NSK CASE STUDY

INDUSTRY

PULP AND PAPER

APPLICATION

PAPER MACHINE - DRYER CYLINDER

COST SAVINGS: $226,330 / YR

FOR 10+ YEARS

A paper mill requested that NSK review the relentlessly poor performance of the drive side bearings on dryer cylinders, requiring replacement as frequently as 3 to 4 times annually. With an holistic review of the application and installed bearings, NSK Engineers determined the root cause of bearing failure - inner ring cracking - was a direct result of the thermal stresses inherent to the high heat conditions of dryer cylinder operation.

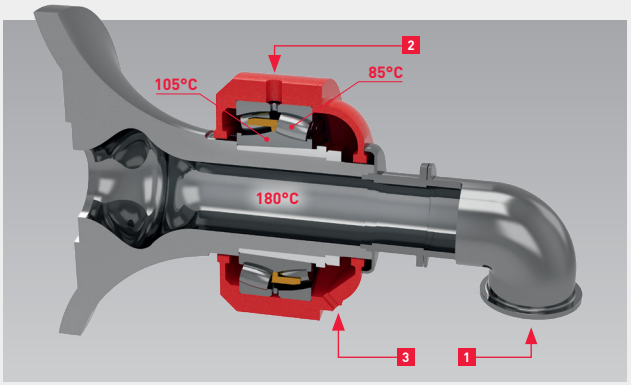
A proven countermeasure - NSK's Tough and Long Life (TL) Spherical Roller Bearing - was recommended and installed. Success was replicated for this customer and by this customer: NSK's TL bearing solution has been in operation for more than 10 years and has been adopted by the mill plant-wide.

RELEVANT FACTS

- Critical machinery in the papermaking process
- Extremely high operating temperature
- Presence of contamination from non-lubricating moisture
- Abnormally high frequency of bearing replacement

VALUE PROPOSALS

- NSK conducted an exhaustive application review and bearing failure analysis, confirming root cause of thermal stress
- Presented TL material technology solution as a means to replicate similar successes achieved with NSK customers
- Installation of TL spherical roller bearings increased reliability of the rolls / MTBF of the asset exponentially



Pictured: Example of a dryer cylinder roll structure showing the typical temperatures present. 1) Steam, 2) Lubrication oil, 3) Oil return

PRODUCT HIGHLIGHTS

NSK's TL series spherical roller bearings are ideally designed for paper machine dryer roll applications - and wherever elevated temperatures prevail - optimizing machine uptime and efficiency with superior resistance to inner ring fracture and exceptional dimensional stability at high temperatures.

- Optimized, high capacity internal design
- Inner rings manufactured with proprietary TL material composition and heat-treatment process
- Superior dimensional stability as high as 200°C
- High strength resistance to hoop stress and inner ring cracking
- High raceway surface hardness promotes a wear resistant, long service life
- Dramatically reduced incidents of bearing failure translate into extended uptime, reduced maintenance costs and increased machine throughput

NSK TL-Series Spherical Roller Bearing

ANNUAL COST-SAVING BREAKDOWN

BEFORE	COST	NSK SOLUTION	COST
Product Cost	$11,600	Product Cost	$3,700
Maintenance	$2,420	Maintenance	$230
Loss of Production	$241,900	Loss of Production	$30,240
Other Cost	$2,100	Other Cost	$1,260
Engineering	$3,740	Engineering	–
Total	**$261,760**	**Total**	**$35,430**
		TOTAL ANNUAL COST SAVING	**$226,330**

YOUR PARTNER FOR MACHINE OPTIMIZATION

Our AIP Added Value Program is based around a simple proposition: 'improvement pays'.
By working with you throughout the AIP Value Cycle, we will help you achieve improvements in machine reliability, productivity and performance, all of which carry a tangible and measurable cost benefit – and we have the tools to prove it! That's what we mean by **improvement pays**.

aip NSK experts