

The logo for AI SIGHT, featuring the letters 'AI' in a white square followed by the word 'SIGHT' in white capital letters.The logo for MENSHEN, featuring a stylized white 'M' icon above the word 'MENSHEN' in white capital letters.

Case study

# Predictive maintenance in the plastic and packaging industry

**Customer:** Georg MENSHEN GmbH & Co. KG

**Location:** Finnentrop, Germany

**Use Cases:** cooling water pumps for injection molding machines

**Industry:** plastic and packaging

MENSHEN is one of the world's leading providers of plastic packaging solutions. This German company, headquartered in the Sauerland region of North Rhine-Westphalia, operates in 14 locations across 11 countries. Working under the motto, "sustainable innovator", the closure specialists develop innovative products with a focus on quality, safety, and sustainability. At the same time, they're always looking for technical developments that can improve their finishing processes and secure their place as top-quality producers.



## Initial situation and problem

Over the last few years, steadily increasing demands on MENSHEN's cooling system for injection molding machines brought the system's pumps to the limits of their power supply.

The cooling water pumps were exhibiting cavitation problems, leading to increased energy demand due to pitting on the pump impellers. In most cases, this damage remained hidden unless the pumps were uninstalled and dismantled for inspection. Generally, the discovery of damage came too late to prevent unplanned production downtime.

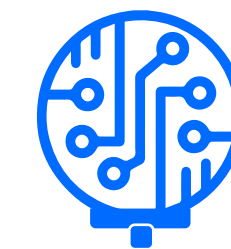
These cooling pumps remain in constant service, making them essential for the stability of MENSHEN's production processes and the quality of their output. MENSHEN, therefore, began looking for a technical solution that could provide both early warning of cavitation in their cooling pumps, and the corresponding measures they could take against it.

AiSight provided that solution. Using our predictive maintenance solution to receive early warning of pump damage and failure, MENSHEN was able to sustainably lower overall operating costs, and energy costs in particular.

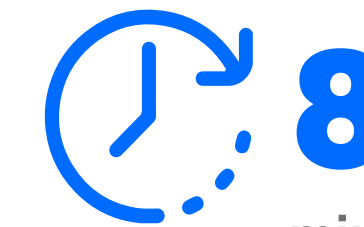
## Approach and implementation

To attain the best results possible from the AiSight solution, our introductory talks with MENSHEN covered the use cases that would deliver the greatest return.

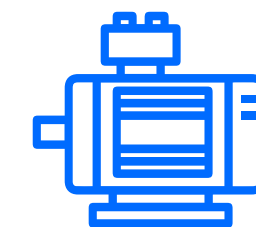
We agreed with the MENSHEN maintenance team that we should install sensors on the motors and bearings of the cooling water pumps responsible for cooling the injection molding machines. In all, we installed 21 sensors on seven cooling pumps.



**21**  
sensors



**8**  
minute average installation time  
for each sensor



Installed on water  
pumps for the  
cooling of injection  
molding machines



**1**  
day in service for the algorithms  
to adapt to machine-specific  
circumstances

## Results and benefits

Because a stable Wi-Fi connection is essential for data transmission from our sensors, MENSHEN prepared for installation by placing Wi-Fi access points in the facility housing the pumps. These provided optimal connectivity for our Aion sensors.

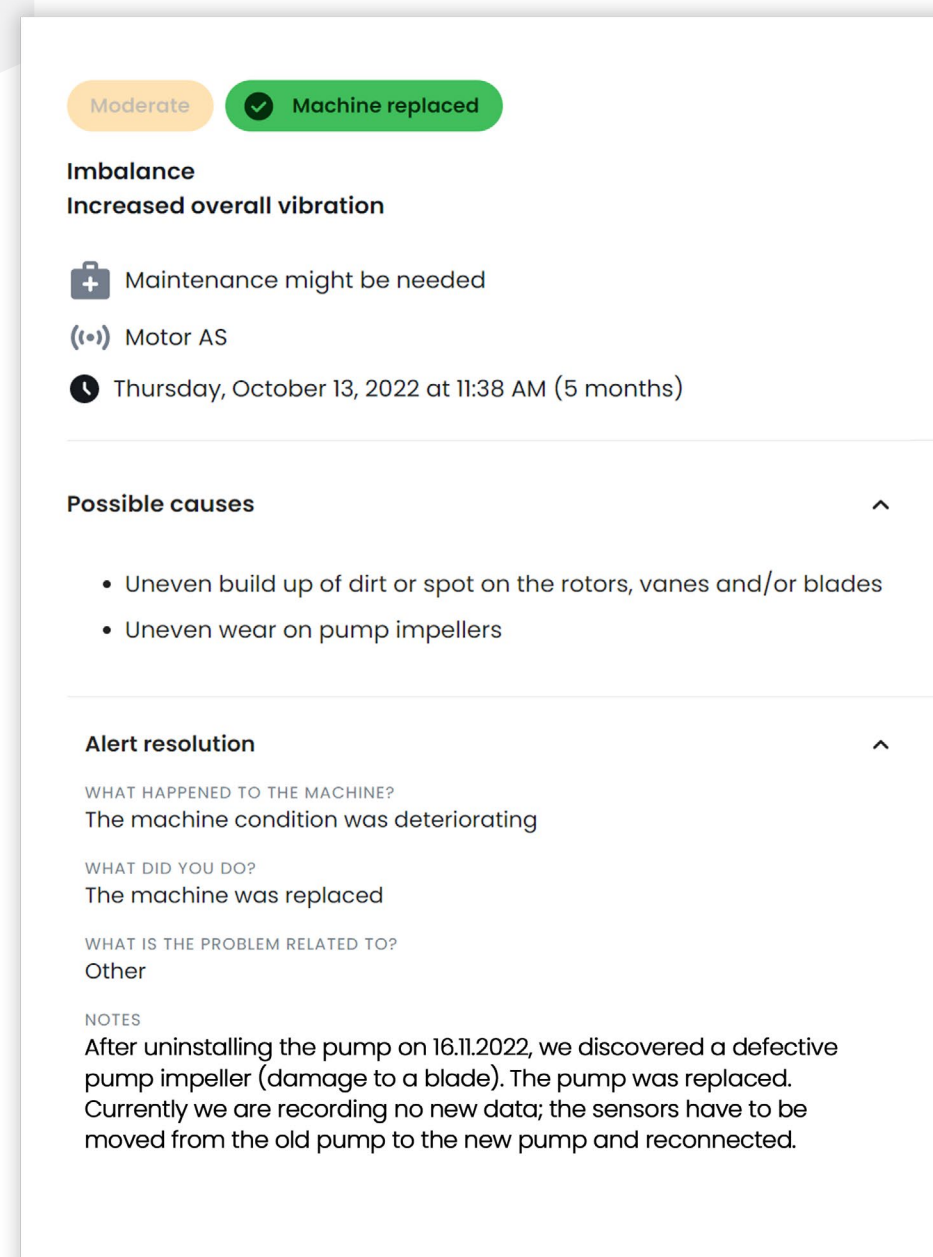


Image 1: alert sent from AiSight to MENSHEN

On August 3rd, 2022, it was time. The validation phase began with the connection of 21 Aion sensors mounted on motors and bearings on seven cooling water pumps. The initial analysis, on September 6th, showed that three of the seven cooling water pumps were already exhibiting early signs of cavitation damage. On the 13th of October, the AiSight Machine Insight Center issued an alert to MENSHEN’s maintenance team (image 1). Our solution had detected elevated vibrations plus an imbalance in one of the motors on a cooling pump (image 2).

The initial examination of this pump revealed no externally visible damage. But on advice from AiSight, the MENSHEN maintenance team decided to remove the pump on November 16th. Inside, they discovered defective impellers with broken fins. In the course of performing this planned maintenance, the maintenance team was able install a replacement pump.

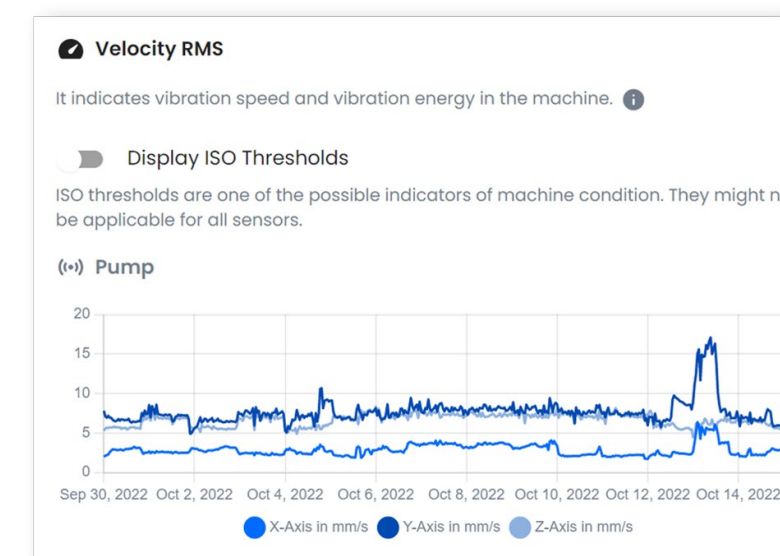


Image 2: screenshot from the AiSight Machine Insight Center indicating critical vibration speed and Envelope P2P around the 13th of October, 2022



## Technical deep dive

As we can see in Image 3, upon disassembling the pump, damage to the impeller blade is obvious. This is consistent with the irregularities identified by the AiSight solution in mid October (Image 2).

Using the AiSight alert, the MENSHEN maintenance team could collect precise observations and was well prepared to inspect the machine in detail in mid-November. Then, during a planned production stand-still, they could replace the machine, avoiding an expensive, unplanned stoppage.

On top of that, on October 13th the AiSight solution also identified bearing damage on a pump motor. This motor was still new and covered under warranty, making this discovery a lucky break for MENSHEN.

In conclusion, we should remember that these pumps failing during full production would have caused multiple complicated problems for MENSHEN. The AiSight solution secures production and provides the information the maintenance team needs to better plan maintenance. MENSHEN's pump supplier attests that using Aion sensors to monitor their pumps makes MENSHEN a cross-industry pioneer.



Image 3: pump with defective impeller and broken blade



▮▮ We're very happy with our decision. The AiSight solution secures reliable productivity, while our maintenance team can also better plan necessary maintenance. And our pump supplier attests that we've taken a cross-industry, pioneering role in pump monitoring by using the Aion sensors from AiSight. ▮▮

**Sebastian Pütter**

Process optimization expert,  
MENSHEN

## Outlook

Based on this successful validation phase, AiSight and MENSHEN are now coordinating the future of AiSight's predictive maintenance in MENSHEN's production facilities, monitoring hydraulic cooling systems, compressors, and other production machines. This makes MENSHEN a first mover in AI adoption in the packaging industry and sets them up to benefit early from coming hardware developments in AiSight's solution.

## About AiSight

AiSight makes unlimited machine uptime a reality. Founded in 2018, based on the potential for advanced AI to fill the need for an easy-to-integrate predictive maintenance solution, AiSight has developed a solution that goes beyond predictive maintenance, into the realm of machine diagnostics. Today, as part of Sensirion Connected Solutions, AiSight's 24/7 machine-monitoring solution has the ability to not only predict malfunctions, but to detect process errors, and protect overall machine health.

