Intelleges

CASE STUDY

Company Data

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Case Study 7: Product Conformance - Automotive Powertrain & Safety Component Manufacturing

Industry Problem: Automotive manufacturers face intense pressure to ensure every powertrain and safety component meets strict design and regulatory standards. A single non-conforming part -- whether a braking system component or engine sensor -- can trigger costly recalls, accidents, and liability. Over the five years ending in 2022, the U.S. averaged more than 1,000 automotive recalls annually. Many of these stem from supplier quality escapes or parts out of spec, underscoring the systemic challenge of product conformance in the supply chain. For automotive OEMs and suppliers alike, the stakes are life-and-death: a poorly manufactured airbag inflator or ABS sensor can lead to catastrophic failures on the road.

Regulatory & Operational Risks: In this sector, compliance with quality standards like **IATF 16949** (automotive quality management) and safety regulations (e.g. Federal Motor Vehicle Safety Standards) is not optional -- it's mandatory for market access. Non-conformance can violate these standards, risking regulatory penalties and lawsuits. Operationally, undetected defects can propagate into mass production, resulting in warranty claims, rework, and brand damage. For example, quality failures have led to huge safety recalls and class-action lawsuits. Beyond immediate costs, a culture of non-conformance erodes customer trust and can even halt production lines if critical components are quarantined. The need for rigorous **Advanced Product Quality Planning (APQP)** and continuous supplier audits is clear -- yet many companies struggle with the volume of documentation and coordination required to enforce conformance at scale.

Daily Pain Points: Quality managers and engineers in automotive manufacturing often fight fires daily. They chase down Certificates of Conformance and test results for hundreds of parts, manually compare supplier PPAP (Production Part Approval Process) documents to specifications, and scramble to respond when a test fails. A mid-market powertrain supplier might have dozens of Tier-2 and Tier-3 suppliers providing castings, sensors, fasteners, etc., each needing to prove materials and dimensions meet spec. Without an integrated system, this means endless email chains, spreadsheets of inspection data, and last-minute line stoppages when a part's paperwork is missing. Line operators might discover a tolerance issue on a batch of fuel injectors only after they've been assembled, forcing urgent investigations. There's also pressure from OEM customers who conduct their own audits: a Tier-1 brake component maker might live in fear of the next customer audit uncovering a documentation gap. In short, **lack of real-time visibility into product conformance** translates to reactive firefighting and elevated risk of letting a defective part slip through.

Intelleges Solution -- Protocol & Workflow: Intelleges attacks this problem at its root by **automating and securing the product conformance protocol** across the entire supply chain. The platform's protocol for Product Conformance is built on automotive best practices (APQP, PPAP) and a 6-step workflow that ensures every component and document is verified before use. Quality engineers define the required specifications and compliance documents in the system, and Intelleges orchestrates data collection and validation at scale. Below is Intelleges' tailored 6-step **Protocol Workflow for Automotive Product Conformance**:

1. **Requirement Mapping:** Define all regulatory and customer-specific

requirements for each part (e.g. material grade, dimensional tolerance, ISO 26262 functional safety criteria). Intelleges links these requirements to part numbers and suppliers, creating a digital thread of obligations. For example, an airbag sensor's file in Intelleges will list its design spec, applicable FMVSS standard, and required test reports.

2. **Supplier Data Collection:** Automatically solicit conformance

evidence from suppliers through secure questionnaires and document requests. Intelleges sends each supplier a tailored checklist (e.g. material certs, test results, process capability indices) for the parts they provide. The platform's **iterative questionnaire system** allows drilling down by part number or lot, ensuring nothing is overlooked. Suppliers upload certificates of analysis, inspection data, and PPAP documents directly into the system.

3. **Automated Validation:** Intelleges verifies submissions in real

time. It checks, for instance, that a steel batch chemical composition report meets the required grade or that a brake pad's coefficient of friction test falls within spec. Any out-of-tolerance data or missing documents trigger automatic alerts. The system cross-references standards -- e.g. flagging if a supplier's ISO 9001 certificate is expired or if a test method doesn't meet ASTM requirements.

4. **Issue Triage & Investigation:** If a potential non-conformance is

detected (like a supplier test report showing a hardness value below spec), Intelleges launches a guided investigation. The platform's **7-step Verification Workflow** (detailed shortly) comes into play to trace the issue: identifying suspect batches, containing affected inventory, and initiating corrective action requests to the supplier. This ensures rapid containment of quality issues before they escalate.

5. **Documentation & Audit Trail:** Intelleges organizes all

conformance evidence by part, supplier, and date. Quality managers can instantly pull up, say, the entire PPAP package for a powertrain gear or the calibration records for a safety sensor. Each data point is time-stamped and audit-ready. This means no more frantic searching through email archives during an OEM audit -- all required documents are at one's fingertips, with **audit readiness built in**.

6. **Continuous Improvement:** The platform aggregates conformance data

to pinpoint systemic issues. Perhaps one casting supplier consistently has dimension drift on a certain feature -- Intelleges analytics highlight this trend so you can proactively engage the supplier or adjust the design tolerances. Year-over-year conformance metrics are tracked, enabling a culture of continuous quality improvement rather than reactive fixes.

This protocol is complemented by Intelleges' **7-step Verification Workflow** for any flagged issues or advanced due diligence. In the automotive context, this verification workflow kicks in for deeper investigations -- for example, verifying a supplier's test results or auditing a new supplier's process. The 7 steps are:

7. **Trigger & Scoping:** When Intelleges flags a potential

non-conformance or high-risk part, a verification case is opened. The scope is defined -- e.g. "Verify metallurgical properties of batch X of engine valves from Supplier Y after an anomaly was detected."

8. **Data Forensics:** The system gathers all related data: material

certs, production lots, prior incidents. Investigators review this information within Intelleges to understand context (e.g. was this batch produced right after an equipment maintenance at the supplier?).

9. **Stakeholder Engagement:** Intelleges notifies relevant

stakeholders (supplier quality engineer, design engineer, supplier contact) and collaborates with them through a secure portal. Everyone sees the same data and discussion thread, ensuring transparency and speed. For instance, the supplier might be asked for additional test samples or to rerun a measurement -- all captured in the platform.

10. **Field Verification:** If needed, the workflow supports on-site or

third-party verification. Investigators can use Intelleges to schedule an on-site audit or request an independent lab test. The results (audit findings, lab reports) feed back into the case file. In one scenario, Intelleges helped coordinate third-party X-ray fluorescence testing for a batch of fasteners to verify material composition when paperwork was suspect.

11. **Analysis & Root Cause:** The collected evidence is analyzed to

confirm whether a true non-conformance exists and to pinpoint the cause. Intelleges might correlate a failure trend to a specific production shift or raw material source. In our engine valve example, the analysis might reveal that the hardness issue was due to a heat treatment furnace malfunction at the supplier's plant.

12. **Corrective Action:** Based on findings, corrective actions are

assigned -- both immediate (e.g. quarantine and replace the affected batch) and long-term (e.g. supplier upgrades process controls). Intelleges tracks these actions to closure, tying them to the original issue. All improvements (like updated process FMEAs or operator retraining records) are stored as part of the verification case.

13. **Closure & Documentation:** Once resolved, the case is closed with

a full report of the incident, investigation, and outcomes. This report is linked to the affected part and supplier profile in Intelleges for future reference. Over time, these verification reports build a knowledge base that Intelleges uses to **prevent recurrence** -- for example, by automatically adding a new checkpoint in the protocol (like requiring a quarterly furnace calibration report from that supplier).

Real-world Results: Companies implementing Intelleges for product conformance have seen dramatic improvements. In one anonymized case, a mid-sized automotive **safety components supplier cut its defect rate by 55% within a year**, thanks to early detection of out-of-spec parts and collaborative resolution with suppliers. Another large OEM reports that with Intelleges, they achieved **over 90% first-pass yield on incoming inspections**, up from 75% previously -- essentially catching far fewer surprises at the plant gate. Notably, Intelleges routinely delivers over *80% supplier response rates* on data and document requests, far above industry norms when chasing via email. This means a more complete picture of quality upstream and fewer blind spots. Critically, these gains translate to fewer recalls and warranty claims. Considering that recalls have surged industry-wide with vehicle complexity, the ability to proactively ensure conformance gives Intelleges clients a competitive edge in quality and reliability.

Why Intelleges -- Scalable Solution for All Sizes: Intelleges brings enterprise-grade compliance rigor in a scalable, user-friendly package. A **large enterprise** automaker benefits from seamless integration of Intelleges into its PLM and ERP systems, handling millions of data points (the platform has been proven to increase productivity by 600% in automating manual compliance tasks). Meanwhile, a **mid-market** Tier-1 supplier uses Intelleges as a turnkey quality system, avoiding the need to build a complex IT solution in-house -- they get a best-practice workflow out-of-the-box. Even a **small manufacturer** finds Intelleges invaluable: it acts as an expert guide, ensuring they meet the same IATF 16949 and customer-specific requirements as the big players, which can be a selling point to win more contracts. In all cases, Intelleges adapts to the company's scale, with a flexible subscription model and cloud delivery (no heavy IT footprint for smaller firms). By blending domain expertise (automotive regulations, APQP know-how) with automation, Intelleges makes rigorous product conformance **the rational, scalable default** mode of operation -- reducing risk and instilling a culture of "do not create defects, do not pass defects, do not accept defects" across organizations. This case study shows how even the most complex supply chains can move from reactive quality firefighting to proactive conformance assurance with Intelleges as a trusted partner.

Ready to Transform Your Compliance Operations?

Intelleges automates complex compliance workflows, reduces risk, and delivers audit-ready documentation — so your team can focus on what matters most.

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Contact Us: info@intelleges.com

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