



Failure Modes and Effects Analysis (FMEA)



Process/Project: Facility Level SBT Framework Deployment **Process/Project/Product:** Hardwood Cutting Board Production - Facility Level
Process Owner: Cagatay Tasdemir **Location:** FPRD Building/Wood Prod. Lab
FMEA Date: August 2018

FMEA Process

Item/Process Step	Potential Failure Mode	Potential Effect(s) Of Failure	Severity	Potential Cause(s) Of Failure	Occurrence	Current Controls	Detection	RPN	Recommended Action	Target Completion Date
Process 1	Wrong Species Picked	Defective Production, Increased Solid Waste, Emissions, Cost Factors	10.00	Lack of organization in wood raw material storage	9.00	0	9.00	810.00	Conduct 5S, Develop new SOP	Nov-19
Process 1	Trip and Fall Hazard	Absenteeism, Bad Brand Image, Sanctions	8.00	Workers' attitude, Improper unloading practices	1.00	0	9.00	72.00	Conduct 5S, Train Workers	Nov-19
Process 1	Excess Picking Time	NVAC, NVAT	5.00	Improper storage conditions, workers' lack of ability to identify species	10.00	0	5.00	250.00	Conduct 5S, Train Workers, New SOP for storage area	Nov-19
Process 1,2,3,5,6,7,8	High dB Noise Exposure	Hearing Loss, WERAR Penalty	10.00	Workers' lack of safety awareness, Lack of SOPs, Absence of PPEs	3.00	1	7.00	210.00	Enforce Mandatory use of Hearing Protection	Nov-19
Process 1	Cup&Crook in Lumber	Defective Production, Low Yield, Excess Processing, Increased Solid Waste, Energy Consumption, Emissions and Cost	6.00	Non-optimal material input, Improper storage conditions, Lack of SOPs, Lack of Workers' Awareness on importance of proper stacking and storing,	10.00	1	7.00	420.00	Procure better quality lumber	Nov-19
Process 2	Cup&Crook in Lumber	Product Dimension Problems, Excess Machine Time, Increased Emissions	7.00	Non-optimal material input, Improper storage conditions, Lack of SOPs	10.00	1	7.00	490.00	Optimize material release specs	Nov-19
Process 2	Faulty Dimensions	Defective Production, NVAC, NVAT, Increased Transportation Emissions/batch	6.00	Dull Knives, Too Fast Material Feeding, Sound Knots	8.00	1	7.00	336.00	Implement TPM, Procure higher quality lumber	Nov-19
Process 4	Faulty Sticks Layout	Defective Production, Low Profit, NVAC, NVAT, Solid Waste	10.00	Ambient Color, Wood ID Skills, Rushed Production, Lack of SOPs, Incautious Worker	9.00	1	8.00	720.00	Train Workers	Nov-19
Process 4	Too Much Glue Usage and Waste	NVAC, Drastic Environmental Impact, Lower RTY	6.00	Uncontrolled application method, incautious operator, lack of SOPs	10.00	0	10.00	600.00	Research for Innovation	Nov-19
Process 4	Too Slow Glue Drying	NVAT, Creates a bottleneck, Too Much Lead Time, WIP	10.00	Technology limitation	10.00	0	10.00	1000.00	Research for Innovation	Nov-19
Process 5	Dust Exposure	Absenteeism, Aspiratory System Problems, WERAR Penalty, Unhappy Employee	10.00	Lack of SOPs, Lack of Supervision, Lack of PPEs, Lack of Workers' Safety Awareness	6.00	0	9.00	540.00	Enforce Mandatory Use of PPEs	Nov-19

Process 6	NO VAT and VAC	Lean Wastes, Unnecessary Cost, Electricity usage and emissions	4.00	Change aversion, Inefficient Use of CNC	10.00	0	10.00	400.00	Inspect CNC operations and brainstorm engineering solutions	Nov-19
Process 7	Part Alignment Issues	Defective Production, Excess Energy Consumption and Emissions, Low Profitability, NVAT, Solid Waste	10.00	Incautious Worker, Lack of proper alignment guides, insufficient suction, too much vulnerability to	10.00	1	9.00	900.00	Develop New Alignment Guide	Nov-19
Process 7	Inefficient Use of CNC - One Piece at A Time	Too Much Machine Time, Too Much Energy Consumption Creates a Totally NVA Process	10.00	Suction Problems, Lack of Motivation to Innovate Solutions	10.00	1	7.00	700.00	Innovate to Maximize Suction	Nov-19
Process 7	Faulty Edging	Defective Production, NVAC, NVAT, Waste, Emissions	8.00	Bit RPM, Faulty Part Placement, Dull Knives	8.00	0	7.00	448.00	Change Bits, Reduce Speeds	Nov-19
Process 8	Faulty Engraving	Defective Production, Solid Waste, NVAC,	10.00	Workers' Lack of Familiarity with the Process	10.00	0	9.00	900.00	Train Workers	Nov-19
Process 8	Too Much Cycle, Setup and Machine Time	Increased Labor and Energy Cost, CO2 Emissions	10.00	Engraving Speed, Lack of Error-Proof Alignment Guide, Too Much Machine Vibration	10.00	0	10.00	1000.00	Develop New Alignment Guide	Nov-19
Process 8	Too Much Setup Time	NVAC, NVAT, Low Profitability	10.00	Lack of Worker's Familiarity, Required Level of Precision during Part Placement in the Machine, Lack of Proper Error-Proof Guide, Lack of SOPs	10.00	2	7.00	700.00	Minimize (if not Eliminate) vulnerability to human error	Nov-19
Process 9	Excess Hand Sanding	Increased Labor Cost	5.00	Too Fast Processing on CNC	5.00	3	5.00	125.00	Reduce Bit Speed and Check Again	Nov-19
Process 9	Excess Mineral Oil Usage and Waste	Adverse Environmental Impact, NVAC, Lower RTY	4.00	Uncontrolled application method, incautious operator, lack of SOPs	6.00	0	9.00	216.00	Brainstorm for Innovation	Nov-19
Process 10	Plastic Packaging Material is against the	Adverse Environmental Impact, Bad Brand Image, Unnecessary Material	7.00	Lack of motivation to switch to alternatives, Cheap Product	10.00	0	10.00	700.00	Explore alternatives	Nov-19
Process 1-10	High Defect Rate	Low Profit, Too Much Waste, Emission, Energy Consumption,	10.00	Lack of Poka-Yoke, Lack of Cross-Training, Varying Skills of Workers, Incautious Workers, Lack of SOPs	10.00	1	9.00	900.00	Implement Poka-Yoke	Nov-19
Process 1-10	Low RTY	Excess Material Cost, Excess Transportation CO2 Emission/batch, NVAT, Excess Processing	10.00	Non-optimal lumber dimensions, defective lumber, uncontrolled usage of wood glue and mineral oil	10.00	1	9.00	900.00	Ensure optimal material specs	Nov-19
Process 3, 4, 5,6,7,8	WIP	Excess Labor and Energy Cost per batch, Increased CO2 due to energy consumption	7.00	Non-Optimal lumber width	5.00	0	8.00	280.00	eliminate bottlenecks (Process 4,7 and 8)	Nov-19
Total Risk Priority Number								13617.00		