Press release

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SKF launches innovative new bearing rating life model

The development of an innovative, rolling bearing rating life model leads to a deeper insight into how to improve the field performance of bearing applications.

Gothenburg, Sweden, 13 April 2015: SKF has launched a pioneering new model that will help engineers to calculate a more realistic bearing rating life by considering more influencing factors than before. The new model is a major step forward for the industry, and will play a vital role in enabling OEMs and end users to match bearings to application conditions with even greater certainty, resulting in improved bearing life and reduced operating costs.

Developed as part of the SKF EnCompass Field Performance Programme, the new SKF Generalised Bearing Life Model will enable original equipment designers and end users to more closely match bearings to actual application conditions.

SKF has developed the model and a corresponding technical paper, which due to its significance to the wider industrial and engineering disciplines has been submitted to the scientific community. The new model builds on the strengths of the current bearing life model, which was developed by SKF over 30 years ago, standardised in ISO 281:2007 and currently used worldwide.

The new SKF Generalised Bearing Life Model now successfully separates surface from sub-surface failure modes. Based on explicit tribological models, it factors in new performance parameters, including those for lubrication, contamination, surface strength and mild-wear resistance. By understanding and accounting for more potential failure modes, the model is able to more realistically predict bearing behaviour and life under a wide range of operating conditions in the field.

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Alrik Danielson, SKF Group President and CEO, notes, "SKF is proud to be taking the lead once again in advancing the science of tribology and applying it to bearing optimisation in our customers' applications.

This innovative new model will improve our ability to help customers select bearings to meet their specific application needs in terms of bearing life, speed, energy use and more." The current bearing rating life model is primarily based on sub-surface fatigue damage accumulation which is transformed into a bearing survival probability by using the Weibull probability distribution model and then modified with surface stress concentration models for poor lubrication and lubricant contamination. The model is used to determine a bearing's unique basic dynamic load rating, also known as C-value; the load for which the calculated rating life of the bearing population with 90% reliability is one million revolutions. However, today SKF high quality bearings rarely fail due to sub-surface fatigue damage. Nowadays failure is typically the result of surface damage caused by such factors as contamination, inadequate lubrication, or other environmental conditions that lead to surface distress and wear.

Bernd Stephan, Senior Vice President, Group Technology Development, explains, "C-value is still a relevant performance parameter, but it tells only part of the story because it doesn't account for the bearing's rolling contact micro-geometry, material properties and other critical factors. New steel heat treatments or materials, better surface textures and contact profiles, high-performance coatings, hybrid bearings, better lubricants – these things cannot be reflected with increases of a single sub-surface fatigue performance parameter like C-value. This is why new concepts in bearing life models are required which, combined with SKF's application knowledge, to enable improved field performance."
Another benefit of the new model is that it is flexible enough to allow the integration of new knowledge in the tribology and materials sciences as it is developed. As bearing science evolves, so will the model.

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SKF is a leading global supplier of bearings, seals, mechatronics, lubrication systems, and services which include technical support, maintenance and reliability services, engineering consulting and training. SKF is represented in more than 130 countries and has around 15,000 distributor locations worldwide. Annual sales in 2014 were SEK 70,975 million and the number of employees was 48,593. www.skf.com

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