CASE STUDY

CATERPILLAR | OPTIMAS INTERNATIONAL

Making Every Connection Count

Construction and Manufacturing | Strengthen Supply Chain | Quality Control

Digging Deep to Drive Quality Improvements for Caterpillar

Caterpillar, one of the world's leading manufacturers of mining and construction equipment and engines, partnered with Optimas International to improve component quality, strengthen supply chain performance and make its products more reliable. By embedding quality controls throughout the manufacturing process and extending best practices across its supplier network, the programme delivered significant cost savings and a substantial reduction in part defects.

Real Results, Real Impact

95%
Reduction in part defects

3 PPM
Quality performance

100%
On-time delivery of PPAP submissions

The Challenge

Caterpillar wanted to improve product reliability by reducing defects across its component supply chain. With an initial defect rate of 60 parts per million (PPM), the target was to halve this figure to 30 PPM, improving quality while reducing the costs and disruption associated with defective parts. This required a consistent proactive approach to quality management that could be applied across its manufacturing processes and supplier network, to prevent issues before they occur and support continuous improvement.

Solution

Optimas International quality engineers conducted an initial review of Caterpillar's supply chain and production processes to identify opportunities to strengthen quality management. The team then developed a proactive programme designed to build quality into every stage of the product lifecycle, from initial development and production planning through to launch and ongoing manufacturing.

The approach combined proven methodologies from two established quality frameworks: VDA 6.3 and the Automotive Industry Action Group (AIAG) Advanced Product Quality Planning (APQP) framework. Together, these provided a structured foundation for identifying potential risks early, preparing production processes effectively and driving continuous improvement.

> *"The team demonstrated their impressive capability on continuous quality improvement with local suppliers and global sourcing consolidation, resulting in excellent quality performance."*
>
> **David Zhang**
> Sourcing Quality Manager, Logistical Centre
> Caterpillar

Optimas International quality engineers also introduced Layered Process Audits to strengthen controls around critical-to-quality (CTQ) features, the product characteristics most important to performance, reliability and customer requirements. By focusing checks on these priorities, manufacturers could identify process deviations earlier and address potential quality issues before they resulted in defective parts.

To ensure a consistent approach across the wider supply chain, the team extended the APQP framework across its own supplier network, helping to align quality expectations, reinforce accountability and ensure supply partners were working towards the same measurable objectives.

Results

Optimas International helped Caterpillar exceed its original quality target and deliver measurable improvements in operational performance.

Beat the original 30 PPM performance target, with a final defect rate 90% below target.

Eliminated almost all warranty costs linked to part defects.

100% on-time delivery of PPAP submissions for new product introductions, supporting a more reliable and predictable launch process.

Optimas International helped Caterpillar exceed its original quality target and deliver measurable improvements in operational performance. The results demonstrate the value of a proactive, collaborative approach to quality management.

Optimas International is a tech-enabled industrial distributor providing fasteners, components, inventory management and supply chain solutions across APAC & EMEA. Partnering with domestic and global manufacturers, the company delivers bespoke, engineering-led and technology-enabled programmes designed to improve efficiency, quality, supply chain resilience and profitability for its customers.

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