

Smoothly Running Business at the Puralube re-Refinery



The third HyLube™ plant is being built at an investment cost of €42m. This will enable the company to achieve an annual waste oil processing capacity of 240,000 tonnes. Base oils are the raw material, from which a wide range of brand-name oils are produced by means of proportioning special additives. In addition, the German subsidiary company of the US Puralube group of companies is preparing to become the first and only refinery in the world to produce quality class III (the highest international quality class) base oils based on waste oil

by the beginning of 2015, intending to retrofit one of its plants constructed between 2004 and 2008. This was a new announcement made by Puralube Managing Director Andreas Schüppel.

Since the start of production in 2004, the company has been on the path to success, having mastered a procedure to manufacture base oils from waste oils that is unique in the world. 'We possess a five-to-ten-year head start on our competitors', stated Schüppel. 'Our new HyLube™ process distinguishes itself from the typical procedures employed in standard recycling plants a great deal. Not only is it a single-stage continual process, so that there is no need for temporary storage. The refinery units themselves are compactly arranged, so that the amount of space required for the plant is decreased significantly', noted the 51-year-old qualified engineer for process engineering, who has been running the company since 2005.

'We take waste oil as it comes. This is a major advantage of the process', Schüppel explained about the process which Puralube licenced from the American UOP Company on a worldwide, exclusive basis and then further developed. Other waste oil processors have to pre-treat the waste oil in several stages with the associated removal of water as well as of petrol, diesel and heavy oil. The HyLube™ process dispenses with the pre-treatment step.

According to Schüppel the process takes place in three steps:

First of all, each molecule of the used oil is combined with hydrogen in a complicated process. Roughly speaking, hydrocarbons are transferred in gas form and cleansed of high-density impurities. In a multi-stage, high-pressure section of the system, the gaseous hydrocarbons are initially separated from the still remaining impurities, sediments, metals, nitrogen and sulphur. The molecules are subsequently chemically broken down, thus producing the high quality material. In the subsequent step, the purified, liquid hydrocarbon mixture is separated out into four different base oils, while the surplus hydrogen is returned to the production cycle.

The hydrogen required for the process comes via pipeline and is pumped over from the Linde AG based out of the Leuna Chemical Park – a factor which Schüppel cites as being one of the location's major advantages.

The recycling specialists are particularly proud of the high quality of their four types of base oil. Based on the worldwide applicable quality standards established by the American Petroleum Institute (API) ranging from class I to class III, Puralube products are currently rated class API II+. These quality classes are based on the sulphur content, on the proportion of saturated compounds and on the viscosity of the base oils. Looking to the future, Schüppel added that 'following the retrofitting of one of the plants, Puralube will be able to produce quality class III base oils from waste oil. A further stage in the process will consist of re-refining the molecules'. He explained the jump in quality by stating that 'the quality of class III begins where class II+ stops' and went on to underscore that 'the Puralube location in Elsteraue is therefore the absolute world leader in technology. Our closest global competitor is only able to produce base oils from waste oil with quality class II+. The next-best producer in Germany in this field can only achieve API I+'.

The HyLube™ process, jointly developed with American specialists in Zeitz, has enabled the company to open up new areas of application. 'Puralube will be able to establish itself as a competitor to the prestigious major concerns', Schüppel emphasised, describing future possibilities. These corporations produce class II oils from primary oils.

In order to illustrate the significance of class III oil production, Schüppel – who hails from Stendal and studied in Merseburg – points out that there exists not a single plant in the United States where API III quality oils are produced. The USA has to import such oils from South Korea. 'We are the only company in the world who can produce this quality from waste oil'. The higher the oil quality, the longer the oil remains viable in engines. The oil replacement intervals can be extended. Engine oils produced using class II+/III base oils would only have to be changed after 30,000 km. Water-clear, odourless and residue-free, Puralube base oils can be processed into oils that can be used not only in engines, but also in metalworking, in gearboxes and in a large number of special processes'.

Base oils produced from used oils not only have qualitative and economic benefits, but ecological benefits as well. While approximately five per cent base oils are obtained from one tonn of primary oil, the figure with the HyLube™ process is 70 per cent. Moreover, according to the information provided by Schüppel, base oils produced from primary oils with the highest quality class are more expensive than those from recycled oils. In addition, the production of base oils from waste oils results in a 46 per cent saving in carbon dioxide emissions compared to conventional production methods. Schüppel is certain that in times when fossil resources are becoming ever scarcer, the importance of recycling waste oils will therefore increase. 'Experience tells us that the demand for class I oils falls by eight per cent every five years. The same period, however, witnesses an increase in demand for the higher-grade class II and class III oils. These are precisely our markets', emphasised Puralube's Managing Director.

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