LIFE-CYCLE PERSPECTIVES

Equipment lifetime and cleaning resources

Look beyond the purchase.



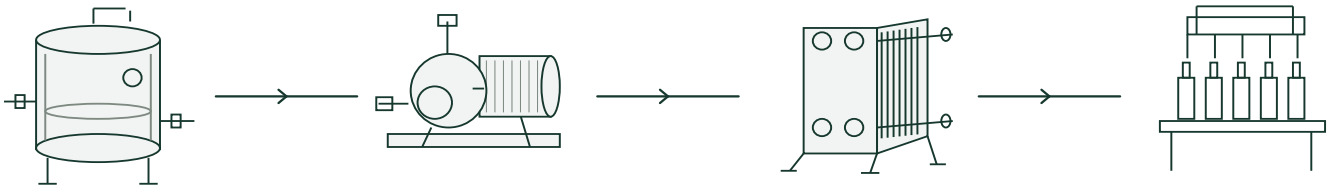
Equipment within the production environment.

Photo / Toby Stodart

EQUIVALENT SERVICE / OPERATION / INVENTORY

Compare a delivered service, then account for its resources.

The process sketch defines the service boundary; the inventory follows the same operating period.



Input material

Actual composition and production schedule

Transfer duty

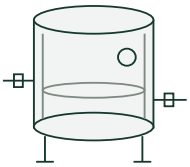
Flow, head, losses and condition

Thermal duty

Inlet / outlet conditions; cleaning

Useful output

Same quality, hygiene and delivered quantity



Separate cleaning inventory / measured at each cycle

Cleaning loop

Validated water, chemistry, heat, cycle time and product displacement.

Equipment and service

Materials, manufacture, transport, commissioning, spare parts and actual service life.

Operating inventory

Meter electricity, thermal energy, water, chemicals, product losses and useful output.

Impact and interpretation

Apply the declared method, data quality and uncertainty; test end-of-life assumptions.

PROCESS STUDY / 01

Define the service before comparing machines



Milk-product packaging at Emmi Mittelland Molkerei, Suhr, Switzerland.

Photo / bauernverband / CC BY 2.0 / cropped & resized

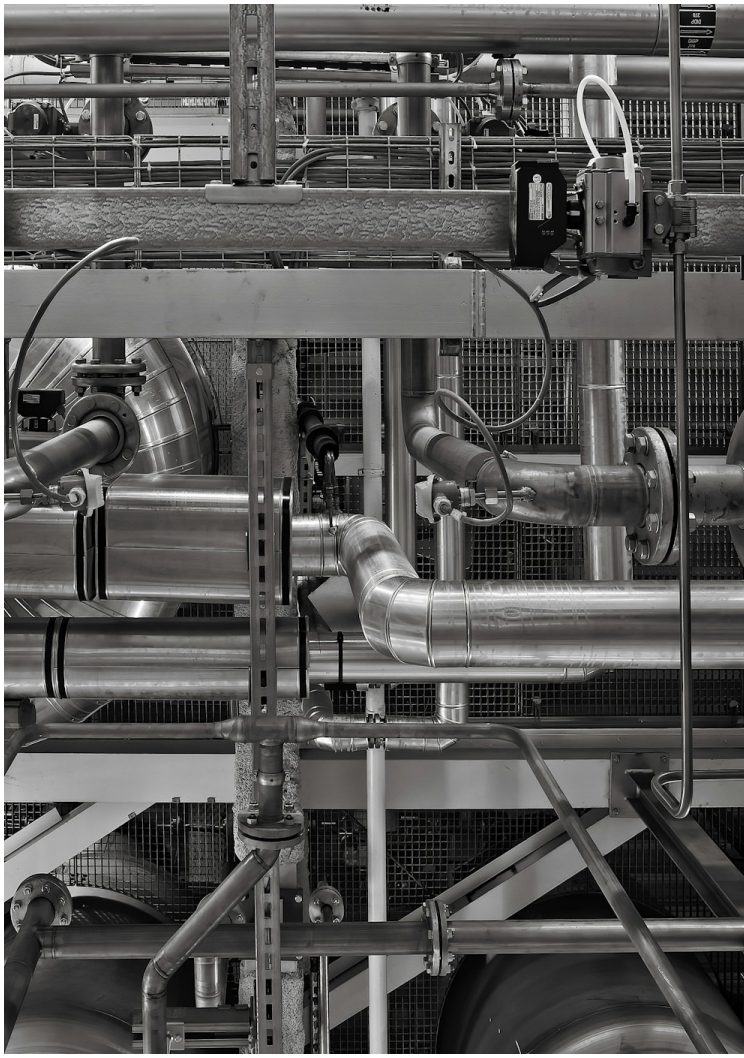
A useful comparison starts with an equal service: the same material, throughput, quality and operating period. Define whether the study covers an individual pump, a thermal duty or the wider processing line. Record the boundaries and include the activities that change between alternatives. Manufacture, operation, maintenance, cleaning and end-of-life can all contribute, but this guide is a framework for collecting evidence rather than a completed LCA. A smaller motor or a longer cleaning interval alone does not establish a better whole-life outcome. Product loss, rejected batches and downtime may change the delivered service and should be included where they affect the comparison.

Two machines should be compared by the service they provide, not only by their purchase price or installed power.

PROCESS STUDY / 02

Measure operation and cleaning together

For a pump, collect actual flow, differential pressure, power, operating hours and fluid properties. For an exchanger, collect inlet and outlet conditions, heat delivered, pressure loss and the fouling trend. Cleaning adds water, chemicals, heat, circulation and downtime to the same service period. Establish the cleaning sequence from hygienic validation, then examine whether the equipment and operating arrangement can deliver that sequence efficiently. Product displacement and drainage can also affect losses. Avoid comparing a measured installed duty with a catalogue maximum or a different production schedule; these describe different operating situations.



The utility network.

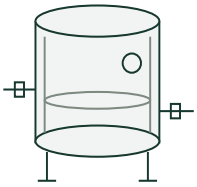
Photo / Ricardo Gomez Angel

PROCESS STUDY / 03

Maintenance changes the assessment boundary

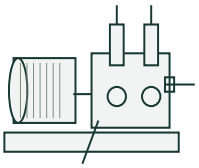
Wear parts, seals, diaphragms, plates and gaskets have replacement intervals that depend on the medium and duty. Record the actual parts and service interventions rather than assigning a universal lifetime. An ABEL CM or EM assessment differs from an S-FP centrifugal duty because pressure, solids handling and flow control differ. Compare technologies only where they can provide the required service. Access for inspection and replacement affects shutdown planning, while a change in material can alter both durability and manufacturing impact. Document disposal or recovery of replaced parts, and identify the data needed to evaluate their contribution within the defined study boundary.

OPERATION STUDY / SELECTED PROCESS DETAILS



Measure cleaning

Record validated cleaning-cycle water, heat, chemicals and time.



Maintain and replace

Track service, spare parts, condition and any product losses.



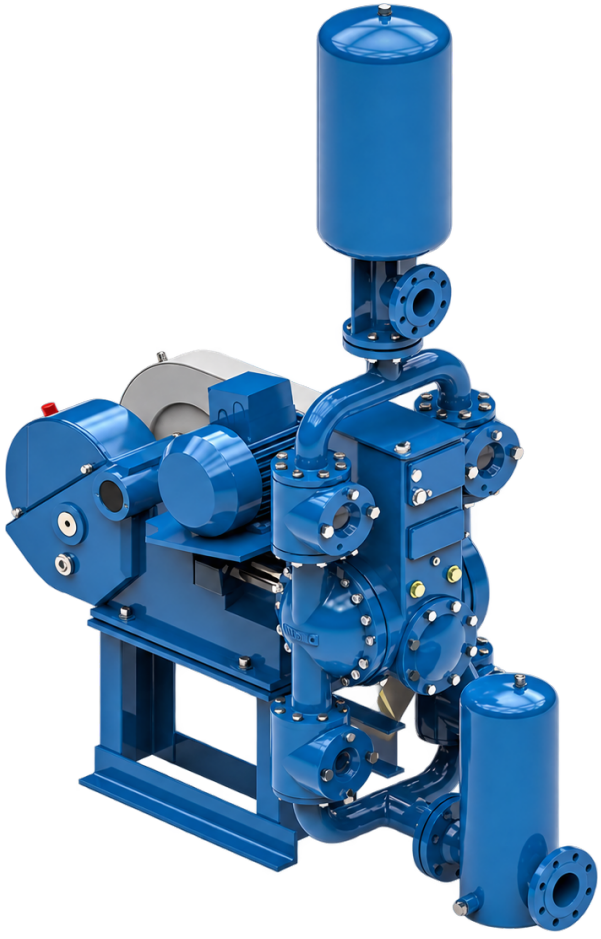
Assess end of life

Declare recovery routes and test lifetime assumptions.

Explanatory equipment studies / configuration, controls and treatment conditions follow the selected product route.

ABEL / CM / FILTER-PRESS FEED

Compare the service, then the machine.



A CM filter-press feed duty has a changing pressure cycle. Use its measured operation, maintenance and cleaning inventory when comparing equal dewatering service.

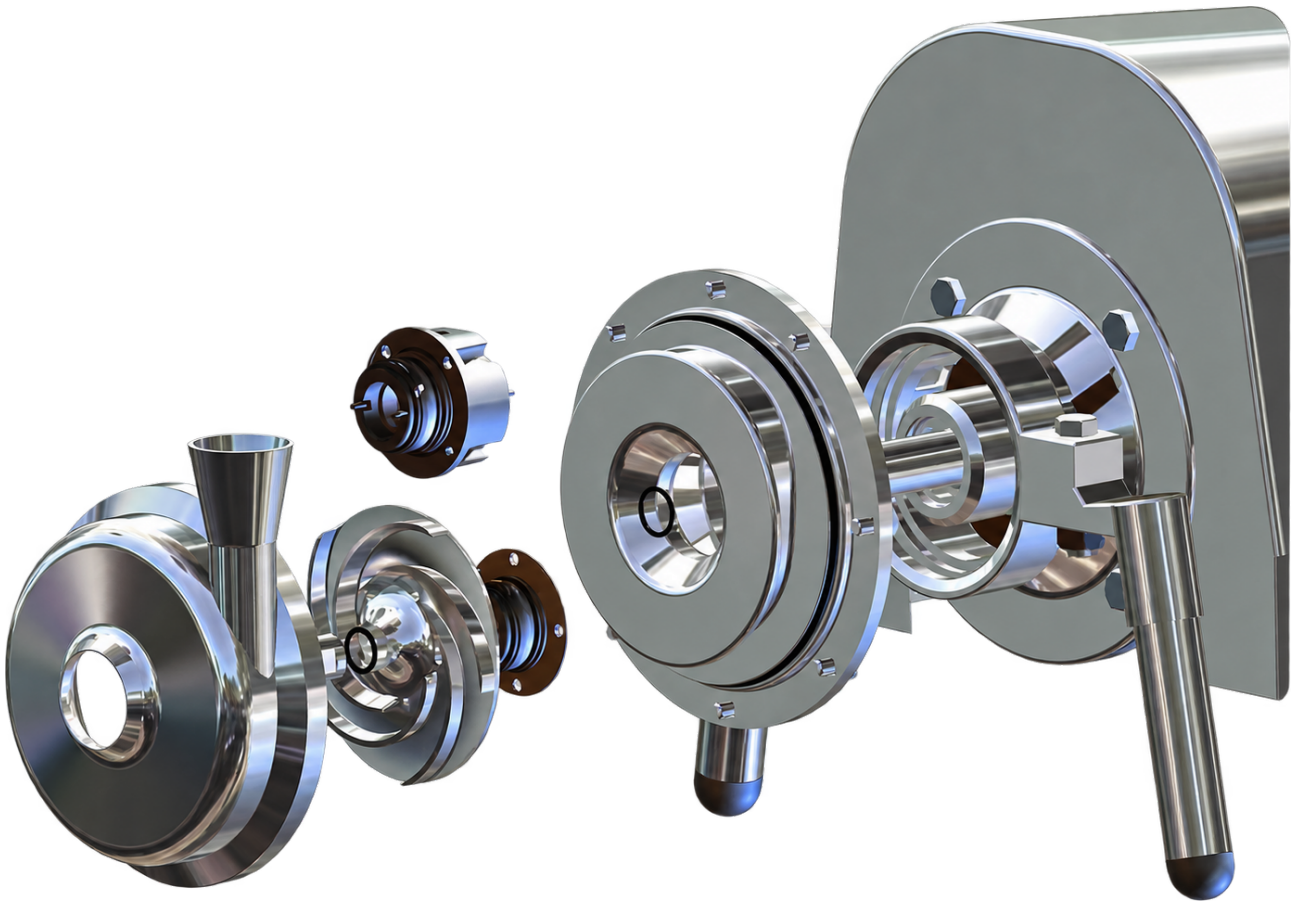
ABEL / CM COMPACT DIAPHRAGM FAMILY

The press performs separation. Specify solids, abrasiveness, chemistry, suction and the pressure cycle; do not substitute this auxiliary duty for product clarification.

EXPLORE ABEL /

DANPUMPS / S-FP

Study product and CIP transfer



DANPUMPS / S-FP EXPLODED ASSEMBLY STUDY

The S-FP sanitary centrifugal range is designed for cleaning in place and service access. Evaluate its actual liquid duty and the cleaning circulation separately. Collect seal, motor, electricity and service data rather than inferring performance from a catalogue image.

Requires flow/head, viscosity, suction and seal selection; pump design does not validate the plant's hygiene cycle.

EXPLORE DANPUMPS /

SONFLOW / SANITARY PLATE HEAT EXCHANGER

Study the thermal duty

SonFlow's sanitary exchangers are designed for food-related heating and cooling and permit cleaning access. Select a configuration that meets the product duty, then record pressure drop, heat input and cleaning resources over representative production cycles.

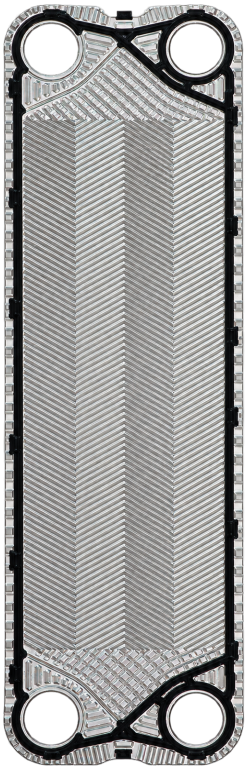


PLATE / FLOW PASSAGE



FRAME / COMPLETE UNIT

Food-contact materials, gasket compatibility and the complete cleaning procedure require application confirmation; no generic cleaning savings are assumed.

EXPLORE SONFLOW /

CONTROL THE PROCESS OUTCOME

Distinguish inventory from impact.

An inventory records material, energy, water, emissions and waste for the defined service. An impact assessment applies a chosen method to that inventory; interpretation then examines uncertainty and the meaning of the result. These are related but distinct tasks. ISO 14040 provides the LCA framework. Lecoqimex equipment data can contribute to a study, but the equipment illustration is not an environmental certification or a claim that a full assessment has been performed.

A PROCESS SPECIFICATION

Functional unit and study boundary

Product loss and downtime

Data quality, impact method and uncertainty

VERIFICATION IN OPERATION

Define the required production duty and the same assessment period for each option. Document materials, manufacture and transport where relevant data are available. Follow the equipment through installation, normal production, cleaning and maintenance. Record the actual electricity, water, chemicals and consumables used per defined useful output. Include parts replacement, losses during service and end-of-life assumptions within the chosen boundary. Compare scenarios only after confirming that both meet the same process and hygiene requirements. Review how uncertainty in lifetime and cleaning frequency changes the conclusion.

THE AUXILIARY ROUTE

Compare equivalent service.

Use a reference operating period and report both totals and the chosen functional-unit result. Test uncertainties such as production hours, cleaning frequency and part life. Avoid awarding a benefit twice, for example as both lower product loss and an unsupported recovery credit. The most useful next step is often better metering rather than a ranking based on incomplete catalogue data. Keep the assumptions available for review.



Industrial vessels and pipework; utility context

Photo / Crystal Kwok

EXPLORE THE RELATED EQUIPMENT /

TURN THE ROUTE INTO A USEFUL ENQUIRY

Specify the material. Define the duty.

For each alternative, collect an equipment specification and a representative operating record. State the useful output, duty variation, cleaning recipe, validated cycle duration and maintenance interval. Document where data are measured, supplied by a manufacturer or estimated. A transparent comparison also records the assumed service life and replacement schedule. Keep the same process requirements and assessment period so that an apparently favourable result does not arise from inconsistent assumptions.

01 Functional unit and study boundary

02 Metered production and cleaning

03 Product loss and downtime

04 Wear-part replacement history

05 Data quality, impact method and uncertainty

RESEARCH BASIS / SELECTED PRIMARY REFERENCES

Category reference only; no claim to its proprietary software / Functional unit, inventory, uncertainty and lifecycle-cost distinction / Framework and interpretation scope / SonFlow / Sanitary plate heat exchanger / DanPumps / S-FP / DanPumps / S-IP/S-MP

PHOTOGRAPHIC REFERENCES

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BEGIN THE CONVERSATION

Let us begin with your process.

Tell us about your stream, the operating conditions and the result you want to achieve.

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Equipment lifetime and cleaning resources / Life-cycle perspectives