A Component-oriented Process Failure Risk Analysis Method (Ver. 5) by Professor Paul G. Ranky, PhD, NJIT/MERC

Product Name and Appearance Before Process	Goff's NEW Raw Material Prep for Climate Curtains	PFRA Study ID Number	1	**Process Code**	**This PFRA Study was Prepared By**
Name of Organization Responsible for the Process	Singh Inc.	Date of This Study (mm/dd/yy)	4/22/2012	**Engineering Release Date of Process**	**PFRA Team**
Other Organizations Involved in the Process	Lenze, Datex, Interlake	Original Date of This Study	1/20/2012	**Type of Product Processed**	Climate curtains and Window Insulator kits **Responsible Organization/ Department**
Subcontractors, process Plants Effected	N/A	Revision Number	1	**Product Group Classifier**	**Comments**
Product Serial Number and Optional Image Map	N/A	Comments	None	**Engineering Release Date of the Product**	N/A

Process ID	Describe the Process for Each Process Step and Optionally Illustrate the State of the Device/ Part/ Subassembly/ Object AFTER the Process is Complete	Specify the Tool(s) Used in Each Process Step	Specify the Fixtures / Clamps Used in Each Process Step	List / Identify the Parts / Components Retrieved in Each Process Step	Process Time	Process Cost	Accumulated Process Cost	The PFRA Team Describes / Illustrates the Potential Process Failure Mode and the Effect; the Risk of Failure		Severity Rating	Detection Rating	Occurrence Rating
						53.00		Proc.ID	Failure Mode(s) and Effect(s)			
					[sec]	[USD]	[USD]			(1-10)	(1-10)	(1-10)
1	Baled recycled vinyl stock is placed on weigh conveyor	Automated Lift system	Weigh Conveyor	Baled Recycled Vinyl Waste	60	0.88	**0.88**	ID 1.1	Material is Unusable	2	3	3
								ID 1.2	Automated lift system not working	3	1	3
2	The stock is fed to first vibrating screen	None	Screen	Metal and other waste from the bales	30	0.44	**1.33**	ID 2.1	Vibrating screen not working	3	1	2
3	The vinyl waste is then sent to the second high speed rotating screen	None	Rotating Screen, Motors, Belts	Scrap	30	0.44	**1.77**	ID 3.1	Failure of screen	5	1	3
								ID 3.2	Faliure of Motor	5	1	3
4	The vinyl is sent to spray wash system	None	Water Spray Nozzles, Pumps	Organic materials	120	1.77	**3.53**	ID 4.1	Spray Nozzles Blocked	5	3	4
								ID 4.2	Pumps not working	10	1	2
5	Melting Tank	None	Tank, Heaters, Agitators	None	900	13.25	**16.78**	ID 5.1	Heaters not working	10	1	2
								ID 5.2	Agitator not working	4	2	1
6	Gravity Fed through Screen	None	Screen, Piping, Valves	Metal Scrap that maybe in the stock	30	0.44	**17.23**	ID 6.1	Screen is blocked	10	5	2
								ID 6.2	Piping Leaking	3	1	1
								ID 6.3	Valves closed shut	5	2	1
7	Conitnous level Heated Storage Tank	None	Tank, Piping, Level Sensor	None	60	0.88	**18.11**	ID 7.1	Level Sensor not working	3	1	4
								ID 7.2	Piping leak	2	4	1
8	Gravity fed to Head Box and Forming Unit	None	Piping, Head Box, Rollers	None	45	0.66	**18.77**	ID 8.1	Piping leak	2	1	1
								ID 8.2	Line Blockage	5	2	1
								ID 8.3	Head Box Blocked	2	1	3
9	RFID Tagging System for Raw Material	Robotic Arm, RFID Scanners	Robotic Arm	Raw Material with RFID Tag	10	0.15	**18.92**	ID 8.4	Robotic arm Malfunction	2	1	2
								ID 8.5	Scanner not working	3	1	1

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13	**RPN (Risk Priority Number)**	**Max. RPN**	**Tooling Factor**	**Clamping/ Fixturing Factor**	**Skill Factor**	**Any Other Factor You Define**	**Accumulated RPN**	**Risk Associated**	**The Effect of Each Process Step Failure Risk on Other Processes**	**The Effect of Each Process Step Failure Risk on Other Parts (I.e. components/ objects)**	**Detection Mode**	**Recommended Corrective Action(s)**
14												
15			**0.1-2,1=100%**	**0.1-2,1=100%**	**0.1-2,1=100%**	**0.1-2,1=100%**						
16	**18**								No Effect	No effect	Material Handling	Communicate material defects to purchasing and suppliers
17	**9**	**18**	1.00	1.00	1.00	1.00	**18.00**	**Low**	Doesn't slow down process, switch to manual trucks		Material Handling	Service Automatic Lift system Regularly
18												
19	**6**								No effect on manufacturing more screens down stream	No effect	Material Handling	Check Screen for blockage and mechanical issues
20		**6**	1.00	0.70	1.00	1.00	**4.20**	**Low**				
21												
22	**15**								High level of rejects going to melting tank	Upset the melting tank	Manufacturing department	Check screen for blockage and mechanical issues
23	**15**	**15**	1.00	0.50	1.00	1.00	**7.50**	**Low**				
24												
25	**60**								Organic junk going to melting tank, Undesirable vinyl liquid	Delay / financial loss	Manufacturing department	Check spray wash system service regularly to insure proper function
26	**20**	**60**	1.00	1.00	1.00	1.00	**60.00**	**Low**	Water pumps not working	improper washing	Manufacturing department	Check pumps and have back ups on hand
27												
28	**20**								Delay the forming and manufacturing process	Delay / financial loss	Manufacturing department	Check gas supply line and pilot light
29	**8**	**20**	1.00	1.00	1.00	1.00	**20.00**	**Low**	Delay in the melting process and uneven mixing	Delay / financial loss	Manufacturing department	Check circuit breaker and motor
30												
31	**100**								Delay the forming and manufacturing process	Delay / financial loss	Manufacturing department	Clean screen
32	**3**	**100**	1.00	0.50	1.00	1.00	**50.00**	**Low**	Less material going to forming/Pressure loss	Delay / financial loss	Manufacturing department	Install temporary piping patch
33	**10**								Delay in the forming process	Delay / financial loss	Manufacturing department	Clear blockage
34	**12**								No effect	No effect	Manufacturing department	Check input and output signal
35	**8**	**12**	1.00	1.00	1.00	1.00	**12.00**	**Low**	Less material going to forming/Pressure loss	Delay / financial loss	Manufacturing department	Install temporary piping patch
36												
37	**2**								Less material going to forming/Pressure loss	Delay / financial loss	Manufacturing department	Install temporary piping patch
38	**10**	**10**	1.00	0.40	1.00	1.00	**4.00**	**Low**	Delay in the forming process	Delay / financial loss	Manufacturing department	Clear blockage
39	**6**								Delay in the forming process	Delay / financial loss	Manufacturing department	Replace with secondary box
40	**4**								No RFID Tags applied, cant detect material quality issues	Possible Delay	Manufacturing department	Apply RFID Tags by hand, Fix Arm
41	**3**	**4**	1.00	1.00	1.00	1.00	**4.00**	**Low**	No Effect		Manufacturing department	Use Hand Scanner, Fix Scanner
42												

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13	**Corrective Action(s) Taken and Date (mm/dd/yr)**				
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