HI-SPEED INDUSTRIAL SERVICE

QualiTest® Diagnostics

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March 12, 2024

Josh Cavitt
Sonoco
Memphis, TN

Josh,

The following is a summary of findings from the quarterly vibration survey performed at your facility on 3/5/24. Please let us know if there are any questions or comments.

QualiTest® uses a four step rating system for defects.

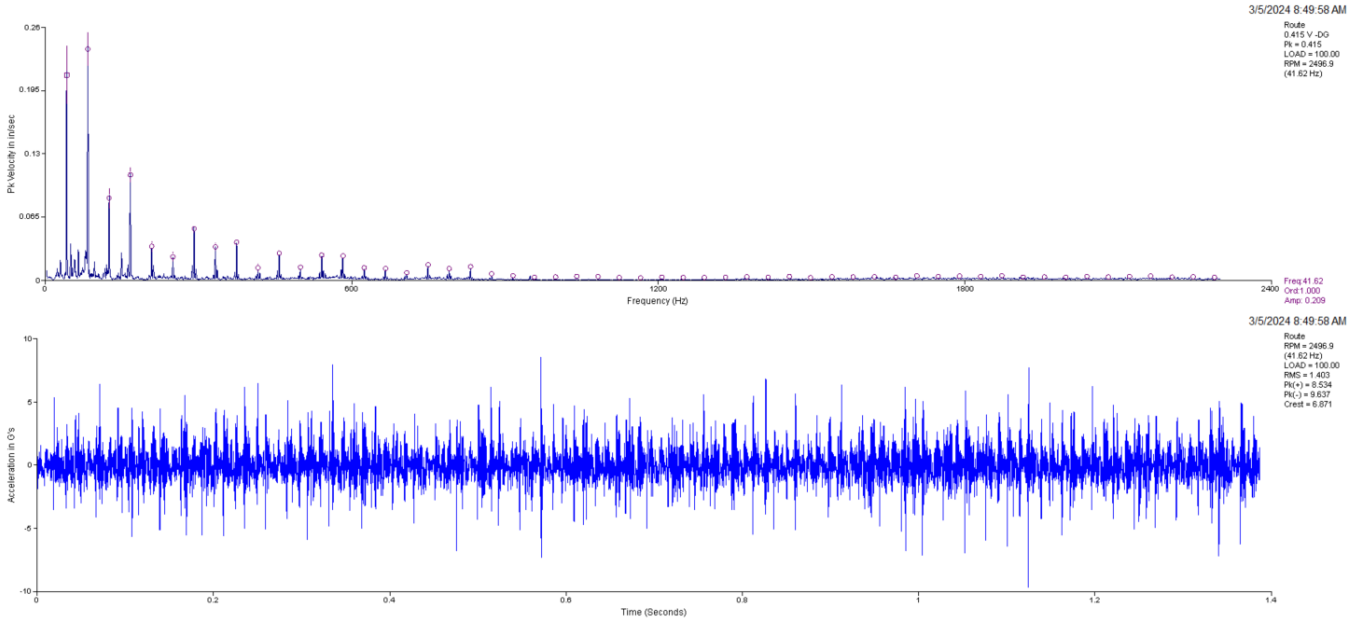
Class I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

Class II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

Class III; Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

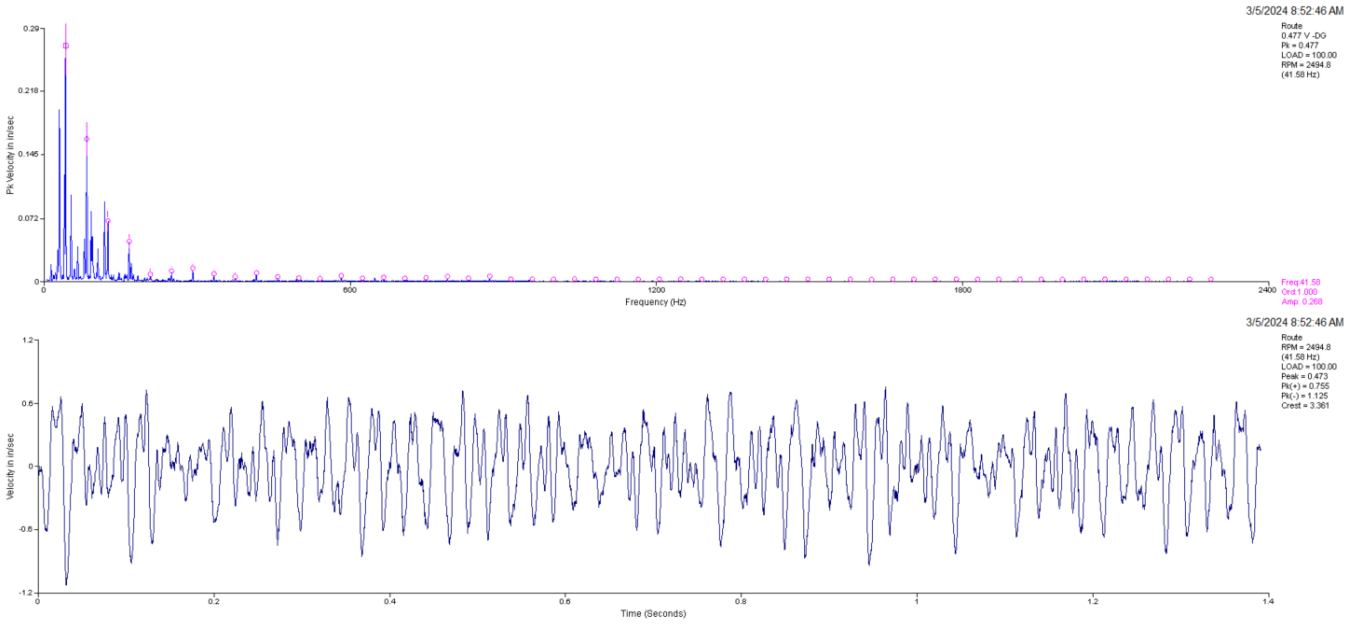
Class IV; Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs

Defects



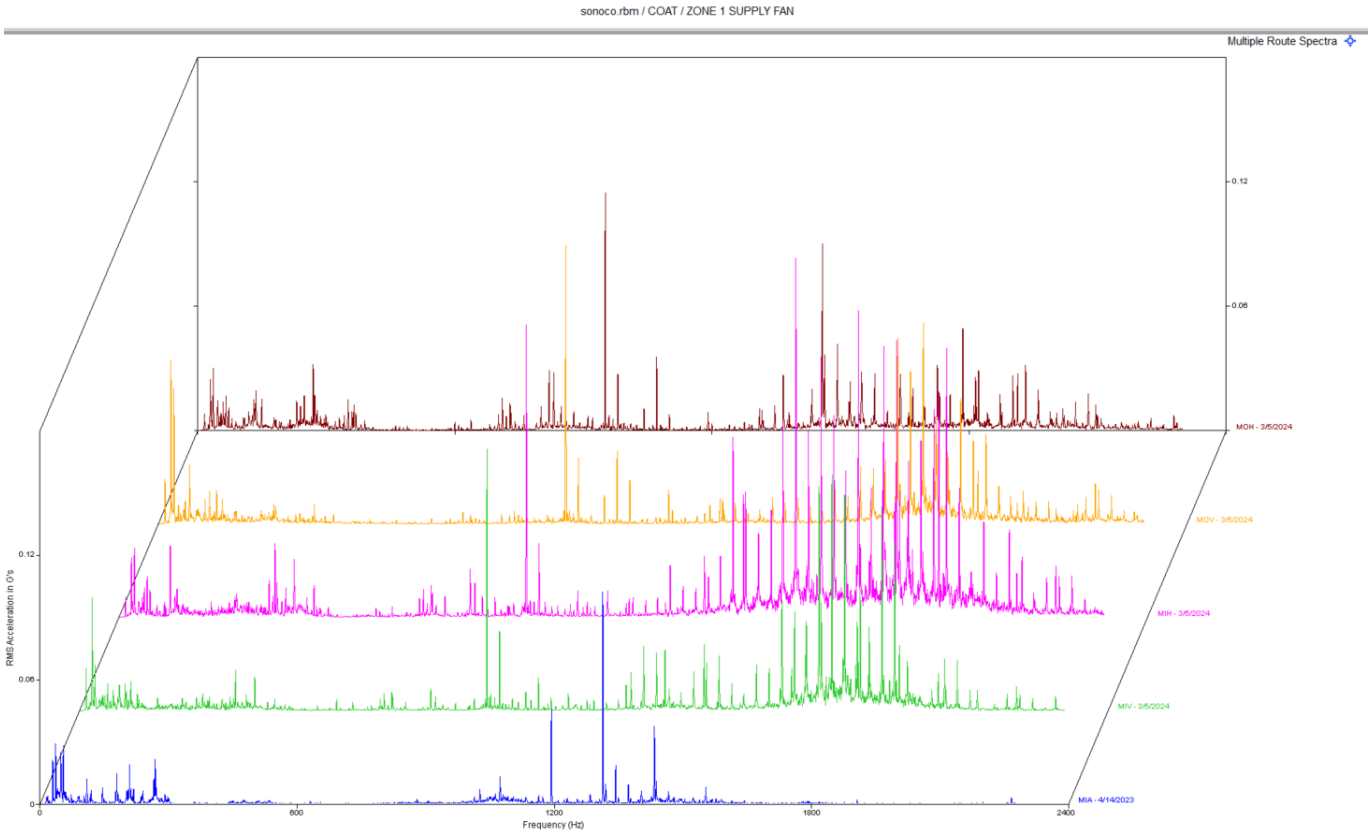
CLASS II P8 Oven Fan

Fan inboard bearing data shows several fan rpm harmonics present in the fan bearing data. This is an indication of mechanical fit looseness. Inspect fan bearings for looseness as time allows. Ensure fan shaft does not have excessive run out.



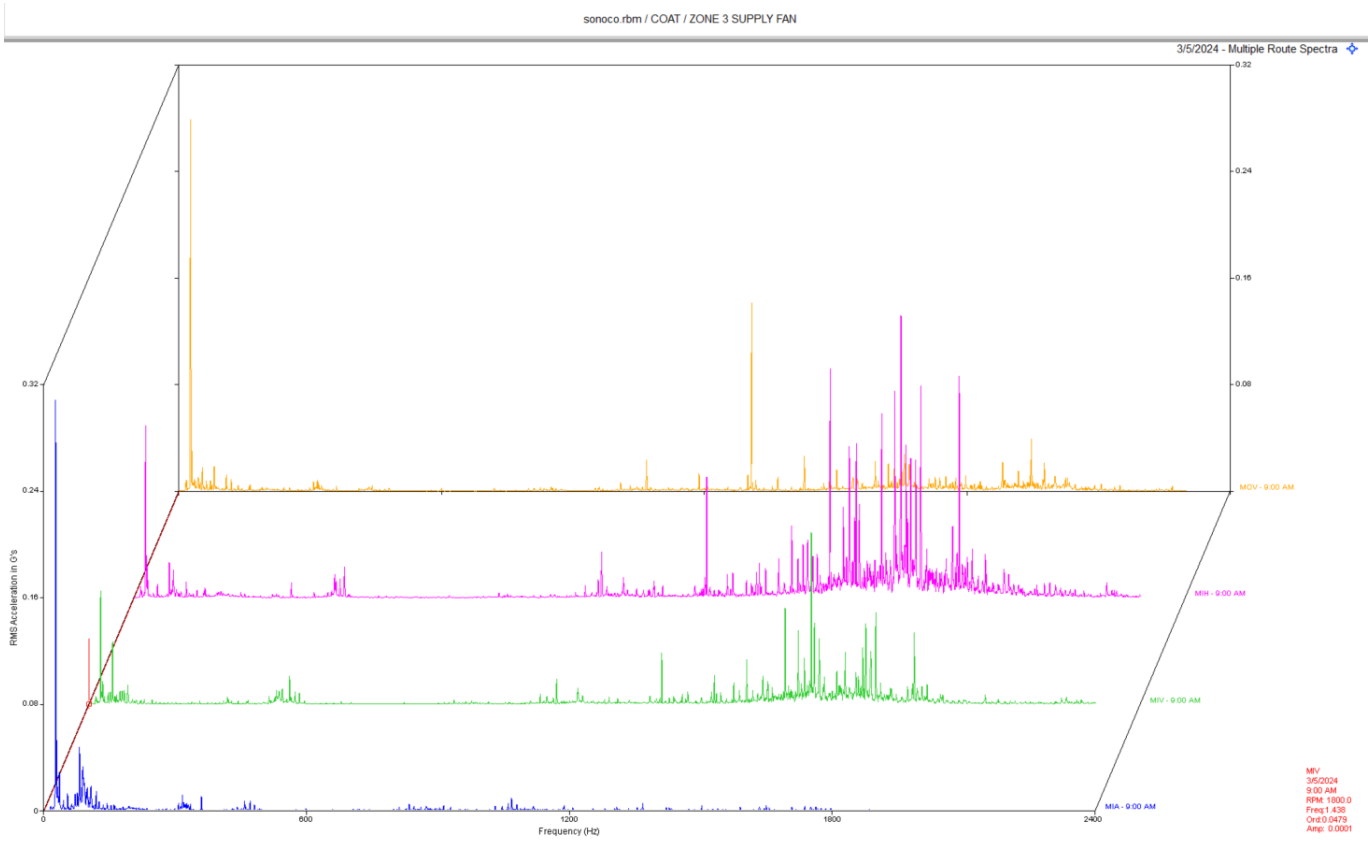
CLASS II P10 Oven Fan

Fan inboard vertical bearing data shows several fan rpm harmonics present in the fan bearing data. There are also sub-synchronous peaks present which may be belt frequencies. This is an indication of mechanical fit looseness and belt/sheaves issues. Inspect fan bearings for looseness as time allows. Ensure fan shaft does not have excessive run out and ensure belts and sheaves are in good shape.



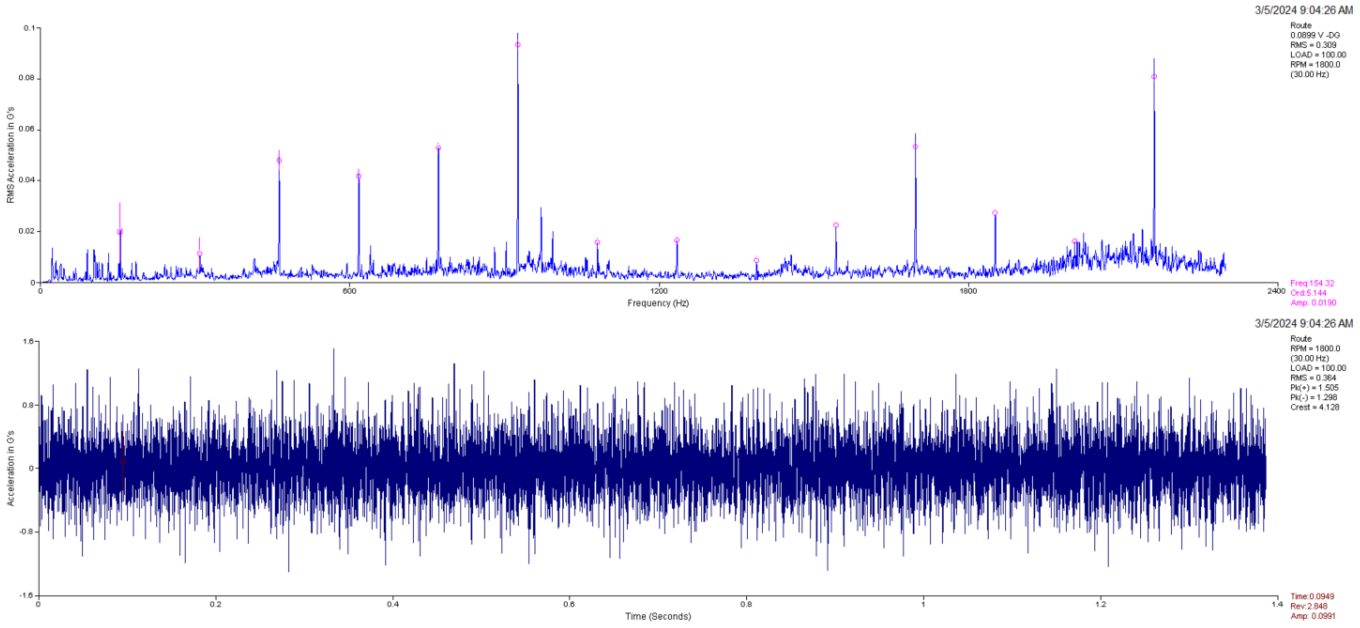
CLASS II Zone 1 Supply Fan

Multi-point spectral waterfall of the motor shows non-synchronous peaks related to bearing defects present in motor data. Motor bearings are defective and motor will need attention as scheduling allows.



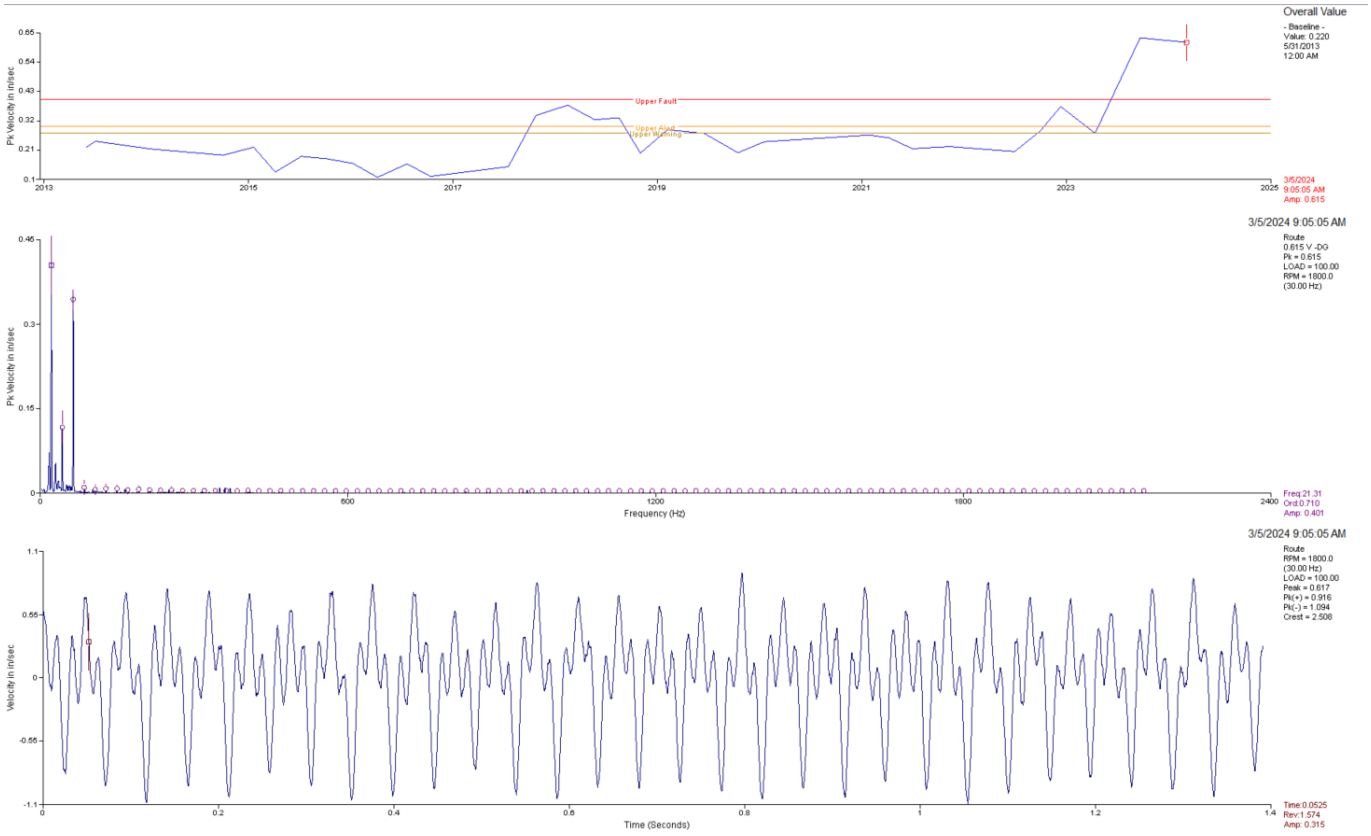
CLASS II Zone 3 Supply Fan

Multi-point spectral waterfall of the motor shows non-synchronous peaks related to bearing defects present in motor data. Motor bearings are defective and motor will need attention as scheduling allows. Motor also has very high 1 x rpm vibration in axial direction. Check motor sheave for face run out and ensure sheaves are aligned.



CLASS II Zone 5 Supply Fan

Fan inboard (DE) bearing data shows non-synchronous harmonics in the spectrum. This is an indication of bearing defects. Inspect fan bearings for defects and wear as scheduling allows.



CLASS III Zone 6 Supply Fan

Sub-synchronous vibrations are present in the motor. These peaks are likely harmonics of either fan speed or belts. For now, inspect sheaves for wear, face run-out, and misalignment. Ensure belts are in good order and properly tightened. Inspect motor base/structure for looseness also.

Abbreviated Last Measurement Summary

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Database: sonoco.rbm
Station: COATER

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
VACPUMP1 - VACUUM PUMP 1	(05-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.129 In/Sec	.582 G-s
MOV	.194 In/Sec	.680 G-s
MIH	.125 In/Sec	.454 G-s
MIV	.166 In/Sec	.618 G-s
MIA	.252 In/Sec	.392 G-s
EIH	.083 In/Sec	.284 G-s
EIV	.066 In/Sec	.330 G-s
EIA	.057 In/Sec	.272 G-s
EOH	.086 In/Sec	.162 G-s
EOV	.086 In/Sec	.181 G-s
EOA	.066 In/Sec	.298 G-s
VACPUMP2 - VACUUM PUMP 2	(05-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.171 In/Sec	.823 G-s
MOV	.153 In/Sec	1.232 G-s
MIH	.281 In/Sec	1.319 G-s
MIV	.175 In/Sec	1.719 G-s
MIA	.141 In/Sec	.288 G-s
EIH	.165 In/Sec	.216 G-s
EIV	.111 In/Sec	.236 G-s
EIA	.082 In/Sec	.303 G-s
EOH	.105 In/Sec	.162 G-s
EOV	.142 In/Sec	.243 G-s
EOA	.064 In/Sec	.236 G-s
CTPUMP2 - COOLING TOWER PUMP 2	(05-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.032 In/Sec	.394 G-s
MOV	.062 In/Sec	.521 G-s
MIH	.039 In/Sec	.334 G-s
MIV	.046 In/Sec	.553 G-s
MIA	.055 In/Sec	.259 G-s
EIH	.031 In/Sec	.698 G-s
EIV	.054 In/Sec	.419 G-s
EIA	.068 In/Sec	.837 G-s
P8OVENFAN - P8 OVEN FAN	(05-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.157 In/Sec	.034 G-s
MOV	.205 In/Sec	.098 G-s
MIH	.234 In/Sec	.124 G-s
MIV	.264 In/Sec	.089 G-s
EIH	.415 In/Sec	1.090 G-s
EIV	.441 In/Sec	1.102 G-s
EIA	.391 In/Sec	.773 G-s
EOH	.165 In/Sec	.815 G-s
EOV	.169 In/Sec	.835 G-s
P10OVENFAN - P10 OVEN FAN	(05-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.126 In/Sec	.041 G-s

MOV	.262 In/Sec	.037 G-s
MIH	.131 In/Sec	.028 G-s
MIV	.405 In/Sec	.106 G-s
EIH	.167 In/Sec	.222 G-s
EIV	.477 In/Sec	.304 G-s
EIA	.409 In/Sec	.193 G-s
EOH	.225 In/Sec	.376 G-s
EOV	.254 In/Sec	.334 G-s

MAINXHAUST - MAIN EXHAUST FAN (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.351 In/Sec	.360 G-s
MOV	.429 In/Sec	.327 G-s
MIH	.276 In/Sec	.396 G-s
MIV	.275 In/Sec	.467 G-s
MIA	.338 In/Sec	.178 G-s
EIH	.178 In/Sec	.296 G-s
EIV	.239 In/Sec	1.136 G-s
EOH	.189 In/Sec	.630 G-s
EOV	.129 In/Sec	.474 G-s

ZONE1FAN - ZONE 1 SUPPLY FAN (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.140 In/Sec	.286 G-s
MOV	.330 In/Sec	.318 G-s
MIH	.159 In/Sec	.770 G-s
MIV	.223 In/Sec	.520 G-s
EIH	.190 In/Sec	.459 G-s
EIV	.148 In/Sec	.402 G-s
EOH	.149 In/Sec	.241 G-s
EOV	.147 In/Sec	.073 G-s

ZONE2FAN - ZONE 2 SUPPLY FAN (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.247 In/Sec	.311 G-s
MOV	.271 In/Sec	.203 G-s
MIH	.320 In/Sec	.426 G-s
MIV	.150 In/Sec	.253 G-s
MIA	.296 In/Sec	.140 G-s
EIH	.233 In/Sec	.090 G-s
EIV	.199 In/Sec	.078 G-s
EIA	.206 In/Sec	.046 G-s

ZONE3FAN - ZONE 3 SUPPLY FAN (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.276 In/Sec	.203 G-s
MOV	.917 In/Sec	.229 G-s
MIH	.443 In/Sec	.585 G-s
MIV	.305 In/Sec	.368 G-s
MIA	1.030 In/Sec	.034 G-s
EIH	.191 In/Sec	.172 G-s
EIV	.228 In/Sec	.036 G-s
EOH	.223 In/Sec	.268 G-s
EOV	.212 In/Sec	.159 G-s

ZONE4FAN - ZONE 4 SUPPLY FAN (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.240 In/Sec	.170 G-s
MOV	.267 In/Sec	.127 G-s
MIH	.295 In/Sec	.214 G-s
MIV	.204 In/Sec	.234 G-s
EIH	.200 In/Sec	.084 G-s
EIV	.081 In/Sec	.028 G-s
EOH	.164 In/Sec	.088 G-s
EOV	.187 In/Sec	.019 G-s

ZONE5FAN - ZONE 5 SUPPLY FAN (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.089 In/Sec	.121 G-s
MOV	.119 In/Sec	.213 G-s

MIH	.101 In/Sec	.084 G-s
MIV	.097 In/Sec	.127 G-s
EIH	.090 In/Sec	1.148 G-s
EIV	.083 In/Sec	1.569 G-s

ZONE6FAN - ZONE 6 SUPPLY FAN (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.615 In/Sec	.079 G-s
MOV	.215 In/Sec	.068 G-s
MIH	.449 In/Sec	.067 G-s
MIV	.276 In/Sec	.063 G-s
EIH	.125 In/Sec	.047 G-s
EIV	.313 In/Sec	.218 G-s
EOH	.161 In/Sec	.145 G-s
EOV	.342 In/Sec	.192 G-s

COOLFAN B - COOLING FAN B (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.289 In/Sec	.153 G-s
MOV	.200 In/Sec	.072 G-s
MIH	.312 In/Sec	.111 G-s
MIV	.276 In/Sec	.114 G-s
MIA	.240 In/Sec	.016 G-s

COOLFAN A - COOLING FAN A (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.336 In/Sec	.296 G-s
MOV	.105 In/Sec	.261 G-s
MIH	.265 In/Sec	.159 G-s
MIV	.109 In/Sec	.288 G-s
MIA	.249 In/Sec	.130 G-s
EIH	.139 In/Sec	.085 G-s
EIV	.093 In/Sec	.374 G-s
EOH	.118 In/Sec	.177 G-s
EOV	.157 In/Sec	.228 G-s

502SPNBLWR - 502 SPENCER BLOWER (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.084 In/Sec	.232 G-s
MOV	.134 In/Sec	.383 G-s
MIV	.114 In/Sec	.206 G-s

CLNESNCBLW - C LINE SPENCER BLOWER (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.106 In/Sec	.078 G-s
MOV	.043 In/Sec	.132 G-s
MIV	.074 In/Sec	.070 G-s

DLNESNCBLW - D LINE SPENCER BLOWER (05-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.252 In/Sec	.109 G-s
MOV	.194 In/Sec	.057 G-s
MIH	.159 In/Sec	.048 G-s
MIV	.176 In/Sec	.096 G-s

Clarification Of Vibration Units:

Acc --> G-s RMS

Vel --> In/Sec PK

As always, it has been a pleasure to serve Sonoco. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

ISO Certified Vibration Analyst, Category III

HI-SPEED INDUSTRIAL SERVICE

QualiTest® Diagnostics

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