Case Study

Durethan AKV 30 H2.0 for bicycle inner bearings

Fig. 1 Inner bearing with adapter made of Durethan[i]

Tear-1 supplier: ALFRED THUN GMBH & CO.KG

Grade: Durethan® AKV 30 H2.0

Manufacturer: Grote & Brocksieper

Among other materials, the firm ALFRED THUN GMBH & CO.KG now uses Durethan® high-performance polyamide for its inner bearings.

Light weight pays dividends – especially with bikes and pedelecs. The less a bicycle weighs, the less energy is needed to ride or carry it. And every gram counts.

That is why this year THUN began equipping all its inner bearings with adapters made of Durethan as standard. One particular advantage is that, even though they have similar strength, they are much lighter than the previously used metal adapters. To be precise: an inner bearing with much more expensive aluminum adapters weighs 38 g, while the same bearing with steel adapters is 158 g heavier (Fig. 2).

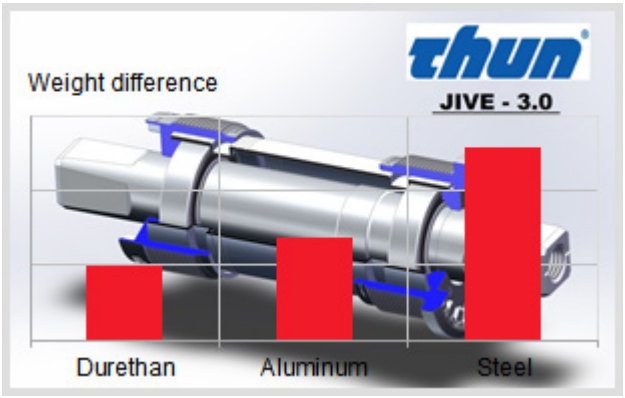

Fig. 2 Weight comparison

Whenever a bicycle needs to have a lightweight design, there is no alternative to high-performance polyamides such as Durethan.

Inner bearings of Durethan are suitable for a wide range of operating temperatures – from an extremely low -20 °C to +40 °C. At high temperatures, the material also has adequate stiffness (Fig. 3).

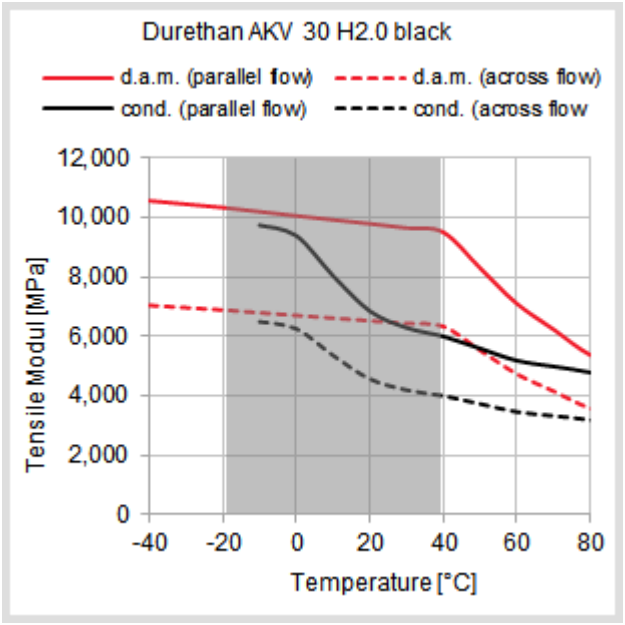

Fig. 3 Stiffness vs. operating temperature

Even at low temperatures, Durethan is noted for its high toughness (Fig. 4).

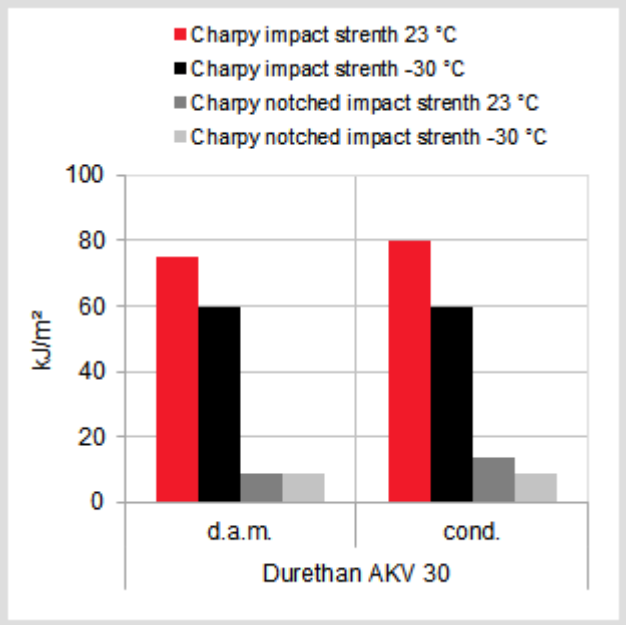

Fig. 4 Comparison of toughness

The Durethan adapters are also virtually corrosion-free and thus have outstanding durability. Corrosion is not only an optical problem. It is particularly problematic because steel or aluminum adapters can seize up in the housing of the bicycle frame. With Durethan, this cannot happen, so that easy dismantling is ensured.

During assembly, Durethan "forgives mistakes," because even if the part is mounted crooked, no damage is caused to the expensive frame. Furthermore, because of the relatively low tightening torque required, it is very user-friendly.

The Durethan AKV 30 H2.0 currently in use is by far the lightest material on the market for this application, and also meets the very highest requirements in terms of strength (Fig. 5) and service life.

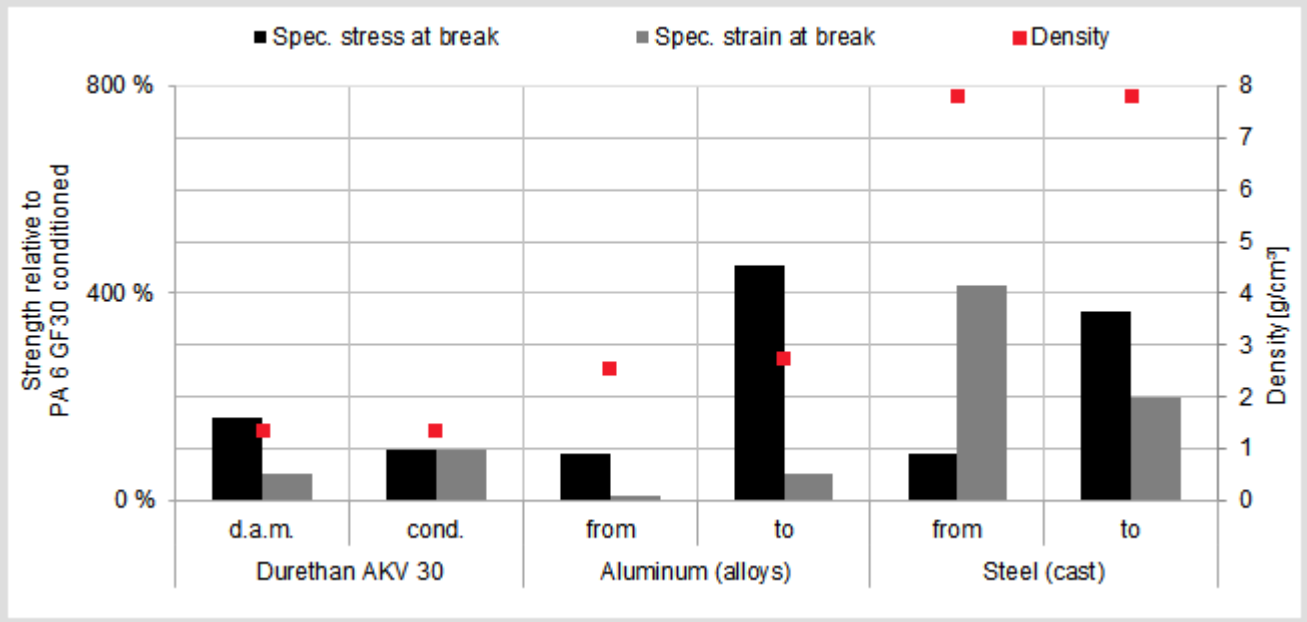

Fig. 5 Comparison of standardized properties in relation to density.

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The ability to save weight in vehicles by using plastics such as Durethan®, Pocan® and Tepex® makes an important contribution to fuel-savings and the associated reduction in CO_2 emissions.

[i] Fig. 1 and background Fig. 2 with kind permission off ALFRED THUN GMBH & CO.KG