

Process	Potential Hazard	Description	Critical	Monitoring	Corrective/Preventative	Records	Verification
Mash	Mould (Chemical, Micro-biological)	Grain is mostly starch with the husks containing enzymes that can break them down into fermentable sugars, particularly in old, warm or moist grain.	Visible clumps of moist grain, mould or off-smells.	Check all grain bags for water damage and check use-by-dates.	Safely discard contaminated grain bags. Always store bags in a cool, dry environment.	Record use-by-date on arrival into brewery.	Review records, visual check before each use.
	Under boiled beer (Micro-biological)	Beer is boiled for minimum 60 minutes at 100°C, although carried out for other reasons it also sterilises the beer. (Elements can break or become inefficient).	Temperature reading below 100°C, visibly not having a 'rolling' boil.	Visual checks and thermometer readings at the start of the boil process.	Turn on secondary element or replace (if broken).	n/a	Weekly maintenance checks on elements.
Boil	Cleanliness of hop filter (micro-biological/ Physical)	The hop filter can become clogged internally with tiny hop seeds and particles.	A mass of visible particles within the filter mesh.	Check before each boil.	Immediately take apart and brush off all particles then sterilise.	n/a	Soak in steriliser overnight to loosen particles then rinse. Weekly deep clean.
	Cleanliness (Micro-biological)	The unfermented beer (wort) is now a ~30°C sugar packed liquid, perfect conditions for the rapid growth of contaminants.	All surfaces, vessels or transferring equipment etc that comes into contact with the cool wort MUST be sterile.	Make sure all surfaces have been fully sterilised at all times during this process. Re-clean anything if it comes into contact with anything not sterilised.	Strictly follow sterilising procedures as ruled out in the protocol below.	Strictly follow cleaning protocol.	Constant review of sterilisation techniques, investment in cleaning tech when able.
Cold Break, Transfer & Yeast Pitching	Leftover steriliser (Chemical)	Steriliser left on equipment after sterilisation in an unsafe concentration.	Visible soapy bubbles and soapy water.	Oleonix brewery process cleaner does not contain any substances at concentrations presenting a health hazard within the meanings of the CHIP regulation BUT does state ingestion of large quantities may cause nausea, vomiting and irritation of mouth, throat and stomach.	Always rinse off all surfaces	Record usage of steriliser.	Always check after every application of steriliser that it has been sufficiently rinsed.
	Non-rapid yeast colonisation and thus infection (Micro-biological)	Yeast is the only 'infection' you want in the beer but 'bad' yeast can have a slow initial growth and allow other micro-organisms to colonise first.	old or contaminated yeast.	Check use-by-dates and condition of yeast	Discard contaminated/old yeast, use and store within manufacturer guidelines.	Record use-by-dates and fridge temperatures.	Review records. Half-yearly testing for yeast-cell viability.
	Infection/small particles from primary additions. (Physical/ Micro-biological/ Chemical)	Primary additions ('dry' hops, spices etc) may present a wide range of potential hazards.	Any adjunct or 'dry' hop, constant vigilance.	Check use-by-dates and storage conditions.	Blanch anything in boiling water first, safely discard anything which fails.	Record use-by-date on arrival into brewery.	Weekly check on hops.
Fermentation	Non-OFT (Micro-biological)	Optimum Fermentation Temperature (OFT) of yeast varies for different strains. An OFT promotes a fast colonisation & fermentation. Outside of OFT bacteria, wild yeasts etc can thrive.	Dependant on yeast but typically outside 10°C to 25°C.	Check fermenters daily with sterilised temperature probe.	Cool/Heat accordingly.	Record temperature deviations on brewsheet.	Review records, look for patterns in deviations.
	Non-air tight, allowing in contaminants. (Micro-biological)	An air lock is essential to stop possible infection from the air, but CO2 needs to escape, so a one-way vent is essential. Water can evaporate out over time.	Water below 1cm in the air lock.	Check every morning.	Fill back up above 1cm with boiled water.	n/a	n/a
	Infection from secondary 'dry hopping' (micro-biological)	Secondary additions ('dry' hops, spices etc) may present a wide range of potential hazards.	Any adjunct or 'dry' hop, constant vigilance.	Check use-by-dates and storage conditions.	Blanch anything in boiling water first, safely discard anything which fails.	Record use-by-date on arrival into brewery.	Weekly check on hops.
	Infection in surrounding	Old yeast is still capable of fermenting sugars, but has dead cells and has	Used yeast clumps, smells or		Days sterilises onto colabed		

	fermenters from old yeast. (Micro-biological)	undergone various genetic mutations. Safe disposal necessary to stop splashes etc.	Used yeast slurry spills or splashes.	Careful now.	Pour steriliser onto splashed areas.	n/a	n/a
	Infection within fermenters. (micro-biological)	Spoilage if left in fermenter too long. Yeast can decay and the beer can get an infection if left inside the fermenter too long. It can compromise fermenters.	Dependant on beer style but typical 2-3weeks. Off sights, smell or taste.	Sight, taste and smell checks before kegging. Sterilisation directly after emptying fermenter.	Safely discard contaminated beer, avoid cross contamination and sterilise fermentors	Record brew date.	n/a
Kegging	Contaminated Keg/Cask interior. (Micro-biological)	The inside of a keg can still have the very old yeast and/or dreggs from the initial beer, which are normally decaying. Improper sterilisation can result in infected beer.	Any keg about to be filled MUST be sterilised regardless. Always critical.	Visual checks inside the keg/cask before and after sterilisation.	Strictly follow sterilising procedures as ruled out in the protocol below.	n/a	n/a
	Infection on connection point on keg.	The connection point to a tapping head on a keg must arrive at the buyers premises as clean as possible	Uncovered connection point.	Check before delivery.	Sterilise connection point and seal with a sterile plastic cap	n/a	n/a
	Infection from tertiary 'dry hopping' (micro-biological)	Any adjunct or 'dry' hop, constant vigilance.	Check use-by-dates and storage conditions.	Blanch anything in boiling water first, safely discard any thing which fails.	Record use-by-date on arrival into brewery.	Weekly check on hops.	Measure every keg.
	Dangerously high keg pressures.	Dangerous high pressures inside steel/plastic kegs.	Above 3.5BAR	Measure before delivery.	De-gas to acceptable level (1-2BAR depending on beer)	Record pressures on brewsheet.	Measure every keg.