

October 9, 2019

Plaskolite

Subject: October 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.

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

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

<u>Class III</u>: 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.

<u>Class IV</u>; 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,

David W. Shook Senior Reliability Specialist *Hi-Speed* Industrial Service dshook@gohispeed.com

> 7030 Ryburn Drive Millington, TN 38053 P. 901-873-5300 F. 901-873-5301

<u>Data</u>

Four of the route machines had vibrations at or above the 0.25"/sec Velocity peak threshold. Please find the vibration summary below:

Hot Water Pumps 1, 3, and 4 have overall vibrations above the threshold limit at 0.5, 0.56 and 0.64"/sec velocity peak respectfully. The vibrations consist of a shaft speed peak and what appears to be 1 or 2 resonant peaks in the spectrums. No immediate action is suggested at this time other than checking the fasteners. Trim balance or pump impeller inspection could be considered next. **Rated a Class I Defect.**

The Middle Syrup Cooling Pump Gearbox is still vibrating at motor speed and the first and second harmonics. We suspect some type of mechanical looseness or associated shaft misalignment. Inspect both couplings for wear or damage, all gearbox mounting bolts and shims and finally align the complete drive train; motor to pump. **Rated a Class III Defect.**

The lower rapid cooling fan belts were flapping and probably need adjustment and or replacement after inspection.

The upper rapid cooling fan motor had a large increase in acceleration. We suspect a bad reading. No action required at this time.

Abbreviated Last Measurement Summary

Database: mmaold.rbm Station: PLASKOLITE MEMPHIS Route No. 3: PLASKOLITE NEW Report Date: 09-Oct-19 14:14

MEAS	UREMENT POINT	OVERALL LEVEL	HFD / VHFD
5285-09	- FAN, COOLING TWR WEST	(09-Oct-19)	
		OVERALL LEVEL	1-20 KHz
W1 - CELL	FRAME -WEST END N-S DIR	.011 In/Sec	.021 G-s
W2 - CELI	FRAME -WEST END E-W DIR	.022 In/Sec	.029 G-s
5285-11 - FAN, COOLING TWR MIDDLE		(09-Oct-19)	
		OVERALL LEVEL	1-20 KHz
M1 - CELL	FRAME -MIDDLE N-S DIR	.0063 In/Sec	.042 G-s
M2 - CELI	FRAME -MIDDLE E-W DIR	.0075 In/Sec	.086 G-s
5285-12	- FAN, COOLING TWR EAST	(09-Oct-19)	
		OVERALL LEVEL	1-20 KHz
E1 - CELI	FRAME -EAST END E-W DIR	.0039 In/Sec	.0025 G-s

OVERALL LEVEL HFD (>5 kHz) .0043 In/Sec .0006 G-s E2 - CELL FRAME -EAST END N-S DIR 5285-21 - RETURN AIR FAN 100 AREA (09-Oct-19)
 OVERALL LEVEL
 1-20 KHz

 .089 In/Sec
 .038 G-s

 .087 In/Sec
 .037 G-s

 .096 In/Sec
 .049 G-s
 11 - MOTOR OUTBD HORIZ 21 - MOTOR INBD HORIZ 71 - FAN INBD (ON FRAME UNDER BRG) S1100 - FLARE BLOWER (09-Oct-19) OVERALL LEVEL 1-20 KHz 11 - MOTOR FLARE STACK END HORIZ 12 - MOTOR FLARE STACK END VERT .011 G-s .0080 In/Sec 12 - MOTOR FLARE STACK END VERT .0094 In/Sec .012 G-s 5214-04 - EAST SYRUP COOL PUMP (09-Oct-19) OVERALL LEVEL 1-20 KHz

 OVERALL LEVEL
 1-20 KHz

 .028 In/Sec
 .083 G-s

 .028 In/Sec
 .113 G-s

 .018 In/Sec
 .113 G-s

 .063 In/Sec
 .094 In/Sec

 .061 In/Sec
 .018 G-s

 .041 In/Sec
 .018 G-s

 11 - MOTOR OUTBOARD HORIZONTAL 21 - MOTOR INBOARD HORIZONTAL 23 - MOTOR INBOARD AXIAL 23 - MOTOR INBOARD AXIAL
31 - GEARBOX INPUT HORIZONTAL
61 - GEARBOX OUTPUT SHAFT HORIZ
71 - PUMP COUPLING END HORIZ
81 - PUMPIMPELLER END HORIZ 81 - PUMPIMPELLER END HORIZ 5214-03 - MIDDLE SYRUP COOL PUMP (09-Oct-19) OVERALL LEVEL 1-20 KHz 11- MOTOR OUTBOARD HORIZONTAL.089 In/Sec.082 G-s21- MOTOR INBOARD HORIZONTAL.081 In/Sec.087 G-s23- MOTOR INBOARD AXIAL.161 In/Sec.050 G-s31- GEARBOX INPUT HORIZONTAL.430 In/Sec61- GEARBOX OUTPUT SHAFT HORIZ.490 In/Sec71- PUMP COUPLING END HORIZ.263 In/Sec.122 G-s81- PUMP IMPELLER END HORIZ.220 In/Sec.074 G-s (09-Oct-19) 5214-01 - WEST SYRUP COOL PUMP OVERALL LEVEL 1-20 KHz 11- MOTOR OUTBOARD HORIZONTAL.079 In/Sec.083 G-s21- MOTOR INBOARD HORIZONTAL.087 In/Sec.080 G-s23- MOTOR INBOARD AXIAL.095 In/Sec.057 G-s31- GEARBOX OUTPUT HORIZONTAL.130 In/Sec61- GEARBOX OUTPUT HORIZ.177 In/Sec71- PUMP CPLG END HORIZ.179 In/Sec.386 G-s81- PUMP IMPELLER END HORIZ.211 In/Sec.038 G-s 11 - MOTOR OUTBOARD HORIZONTAL 5282-02 - PUMP #1 HOT WATER 5282-02 (09-Oct-19) OVERALL LEVEL 1-20 KHz 11 - #1 Hot Water Pump Mtr Top N-S
12 - #1 Hot Water Pump Mtr Top E-W .326 In/Sec .503 In/Sec 1.255 G-s .405 G-s - PUMP #3 HOT WATER 5282-04 (09-Oct-19) 5282-04
 OVERALL LEVEL
 1-20 KHz

 .568 In/Sec
 .338 G-s

 .431 In/Sec
 .137 G-s
 .338 G-s 11 - #3 Hot Water Pump Mtr Top N-S 12 - #3 Hot Water Pump Mtr Top E-W .137 G-s 5282-05 - PUMP #4 HOT WATER 5282-05 (09-Oct-19) OVERALL LEVEL 1-20 KHz .330 In/Sec .400 G-s 11 - #4 Hot Water Pump Mtr Top N-S

12	- #4 Hot Water Pump Mtr Top E-W	.646 In/Sec	.203 G-s
5283-01 - BLOWER, EDGE WATER REMOVAL		(09-Oct-19)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBOARD HORIZONTAL	.104 In/Sec	.106 G-s
21	- MOTOR INBOARD HORIZONTAL	.080 In/Sec	.170 G-s
23	- MOTOR AXIAL	.067 In/Sec	.152 G-s
71	- BLOWER COUPLING END HORIZONTAL	.092 In/Sec	.204 G-s
81	- BLOWER WHEEL END HORIZONTAL	.131 In/Sec	.142 G-s
5281-12 - BLOWER, SLOW COOLING (UPPER)		(09-Oct-19)	
	, , , , , ,	OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBD HORIZ	.042 In/Sec	3.138 G-s
21	- MOTOR INBD HORIZ	.054 In/Sec	7.367 G-s
23	- MOTOR INBD AXIAL	.070 In/Sec	.309 G-s
71	- FAN INBD (ON PILLOWBLOCK FOOT)	.051 In/Sec	.281 G-s
81	- FAN OUTBD (ON PILLOWBLOCK FOOT)	.043 In/Sec	.356 G-s
528	1-13 - BLOWER SLOW COOLING (LOWER)	(09 - 0c + -19)	
520		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBD HORIZ		$1 918 C_{-8}$
21	- MOTOR INBD HORIZ	049 In/Sec	3 668 6-8
210	- MOTOR INED HORIZ	192 Tr/Sec	5.000 G 3
2211	- MOTOR INBD AVIA	057 Tp/Sec	2 200 C-a
23 71	- FAN INDD (ON DILLOWDLOCK FOOT)	.037 IN/Sec	2.200 G-S
/ <u>1</u> 01	- FAN INBD (ON FILLOWBLOCK FOOT)	.023 IN/Sec	.193 G-S
81	- FAN OUTBD (ON FILLOWBLOCK FOOT)	.022 IN/Sec	.156 G-S
528	1-14 - BLOWER, RAPID COOLING (UPPER)	(09-Oct-19)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBD HORIZ	.104 In/Sec	3.702 G-s
21	- MOTOR INBD HORIZ	.160 In/Sec	16.48 G-s
23	- MOTOR INBD AXIAL	.098 In/Sec	2.125 G-s
71	- FAN INBD (ON PILLOWBLOCK FOOT)	.069 In/Sec	.995 G-s
81	- FAN OUTBD (ON PILLOWBLOCK FOOT)	.107 In/Sec	.245 G-s
528	1-08 - BLOWER, RAPID COOLING (LOWER)	(09-Oct-19)	
		OVERALL LEVEL	1-20 KHz
11	- MOTOR OUTBD HORIZ	.145 In/Sec	1.676 G-s
21	- MOTOR INBD HORIZ	.147 In/Sec	1.493 G-s
23	- MOTOR INBD AXIAL	.063 In/Sec	.813 G-s
71	- FAN INBD (ON PILLOWBLOCK FOOT)	.092 In/Sec	.648 G-s
81	- FAN OUTBD (ON PILLOWBLOCK FOOT)	.079 In/Sec	.625 G-s
528	1-10 - 200 BELT DELVE DOLVMEDIZED	(09 - 0c + -19)	
520.		OVERALL LEVEL	1-20 KH-
11		046 Tr/Soc	177 C-2
21	- MOTOR JUBD HORIZ	.040 III/Sec	.177 G-S
22 22	- CENDDON INDU NUKIA	020 Tr/Sec	100 0 -
22	- GEARDUA INFUI AAIAL	.030 IN/Sec	.170 G-S
21	- GEARDUA INFUI HURIZ	.020 IN/Sec	.131 G-S
01 71	- GLARBUA UUTPUT HUKIZ	.012 IN/Sec	.0/5 G-S
11	- INBUARD PILLOWBLOCK	.001/ in/Sec	.0021 G-S
81	- OUTBOARD FILLOWBLOCK	.0029 In/Sec	.UUI6 G-S

Clarification Of Vibration Units: Acc --> G-s PK Vel --> In/Sec PK HFD --> G-s PK