Stanyl® HGR3 - The ultimate in low friction

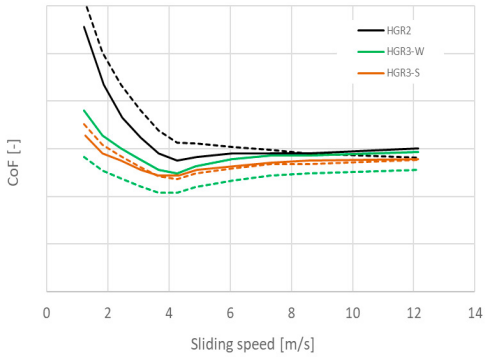
Tuned to your chain and oil of choice

Reduce friction in the engine and you reduce CO_2 emission and improve the engine efficiency. In current chain driven valve timing systems, almost 50% of the friction losses are attributed to chain to tensioner arm and guide contacts. Friction reduction can achieve fuel savings that would require an equivalent replacement of 20 kilograms of material using 'conventional' metal-to-plastic conversion.

Until recent, Stanyl® HGR2 was the benchmark in low friction. It provided best in class friction reduction for engine oil lubricated chain guide systems. It was awarded winner in the 2017 SPE Materials category where it brought 0.5Nm of friction torque reduction in a V8 engine. This was equivalent to a 0.4% fuel economy improvement. The grade was adopted by many OEMs

Now a new standard has been set with HGR3. It provides a technology platform where a range of materials are available. This enables Tier1s to choose the HGR3 grade that works best with their preferred low friction chain technology and the engine oils prescribed by the OEM. Friction reduction of up to 20% in the low engine RPM (Revolutions per Minute) range is possible.

Estimating the impact of material on friction



The full and dashed curves denote two different oils.

Nowadays engine oils are optimized for low viscosity while at the same time new additives are used to compensate for a loss of lubrication capability. The mix of additives interacts with chain and guide material to play a unique role in lowering the friction. As the graph above shows, the HGR3 platform of materials provides an optimal solution for each lubricant. A similar situation occurs with different chain types. Each chain manufacturer will utilize its own technology base to produce chains that are designed to bring the lowest friction. Again, the HGR3 technology platform provides the optimal guide material to bring the best combination for lowest chain-on-guide friction. In line with our drive to continuous improvement, also the wear resistance and ease of processing of these new grades have been further enhanced compared to HGR2.

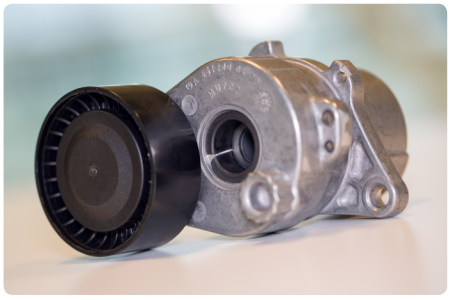
Proven performance in low wear & friction solutions

Timing chain:

For two decades, DSM has been leading the pack when it comes to reduced friction materials for guide rails in Timing Systems. DSM developed a complete portfolio of materials, answering every challenge in friction performance and system robustness. Various Stanyl grades are all commercially proven solutions and have become the industry standards; 60% of the all newly built cars utilize PA46 in its timing chain system. Now Stanyl HGR3 has been added to that portfolio. DSM is committed to continue the development for better solutions with even lower friction that will help to further reduce CO_2 emissions from automobiles.

FEAD:

Stanyl is recently introduced to the industry to replace aluminum in FEAD auto-tensioner systems – and in particular for the alternator mounted tensioner. A high strength, high stiffness and thermally conductive grade has been developed to maintain correct idler pulley alignment on the plastic tensioner arm whilst being able to heat sink the damping energy away from the friction interface. Classically sandwiched between the aluminum tensioner arm and tensioner base, Stanyl TW371 provides the necessary wear resistance and consistent damping performance – along with excellent chemical and heat resistance in an area exposed to dirt, rain, under-the-hood liquids, and engine heat.



Gears:

Plastic actuator design is a dynamic field, where the plastic provides great design freedom, enabling gear configurations too difficult or expensive to create with metal. DSM has been successfully pioneering in this field and Stanyl is used in over 200 million vehicles worldwide in actuators such as electronic throttle control (ETC) and exhaust gas recirculation (EGR). Stanyl offers best- in-class tribological behavior, especially at high temperatures and in dry-run, with up to 50 percent less wear than PPA, PEEK, PA66. Due to high performance of Stanyl plastic material, cost savings can be obtained by design optimization, wall thickness reduction, but also processing optimization versus competitor plastic materials.

Learn more via our website

www.dsm.com/plastics

or contact us directly via

www.dsm.com/contactdep