

Success Story

Industry: Semiconductor

Application: Vacuum Pump

Cost Savings: € 7,180,000

Introduction

A major manufacturer of silicon wafers for microprocessors experienced a failure on their vacuum pumps which were equipped with NSK bearings. A proactive maintenance strategy needed to be integrated. After consultation with NSK, an AIP expert visited the site to perform a complete Condition Monitoring Service review of the plant. With the support of the CMS equipment it was possible to produce a plant health map. Over a period of several months NSK was able to help the customer to devise their predictive maintenance strategy using analysis from the measurements. The customer also purchased the same CMS equipment as NSK to take readings and shared these readings with NSK for expert analysis. This resulted in avoidance of a further unplanned pump failure, which would have caused significant scrap at a very high cost.

Key Facts

- Vacuum pump for production of silicon wafers for microprocessors
- A predictive maintenance strategy needed to be integrated
- NSK Solution: Condition Monitoring Service (CMS) helped the customer to develop a predictive maintenance strategy
- Early detection of pump problems allowed proactive maintenance and avoided failures
- NSK integrated approach to both bearing specification for high technology vacuum pumps and after-care service applied
- On-going support provided, together with specification of vibration analysis equipment allows future collaboration



↑ Ebara Vacuum Pump

Value Proposals

- Pump failure in service resulted in significant costs and NSK were asked to investigate the cause
- NSK performed a vibration analysis of the remaining pumps
- Using NSK's CMS service a full review of the plant resulted in a health map
- This allowed NSK to work with the customer to develop a proactive maintenance strategy
- Several CMS reviews were completed which also showed trend analysis and early failure prediction
- It also was recommended to monitor any pumps with high vibration levels with potential to fail so they can be replaced before failure occurs
- On-going support is now in place to continue with CMS as the customer develops his own capability



Product Features

- Live assessment of a machines condition and health while machine is still in operation
- Predicted life of the critical components inside a machine allowing the customer to plan maintenance more accurately
- Early warning of problems occurring in machinery. Condition Monitoring is the most sensitive and long reaching method of detecting the signs of machine wear
- On-site support from NSK engineers
- Assurance that NSK as a full range supplier can help with the provision of critical bearing and linear motion spares
- Performance improvements and operational cost savings



↑ Condition Monitoring Service (CMS)

Cost Saving Breakdown

Before	Cost p.a.	NSK Solution	Cost p.a.
 <p>NSK CMS service identified machine problem and allowed avoidance of severe failure. Product manufactured is €35.9K per unit - the production line holds 200 units</p>	€ 7,180,000		
 <p>Product manufactured in a complete vacuum, if there is a mechanical failure the vacuum is lost and airborne contaminants as small as 5 microns, render the manufactured product unusable.</p>			
Total Costs	Before		NSK Solution