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Vacubelt® filter belt: high process reliability

To optimize cooling lubricant filtration for the lateral grinding machines used in transmission manufacturing, a Vacubelt® 3354 polyester filter belt from GKD Gebr. Kufferath AG replaces the plastic belt previously used in the Schaeffler Group. Greater supply and process reliability with significantly better shelf life, stability, and service life are the key benefits of the new belt type.

As a manufacturer of precision products, the Schaeffler Group creates systems for engines, transmissions and chassis, as well as roller bearing and plain bearing solutions for industrial applications that are used in over 60 sectors. Roller bearings comprise one outer ring and one inner ring, with caged rolling elements – such as balls, pins or cylinders – sandwiched between the two that move on tracks. This design therefore transmits a load between two surfaces running in counter-rotation with little frictional resistance. In ring manufacturing operations, grinding is considered the key process, as optimum cooling and lubrication performance is of central importance together with a precise system design. Cooling lubricants dissipate heat, reduce friction and remove any swarf or corundum particles. Permanent regeneration of the cooling lubricant is therefore required for a high quality surface finish. In transmission manufacturing, a pressure belt filter supplies three lateral grinding machines. On these systems, the lateral surfaces of the bearing rings (between 50 and 100 millimeters in length) are ground on the top and underside. The Vacubelt® 3354 polyester filter belt from GKD is used as a test belt for continuous cleaning and preparation of the cooling lubricant in the central filter system for the lateral grinding machines. The coolant, loaded with abraded material and swarf, is transported to the pressure belt filter's dirt tank and from there via a pressure pump into the filter chamber, where it is distributed on the belt using nozzles.

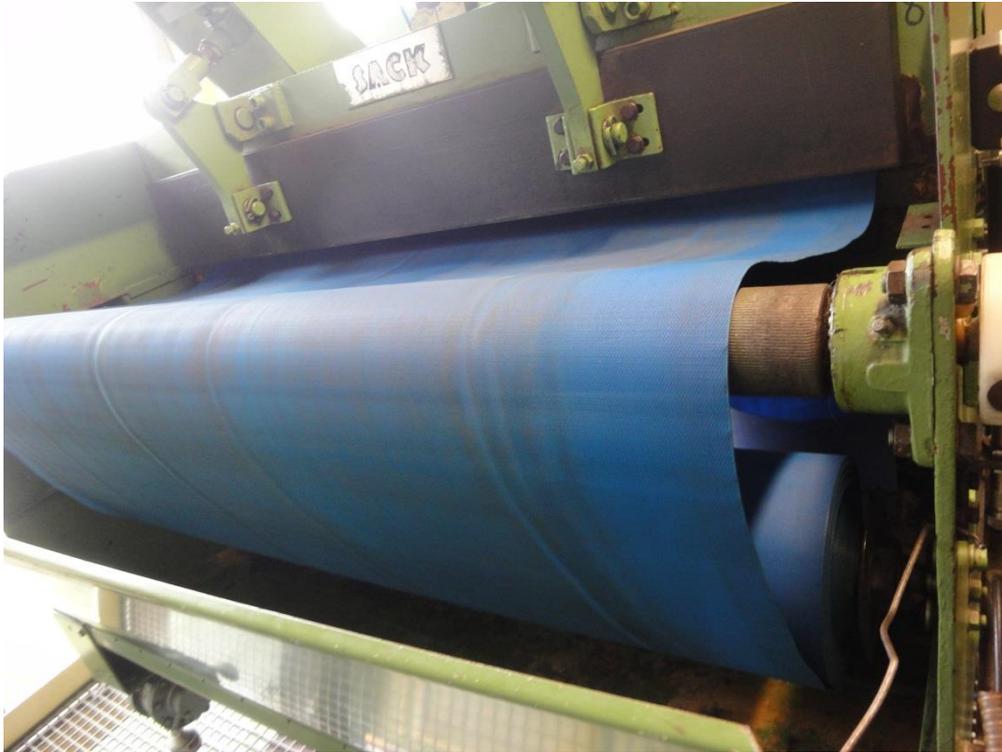


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The pressure forces the suspension through the filter belt, while the dirt particles are retained on its surface and form a filter cake. The cleaned cooling lubricant is then pumped from the clean tank back to the machine tools. The pressure belt filter is fed from a reel of filtration mesh that measures 50 meters long and 1.30 meters wide. As the filter cake gets thicker, the differential pressure increases. At 0.7 bar, the supply line delivering the dirt load is automatically interrupted for filter regeneration. The mesh is removed, cleaned and then fitted back in the system. As the pressure belt filters are used in pairs, the requisite process reliability is guaranteed. While one unit is filtering, the other is being regenerated. With its 150 µm pore opening, the GKD Vacubelt® fulfills the requirements of the Schaeffler Group perfectly. Beside efficient filtration without addition of filtration aids, its high air permeability of 1,300 l/m²/s is another key advantage of the highly permeable belt. The smooth surface made of polyester monofilaments also allows easy cleaning. Combined with a higher weight, the significantly thicker weft wire in comparison with conventional belt types ensures an extremely high degree of lateral stability. Measuring just 0.9 millimeters thick, it guarantees permanent tracking stability without formation of kinks or cracks. Unlike the previous belt, this prevents skewed running, so the edges do not get bent over or even ripped. The number of cycles is therefore significantly higher – with comparable results in residual dirt analyses. This leads to discernibly increased supply reliability, maximum service life, as well as significantly improved process reliability and efficiency in an unprecedented scope.



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As a privately owned technical weaver, GKD - Gebr. Kufferath AG is the world market leader in metal, synthetic and spiral mesh solutions. Four independent business divisions bundle their expertise under one roof: Industrial Mesh (woven metal mesh and filter solutions), Process Belts (belts made of mesh and spirals), Architectural meshes (façades, safety and interior design made of metal fabrics) and Mediamesh® (Transparent media façades). With its headquarter in Germany and five other facilities in the US, South Africa, China, India and Chile – as well as its branches in France,



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Spain, Dubai and worldwide representatives, GKD is close to markets anywhere in the world.

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