HI-SPEED INDUSTRIAL SERVICE

MILLINGTON, TN

November 12, 2021

SONOCO

Subject: November(Q4) vibration report

Most of the machines surveyed were found to be in good condition with the exception of the following:

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

Hi-Speed **Industrial Service** tests and inspects industrial machinery and equipment and makes recommendations concerning maintenance and repairs based on its experience in the field of industrial repair and maintenance. The information contained herein is provided as an opinion only, not as a guaranty or warranty of the matters discussed herein.

This completes our assessment of your equipment for this survey. Thank you for your business and don't hesitate to call if you have any comments or questions.

Sincerely,

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Observations

Coater Main Exhaust Fan
Fan speed vibrations dominate the unit and especially the motor. The fan bearings show harmonic content which could indicate excessive clearance. Inspect the unit structure, motor base, and motor for cracks and for loose or missing fasteners. Inspect the sheaves and belts for wear and eccentricity. Remove the belts and dial indicate the fan shaft for run out by the sheave, and excessive movement in all directions by the bearings using force. Clean and inspect the fan wheel. Trim balancing might be required at the end. This is a large increase since last quarter. **Rated a Class III Defect.**

Coater Zone 1 Fan Unit
Inspect for belt and sheave wear and alignment. Inspect motor base and fasteners. **Rated a Class II Defect.**

Coater Zone 2 Fan Unit
Fan bearing data looks good now. No issues.

Coater Zone 3 Fan Unit
Not much change. Vibrations at 27 HZ (fan Speed) in the motor axial are 0.6”/sec peak overall. Ensure all foot bolts on the motor and fan bearing housings are torqued. Inspect sheaves for wear/loose hardware. Ensure belts are at appropriate tension. Check sheave alignment. The inboard fan bearing is showing defect frequencies. Ensure good lubrication. **Rated a Class II Defect.**

Coater Zone 4 Fan Unit
No issues.

Coater Zone 5 Fan Unit
Inboard fan bearing shows early race defect frequencies. Information only at this time. **Rated a Class I Defect.**

Coater Zone 6 Fan Unit
Motor data shows a few harmonics. Check fasteners and belts and sheaves as time allows. **Rated a Class I Defect.**

Coater Cooling Zone A Fan Unit
No issues.

Coater Cooling Zone B Fan Unit
The inboard cooling fan bearing is in distress. Expect to change out in the near future. **Rated a Class II Defect.**

Vacuum pump 1
Motor still has slight axial vibration. Inspect belts and sheaves for wear and alignment as time allows. **Rated a Class I Defect.**

Vacuum Pump 2
Back in service. No issues.

Cooling tower pump 1
No issues.

Cooling tower pump 2
The motor data shows a few noise humps in the frequency spectrums. This could be an indication of dry or distressed bearings. Cavitation could be an issue also. Recommend motor replacement as time allows. Check for inlet restrictions. **Rated a Class II Defect.**

P8 Oven Fan
Harmonics of fan speed still dominate the unit vibration data in the fan bearings. Overall vibrations are at near 0.8"/second velocity peak in the axial. Ensure that sheaves are aligned, and all bearing housings are torqued. Inspect belts and sheaves for wear. Check the shaft runout to ensure the shaft is not bent. Remove the belts and dial indicate shaft movement adjacent to bearings in horizontal and vertical while applying force to confirm excessive bearing housing fit clearances. Clean fan of any buildup. Have fan balanced if necessary. **Rated a Class III Defect.**

P9 Oven Fan
Harmonics of fan speed still dominate the unit vibration data in the fan bearings. Overall vibrations are at near 0.9"/second velocity peak in the axial. Ensure that sheaves are aligned, and all bearing housings are torqued. Inspect belts and sheaves for wear. Check the shaft runout to ensure the shaft is not bent. Remove the belts and dial indicate shaft movement adjacent to bearings in horizontal and vertical while applying force to confirm excessive bearing housing fit clearances. Clean fan of any buildup. Have fan balanced if necessary. **Rated a Class III Defect.**

P10 Oven Fan
Harmonics of fan speed still dominate the unit vibration data in the fan bearings. Overall vibrations are at near 1.0"/second velocity peak in the axial. Ensure that sheaves are aligned, and all bearing housings are torqued. Inspect belts and sheaves for wear. Check the shaft runout to ensure the shaft is not bent. Remove the belts and dial indicate shaft movement adjacent to bearings in horizontal and vertical while applying force to confirm excessive bearing housing fit clearances. Clean fan of any buildup. Have fan balanced if necessary. **Rated a Class III Defect.**

P19 Oven Fan
Motor overall vibrations have dropped to 0.77”/second velocity peak. Inspect the drivetrain for wear and alignment. Check that all motor and fan bearing fasteners are tight. Fan bearing data was limited. Modify the bearing guards for better access for vibration transducers. **Rated a Class II Defect.**

A Line Blower
No issues.

B Line Blower
No issues.

C Line Blower
No issues.

D Line Blower
No issues.

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                    Abbreviated Last Measurement Summary
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                Database:  sonoco.rbm
                Station:   SONOCO
                Route No.  1:  SONOCO
                Report Date:  12-Nov-21   07:24

MEASUREMENT POINT     OVERALL LEVEL       HFD / VHFD      MACHINE SPEED
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VACPUMP1   - VACUUM PUMP 1                  (10-Nov-21)
                       OVERALL LEVEL     1 - 20 KHz
       MOH               .157 In/Sec       .171 G-s        1800.0 RPM
       MOV               .123 In/Sec       .183 G-s
       MIH               .115 In/Sec       .229 G-s
       MIV               .239 In/Sec       .252 G-s
       MIA               .284 In/Sec       .211 G-s
       EIH               .107 In/Sec       .137 G-s
       EIV               .062 In/Sec       .060 G-s
       EIA               .066 In/Sec       .171 G-s
       EOH               .060 In/Sec       .109 G-s
       EOV               .061 In/Sec       .145 G-s
       EOA               .035 In/Sec       .175 G-s

VACPUMP2   - VACUUM PUMP 2                  (10-Nov-21)
                       OVERALL LEVEL     1 - 20 KHz
       MOH               .160 In/Sec       .521 G-s        1800.0 RPM
       MOV               .147 In/Sec       .861 G-s
       MIH               .266 In/Sec       .391 G-s
       MIV               .141 In/Sec       .734 G-s
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MIA	.160 In/Sec	.248 G-s	
EIH	.099 In/Sec	.141 G-s	
EIV	.107 In/Sec	.177 G-s	
EIA	.079 In/Sec	.117 G-s	
EOH	.077 In/Sec	.126 G-s	
EOV	.129 In/Sec	.175 G-s	
EOA	.070 In/Sec	.209 G-s	

CTPUMP1 - COOLING TOWER PUMP 1 (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.139 In/Sec	.041 G-s	1800.0 RPM
MOV	.204 In/Sec	.095 G-s	
MIH	.085 In/Sec	.054 G-s	
MIV	.050 In/Sec	.128 G-s	
MIA	.243 In/Sec	.145 G-s	
* EIH	.078 In/Sec	.203 G-s	
* EIA	.033 In/Sec	.141 G-s	

CTPUMP2 - COOLING TOWER PUMP 2 (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.146 In/Sec	.205 G-s	1800.0 RPM
MOV	.115 In/Sec	1.233 G-s	
MIH	.127 In/Sec	.364 G-s	
MIV	.120 In/Sec	.893 G-s	
MIA	.111 In/Sec	.259 G-s	
* EIH	.038 In/Sec	.273 G-s	
* EIA	.048 In/Sec	.032 G-s	

P8OVENFAN - P8 OVEN FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.178 In/Sec	.074 G-s	1800.0 RPM
MOV	.203 In/Sec	.096 G-s	
MIH	.220 In/Sec	.171 G-s	
MIV	.195 In/Sec	.129 G-s	
MIA	.178 In/Sec	.017 G-s	
EIH	.290 In/Sec	.981 G-s	
EIV	.471 In/Sec	1.141 G-s	
EIA	.738 In/Sec	.329 G-s	
EOH	.229 In/Sec	1.247 G-s	
EOV	.249 In/Sec	1.067 G-s	
EOA	.791 In/Sec	.568 G-s	

P9OVENFAN - P 9 OVEN FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.132 In/Sec	.070 G-s	1800.0 RPM
MOV	.314 In/Sec	.041 G-s	
MIH	.167 In/Sec	.254 G-s	
MIV	.336 In/Sec	.128 G-s	
MIA	.417 In/Sec	.036 G-s	
EIH	.343 In/Sec	1.120 G-s	
EIV	.621 In/Sec	1.331 G-s	
EIA	.792 In/Sec	.876 G-s	
EOH	.194 In/Sec	.647 G-s	
EOV	.199 In/Sec	.772 G-s	
EOA	.899 In/Sec	.760 G-s	

P10OVENFAN - P10 OVEN FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.251 In/Sec	.032 G-s	1800.0 RPM
MOV	.279 In/Sec	.015 G-s	
MIH	.316 In/Sec	.043 G-s	
MIV	.396 In/Sec	.044 G-s	
MIA	.379 In/Sec	.049 G-s	
EIH	.204 In/Sec	.327 G-s	
EIV	.472 In/Sec	.339 G-s	
EIA	.744 In/Sec	.182 G-s	
EOH	.422 In/Sec	.481 G-s	
EOV	.358 In/Sec	.361 G-s	
EOA	1.070 In/Sec	.102 G-s	

MAINXHAUST - MAIN EXHAUST FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.846 In/Sec	.590 G-s	1800.0 RPM
MOV	.600 In/Sec	.345 G-s	
MIH	1.002 In/Sec	.206 G-s	
MIV	.581 In/Sec	.315 G-s	
MIA	.296 In/Sec	.112 G-s	
EIH	.716 In/Sec	.836 G-s	
EIV	.545 In/Sec	1.473 G-s	
* EIA	.217 In/Sec	.398 G-s	
EOH	.638 In/Sec	.910 G-s	
EOV	.452 In/Sec	1.971 G-s	
* EOA	.562 In/Sec	.196 G-s	

ZONE1FAN - ZONE 1 SUPPLY FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
* MOH	.110 In/Sec	.492 G-s	1800.0 RPM
* MOV	.221 In/Sec	.126 G-s	
MIH	.169 In/Sec	.396 G-s	
MIV	.213 In/Sec	.528 G-s	
MIA	.786 In/Sec	.353 G-s	
EIH	.148 In/Sec	.501 G-s	
EIV	.097 In/Sec	.600 G-s	
EIA	.241 In/Sec	.099 G-s	
EOH	.110 In/Sec	.200 G-s	
EOV	.090 In/Sec	.166 G-s	
EOA	.129 In/Sec	.175 G-s	

ZONE2FAN - ZONE 2 SUPPLY FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.181 In/Sec	.249 G-s	1800.0 RPM
MOV	.178 In/Sec	.202 G-s	
MIH	.163 In/Sec	.128 G-s	
MIV	.249 In/Sec	.128 G-s	
MIA	.262 In/Sec	.111 G-s	
EIH	.247 In/Sec	.076 G-s	
EIV	.146 In/Sec	.092 G-s	
EIA	.176 In/Sec	.038 G-s	
* EOH	.155 In/Sec	.824 G-s	

ZONE3FAN - ZONE 3 SUPPLY FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.463 In/Sec	.239 G-s	1800.0 RPM
MOV	.151 In/Sec	.163 G-s	

MIH	.276 In/Sec	.339 G-s	
MIV	.228 In/Sec	.361 G-s	
MIA	.605 In/Sec	.190 G-s	
EIH	.230 In/Sec	1.186 G-s	
EIV	.155 In/Sec	.825 G-s	
EIA	.319 In/Sec	.478 G-s	
EOH	.208 In/Sec	.156 G-s	
EOV	.108 In/Sec	.185 G-s	
* EOA	.422 In/Sec	.109 G-s	

ZONE4FAN - ZONE 4 SUPPLY FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.305 In/Sec	.108 G-s	1800.0 RPM
MOV	.289 In/Sec	.188 G-s	
MIH	.235 In/Sec	.326 G-s	
MIV	.324 In/Sec	.351 G-s	
MIA	.337 In/Sec	.135 G-s	
EIH	.278 In/Sec	.285 G-s	
EIV	.108 In/Sec	.041 G-s	
EIA	.317 In/Sec	.330 G-s	
EOH	.209 In/Sec	.143 G-s	
EOV	.185 In/Sec	.183 G-s	
* EOA	.278 In/Sec	.116 G-s	

ZONE5FAN - ZONE 5 SUPPLY FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.200 In/Sec	.027 G-s	1800.0 RPM
MOV	.135 In/Sec	.077 G-s	
MIH	.101 In/Sec	.024 G-s	
MIV	.090 In/Sec	.096 G-s	
MIA	.163 In/Sec	.100 G-s	
EIH	.100 In/Sec	.355 G-s	
EIV	.076 In/Sec	1.209 G-s	
EIA	.106 In/Sec	.744 G-s	
* EOH	.085 In/Sec	.069 G-s	
* EOV	.178 In/Sec	.039 G-s	

ZONE6FAN - ZONE 6 SUPPLY FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.223 In/Sec	.070 G-s	1800.0 RPM
MOV	.425 In/Sec	.058 G-s	
MIH	.230 In/Sec	.059 G-s	
MIV	.349 In/Sec	.033 G-s	
MIA	.188 In/Sec	.041 G-s	
EIH	.152 In/Sec	.154 G-s	
EIV	.234 In/Sec	.512 G-s	
EIA	.301 In/Sec	.233 G-s	
EOH	.227 In/Sec	.078 G-s	
EOV	.257 In/Sec	.044 G-s	
* EOA	.260 In/Sec	.066 G-s	

COOLFAN B - COOLING FAN B (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.165 In/Sec	.500 G-s	1800.0 RPM
MOV	.219 In/Sec	.499 G-s	
MIH	.146 In/Sec	.550 G-s	
MIV	.160 In/Sec	.453 G-s	

MIA	.293 In/Sec	.264 G-s	
EIH	.219 In/Sec	.803 G-s	
EIV	.206 In/Sec	1.549 G-s	
EIA	.433 In/Sec	.285 G-s	
EOH	.176 In/Sec	.288 G-s	
EOV	.210 In/Sec	.328 G-s	
* EOA	.333 In/Sec	.219 G-s	

EXHAUSTFAN - EXHAUST FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.302 In/Sec	.058 G-s	1800.0 RPM
MOV	.253 In/Sec	.067 G-s	
MIH	.386 In/Sec	.110 G-s	
MIV	.294 In/Sec	.137 G-s	
MIA	.436 In/Sec	.037 G-s	

COOLFAN A - COOLING FAN A (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.099 In/Sec	.160 G-s	1800.0 RPM
MOV	.179 In/Sec	.118 G-s	
MIH	.133 In/Sec	.083 G-s	
MIV	.256 In/Sec	.041 G-s	
MIA	.197 In/Sec	.064 G-s	
EIH	.116 In/Sec	.280 G-s	
EIV	.094 In/Sec	.241 G-s	
EIA	.139 In/Sec	.067 G-s	
EOH	.105 In/Sec	.205 G-s	
EOV	.135 In/Sec	.178 G-s	
* EOA	.213 In/Sec	.055 G-s	

P19OVENFAN - P 19 OVEN FAN (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.167 In/Sec	.290 G-s	1800.0 RPM
MOV	.219 In/Sec	.176 G-s	
MIH	.303 In/Sec	.427 G-s	
MIV	.769 In/Sec	.413 G-s	
MIA	.515 In/Sec	.088 G-s	
EOH	.266 In/Sec	.139 G-s	
EOV	.389 In/Sec	.304 G-s	
EOA	.308 In/Sec	.054 G-s	

ALNESNCBLW - A LINE SPENCER BLOWER (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.129 In/Sec	.277 G-s	1800.0 RPM
MOV	.144 In/Sec	.215 G-s	
* MIH	.076 In/Sec	.239 G-s	
* MIV	.057 In/Sec	.273 G-s	
* MIA	.064 In/Sec	.144 G-s	

BLNESNCBLW - B LINE SPENCER BLOWER (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz	
MOH	.129 In/Sec	.206 G-s	1800.0 RPM
MOV	.139 In/Sec	.390 G-s	
MIV	.080 In/Sec	.347 G-s	

CLNESNCBLW - C LINE SPENCER BLOWER (10-Nov-21)

	OVERALL LEVEL	1 - 20 KHz

MOH	.105 In/Sec	.096 G-s	1800.0 RPM
MOV	.049 In/Sec	.158 G-s	
* MIH	.146 In/Sec	.106 G-s	
MIV	.061 In/Sec	.113 G-s	
* MIA	.043 In/Sec	.196 G-s	

DLNESNCBLW - D LINE SPENCER BLOWER (10-Nov-21)

OVERALL LEVEL 1 - 20 KHz

MOH	.289 In/Sec	.028 G-s	1800.0 RPM
MOV	.202 In/Sec	.047 G-s	
MIH	.201 In/Sec	.122 G-s	
MIV	.197 In/Sec	.206 G-s	
MIA	.131 In/Sec	.049 G-s	

Clarification Of Vibration Units:

Acc --> G-s RMS

Vel --> In/Sec PK

* - Indicates Data Has Date/Time Different From Machine Date/Time