

### Cost savings and excellent performance

- **Transmission oil pan for cars made from polyamide 6 instead of polyamide 66**
- **High surface quality, low warpage**
- **Trend toward polyamide 6 also observed in other components of the oil circuit**
- **Recycled compounds available for oil pans**

**Cologne, March 23, 2021** – In the manufacture of transmission oil pans, polyamides offer numerous advantages over sheet steel or die-cast aluminum in terms of lightweight construction, cost-cutting functional integration and design flexibility. Polyamide 66 in particular has therefore found widespread use in series production of these large injection-molded parts in recent years. However, polyamide 6 is also very well suited to the purpose, as is evident from an increasing number of applications. One recent example of this trend comes in the form of a transmission oil pan made by IBS Filtran GmbH and consisting of Durethan BKV35H2.0 from LANXESS. It is part of latest-generation automatic transmissions for vehicles from various carmakers. “IBS Filtran and LANXESS have enjoyed a long-standing and successful partnership in the development of components for oil circuits in passenger cars. One of the highlights of our work together was the development of the first plastic transmission oil pan for cars,” says Babak Talebloo, key account manager for IBS Filtran at LANXESS.

### Low shrinkage and easy to weld

“There were two main factors behind the use of our polyamide 6 in the new oil pan. It fulfills the key requirements regarding thermal and oil resistance, toughness and surface quality and is much cheaper than any comparable polyamide 66,” explains Christof Boden, expert in plastic components in vehicle oil circuits at LANXESS. IBS Filtran has extensively investigated the oil and thermal resistance of the polyamide 6 reinforced with 35% by weight of short glass fibers.

#### LANXESS AG

Contact:  
Michael Fahrig  
Corporate Communications  
Spokesperson Trade & Technical  
Press  
50569 Köln  
Germany

Phone: +49 221 8885-5041  
michael.fahrig@lanxess.com

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Endurance tests at 150°C in various transmission oils have shown that in terms of aging, there is no difference from a comparable polyamide 66. In fact, polyamide 6 has somewhat better impact resistance and elongation at break, which means that the oil pan is generally better able to cope with stone chippings. The excellent surface quality that can be achieved with the compound is another benefit. These outstanding surface characteristics in the area around the oil pan gasket, for example, help the gasket to work well. Polyamide 6 also exhibits less shrinkage, which has a similar effect because it results in less warpage. The material's good weldability is another of its strengths. The inner shell of the oil filter is joined to the main body of the pan by means of vibration welding. "The weld seam demonstrates tremendous strength and is therefore capable of reliably withstanding the pressure," says Boden.

### **Structural supply problem for polyamide 66**

Over the last three years, polyamide 66 has at times become much more expensive mainly due to shortages of adiponitrile, a primary product for the manufacture of the material, and is in some cases not available in sufficient quantities. This has also prompted manufacturers of plastic components for oil circuits to seek more affordable and reliably available alternatives to polyamide 66. Polyamide 6 is a viable candidate thanks to its similar profile of properties. "For instance, in addition to car transmission oil pans, we are increasingly seeing truck oil pans and cylinder head covers made from polyamide 6 being used in series production and development," explains Boden.

### **More products added to range for oil circuit components**

LANXESS is expanding its range of polyamides for vehicle oil circuits all the time. Among the new additions are Durethan ECOBKV30H2.0, ECOBKV35H2.0 and ECOBKV60XF. Recycled fibers manufactured from waste glass make up 30%, 35% and 60% by weight respectively of these three polyamide 6 compounds. ecocycle, an independent

#### **LANXESS AG**

Contact: Michael Fahrig  
Corporate Communications  
Spokesperson Trade & Technical  
Press  
50569 Köln  
Germany

Phone: +49 221 8885-5041  
michael.fahrig@lanxess.com

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inspection company, has examined the amount of recycled material in each compound using the mass balance method and awarded an eco-loop certificate in accordance with ISO 14021:2016. As Boden says, "With these products, we are keeping in step with the trend for increased use of recycled materials in the automotive industry."

Another example of new applications in the oil circuit comes in the form of the polyamides of the XTS series. XTS stands for Xtreme Temperature Stabilization and underlines the compounds' extraordinarily high long-term thermal resistance of up to 230°C. "For example, they can be used for oil pans on vehicles that have the catalytic converter mounted near the transmission, which results in the oil pans being subjected to increased thermal loads during exhaust treatment intervals," explains Boden. "The use of these compounds can avert the need to install deflector plates to protect the oil pans from intense heat."

### **Comprehensive HiAnt customer service**

Through its HiAnt engineering service, HPM provided IBS Filtran with comprehensive support in the development of the transmission oil pan. Under this brand, the business unit has combined its expertise in product, application, procedural and technological development to aid in cooperation with customers. For instance, HPM conducted simulations of critical load cases for the transmission oil pan, such as stone chippings. The services that it provided also included tests on the finished part, such as tests involving stone chippings and transmission oil deposits.

#### **LANXESS AG**

Contact: Michael Fahrig  
Corporate Communications  
Spokesperson Trade & Technical  
Press  
50569 Köln  
Germany

Phone: +49 221 8885-5041  
[michael.fahrig@lanxess.com](mailto:michael.fahrig@lanxess.com)

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### Images



The transmission oil pan made from the Durethan BKV35H2.0 polyamide 6 compound is part of latest-generation automatic transmissions for vehicles from various carmakers.  
Photo: LANXESS



LANXESS experts inspect the high surface quality of the transmission oil pan.  
Photo: LANXESS

### LANXESS AG

Contact: Michael Fahrig  
Corporate Communications  
Spokesperson Trade & Technical  
Press  
50569 Köln  
Germany

Phone: +49 221 8885-5041  
[michael.fahrig@lanxess.com](mailto:michael.fahrig@lanxess.com)

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## News Release

LANXESS is a leading specialty chemicals company with sales of EUR 6.1 billion in 2020. The company currently has about 14,300 employees in 33 countries. The core business of LANXESS is the development, manufacturing and marketing of chemical intermediates, additives, specialty chemicals and plastics. LANXESS is listed in the leading sustainability indices Dow Jones Sustainability Index (DJSI World and Europe) and FTSE4Good.

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Corporate Communications  
Spokesperson Trade & Technical  
Press  
50569 Köln  
Germany

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[michael.fahrig@lanxess.com](mailto:michael.fahrig@lanxess.com)

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