

**1605 DUOLEC™ Vari-Purpose Gear Lubricant  
4946 All-Purpose Turbine Oil**

**WINDSOR STEVENS PAPER COMPANY, Windsor, CT  
Calender Stack / Beloit Jones Pulper  
SIC 2679 Converted Paper & Paperboard Products**

- ▶ *NO BEARING FAILURES SINCE 2001*
- ▶ *SAVING \$5,000.00 A YEAR BY ELIMINATING BEARING REPLACEMENTS*
- ▶ *SAVING \$2,301.90 A YEAR IN ELECTRIC COSTS*

**CUSTOMER PROFILE**

Windsor-Stevens Inc. is an employee owned company located in Windsor, Connecticut. The building they occupy was originally a cotton fabric mill built in 1832. In the mid 1800's it was converted to a paper mill. The paper machine and stock preparation equipment were completely rebuilt and replaced between 1954 and 2000. Today, Windsor-Stevens has a well-equipped fiberboard machine. The mill is unique in that it is the only unit in the United States that manufactures specialty fiberboard using the multi wet ply-back principle. This method limits volume of production but results in an excellent, high quality product. Individual lightweight, highly hydrated layers of fiber are formed, pressed and repressed. The company manufactures high strength electrical insulation and specialty fiberboards that are typically used in electrical, mechanical and automotive applications.



**APPLICATION**

This operation uses a calender stack consisting of a number of rolls, one atop the other supported by poured babbitted bearings. They also use a Beloit Jones Pulper. The Beloit Jones Pulper is a batch machine used an average of 25 hours weekly. The gearbox of this machine holds 36 gallons of oil. It is a key piece of equipment without which production is not possible.

**LUBRICATION  
ENGINEERS,® Inc.**

*Leaders in Lubricants* 



**Calender Stack**



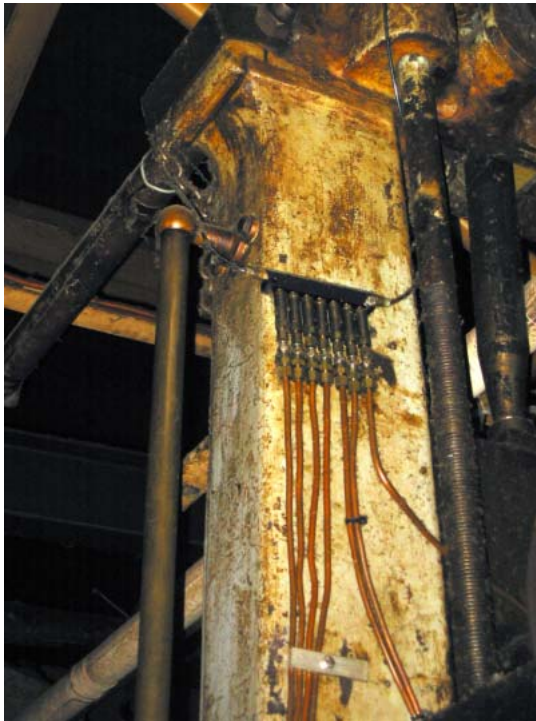
**Babbit Bearings**

### ***AREA OF INTEREST***

Ralph Tropeano started working at the mill in 1993. He started as the Process Engineer, then was the Mill Manager and since 1998, he has been the Vice President Manufacturing. He is ever vigilant in seeking ways and methods to keep the mill competitive and profitable. Dave Piangerelli of Lubrication Technologies met with Mr. Tropeano and discussed the calender stack and its problematic operation. A gravity drip feed type lubricator, that was not reliable, lubricated these bearings. The occasional failure of the lubricator to operate properly resulted in the failure of bearings, which cost the company an average of \$3,000.00 per year in lost production. The additional cost to repour the bearings was put at approximately \$2,000.00 per year.



**Beloit Jones Pulper**



**Lube System Manifold**



**Interlube TX filled with LE 4946**

Mr. Tropeano also expressed concern for the Beloit Jones Pulper gearbox. Mr. Tropeano was worried about a foaming issue with the product being used, Shell Omala 220, and higher than usual amperage readings. A sample of the Shell product was obtained and it appeared that the product had exhibited some shearing resulting in a lower viscosity than that recommended by the manufacturer of the pulper. The viscosity of the Omala 220 was 185 cSt @ 40°C, far below the ISO 220 range.

### **LE SOLUTION**

David recommended the installation of an Interlube TX automatic lubrication system for the calender stack and the use of LE's 4946 All Purpose Turbine Oil. LE's 4946 is a turbine oil designed with additives that offer excellent rust protection and exceptional oxidation stability. Lubrication Technologies provided the system

components and Mr. Tropeano's crew facilitated the installation of the system. LE's 1605 DUOLEC™ Vari-Purpose Gear Lubricant was installed in the Beloit Jones Pulper gearbox. LE's 1605 is a high performance industrial and automotive gear oil. It is designed for use in any industrial gear or bearing application that requires a thermally stable, extreme pressure lubricant.

### **CUSTOMER COST SAVINGS**

Since the installation of the system and LE's 4946 for the calender stack in 2001, there have been no bearing failures in this application resulting in a savings of \$5,000.00 per year, or \$30,000 to date.

Since the conversion to LE's 1605 in the Belot Jones Pulper, an immediate reduction of amperage was noted. Dropping from an average of 220 amps to between 205 and 210 amps.

The following is used to calculate the estimated yearly savings:

**.Volts X Amps Saved X 1.73 (3-phase conversion factor) = kW Saved**  
**kW X Hours of Operation = kWh Saved**  
**kWh X Electrical Energy Cost = Dollars saved**

**.575v X 10a X 1.73 = 9.9475 kW**  
**9.9475 kW X 1,300 hr = 12,932 kWh**  
**12,932 x \$0.178/kWh = 2,301.90**

## Yearly Electrical Savings are estimated to be \$2,301.90

In addition, the 1605 in the pulper will be analyzed periodically and based on past experience with LE gear oil in pulper gearboxes, the life of the oil is estimated to double when compared to the previous oil resulting in additional savings regarding waste oil generation and handling.

UNIT ID: BELOIT HYDROPULPER GB				WINDSOR STEVENS					
SECOND ID				POQUONOCK, CT 06064					
UNIT TYPE		SPIRAL BEVEL GEARBOX		TRACKING #		05343K02167			
APPLICATION		PAPER MILL		MFR		BELOIT			
LUBE/FLUID MFR		SHELL		MODEL					
LUBE TYPE	OMALA	SUMP CAPACITY	00040	LUBE TIME	500	DATE SAMP.	08/22/2007	SEVERITY:	2
GRADE	ISO 220	HYD SYS PRESS	00000	UNIT TIME		DATE REC.	08/28/2007	ACCOUNT No.	59300001570082
FILTER TYPE		MICRON RATING	000	LUBE ADD		DATE COMP.	08/29/2007	Loc Lab No.	521548 RNF

COMMENT Data flagged for observation only; Viscosity is MODERATELY LOW; Test results do not support or answer questions raised by your note; SUGGEST WE PERFORM ASTM D-892 FOAM TEST. PLEASE ADVISE;

WEAR METALS - PPM																			CONTAMINANT METALS - PPM				MULTI-SOURCE METALS - PPM				ADDITIVE METALS - PPM			
Fe	Cr	Ni	Al	Cu	Pb	Sn	Cd	Ag	Ti	V	Si	Na	K	Mo	Sb	Mn	Li	B	Mg	Ca	Ba	P	Zn							
2	0	0	0	8	0	0	0	0	0	0	3	1	0	0	0	0	0	1	0	100	1	260	53							

TEST DATA																				
DATE	LUBE UNIT	LFUIBL	FUEL	SOOT	WATER	VIS	VIS	TAN	TBN	I-R	I-R	IS	O4	6	10	14	21	38	70	100
SAMPLED RECEIVED		CHG	Vol.	Vol.	Hot Plate	40C CS	100C CS	Total Acid	Total Base	OXID	ITR	CM	MM	MI	MI	MI	MI	MI	MI	MI
08/22/2007	500	N			0.00	185.00		0.34												
08/28/2007		U				AAA														

Comments are advisory only and are based on the assumption that the sample and data submitted are valid. Missing lube or unit time limits the evaluation. No warranty is expressed or implied.

**Lubrication Engineers®  
 Analysis Report (LEAP)  
 prior to conversion to  
 LE products**



Ralph Tropeano

Lubrication Engineers Inc. would like to thank Vice President Manufacturing Ralph Tropeano and LE Lubrication Consultant David Piangerelli for providing the information used to prepare this report.



David Piangerelli