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Autore	Lugt Piet M
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Nota di contenuto	GREASE LUBRICATION IN ROLLING BEARINGS; Contents; Preface; Series Preface; List of Abbreviations; 1 Introduction; 1.1 Why Lubricate Rolling Bearings?; 1.2 History of Grease Lubrication; 1.3 Grease Versus Oil Lubrication; 2 Lubrication Mechanisms; 2.1 Introduction; 2.2 Definition of Grease; 2.3 Operating Conditions; 2.4 The Phases in Grease Lubrication; 2.5 Film Thickness During the Bleeding Phase; 2.5.1 Ball Bearings; 2.5.2 Roller Bearings; 2.6 Feed and Loss Mechanisms During the Bleeding Phase; 2.7 Film Thickness and Starvation (Side Flow); 2.8 Track Replenishment; 2.9 Grease Flow 2.9.1 Non-Newtonian Rheology 2.10 Wall-Slip; 2.11 Oxidation; 2.12 EP Additives; 2.13 Dynamic Behaviour; 2.14 Grease Life; 2.14.1 Temperature; 2.14.2 Speed; 2.14.3 Load; 2.14.4 Bearing Type; 2.14.5 Grease Type; 2.14.6 Environment; 3 Grease Composition and Properties; 3.1 Base Oil; 3.1.1 Natural Triglyceride and Wax Ester Base Oils; 3.1.2 Mineral Oils; 3.1.3 Synthetic Oils; 3.2 Base Oil Viscosity and Density; 3.2.1 Viscosity-Temperature; 3.2.2 Viscosity-Pressure-Temperature; 3.2.3 Density, Compressibility; 3.3 Thickener; 3.3.1 Soap Greases, Simple Greases; 3.3.2 Complex Greases 3.3.3 Non-soap Thickeners 3.3.4 Mixed Thickeners; 3.3.5 Mechanical Structure; 3.3.6 Oil Retention; 3.3.7 Properties of Different Types of Grease Thickeners; 3.4 Additives; 3.4.1 Corrosion Inhibitors; 3.4.2

Antioxidants; 3.4.3 EP/AW Additives; 3.5 Solid Fillers/Dry Lubricants; 3.5.1 MoS₂ and Graphite; 3.5.2 Nanoparticles; 3.5.3 ZnO; 3.5.4 Teflon (polytetrafluoroethylene); 3.5.5 Polyethylene; 3.6 Compatibility; 3.7 Polymer Grease; 4 Grease Life in Rolling Bearings; 4.1 Introduction; 4.2 Relubrication Intervals and Grease Life; 4.3 The Traffic Light Concept; 4.3.1 Low Temperatures 4.3.2 Extreme Low Temperature 4.3.3 Extreme High Temperature; 4.4 Grease Life as a Function of Temperature in the Green Zone; 4.5 SKF Relubrication and Grease Life; 4.6 Comparison Grease Life/Relubrication Models; 4.7 Very Low and High Speeds; 4.7.1 Speed Ratings and Speed Factors; 4.7.2 High Speed; 4.7.3 Very Low Speeds; 4.8 Large Rolling Bearings; 4.9 Effect of Load; 4.9.1 Varying Load; 4.9.2 Direction of Load; 4.9.3 Very Heavy Loads; 4.10 Effect of Outer-Ring Rotation; 4.11 Cage Material; 4.12 Bearing Type; 4.12.1 Roller Bearings; 4.12.2 Hybrid Bearings 4.13 Temperature and Bearing Material 4.14 Grease Fill; 4.15 Vertical Shaft; 4.16 Vibrations and Shock Loads; 4.17 Grease Shelf Life/Storage Life; 5 Lubricating Grease Rheology; 5.1 Visco-Elastic Behaviour; 5.2 Viscometers; 5.2.1 Parallel Plate and Cone-Plate Viscometers; 5.2.2 Errors in Rheometry Measurements; 5.2.3 Errors in Thin Film Parallel Plate Rheometry Measurements; 5.3 Oscillatory Shear; 5.3.1 Theory; 5.3.2 Application to Grease; 5.3.3 Effect of Thickener Concentration; 5.4 Shear Thinning and Yield; 5.4.1 Grease; 5.4.2 Lubricating Oil; 5.5 Yield Stress; 5.5.1 The Concept 5.5.2 Influence of Temperature

Sommario/riassunto

"The definitive book on the science of grease lubrication for roller and needle bearings in industrial and vehicle engineering. Grease Lubrication in Rolling Bearings provides an overview of the existing knowledge on the various aspects of grease lubrication (including lubrication systems) and the state of the art models that exist today. The book reviews the physical and chemical aspects of grease lubrication, primarily directed towards lubrication of rolling bearings. The first part of the book covers grease composition, properties and rheology, including thermal and dynamics properties. Later chapters cover the dynamics of greased bearings, including grease life, bearing life, reliability and testing. The final chapter covers lubrications systems - the systems that deliver grease to the components requiring lubrication. Grease Lubrication in Rolling Bearings: Describes the underlying physical and chemical properties of grease. Discusses the effect of load, speed, temperature, bearing geometry, bearing materials and grease type on bearing wear. Covers both bearing and grease performance, including thermo-mechanical ageing and testing methodologies. It is intended for researchers and engineers in the petro-chemical and bearing industry, industries related to this (e.g. wind turbine industry, automotive industry) and for application engineers. It will also be of interest for teaching in post-graduate courses"--
