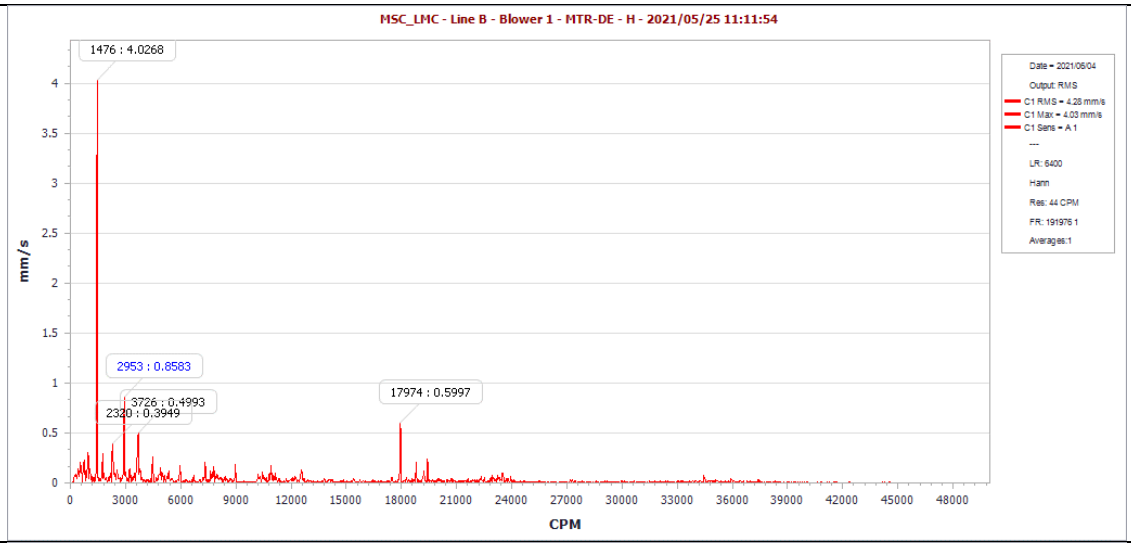
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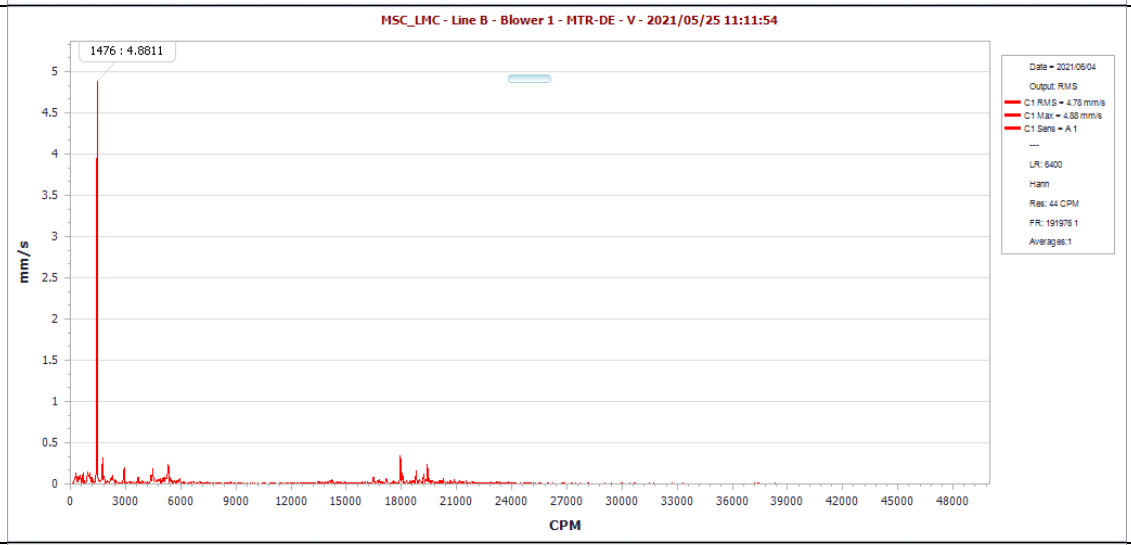
SPECTRUM REPORT

Unit: mm/s

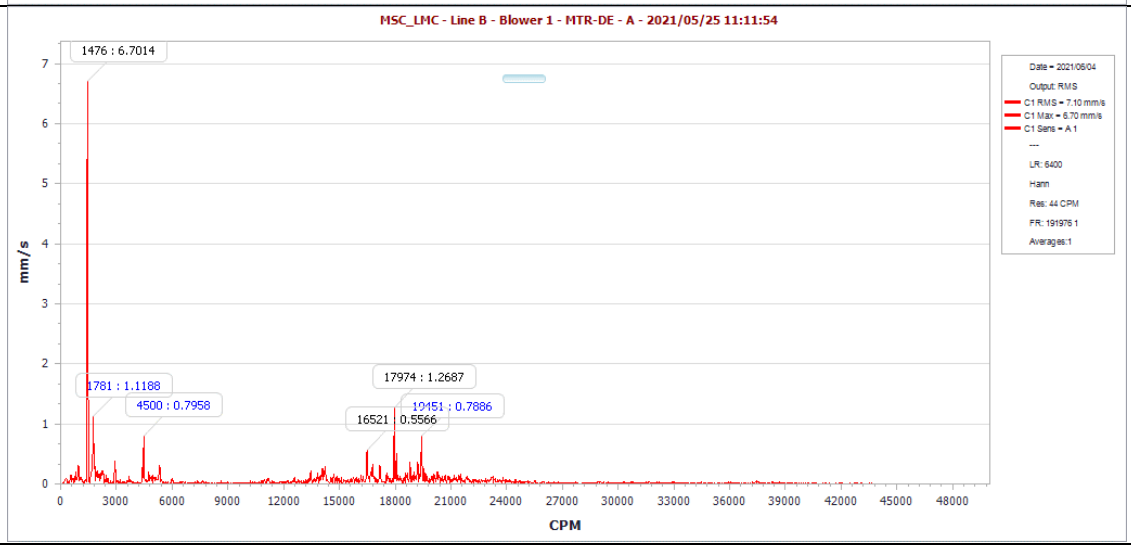
HORIZONTAL



VERTICAL



AXIAL



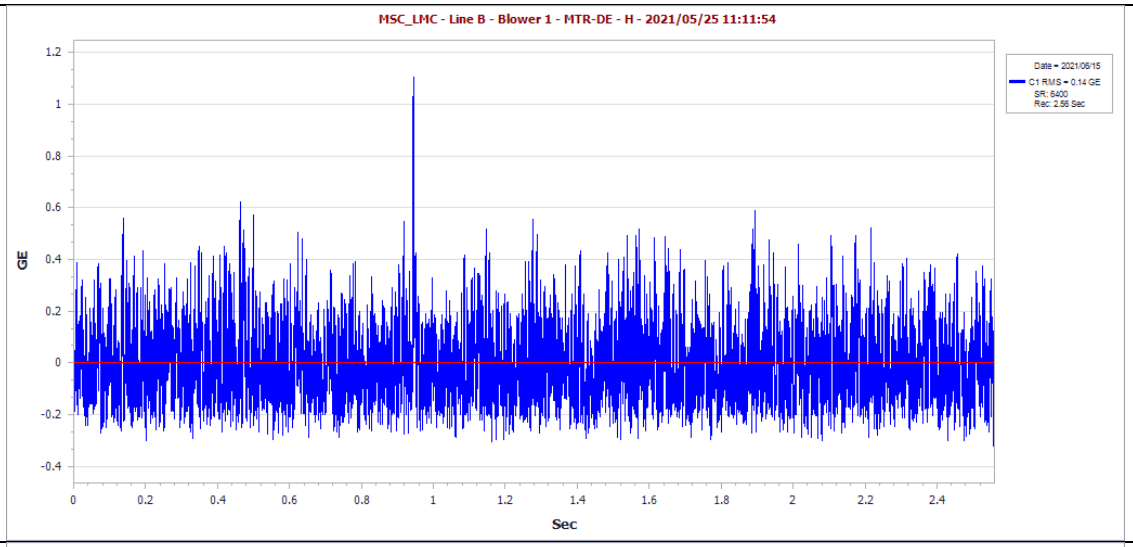
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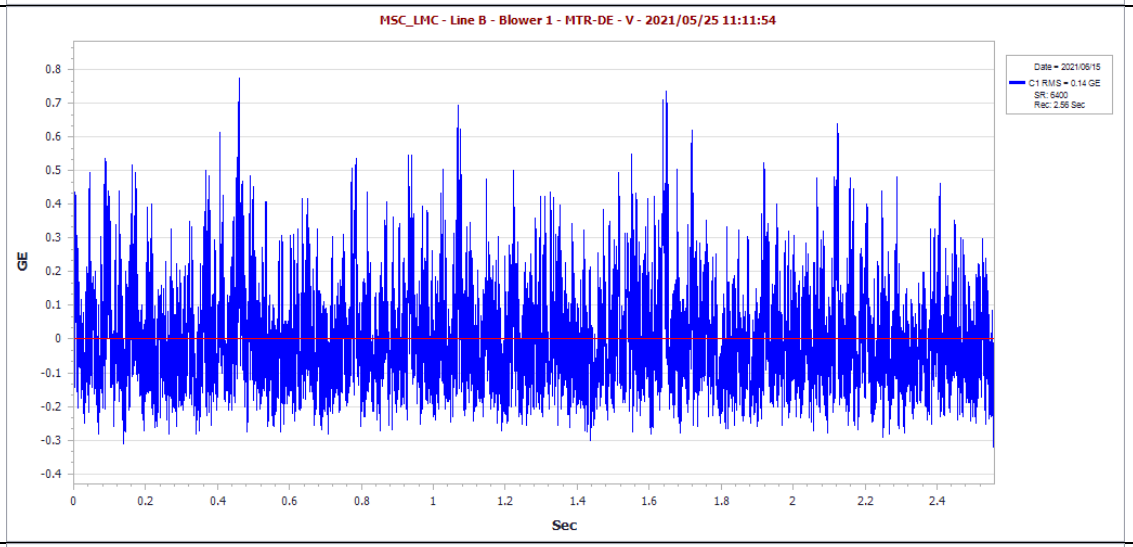
TIME WAVE FORM REPORT

Unit: G'E

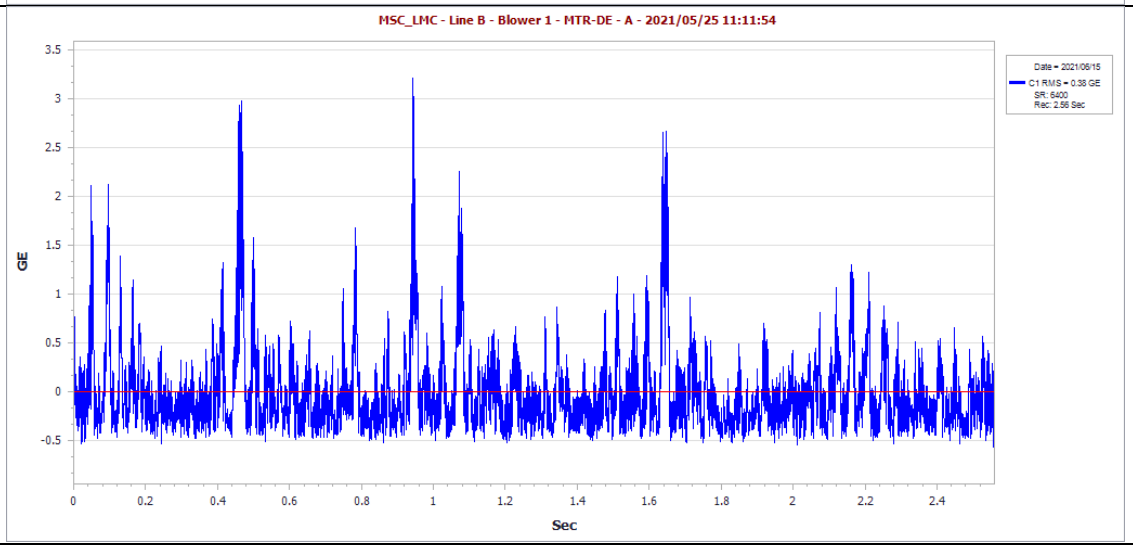
HORIZONTAL



VERTICAL



AXIAL



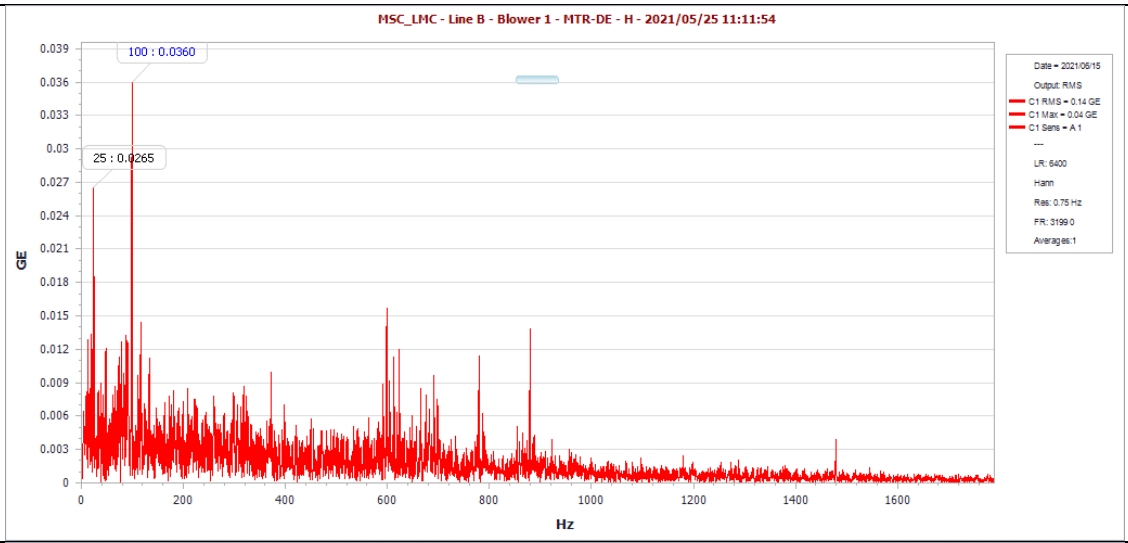
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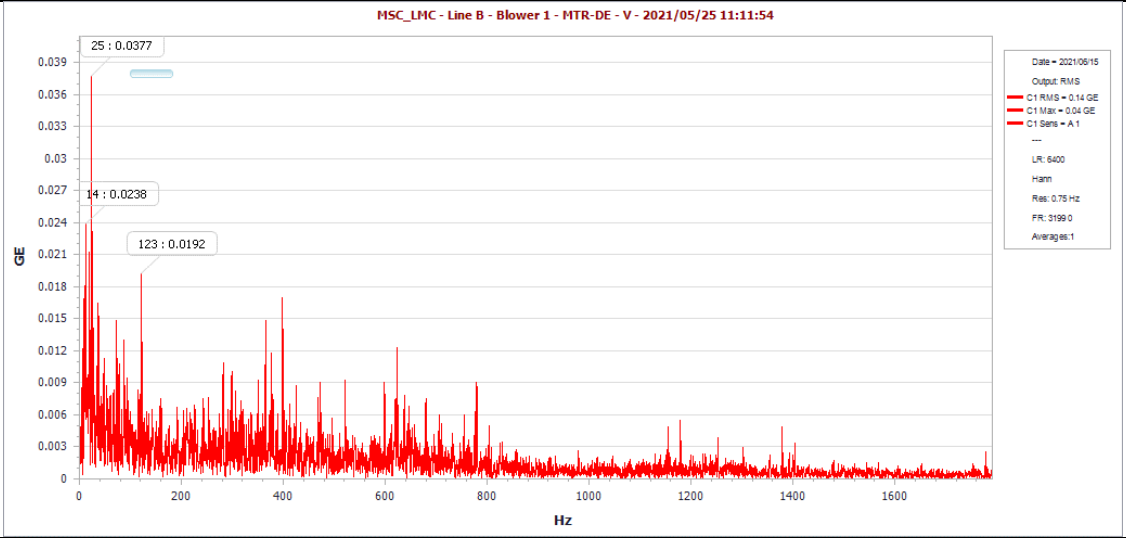
SPECTRUM REPORT

Unit: G'E

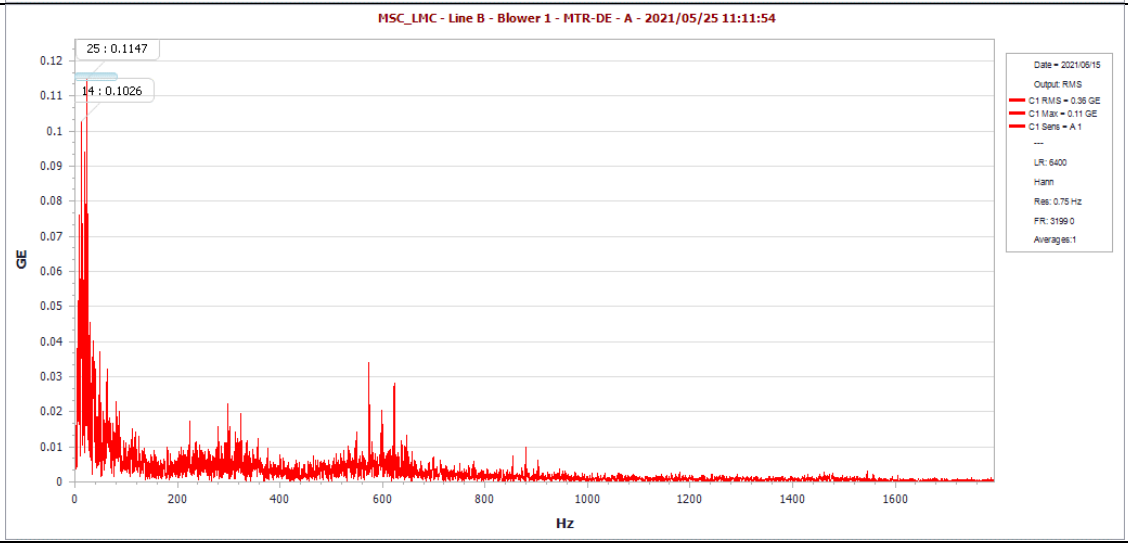
HORIZONTAL



VERTICAL



AXIAL



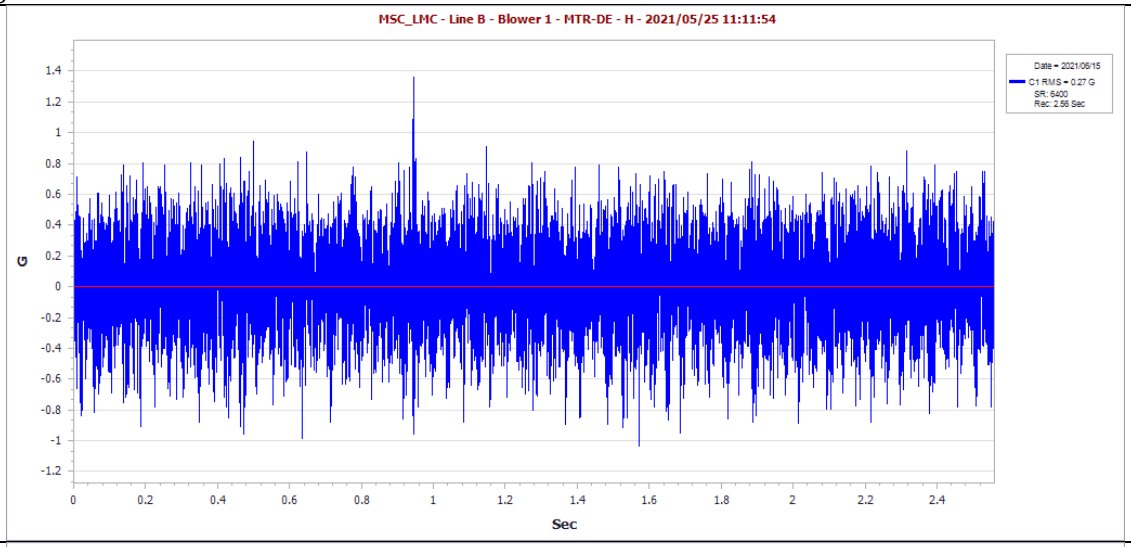
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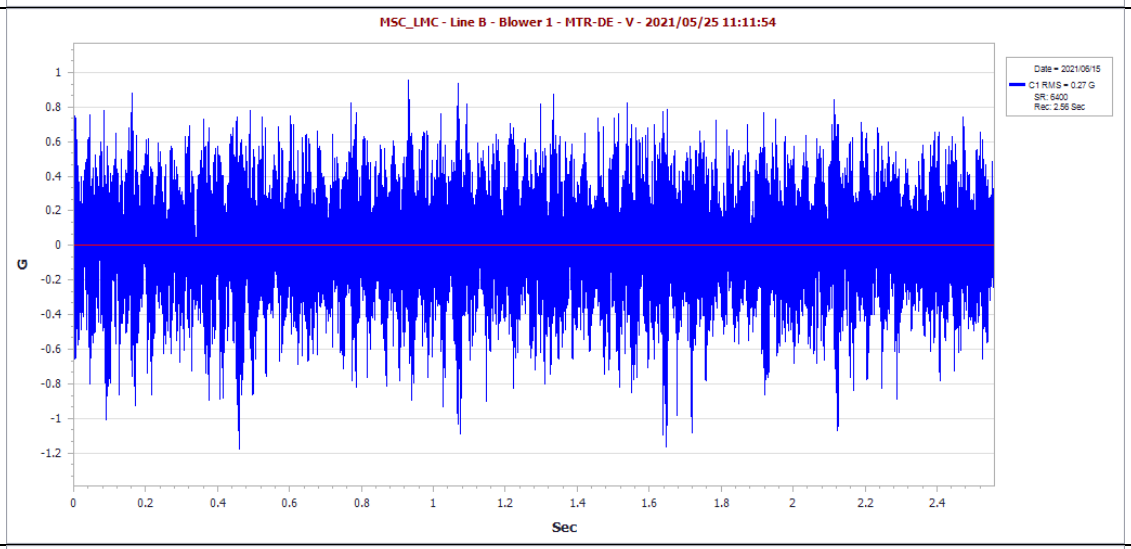
TIME WAVE FORM REPORT

Unit: g

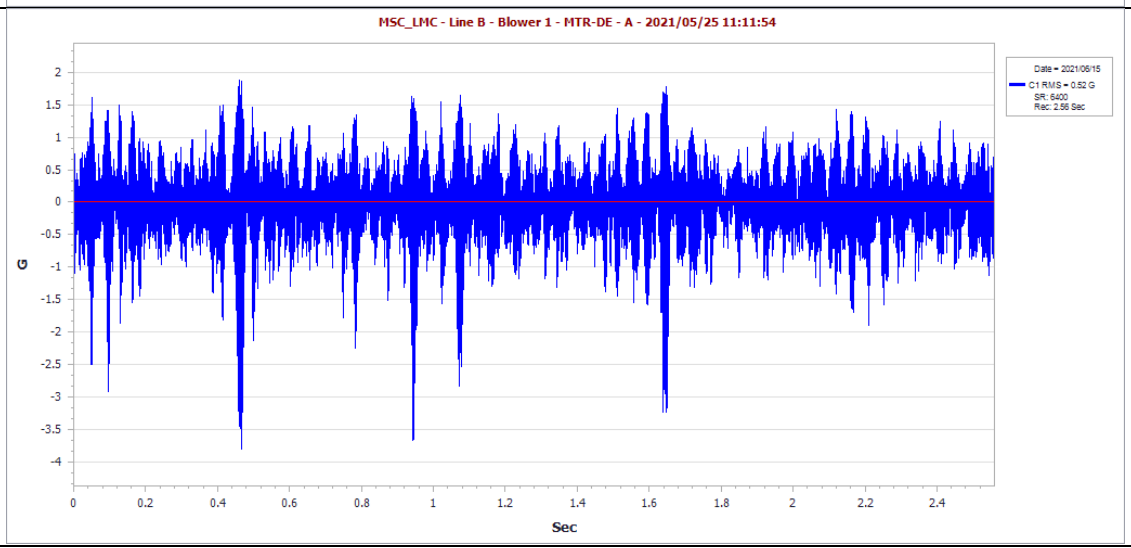
HORIZONTAL



VERTICAL



AXIAL



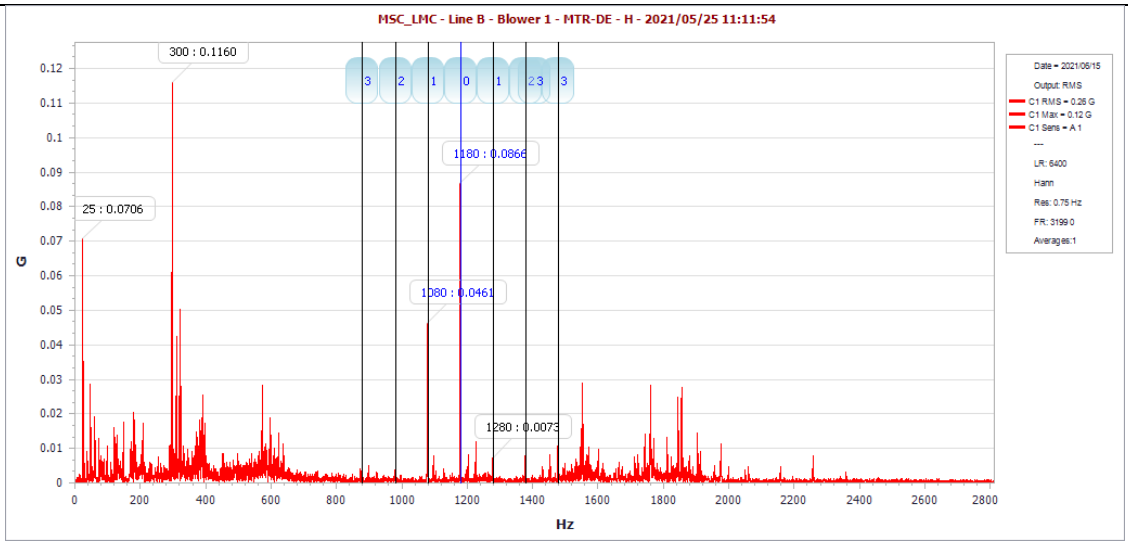
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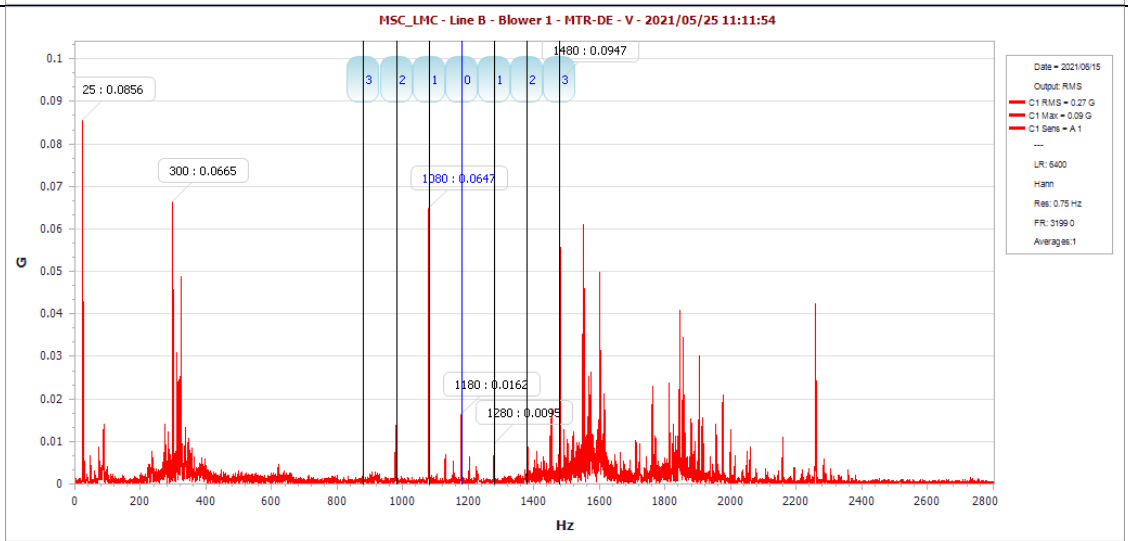
SPECTRUM REPORT

Unit: g

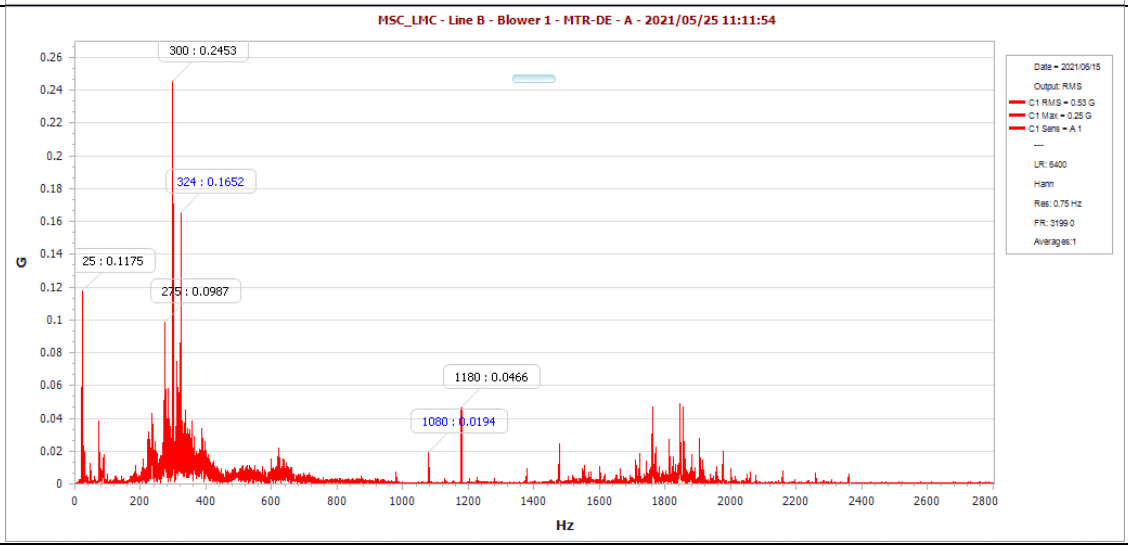
HORIZONTAL



VERTICAL



AXIAL



OBSERVATIONS

Highest vibration was found at 1X (1476 CPM) in axial direction which was affected from the radial directions especially the vertical.

Peak at 100 Hz was found on the G'E plot which indicated the soft foot problem. This was mainly found the foundation.

Suspected the broken/cracked rotor bar or loose rotor bar joints that was confirmed by the RBPF at 48X with 2 x FL sidebands.

RECOMMENDATIONS

- Inspect the isolator condition and the dampers are required to be added. Then recheck the fan unbalance condition.
- Correlate with MCSA to monitor the develop of the rotor problem

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ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

General Data

Job Order No	: DEMO Wireless Vibration	Measured Date	: May 25, 2021
Plant	: Michelin Siam Co., Ltd (Laem Chabang)	Unit	: Blower 2
Equipment	: Blower	Speed	: 3000 rpm.
Motor	: N/A kW	Speed	: 3000 rpm.
Coupling	: DIRECT DRIVE		

Technical Data

Vibration Equipment	: ERBESSD
Vibration Transducer	: WIRELESS PHANTOM
Unit	: mm/s_{rms}
Operation Condition	: On Load

Code Explanation

Position Code	Explanation
MTR-DE	Motor Drive End bearing

Direction Code	Explanation
V	Vertical direction of the vibration detection
H	Horizontal direction of the vibration detection
A	Axial direction of the vibration detection

ISO Code	Explanation
ISO 10816-3	Group 2: Medium sized machine (power 15 - 300 kW)

Severity Code		Explanation
Good	< 2.3 mm/s_{rms}	For new machine condition
Admissible	2.3 – 4.5 mm/s_{rms}	For unlimited long-term operation allowable
Still Admissible	4.5 – 7.1 mm/s_{rms}	For short-term operation allowable
Inadmissible	> 7.1 mm/s_{rms}	Vibration causes damage

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LAST MAGNITUDE MEASUREMENT REPORT

Blower 2

DATE : 25 May 2021

COLLECT DATA : Every 10 minute



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Vibration Measurement Report

Location	Date & Time	H	V	A	Unit	Severity
MTR-DE	2021-05-25 11:04:31	19.7439	2.6011	11.3640	mm/s	Danger
	2021-05-25 11:13:18	19.2417	2.4149	11.1843	mm/s	Danger
	2021-05-25 11:14:30	19.4609	2.5231	11.2727	mm/s	Danger

Temperature Measurement Report

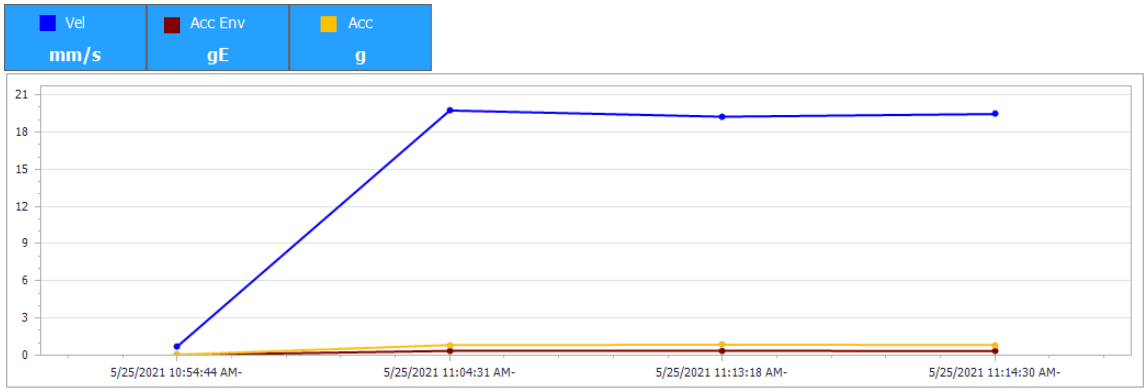
Location	Date & Time	Internal Temperature	Unit
MTR-DE	2021-05-25 11:02:04	33.75	ºC
	2021-05-25 11:03:46	34.5	ºC
	2021-05-25 11:05:25	34.5	ºC
	2021-05-25 11:05:36	35.5	ºC
	2021-05-25 11:06:39	35.5	ºC
	2021-05-25 11:08:03	36.25	ºC
	2021-05-25 11:09:32	36.75	ºC
	2021-05-25 11:11:18	37.25	ºC
	2021-05-25 11:12:33	37.5	ºC
	2021-05-25 11:14:10	37.75	ºC
	2021-05-25 11:15:44	38	ºC
	2021-05-25 11:16:34	38	ºC
	2021-05-25 11:16:55	38	ºC
	2021-05-25 11:18:21	38.25	ºC
	2021-05-25 11:19:16	38.25	ºC
	2021-05-25 11:21:29	38.75	ºC
	2021-05-25 11:24:21	38.75	ºC

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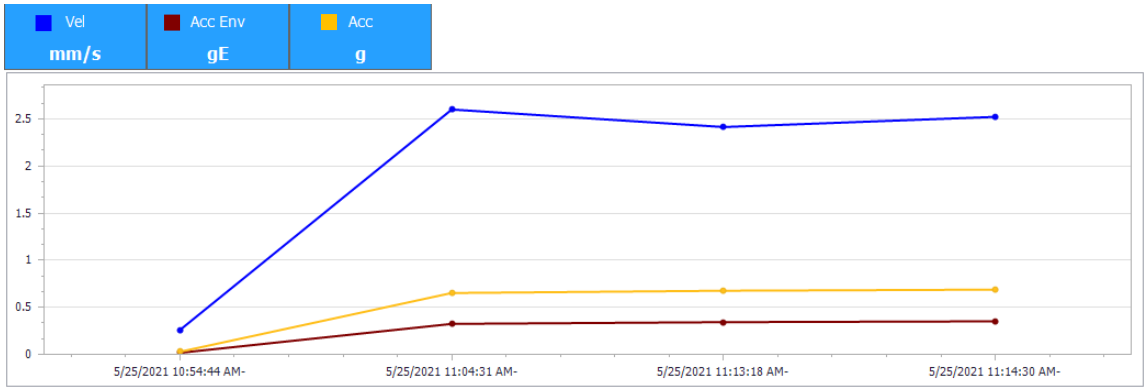
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TREND REPORT

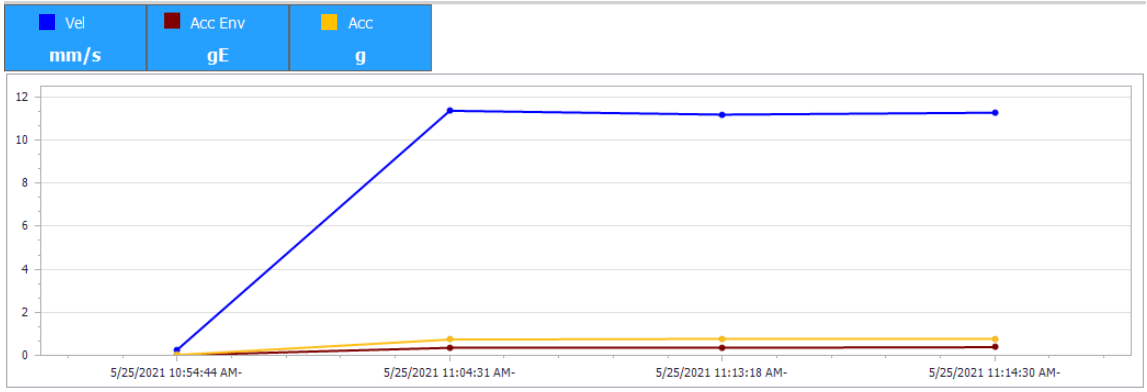
HORIZONTAL



VERTICAL



AXIAL

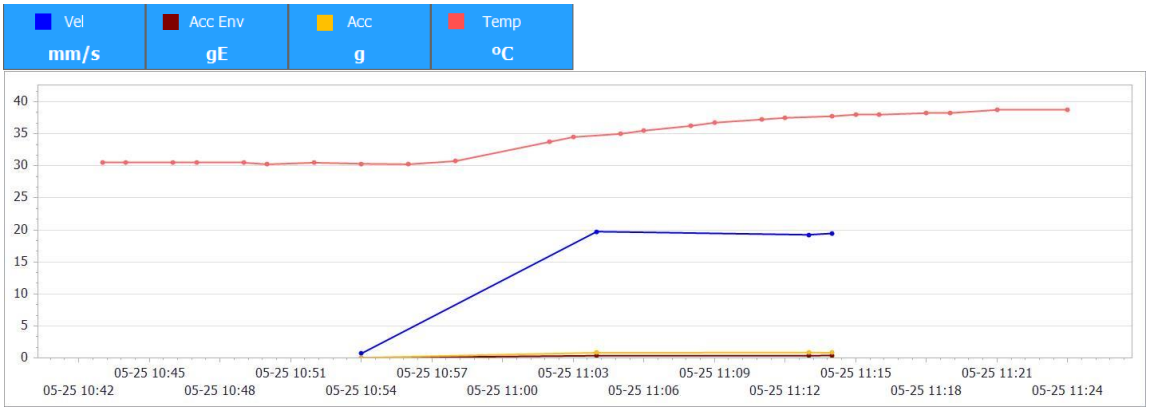


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TREND REPORT

TEMPERATURE (VIBRETION SENSOR)

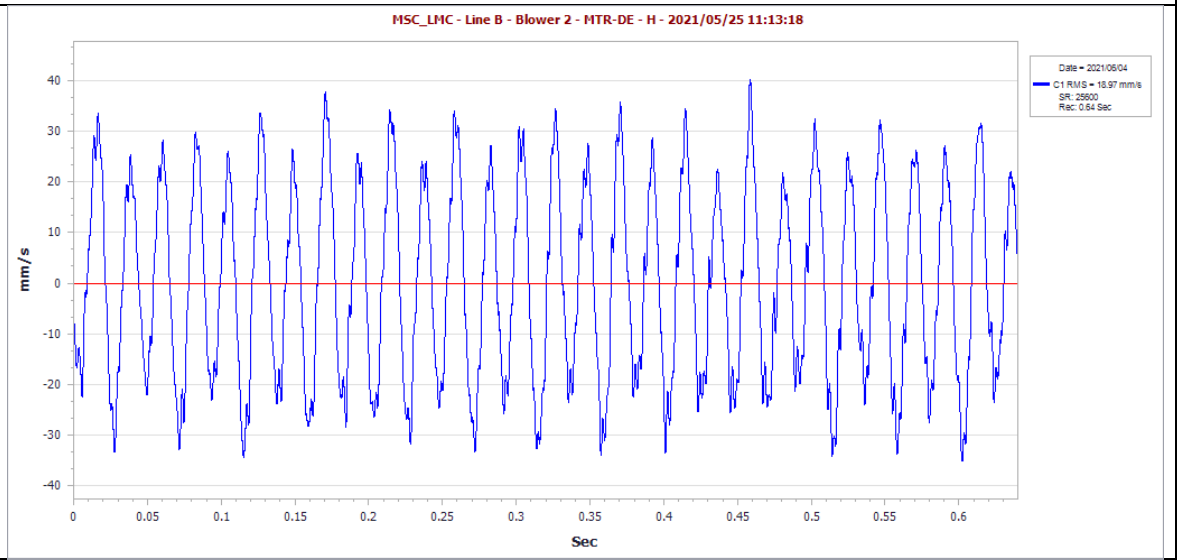


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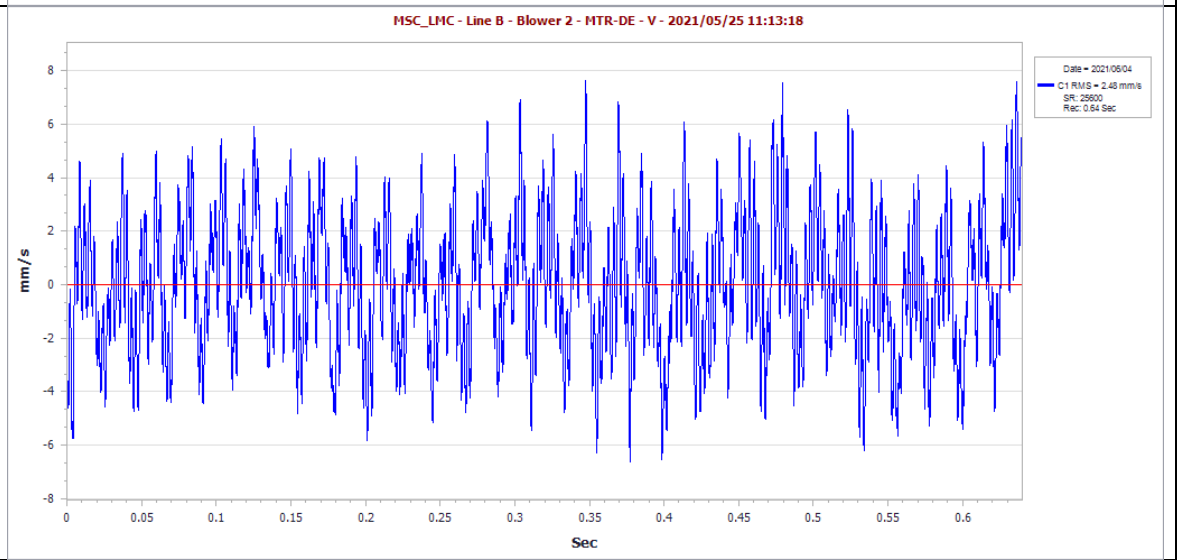
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TIME WAVE FORM REPORT

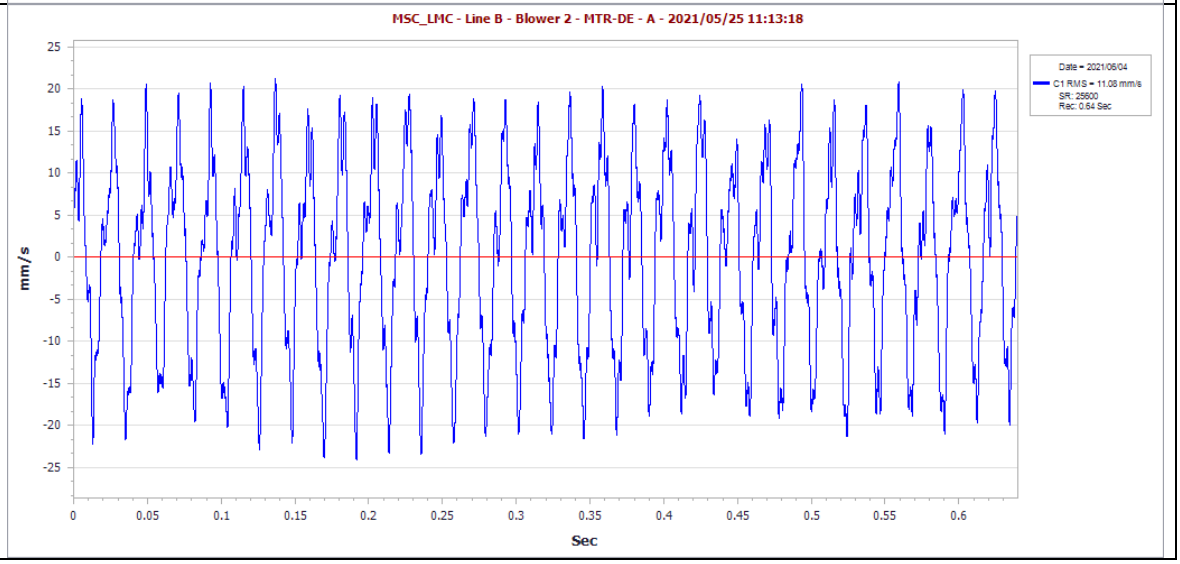
HORIZONTAL



VERTICAL



AXIAL

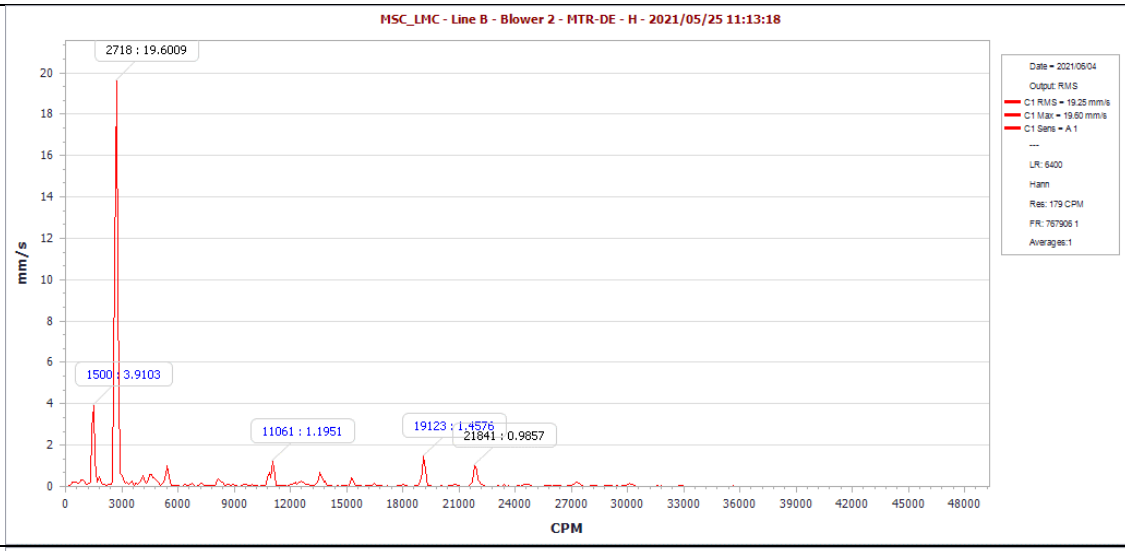


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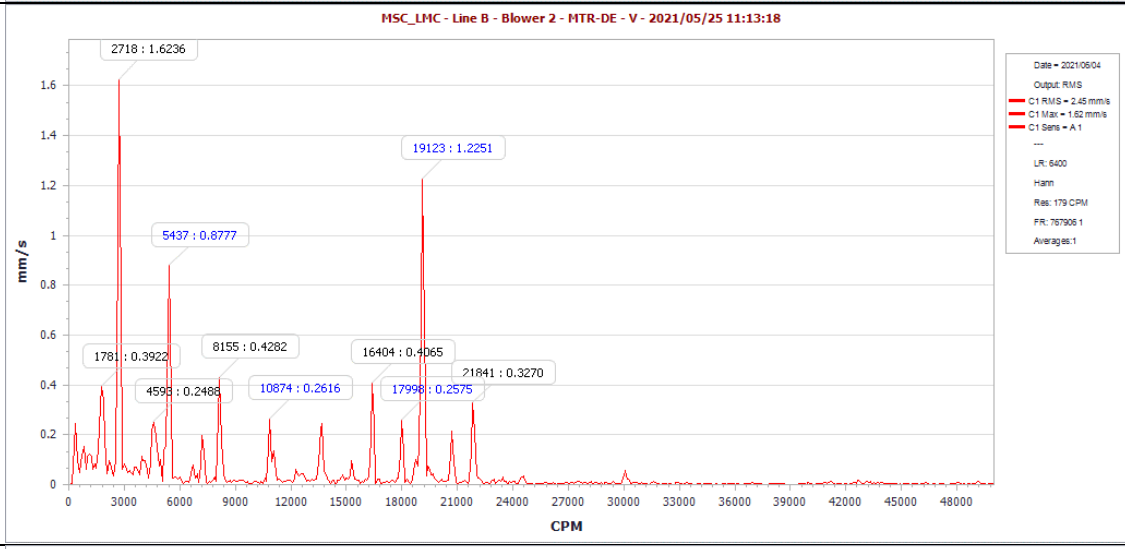
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SPECTRUM REPORT

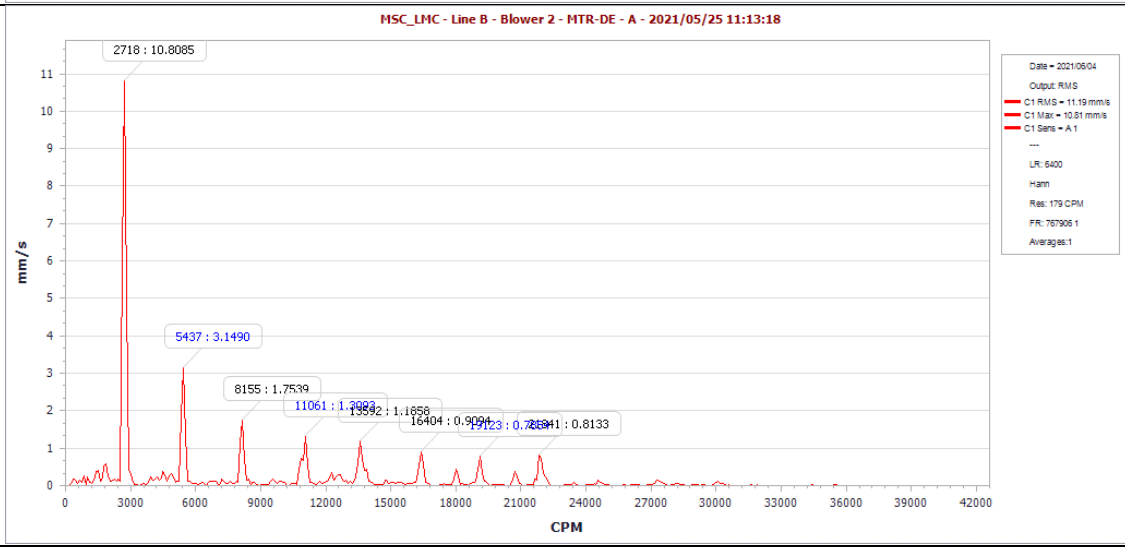
HORIZONTAL



VERTICAL



AXIAL



OBSERVATIONS

Highest vibration was found at 2719 CPM (suspected as the motor speed) in horizontal direction which was higher than 4 times of the vibration readings from the vertical direction (H: 19.6 mm/s / V:2.6 mm/s).

RECOMMENDATIONS

- Confirm the actual speed with the motor nameplate or specification sheet if the motor is running under this speed or not.
- Suspected 2719 CPM was the critical speed of the machine. Consider to add supports to the structure in order to increase the stiffness in the horizontal direction