



After discovering **Pertinence Suite's** capabilities and rescuing a key contract, **Composites Atlantic Limited** decided to adopt the software solution as a standard troubleshooting tool for ongoing improvements in its manufacturing processes



The Challenge

- Solve the inexplicable, recurrent nonconformance problem of disbonding (separation between layers) on 4 different leading edge families
- Demonstrate for the client, CAL's ability to come up with an innovative solution to fulfill their supply needs with reliable quality and on-time delivery
- Continually improve the manufacturing process by gaining a better understanding of the various characteristics of the materials, the equipment and the procedures

The Solution

- Pertinence Suite: the Process Rules Discovery module

The Benefits

- Resolved the persistent enigma and corrected the disbonding defect on the leading edge products
- Slashed the scrap rate from 13% to 0% and the rework rate from 28% to less than 1% on the leading edge products most affected by this noncompliance issue
- Absorbed the shipping delays accumulated over a 2 year period, in less than 7 months
- Regained the customer's confidence
- Increased potential for additional applications and expanded use of this software solution to improve other manufacturing processes and ensure quality control on other programs



"Thanks to Pertinence Suite, in less than 6 weeks we put an end to a frustrating five-year struggle to understand and correct a recurring defect in products for a major customer. As a result, we not only absorbed the accumulated delays in shipping, but we also regained our self confidence and renewed the customer's trust in our technical expertise."

– Derek Kinsman, COO, Composites Atlantic

"In the fall of 2006, five years into a major contract for the biweekly delivery of ten types of products (leading edges, rudders...) to be used on aircraft manufacturing, we had slipped dangerously behind schedule in manufacturing and deliveries, up to 6 months late on one product in particular," recalls Séverine Guitton, Head of Quality & Methods for Composites Atlantic Limited (CAL). The reason: a 2% average scrap rate and 18% rework on the 4 product lines due to debonding (separations between 2 layers of Kevlar) discovered during the final quality control using ultrasound. On the most heavily affected leading edge products, the scrap rate had reached 13% and rework hit 28%! However, there was absolutely no logic that could explain this highly irregular defect. All of the manufacturing parameters, constantly checked and rechecked, fit perfectly with the plans.

CAL's COO, Derek Kinsman adds, "These unacceptable and inexplicable rates had 4 serious ramifications: inability to maintain the delivery schedule due to production delays; internal cost increases jeopardizing the viability of the program; a high risk of losing the customer's confidence in our technical capabilities; and our own frustration with the continued failure to find a solution to this problem, despite concerted efforts and repeated attempts by our Process and Quality Control experts, including direct collaboration with our client." That's when CAL decided to look into Pertinence Suite, which they first discovered in a magazine article and later found at a trade show where they discussed the software solution in greater detail during a meeting with the vendor, Intercim.



Less than 6 weeks to drastically reduce the rework and scrap rates

Careful to test the capabilities of Pertinence Suite's Process Rules Discovery module and to examine the potential return on their investment prior to purchasing the software, CAL opted for a 6-month lease. "This was a real convenience Intercim offered, which we greatly appreciated," Séverine Guitton notes. In January 2007, following a three-day training session to



Composites Atlantic Limited (CAL)

- Subsidiary of EADS Sogerma, located in Lunenburg, Nova Scotia, Canada
- Leader in the design, test, certification and manufacturing of composite pieces for the A&D and energy industries
- Present in both national and international markets for more than 20 years
- With over 400 employees, CAL provides proven expertise in project management, systems engineering and design, testing, certification, quality assurance and manufacturing

About Intercim

Intercim is a global leader in Manufacturing Operations Management (MOM) solutions for the aerospace & defense, automotive, pharmaceutical and semiconductor industries. Our flagship product, the Pertinence Suite powered by Velocity, is a truly innovative software solution that bridges the gap between product design and supply chain. Our unique technology empowers distributed teams to collaborate on process planning, execution and quality to reduce manufacturing costs, time to market and cycle time. With 25 years experience Intercim operates from offices throughout the US and in Europe. Its customers include industry leaders like Airbus, Ball Aerospace, BMW, Boeing, Honeywell, Intel, Sanofi Pasteur. Partnerships with Dassault Systèmes, SAP and Microsoft support the company in its mission to provide operational excellence for all.

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get up to speed on this new tool, the Head of Quality & Methods, with the help of an Intercim consultant, tackled the most severely affected product line. She entered more than two years of production records, including data from all the different product lines and manufacturing procedures, and even those not showing any defects, into the Process Rules Discovery module. Then they spent a month adding 96 parameters at various stages of the production process, for each new part that was manufactured. After just one week of analyzing all of this data via the Pertinence Suite module, two totally unrelated and until then unsuspected characteristics proved to have an influence on the lack of consistent adhesion (debonding defect). The first is related to the fluidity of the resin used in the composite, and the second relates to the down time (the period during which the part is vacuum-packed and stored until cooked in an autoclave).

In less than 6 weeks, Process Rules Discovery enabled us to clearly establish specific rules regarding key parameters (time limits, for example, or fluidity intervals), far from any known scientific explanation and most strikingly in total contradiction to all of our intuitions," underlines Séverine Guitton. "By applying these rules to our normal operating procedures, we immediately reduced the scrap rate from 13% to zero and rework came down from 28% to less than 1%," she continues. At the end of this convincing initial application, CAL decided to purchase a license for Pertinence Suite in May 2007, with a full return on their investment expected within 6 months, on this contract alone.

Pertinence Suite, the new standard tool for quality control

Consequently, the procedure was applied across the board taking in three additional leading edge product lines in this customer program. The procedure is relatively the same, only the size of the molds differs. However, Process Rules Discovery shows that this size discrepancy is far from insignificant; in fact, it changes the rules for the parameters, particularly the ideal down time. By October 2007, thanks to a better understanding of the processes and tight compliance with the new rules, CAL completely caught up on the backorders (which averaged 3 months overall). "We regained our self confidence and renewed our customer's trust," Derek Kinsman emphasizes.

The next step for more widespread use of Process Rules Discovery: the transfer of skills and know-how to other experts in the Process Department and expanded application in preventative maintenance missions, for all the manufacturing processes. "For example, we're going to study the effects of curing the products in different parts of the autoclave to see if the positioning has an impact on the quality of the product," Séverine Guitton explains. "This time, the goal will not be to resolve a specific problem, but to gain a better understanding of how the equipment, the materials used and our procedures act, interact and react in order to improve performance and efficiency." Derek Kinsman concludes by saying, "Pertinence Suite has now become one of our standard tools for process troubleshooting and several other programs are candidates for application of this powerful deductive software to improve quality and performance."