Liquid filling machine ï¿½ jars, bottles, pouches and buckets

Target application: liquid filling machine

Reference configuration: Liquid filling machine, 1,000ï¿½24,000 containers/h

For products that do not need a full aseptic barrier, MCF Technology supplies liquid filling machines matched to the product rheology and to the container: hot-fill fillers for sauces and jams, volumetric and mass-flow fillers for beverages, piston dosers for chunky products, plus capping, seaming, labelling and end-of-line packaging as one integrated line.

SCOPE OF SUPPLY

- Rotary or linear filler: volumetric, mass-flow, level or weight dosing
- Piston / pump dosers for chunky and high-viscosity products
- Hot fill with steam headspace injection or vacuum closing
- Capping, seaming and induction sealing for twist-off, crown, screw caps and cans
- Format changeover kits for jars, bottles, pouches, buckets and IBC
- Labelling, coding, case packing and palletising as end of line

TYPICAL OUTPUTS

Jams, sauces and tomato passata in glass jars (200 mlï¿½4 000 ml) ï¿½ Juices and beverages in PET and glass (250 mlï¿½2 000 ml) ï¿½ Pouches, doypacks and spouted packs ï¿½ Buckets, pails and 200 L drums for food service ï¿½ Cans and retortable containers

PROCESS, STEP BY STEP

1. **Container depalletising and rinsing ï¿½ Air or water rinser ï¿½ up to 36 000 bph**
   Jars, bottles and cans are unpacked, oriented and rinsed; on glass an inspection station rejects chipped or foreign-body containers.
2. **Dosing ï¿½ Mass-flow ï¿½0.5% ï¿½ piston ï¿½1%**
   Mass-flow or level filling for thin liquids, piston or pump dosing for viscous and chunky products, net-weight filling for large containers.
3. **Hot fill or ambient fill ï¿½ Hot fill >= 85 ï¿½C ï¿½ ambient with preservation**
   Acid products are filled hot so the pack and headspace are commercially sterilised by the product's own heat; ambient filling is used with downstream pasteurisation.
4. **Headspace management and closing ï¿½ Steam flush ï¿½ vacuum closing ï¿½ twist-off, crown, screw, can seaming**
   Residual oxygen is displaced with steam or nitrogen before closing, then the closure is applied with controlled torque and 100% verified.
5. **Inversion, pasteurisation or cooling ï¿½ Inversion 20ï¿½60 s ï¿½ tunnel cooling to 35ï¿½40 ï¿½C**
   The pack is inverted for cap sterilisation, then cooled in a tunnel ï¿½ or tunnel-pasteurised when the recipe requires post-fill treatment.
6. **Labelling, coding and inspection ï¿½ Checkweigher ï¿½ fill-level and cap inspection**
   Labelling, lot and date coding, then automatic rejection of low-fill, missing-cap or out-of-weight packs, with statistics recorded per shift.
7. **End of line and traceability ï¿½ Case packing, shrink wrap, palletising**
   Cases, trays and pallets are formed and coded so that every pallet can be traced back to the batch and to the filling window.

DIMENSIONS AND BUILDING ENVELOPE

Machine footprint	3.5 ï¿½ 2.5 m for a linear 8-head filler, 5.5 ï¿½ 4.5 m for a 40-valve rotary monoblock
Machine height	2.4ï¿½3.1 m; 4.5 m clear height for maintenance and hopper access

Line envelope	180ï¿½420 mï¿½ including conveyors, closing, inspection and buffer tables
Service clearance	1.2 m on the operator side, 1 m on the service side
Changeover parts store	15ï¿½40 mï¿½ for format sets, star wheels and guides

LAYOUT ï¿½ FUNCTIONAL ZONES IN FLOW ORDER

1 ï¿½ Container infeed	Depalletiser or bottle unscrambler, rinser or ionised air cleaner
2 ï¿½ Filling	Volumetric, mass-flow, gravity or piston filling according to viscosity
3 ï¿½ Closing	Capper, seamer or sealer with torque and vacuum control
4 ï¿½ Inspection	Checkweigher, fill-level control, cap presence and metal detection
5 ï¿½ Coding & labelling	Batch and expiry coding, self-adhesive or sleeve labelling
6 ï¿½ Utilities & CIP	Compressed air, steam for hot filling, automatic CIP of the product path

UTILITIES AND CONSUMPTION

Installed power	18ï¿½90 kW according to head count and conveyors
Steam	0.2ï¿½1 t/h at 6 bar for hot filling and CIP heating
Compressed air	150ï¿½450 Nmï¿½/h at 7 bar, oil-free on product contact
Water	2ï¿½8 mï¿½/h for rinsing and CIP
Performance	Filling accuracy ï¿½ 0.3ï¿½0.5%, format changeover 20ï¿½45 minutes
Manning	2ï¿½4 operators per shift on the filling island

INSTALLATION, SITE CONDITIONS AND SCOPE BOUNDARIES

- Scope of supply: process equipment, automation, mechanical and electrical erection, commissioning, FAT/SAT, HACCP validation and operator training.
- Excluded from the ranges: land, civil works, building steelwork, external utility generation and import duties.
- Installation, commissioning and after-sales service are delivered worldwide by MCF crews, with remote diagnostics on the SCADA.

TECHNICAL FAQ

Which dosing principle for which product?

Mass-flow or level filling for thin, homogeneous liquids; volumetric piston dosing for viscous or chunky products; net-weight filling for high-value products and large containers where accuracy per pack matters.

What accuracy can be expected?

Typically ï¿½0.5% on mass-flow filling of thin liquids and ï¿½1% on piston dosing of chunky products, verified with checkweighers and statistical control at the end of line.

How does hot fill give ambient shelf life?

The product enters the container above about 85 ï¿½C, the headspace is steam-flushed or vacuum-closed and the pack is inverted for cap sterilisation, then cooled in a tunnel. It suits acid products (pH < 4.6) such as jams, passata and juices.

Can one machine handle several formats?

Yes, within a family: changeover kits and servo adjustment cover a range of diameters and heights. Very different families (glass jar and pouch) are usually better served by two dedicated lines.

Do you supply the complete end of line?

Yes: capping, labelling, coding, cooling tunnel, case packing, shrink wrapping and palletising, delivered and commissioned with the filler as one line under one automation layer.

NEXT STEPS

- Full technical page: https://mcftechnology.group/en/liquid-filling-machine
- Configure the line and request the feasibility study: https://mcftechnology.group/en/configurator
- Run the ROI simulator: https://mcftechnology.group/en/roi-simulator
- Build the bankable financial plan (3ï¿½10 years): https://mcftechnology.group/en/financial-plan
- Request a quotation: https://mcftechnology.group/en/contact

DISCLAIMER

All figures in this datasheet are indicative engineering ranges used by MCF Technology for budget screening and layout discussion of the reference configuration. They are not a quotation, not a performance guarantee and not the audited result of a specific plant. Final specification, dimensions, utilities and CAPEX are fixed in the feasibility study on your product, packaging formats, utilities cost and site conditions.