FMEA Builder & Quality Assessor

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Developed by Kemal Dorak

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1. Upload FMEA Knowledge Sources

Upload specifications, standards, process flows, and historical data

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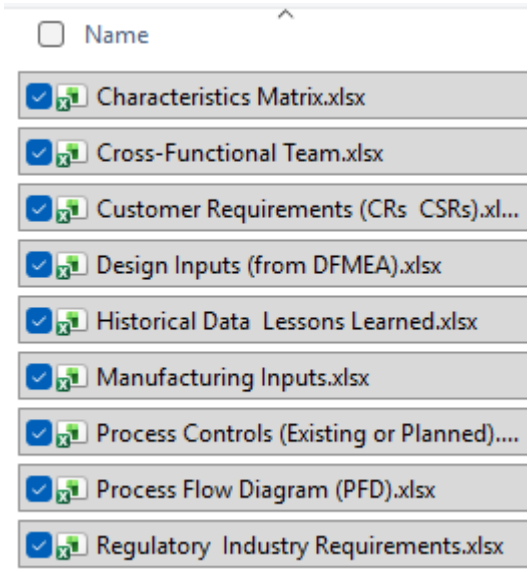

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Generated FMEA Preview

	Process Step	Work Element	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Potential Cause(s)	Occurrence	Current Controls	Detection	RPN	Recommended Action
0	6	Boiler joints	Joint torque out of spec or sealant bead missing/incomplete	External or internal leakage, pressure loss, failed leak pre-test, rework, possible custo	9	Incorrect torque application, torque tool drift, operator miss on sealant application, i	4	DC torque trace; UV vision; TQ-01 / 3 mo; Type-1; GR&R ≤10%; 1 In-station; stop & retc	3	108	Maintain torque tool calibrati
1	7	OPV setpoint	Relief pressure set outside 9.5-10.5 bar target or lock-nut not secured	Incorrect relief pressure, poor shot pressure performance, possible overpressure or w	8	Improper adjustment, master gauge error, lock-nut not tightened, paint mark missing	3	Reference master gauge; PG-01 / 6 mo; GR&R study; 1 at set; lock-nut; paint mark; re-	3	72	Standardize OPV adjustment
2	8	Pump orientation	Pump isolation not installed or pump orientation not keyed/seated correctly	Assembly misfit, vibration/noise increase, possible hose routing issues, functional ins	6	Operator misassembly, poka-yoke bypass, missing isolation component, incomplete	3	Visual poka-yoke; VIS-01 / N/A; WI audit; 1 In-station; halt; re-install; Control Plan CP-	3	54	Improve visual standards for k
3	9	Flow meter orientation	Flow meter installed backwards or O-ring cut/rolled/missing	No or incorrect flow reading, leakage, brew performance failure, EOL leak failure, cus	8	Arrow direction not checked, O-ring damaged during assembly, poor part handling, i	4	Visual + leak test; VIS-02 / N/A; first-piece 100% visual; 1/10 leak; In-station; rework; re	4	128	Add stronger orientation visu
4	10	Hose clamp engagement	Clamp band not positioned 1-2 mm from hose end or clamp not fully engaged	Leakage, hose loosening or blow-off, pressure loss, system leakage failure	9	Incorrect clamp placement, insufficient clamping, hose variation, operator error	4	Go/no-go gauge; GG-01 / 12 mo; Type-1; 1 In-station; re-clamp; replace hose; Control	3	108	Tighten standard work for cla
5	11	Ground bond resistance	Ground bond resistance above 0.1 ohm at 40 A	Electrical safety noncompliance, shock risk, IEC/UL failure, blocked shipment	10	Paint or contamination at bond point, poor fastener contact, missing hardware, dam	2	Ground bond tester; GB-40A / annual; R&R N/A (attribute); 1 EOL; rework bond; remov	2	40	Control paint-free bond locati
6	12	Thermistor contact	TIM missing/insufficient or thermistor torque out of spec	Incorrect temperature sensing, poor brew temperature control, group temperature o	8	Paste not applied, inadequate paste coverage, incorrect torque, tool variation, operat	4	UV vision + torque tool; VIS-03 / TQ-02; Attribute; GR&R torque; 1 In-station; reapply p	3	96	Strengthen UV verification for
7	14	Strain relief clamp	Clamp does not achieve specified pull strength	Cable movement or pull-out, stress on electrical connections, reliability issue, possib	8	Wrong insert, improper clamp installation, insufficient clamp force, component varia	3	Pull test fixture; PT-01 / 6 mo; Attribute; MSA app; Cell audit; rework clamp; change in	4	96	Audit insert selection, verify c
8	15	Firmware version	Incorrect firmware loaded, SN-to-FW mapping error, or CRC failure	Functional mismatch, unstable machine behavior, traceability error, blocked shipmer	8	MES mapping logic error, wrong firmware selection, incomplete programming, corru	2	MES log + CRC test; MES / N/A; system validation; 1 EOL; block ship if mismatch; Cont	2	32	Maintain validated MES rules,
9	17	Pressure set	Flow pressure under load outside 9 bar ±1 bar	Shot pressure out of market spec, poor extraction performance, brew inconsistency,	8	Calibration drift, incorrect pressure setting, pump or OPV variation, gauge error	4	Cal bench (master gauge); PG-01 / 6 mo; Type-1; GR&R ≤10%; 1 Cal; recalibrate; hold;	3	96	Review calibration process ca

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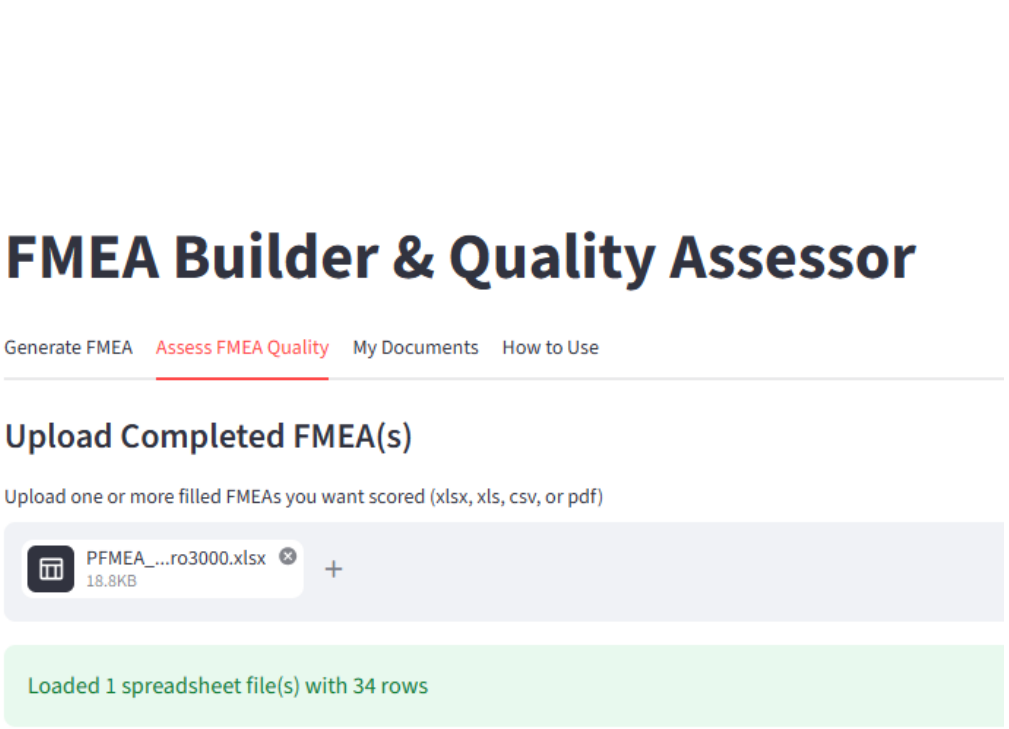
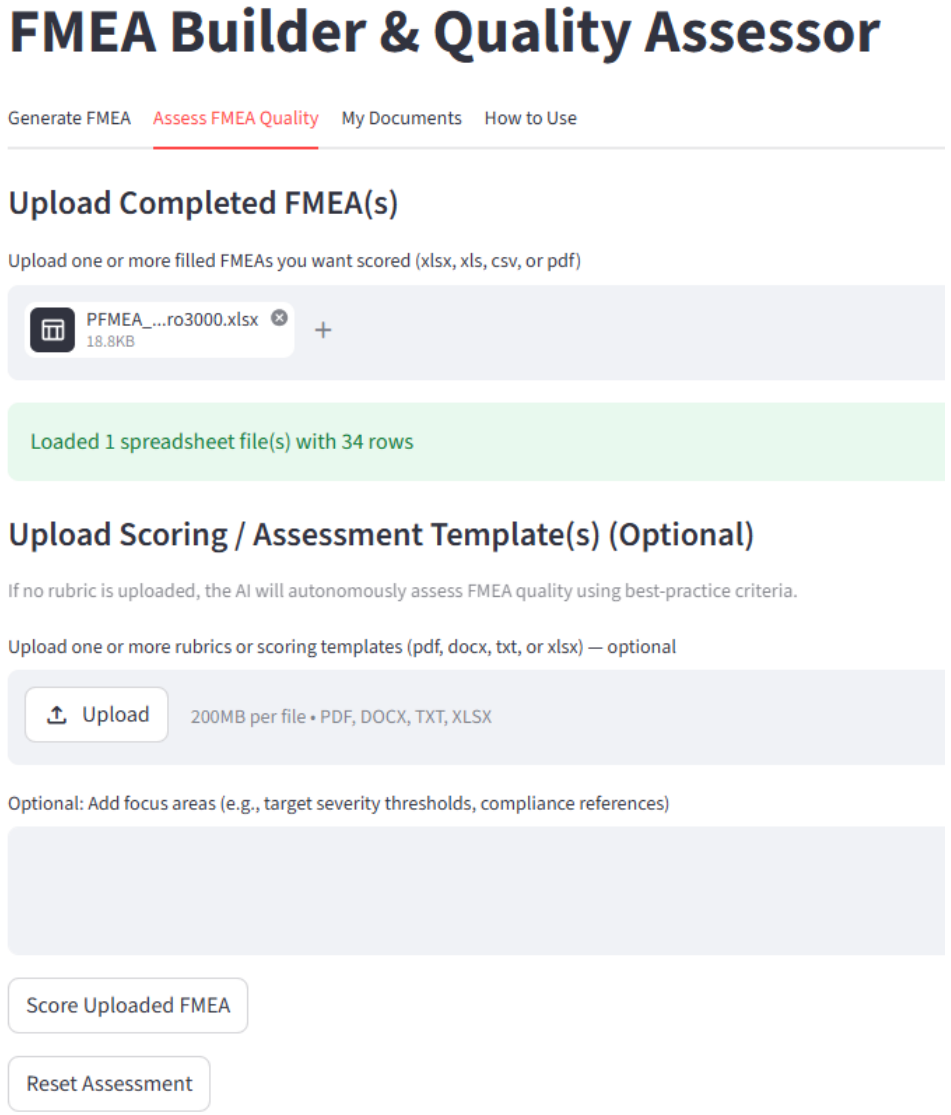
	A	B	C	D	E	
	Process Step	**Work Element**	**Potential Failure Mode**	**Potential Effect(s) of Failure**	**Severity**	**Potential Caus**
	6	Boiler joints	Joint torque out of spec or sealant bead missing/incomplete	External or internal leakage, pressure loss, failed leak pre-test, rework, possible customer-visible leak	9	Incorrect torqu
	7	OPV setpoint	Relief pressure set outside 9.5-10.5 bar target or lock-nut not secured	Incorrect relief pressure, poor shot pressure performance, possible overpressure or weak extraction, calibration failure	8	Improper adju
	8	Pump orientation	Pump isolation not installed or pump orientation not keyed/seated correctly	Assembly misfit, vibration/noise increase, possible hose routing issues, functional instability, downstream rework	6	Operator misa
	9	Flow meter orientation	Flow meter installed backwards or O-ring cut/rolled/missing	No or incorrect flow reading, leakage, brew performance failure, EOL leak failure, customer leak complaint	8	Arrow directio
	10	Hose clamp engagement	Clamp band not positioned 1-2 mm from hose end or clamp not fully engaged	Leakage, hose loosening or blow-off, pressure loss, system leakage failure	9	Incorrect clam
	11	Ground bond resistance	Ground bond resistance above 0.1 ohm at 40 A	Electrical safety noncompliance, shock risk, IEC/UL failure, blocked shipment	10	Paint or contar
	12	Thermistor contact	TIM missing/insufficient or thermistor torque out of spec	Incorrect temperature sensing, poor brew temperature control, group temperature out of 90-96 C range, performance drift	8	Paste not appl
	14	Strain relief clamp	Clamp does not achieve specified pull strength	Cable movement or pull-out, stress on electrical connections, reliability issue, possible safety concern	8	Wrong insert,
0	15	Firmware version	Incorrect firmware loaded, SN-to-FW mapping error, or CRC failure	Functional mismatch, unstable machine behavior, traceability error, blocked shipment, field performance issues	8	MES mapping
1	17	Pressure set	Flow pressure under load outside 9 bar ±1 bar	Shot pressure out of market spec, poor extraction performance, brew inconsistency, calibration hold	8	Calibration dri
2	18	Group temp	Head temperature outside 90-96 C specification	Poor brew temperature, customer dissatisfaction, brew performance failure, requirement CR-002 not met	8	Incorrect sens
3	19-20	System leakage	Leak rate above limit or visible external leak during air decay/hot wet test	Water leakage, safety and reliability concerns, customer complaint, failure of CSR zero external leak requirement	10	Poor joint seal
4	21	Brew performance	Flow-time not approximately 60 ml/30 s or TDS outside target window	Poor cup quality, inconsistent extraction, customer dissatisfaction, market performance requirement miss	7	Pressure calibr
5	28	Noise level	SPL at 1 m exceeds 65 dBA ±2 dB window	Customer dissatisfaction, market spec failure, perceived poor quality	5	Pump vibratio
6	29	Traceability	Data incomplete; missing IDs, serial, firmware, or required fields in MES	Loss of traceability, inability to contain defects, packout block, CSR requirement failure	7	MES rule failur
7						

Assess the quality of FMEAs





Assessment of the FMEA quality and improvements

Assessment Results

	Failure Mode	Risk Score	Completeness	Clarity	Severity Justification	Detection Adequacy	Improvement Actions
0	Pump below spec flow/pressure	63	Good	Good	Adequate	Adequate	Justify severity with customer impact threshold for brew performance complaints; add incoming test coverage rationale
1	Heater open/low wattage	58	Good	Good	Good	Adequate	Document why severity 8 applies versus potential safety escalation; convert sampled power draw verification to 100% te
2	Latent ESD damage	78	Adequate	Good	Needs improvement	Needs improvement	Clarify the specific end-user safety consequence behind severity 9 and separate functional reset from safety control loss i
3	Gasket degraded/contaminated	63	Good	Good	Adequate	Needs improvement	Add measurable storage limits for temperature, UV exposure, and shelf life; supplement visual checks with lot expiry syst
4	Under-torque causing micro-leak	83	Good	Good	Good	Adequate	Add explicit justification for occurrence based on torque tool capability and historical leak ppm; implement in-station pre
5	OPV set too high/low	79	Good	Good	Adequate	Adequate	Split over-pressure safety risk and under-pressure performance loss into separate failure modes or effects to better justify
6	Wrong orientation / missing isolators	55	Good	Good	Adequate	Needs improvement	Strengthen detection beyond visual/tug test with fixture-based orientation confirmation; document whether hose strain
7	Backward installation / O-ring nicked	64	Adequate	Good	Adequate	Adequate	Separate reversed installation from O-ring damage into distinct failure modes because causes and controls differ; add ma
8	Coil not seated; reversed wires	58	Adequate	Good	Adequate	Adequate	Split coil seating and reversed wiring into separate rows with tailored occurrence and controls; verify keyed spades fully p
9	Clamp loose/not fully seated	84	Good	Good	Good	Adequate	Justify occurrence with tool wear and operator error data; validate end-of-line air leak test sensitivity for hot and cold lea

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A	B	C	D	E	F	
Failure Mode	**Risk Score**	**Completeness**	**Clarity**	**Severity Justification**	**Detection Adequacy**	**Improvement Actions**
Pump below spec flow/pressure	63	Good	Good	Adequate	Adequate	Justify severity with customer
Heater open/low wattage	58	Good	Good	Good	Adequate	Document why severity 8 app
Latent ESD damage	78	Adequate	Good	Needs improvement	Needs improvement	Clarify the specific end-user s
Gasket degraded/contaminated	63	Good	Good	Adequate	Needs improvement	Add measurable storage limit
Under-torque causing micro-leak	83	Good	Good	Good	Adequate	Add explicit justification for o
OPV set too high/low	79	Good	Good	Adequate	Adequate	Split over-pressure safety risk
Wrong orientation / missing isolators	55	Good	Good	Adequate	Needs improvement	Strengthen detection beyond
Backward installation / O-ring nicked	64	Adequate	Good	Adequate	Adequate	Separate reversed installatior
Coil not seated; reversed wires	58	Adequate	Good	Adequate	Adequate	Split coil seating and reversed
Clamp loose/not fully seated	84	Good	Good	Good	Adequate	Justify occurrence with tool w
Miswire; ground lug on paint	66	Adequate	Good	Good	Good	Split miswire and painted gro
Poor thermal contact / missing paste	68	Adequate	Good	Adequate	Needs improvement	Separate missing paste from p
Insufficient clamp / wrong cord OD	77	Adequate	Good	Good	Needs improvement	Increase detection from samp
Mislocated from heat source	79	Good	Good	Good	Needs improvement	Current visual template is wea
Wrong/corrupt firmware	61	Good	Good	Adequate	Adequate	Clarify whether severity 8 incl
Cross-thread/stripped boss	51	Adequate	Good	Adequate	Needs improvement	Broaden effects if long-term l
Gasket pinch / panel warp	47	Adequate	Good	Needs improvement	Adequate	Separate cosmetic panel warp
Reservoir not latched / O-ring twist	54	Adequate	Good	Adequate	Needs improvement	Split latch failure and O-ring t
Transducer miscalibrated	57	Needs improvement	Adequate	Adequate	Needs improvement	The row is incomplete becaus