

A2 STAGE-GATE REVIEW SERIES · HYGIENIC DESIGN

HYGIENIC DESIGN & CONSTRUCTION CHECKLIST

A hygienic-design self-audit for food & beverage facilities — building fabric and surfaces, drainage, product-contact equipment, openings and pest exclusion, hygienic services, and air and condensation control. Use it through detailed design and before hygiene sign-off, alongside the layout checklist (A1).

VERSION 1.0 · JUL 2026 46 CHECKS · 6 SECTIONS GATES: DETAILED DESIGN · HYGIENE SIGN-OFF

HOW TO USE THIS CHECKLIST

- 1 Review each section against your detailed drawings — architectural finishes schedule, drainage layout, equipment GA and P&IDs, HVAC zoning. Tick only what is **demonstrable on a drawing or specification**.
- 2 Section 3 (product-contact equipment) is a **hold point**: dead legs, crevices and poor drainability are designed-in defects that cleaning can never overcome.
- 3 Numeric values quoted are common industry references; **confirm against your product, process risk category and local regulation** before applying.
- 4 Best run by process, hygienic-design/QA and project engineering together — the equipment and the building must be assessed as one system.

01 BUILDING FABRIC & SURFACES

Every surface over or around open product is a cleaning liability or an asset — the finish decides which.

- ☐ Floors in wet/process areas are impervious, non-slip, chemically resistant and laid to fall toward drains with no ponding (FSSAI Schedule 4).
- ☐ Floor/wall and wall/ceiling junctions are coved (≈ 100 mm radius) to eliminate square corners that trap soil and resist cleaning.
- ☐ Walls are smooth, impervious, light-coloured and washable to at least splash height; the finish resists the actual cleaning chemicals and temperatures used.
- ☐ Ceilings are sealed, cleanable and detailed to prevent condensation dripping onto open product; no open voids shedding onto the line.
- ☐ No wood, flaking paint, corroding metal, or absorbent/friable materials are exposed in open-product areas.
- ☐ Structural steel, pipe supports and cable trays over product are minimised and detailed to shed — not collect — dust and water.
- ☐ Glass and brittle plastics in production are shatter-protected and on a glass/brittle-plastic register; external windows are sealed or insect-screened.
- ☐ Finish specification is graded by hygiene class of each room — higher care means fewer joints, more coving, and a defined cleanable standard.

02 DRAINAGE

Water always finds the low point — design where that is, or the process will find it for you.

- ☐ Floor falls ($\approx 1:60$ – $1:100$) carry water to drains without pooling; drains are sized for peak CIP/washdown flow, not average.
- ☐ Drainage flows from high-care toward low-care — never the reverse; no drain line runs from a lower-care area into a high-care area.
- ☐ Floor drains, channels and gullies are trapped, accessible for cleaning, and fitted with odour and pest barriers.
- ☐ Open channels crossing open-product/high-care zones are avoided where possible; where unavoidable they are covered and cleanable.
- ☐ Equipment and CIP discharges are air-broken to floor/site drains (no direct connection) to prevent back-siphonage into the plant.
- ☐ Drainage is shown on the layout and coordinated with equipment positions — drains are where the plant that needs them actually stands.

03 PRODUCT-CONTACT EQUIPMENT

HOLD-POINT SECTION

A dead leg or crevice designed into the plant is a contamination risk cleaning can never remove.

- ☐ Product-contact surfaces are corrosion-resistant, non-toxic and non-absorbent (typically 304/316 stainless), with a finish suited to the product (commonly $\leq Ra\ 0.8\ \mu m$) (EHEDG).
- ☐ Equipment is self-draining with no dead legs, crevices or horizontal ledges that retain product or water (EHEDG Doc. 8).
- ☐ Product-zone welds are continuous, ground and polished; no lap joints, exposed threads or crevices in contact with product.
- ☐ Bearings, seals and lubrication points sit outside the product zone, or use food-grade lubricants where incidental contact is possible.
- ☐ Elastomers and gaskets are food-grade, correctly seated with no product-trapping gaps, and on a defined replacement schedule.
- ☐ CIP/COP coverage is verified for every product-contact surface — spray-ball shadowing checked; pipework velocity adequate for turbulent flow (commonly $\geq 1.5\ m/s$) (EHEDG).
- ☐ Equipment is installed with cleaning and inspection access all round — clearance from walls, floor and adjacent plant; feet sealed to floor or on a coved plinth.

04 OPENINGS & PEST EXCLUSION

Every opening is a route in for pests, dust and unconditioned air unless it is designed not to be.

- ☐ External doors to production are self-closing, well-sealed and protected (air curtains, strip curtains or airlocks) against pest and dust ingress.
- ☐ Openings between hygiene zones use airlocks or interlocked doors that preserve the pressure cascade; no straight-through door pairs.
- ☐ Dock levellers, shutters and material openings seal when not in use; gaps beneath external doors are < 6 mm for rodent exclusion.
- ☐ All service penetrations, conduits and duct openings through walls/floors between zones are sealed — no untrapped voids.
- ☐ Insect-control units are sited away from — and never over — open product or packaging lines.
- ☐ Building-envelope pest-proofing is verified (mesh, seals, no harbourage) and reflected on the layout and elevations.

05 HYGIENIC SERVICES & UTILITIES

Whatever touches product — water, air, steam, light — carries the same hygiene burden as the plant itself.

- ☐ Pipework, ducts and trays over open product are minimised, sloped/detailed to shed, and cleanable; no threaded or ledged runs above product.
- ☐ Water contacting product or surfaces is potable, with backflow prevention on all connections (FSSAI · IS 10500).
- ☐ Compressed air/gases contacting product are filtered and, where required, oil-free and dried to the process spec (ISO 8573).
- ☐ Steam in direct product contact is culinary/clean steam of defined quality; sample and verification points are provided.
- ☐ Lighting is adequate for the task (commonly ≈200–500 lx at work surfaces, higher at inspection) with sealed, shatter-protected, cleanable fittings (IS 3646).
- ☐ Hand-wash and sanitation stations are positioned at zone entries and at adequate density for the headcount and hygiene class.

06 AIR, CONDENSATION & ENVIRONMENT

Air is the one ingredient you never see and never wash — control it at the design stage or not at all.

- ☐ A room pressure cascade steps down from high-care to low-care, verified with the HVAC design; high-care areas are held positive.
- ☐ Air supplied to open-product/high-care areas is filtered to a grade matched to the hygiene class of the room.
- ☐ Temperature and humidity are controlled to prevent condensation on any surface above open product.
- ☐ Dust-generating operations (dry mixing, tipping, sieving) have local extraction that does not cross-contaminate other zones.
- ☐ Process exhaust and odour are segregated from fresh-air intakes and from other zones' air systems.
- ☐ Environmental-monitoring points (surface and air) for high-care areas are planned into the layout, not retrofitted.

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