



COMPOSITE BLADE PRODUCTION & QUALITY CONTROL

ENERGY, PROCESS & UTILITIES

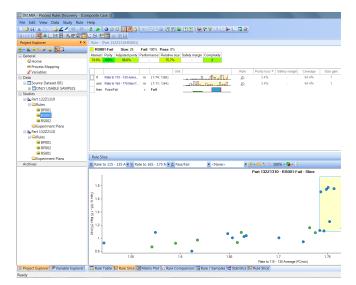


Understand and Prevent Manufacturing Defects

DELMIA's Composite Blade Production and Quality Control solution for the Energy, Process & Utilities Industry can establish process monitoring and provide real-time adjustments to changing conditions.

DELMIA's Energy, Process & Utilities Composite Blade Production and Quality Control solution facilitates corrective and preventive action on composite blade production quality issues. Easily collecting shop floor data in real-time, the solution quickly identifies root causes of failure. The value is driven from the analysis of historical shop floor data and discovery of rules validated by experts.

DELMIA's Energy, Process & Utilities Composite Blade Production and Quality Control solution is a data-driven, rule-based continuous process improvement methodology for wind blade manufacturing. Taking into account the quantified influence of process variables, the solution can provide advanced warning of potential problems, allowing manufacturers to adjust their processes in real-time.



Understand quantified influence of process variables.

🖄 DELMIA - Process Rules Discovery - [Cor	mposite Case 3]															
File Edit View Data Study Rule	Help															
In 🥲 刷 IX h h 🖆 🚄 Z 19・0・	1 2 i 🎽 🗿 🗿 🚮 I	1			: f🔒 s	P 	2 🍌 🔀 🖬 🗷	E.								
8 -					_			-								
	Study - [Part 132Z1															
S - K - S - A - K - 1						ation with output										
General	1						; Target:	Rate to 115 - 135 N 🕶 🌮 🕑								
🚯 Home	General Info	rmation					Target		0	- I - Aliana - Milaka I	D-4- 4- 115 12					
Process Mapping	Dataset: Source Dataset 001:ONLY USABLE SAMPLES:Analysis:Part 132Z1310											Corr	elation with: F	Rate to 115 - 13 op 8 variables	5 MIN (=C/M	iin)
2 Variables	Output variable:	Pass/Fail									-					
Data	Context:							Rate to 115 - 165 Min								
Source Dataset 001 Studies	Class list: Pass Fail															
□ Studies		8 (17.8%) 37 (8						Rate to 135 - 165 Min (ºC/min)								
🖃 🗀 Rules	Learning strategy: Process optimization Last update: 09/21/2012 15:04:38 Completed E															
➡ BP001		Edat apoute. Obj	21/2012 13:04:30	completed				Rate to 165 - 175 Min (ºC/min)								
i ⇒ RS001	Explanatory	Potential														
➡ RS002	Compute Last update: <none></none>										o 135 - 165 Average Max (ºC/min)					0.0
Experiment Plans	Compute	Last update: </td <td>ione></td> <td></td>	ione>													
Part 132Z2110 Part 132Z2110	All Pass Fail										Rate to 135-165 Spread				-0.7	
■ ■ Roles	Explanatory Potent	tial 94.7% 100%	89.5%								<u> </u>					
i BP002	Reference Model 50% 17.8% 82.2%										Time at Cure Spread			-0.55		
(€ RS001																
Experiment Plans	Coverage of	Samples						R	Rate to 115 - 135 Average (PC/min)			0.52				
Archives	-	All	BP RS													
	Coverage by rule of same class 100% 100% 100%										Rate to 115-165 Spread			-0.52		
	Input coverage											0 0.1 0.2	0.3 0.4	4 0.5 0.6	0.7 0.8	
												0 0.1 0.2		+ 0.5 0.6 Correlation value	0.7 0.0	5 0.
	BP = Best Practice RS = Risk Situation															
									•	I Lastupda	ate: 2013-05-22T16:07:43 - Part 132Z	1310 - Click on a ba	r for graphical and	alvsis		
	Rule Table				_								_		_	
	Int Name E Cla		Adjusted purity	Performance			e Safety margin		Rate to 115-1	65 Spread	Rate to 115 - 135 Average (°C/mi	n) Rate to 135 - 1	65 Max (°C/min) Rate to 165 - 17	5 Max (°C/min	n) Res
	Summa			-	22.33		4.1%	2.3	1		1		1			
	BP001 Pa			-	8	100%	4.1%	3	[0.08 ; 0	0.47]				+		[10
	RS002 Fa			-	31 28	83.8% 75.7%		2			[1.74 ; 1.89]	[1.79	; 2.04]	[1.11;	1.04.1	[-19
	K3001 Fa	11 74.5% 100%	30.0 %		20	15.176	-	2			[1.74, 1.05]			[1.11,	1.54]	
	•							111								
Displayer Project Explorer	🔀 Rule Table 🔛 R	ule Slice 🔡 Matr	ix Plot 🔝 Rule	Comparison	📑 Ru	ule / Sample	s 🖪 Rule List									
Ready																

Analyze shop floor data to discover hidden root causes.

INDUSTRY CHALLENGES

- How to understand and prevent composite blade manufacturing defects?
- How to capture manufacturing knowledge and reduce cycle time?
- How to establish process monitoring and improvements?
- How to solve unexplained voids, wrinkles, delamination and other defects?

SOLUTION HIGHLIGHTS

- Easily collect shop floor data in real-time
- Quickly identify root causes of failure
- Edit and establish rules with experts
- Understand quantified influence of process variables
- Obtain advance warning of potential problems
- Real-time adjustment of process to changing conditions
- Monitor rule compliance and receive notification when new rules are needed

SOLUTION VALUES

- Unique real-time detection and avoidance of quality risks based on analysis of historical shop floor data
- Discovery of rules validated by experts
- Understand and prevent manufacturing defects
- Capture manufacturing knowledge and reduce cycle time
- Establish process monitoring and improvements

USERS

• Quality Engineers



Delivering Best-in-Class Products

S CATIA

3S SOLIDWORKS 3D Design

35 SIMULIA

Realistic Simulation

Digital Manufacturing and Production

3s enovia

Collaborative Innovation

About Dassault Systèmes

SGEOVIA Model and Simulate our Planet

SEXALEAD Information Intelligence

inonination intelligence

Dashboard Intelligence

Social Innovation

3D Communication

Dassault Systèmes, the **3D**EXPERIENCE Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 150,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit www.3ds.com.

CATIA, SOLIDWORKS, SIMULIA, DELMIA, ENOVIA, GEOVIA, EXALEAD, NETVIBES, 3DSWYM and 3DVIA are registered trademarks of Dassault Systèmes or its subsidiaries in the US and/or other countries.

Europe/Middle East/Africa

Dassault Systèmes 10, rue Marcel Dassault CS 40501 78946 Vélizy-Villacoublay Cedex France

Visit us at

3DS.COM/DELMIA

Asia-Pacific

Dassault Systèmes Pier City Shibaura Bldg 10F 3-18-1 Kaigan, Minato-Ku Tokyo 108-002 Japan Americas

Dassault Systèmes 175 Wyman Street Waltham, Massachusetts 02451-1223 USA



Item: 3DS.WP.TRI.2012x.0417