

G. Kaspari*

Lubrication Technology of AS: Oil-lubrication System „Lubriflex®“ on the Market for Five Years

Ten years ago Klaus Hertz started working with the AS-Group and therefore oil-lubrication systems became an issue for AS. In the first five years conventional lubrication systems were built. Characteristics: Large oil volume, thick walls, heavy submerged pumps, poor accessibility, etc. 2002 a new development was realized. Main objective: short times of circulation and better degassing. Result: The oil-lubrication system „Lubriflex®!“ (Fig. 1)

In 2003 the first system was installed in Rhineland-Palatinate (Germany). In the same year another system was installed at Neenah and another one at another paper mill which is known today as Smurfit Kappa Zülpich. In 2004 further installations at SCA in Neuss, Stora Enso in the Netherlands, Papierfabrik Vreden and Papierfabrik Feurstein in Austria followed.

In 2004 a small revolution could be noted: AS received the order for the entire lubrication technology at the PM 4 of the paper mill in Varel. Until then only two suppliers had received those orders for new paper machines – sometimes one of them got it, sometimes the other. Today both are owned by a large group.

The last **Lubriflex®** was delivered to Papierfabrik Louisenthal in Königstein for the new bank note printing machine (Fig. 2). At the moment AS is mounting a **Lubriflex®** for ArjoWiggins in Belgium.

In retrospect one of the numerous good characteristics proved to be particularly value: the possibility of easy cleaning.

After *only* five years; some attentive readers will ask themselves. In Varel it took only one year until basic cleaning had to be done. What happened? (Fig. 3)

A substance in the oil coagulated when it reacted with air. Everywhere bitumen-like spots could be found. The specialists immediately modified the formula of the oil. Since then, no more adsorptions have occurred. In retrospect, the persons in charge of Varel were extremely glad to have bought the **Lubriflex®** of AS.

None of the other systems which were offered at that time could be cleaned so easily! Pump down a small amount of oil, remove the top cover manually, remove the degassing modules manually, spray them off and fit them again: refill the tank and the system can run again! Thanks to the good experience with the system, the last project at the KM 2 was also rebuilt with the lubrication technology of AS. Eight drying cylinders were equipped with the latest **FlexoFlow®** techniques. The persons in charge are crazy about the system!

The paper mill Neenah in Bavaria uses oil of the type 460. Due to the fact that they also use progressive plunger metering devices and old flow limiting devices with screens, they drive the system at high pressure and also high temperature. After five years a tough coating had



Fig. 1: Oil-lubrication system Lubriflex® Type MAXI, installation 2004, picture taken in 2009



Fig. 2: Oil-lubrication system Lubriflex®, so that everything runs best for the production of the paper money



Fig. 3: Adsorptions in the degassing module

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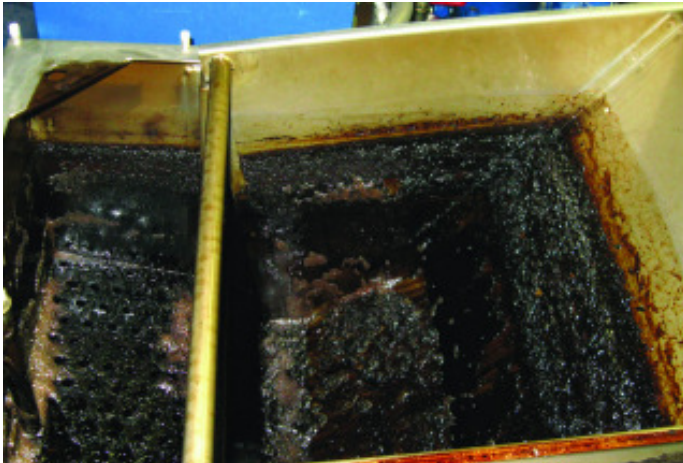


Fig. 4 and 5: The tank before cleaning and afterwards

deposited in the **Lubriflex**[®]. Josef Alberding solved the problem. Afterwards the system looked like it had been installed only yesterday (Fig. 4 and 5)

“At the beginning the small volume, respectively the short circulation time of less than 10 minutes met with criticism”, Gerd Kaspari remembers. “But the system has proved its worth. 50 installations, even in China, evidence this. As we do not have any framework contracts with paper machine builders, this is a very good number for us as a niche supplier.”

Many people argued as follows: Due to the small oil volume the stored heat capacity would not be sufficient. However, first of all oil-lubrication systems are not designed to heat the paper machine and secondly the new active flow meters of AS, **FlexoFlow**[®], offer a good solution for this (Fig. 6).

For example: a lump sum value of 3 l/min is indicated for cylinder bearings. When the system was cold, the oil cooled so fast that it could not drain off completely. For that reason overflowed bearings occurred. This led to oil carpets at new paper machines!

The engineers of AS have an integrated approach and recognized that the combination of **FlexoFlow**[®] and **Lubriflex**[®] is an efficient system to prevent such negative incidents from occurring at all.

The volume flow rate of the oil is slowly increased individually for each lubrication point. Either the temperature or the time in which the



FlexoFlow[®] adjusts upwards by itself from 0.5 to 3.0 l/min is preset. The frequency control at the pump motors of the **Lubriflex**[®] provides energetically sensible operation. The frequency control on its own is not a sufficient solution if intelligent flow meters are not installed to prevent oil overflows. The plant’s safety would even be endangered! In practice a local under supply can occur. Particularly with smaller volume flow rates at tension rollers, guide rollers, etc. there is not enough dynamic pressure resp. the contact surface at the smallest pinions is too small for the volume flow rate; this can lead to a complete standstill of the pinions. Only the **FlexoFlow**[®] is in a position to re-open the controller independently and release the volume flow rate. With the help of production tolerances, freewheel can be guaranteed even at a low volume of 0.01 l/min. This means an unintentional standstill cannot occur (Fig. 7).

If you also install the **FlexoFlow**[®] Manager, you will have the optimum tailored lubrication requirements. As from now on the volume flow rate will be controlled via the “delta T” (i. e. the difference between the outlet temperature and the inlet temperature).

In any case, only 0.9 l/min on the drive side, respectively 1.1 l/min on the operating side, at the bearing of the drying cylinder are necessary. In future, this will be the minimum level of the active adjustment tailored to the needs of lubrication. If increased friction or heat, e.g. due to new insulation, cause higher temperatures, the **FlexoFlow**[®]

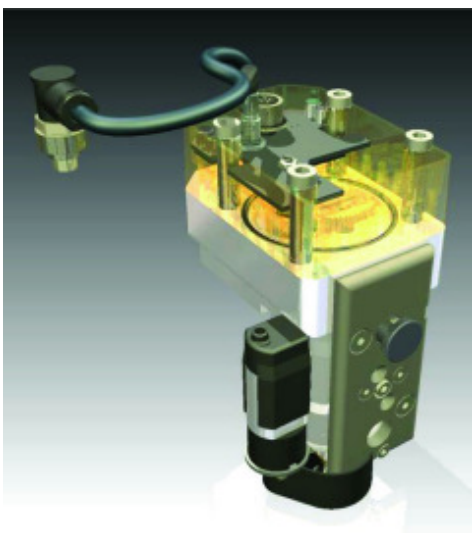


Fig. 6: Active and intelligent flow meter FlexoFlow[®]

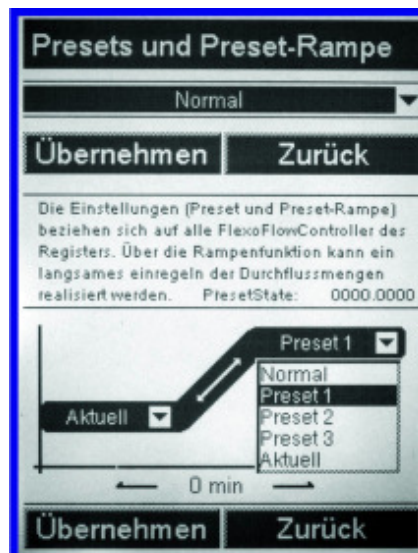


Fig. 7: Approach ramp - only as much oil as the cold system can discharge

Manager will increase the amount of oil independently. An alarm is triggered if the oil exceeds a predetermined maximum value (Fig. 8).

If only an average of 1.5 l/min is flowed to the 80 drying cylinders instead of the previous 3.0 l/min, you will economise 240 l/min of flow rate for the 160 drying cylinder bearings. This means for a **Lu-briflex**® with a circulation time of 10 minutes 2,400 litres less oil volume. For many older conventional systems you will even economise 500 litres as they were designed for dwell times of 20 to 30 minutes.

As every **FlexoFlow**® readjusts its set value independent of the temperature, viscosity and pressure of the oil, the system pressure can also be reduced considerably. In future a customer with a system pressure of 25 bar can economise 4/5 of his current electricity costs by running the system with only 5 bar. Beyond that he protects the components like pump, motor and filter and also economises on oil which suffers less mechanic pressure.

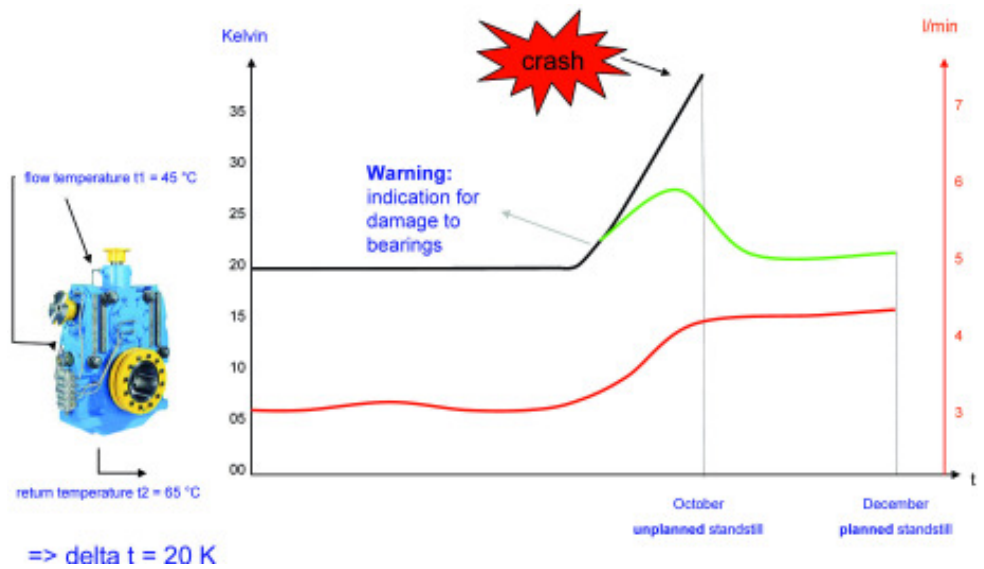


Fig. 8: FlexoFlow® Manager monitoring with influence capability

Gerd Kaspari already has the next technology in mind to make the oil-lubrication system as safe as your blood circulation. He keeps his own blood circulation on the go by riding his racing bike and while doing so often has his best ideas!
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