MOTION & CONTROL NSK

TECHNICAL INSIGHT

A PUBLICATION OF NSK EUROPE

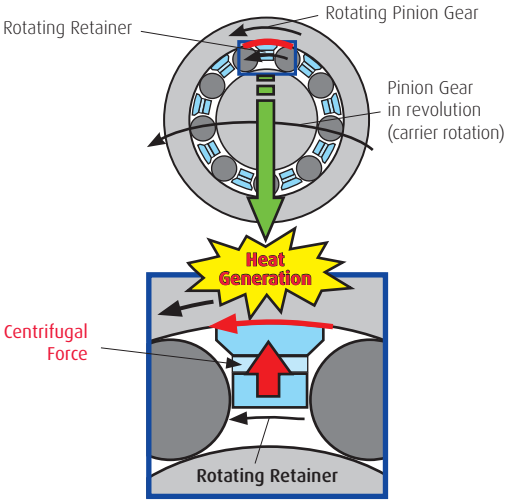
Lineup of a Cage & Roller and Planetary Shaft

Development Objectives

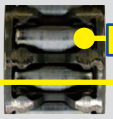
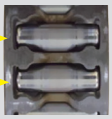
- Application of a special coating to the bearing cage for higher speed
- Downsizing is possible through use of NSK original material and special heat treatment

General Description and Product Features (Structure and Operating Principles)

Cage and Roller for High-Speed Planetary



Higher-speed design of planetary
→ Generation of seizure and abnormal wear

	Conventional Technology		NSK-Developed Product
	Standard Product	High-speed Spec	Ultra High-speed Spec
External View			
Surface Property of Retainer	Topmost Surface No Coat Base Material (Cr+Mo Steel)	Topmost Surface Coat Carbonitriding Layer	Topmost Surface Special Coat
Frictional Force (Heat Generation)	Large	Medium	Small
High-Speed Performance	 2 times	 1,5 times	

High-Speed performance of "twice the standard product" and
"1.5 times the High-Speed Spec" has been achieved

Features of Super-long Life Planetary Shaft

1. Optimisation of chemical components

   Adoption of high Cr-alloy steel (NSK original)

2. Optimisation of heat treatment conditions

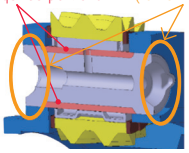
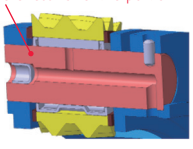
   Optimum amount of residual austenite

3. Heat treatment technology employed according to specifications

   Applicable to swaging and pining types

A longer life of "4.5 times more than standard product" and "2.5 times more than special heat treatment spec" has been achieved

Ultra-long service Life Planetary Shaft

Shaft Type	Swaging	Pinning
	Higher hardness only for required portions; End face of shaft (lower hardness) 	Higher hardness for entire portion 
Standard (Life Factor 1)	SUJ2 + High Frequency	SUJ2 + Quench Annealing
Long Life (Life Factor 1.8)	SUJ2 + (Special High Frequency)	SUJ2 + Special Heat Treatment or Special High Frequency
Super-long Life (Life Factor 4.5)	NSK-original material + Special High Frequency	NSK-original material + Carbonitriding

2.5 times