



Equipment Lifespan Reference

A guide to typical service life, maintenance practices
and material options across twelve categories of
industrial process equipment.

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How to Read This Guide

Every category page in this guide uses the same four visual conventions, explained below. Actual lifespan for any given unit always depends on the operating variables at the bottom of this page.

✓ The Lifespan Range



Black dot marks the low end of the typical range.

Red dot marks the high end of the typical range

A "+" means service life can extend further with strong upkeep

A fading bar with no end dot means the source gives a floor but no stated ceiling

Scale is fixed at 0–40 years on every page for comparison

✓ Material Families

Stainless / Corrosion-Resistant

Carbon Steel / Cast Iron

Exotic Alloys

Polymers & Non-Metallic

Each material chip on a category page carries its family icon so material options can be scanned visually.

✓ Maintenance Intensity

Low
Maintenance

Periodic inspection; few scheduled component replacements.

Medium
Maintenance

Scheduled part replacement every few years plus routine checks

High
Maintenance

Frequent, specialized or continuous monitoring and replacement

Key Maintenance Principles

Universal Best Practices: These ten practices apply across every equipment category in this guide. Actual service life always varies based on operating conditions. Use the category pages that follow for equipment-specific detail

01 Preventive Maintenance

Regular inspections and scheduled replacements extend life significantly.

02 Material Selection

Right material choice for process conditions can add 5-10 years of life.

03 Operating Conditions

Stay within design temperature, pressure, and flow ranges.

04 Cleanliness

Protect against contamination (abrasive solids, water, corrosive particles).

05 Thermal Management

Control temperature fluctuations and thermal cycling stress.

06 Seal/Gasket Replacement

Schedule replacements before failure (typically 3-5 years).

07 Bearing Monitoring

Lubrication and early failure detection critical.

08 Alignment

Precise mechanical alignment prevents premature bearing/seal failure.

09 Documentation

Maintain detailed maintenance records for trend analysis

10 Testing

Use predictive tools (vibration analysis, oil analysis, ultrasonic testing).



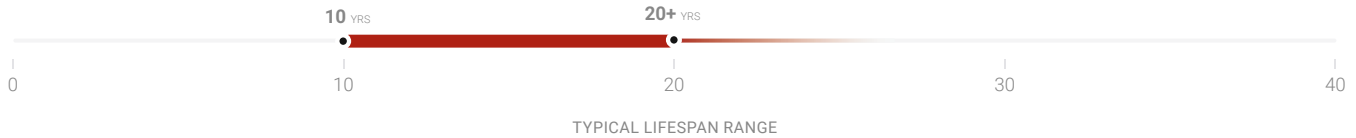
Heat Exchangers

TYPICAL LIFESPAN

10-20+ years

Depends heavily on type and operating conditions

 High Maintenance



BY TYPE / CONFIGURATION

Plate-and-Frame (Gasketed)	10-20+ yrs
Brazed Plate (BPHE)	8-12 yrs
Shell & Tube	12-20 yrs
HVAC / Cooling	25-30 yrs
Industrial / Harsh Environments	4-8 yrs

How to Make It Last

- Regular cleaning (yearly to bi-yearly)
- Gasket replacement every 3-5 years (for gasketed units)
- Proper operating temperature management
- pH control to minimize corrosion
- Maintain inlet/outlet flow conditions
- Prevent fouling and scaling buildup
- Proper filtration of fluids
- Avoid water hammer and pressure spikes

Material Options

	304 Stainless Steel (standard applications)
	316L Stainless Steel (improved corrosion resistance)
	SS904L (phosphoric acid, high-temperature applications)
	Titanium (aggressive fluids, maximum corrosion resistance)
	Copper-Nickel (seawater/brackish applications)
	Duplex/Super Duplex Stainless (high chloride environments)
	Carbon Steel (non-corrosive applications)



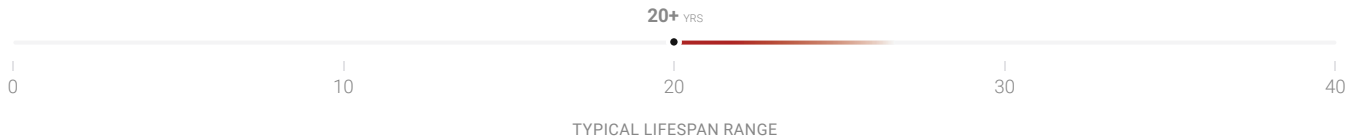
Tanks & Vessels

(Pressure & Storage)

TYPICAL LIFESPAN
20+ years

Design life before inspection required

Medium Maintenance



How to Make It Last

- Regular pressure testing and inspections
- Maintain proper fluid cleanliness
- Monitor corrosion rates (especially for process chemicals)
- Proper temperature and pressure management
- Regular internal/external inspections
- Protective coatings maintenance
- Cathodic protection systems (if applicable)
- Prevent water/chemical accumulation in crevices
- Manage thermal cycling stress

Material Options

	Carbon Steel (general purpose, requires coating)
	304 Stainless Steel (chemical resistance)
	316 Stainless Steel (enhanced chemical/salt resistance)
	316L Stainless Steel (improved corrosion resistance)
	Duplex Stainless Steel (high strength, corrosion resistant)
	Hastelloy/Exotic Alloys (extreme chemical environments)
	Glass-Lined Steel (pharmaceuticals, reactive chemicals)
	Polymers/FRP (lightweight, chemical-specific)



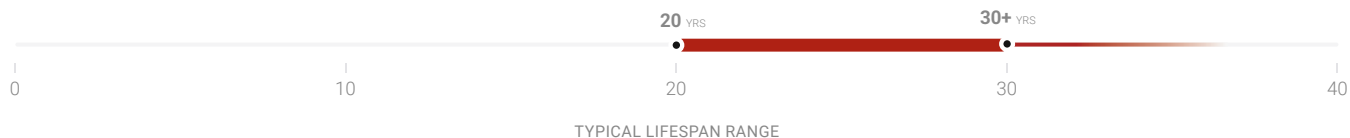


Reactors

TYPICAL LIFESPAN
20-30+ years

Design life varies

Medium Maintenance



How to Make It Last

- Regular inspection for cracks (dye penetrant testing)
- Ultrasonic testing of shell thickness
- Control operating temperature within design limits
- Manage pressure spikes and surges
- Proper mixing/agitation maintenance
- Inspect seals and gaskets regularly
- Prevent corrosion through material selection
- Monitor bearing and shaft condition
- Thermal stress management

Material Options

☰	Carbon Steel (non-corrosive processes)
○	304/316 Stainless Steel (general chemical processes)
○	316L Stainless Steel (corrosive chemicals)
◇	Hastelloy C-276 (extremely corrosive environments)
○	Duplex/Super Duplex (high-strength, salt/acid resistant)
○	Glass-Lined (pharmaceutical, hygiene-sensitive applications)
◇	Nickel-lined or nickel alloys (caustic soda, alkaline)





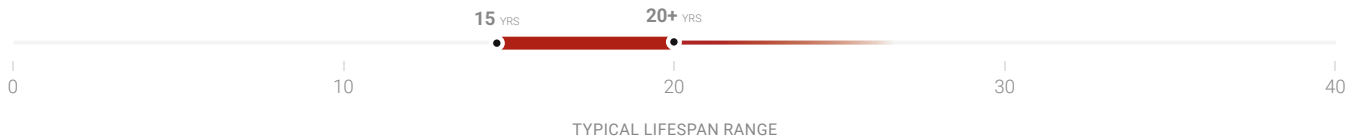
Pumps

TYPICAL LIFESPAN

15-20+ years

Many can exceed 25 years; some tested 40+ years

 High Maintenance



BY TYPE / CONFIGURATION

ANSI Pumps	15-20 years typical; many exceed 25 years
Heavy-Duty Centrifugal Pumps	8+ years in corrosive/abrasive service
Slurry Pumps	8-10 years (in demanding services)
Specialty Alloy Pumps	8+ years minimum in aggressive fluids

How to Make It Last

- Proper pipe alignment and geometry (suction line flow < 10 fps)
- Precise motor/pump alignment (even 0.060" misalignment causes failure)
- Protect against cavitation and fluid starvation
- Manage operating temperature (keep within rated range)
- Use appropriate sealing solutions (mechanical seals, packing)
- Regular bearing maintenance and inspection
- Filter fluids to remove abrasive solids
- Avoid frequent start/stop cycling
- Control fluid pH, viscosity, and specific gravity
- Pressure testing of pump heads

Material Options

	Cast Iron (general duty, low-corrosion fluids)
	304 Stainless Steel (moderate corrosion resistance)
	316/316L Stainless Steel (better corrosion resistance)
	Duplex/Super Duplex (high-strength, salt/acid resistant)
	654 SMO/6%Mo Austenitic Stainless (hot phosphoric acid)
	SS904L (phosphoric acid with contaminants)
	Hastelloy (extreme chemical environments)
	Bronze/Copper alloys (seawater applications)



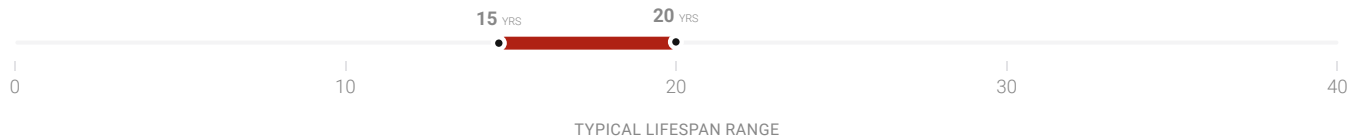
Compressors

TYPICAL LIFESPAN

15-20 years

Well-maintained units may reach 25-30 years

 High Maintenance



How to Make It Last

- Regular oil analysis monitoring
- Maintain proper bearing temperatures
- Monitor vibration levels (early warning system)
- Prevent surge and aerodynamic instability
- Keep operating within stable flow range
- Regular seal and gasket replacement
- Control intake air quality and temperature
- Prevent fouling of impeller/diffuser surfaces
- Maintain proper coolant/oil levels
- Shaft alignment verification
- Avoid sustained overload operation

Material Options

-  Cast Iron/Ductile Iron (basic construction)
-  Carbon Steel (standard impellers)
-  304/316 Stainless Steel (corrosive gas environments)
-  Aluminum Alloys (light-duty, non-corrosive)
-  Duplex Stainless (salt spray, corrosive atmospheres)
-  Titanium (extreme corrosion resistance, lightweight)

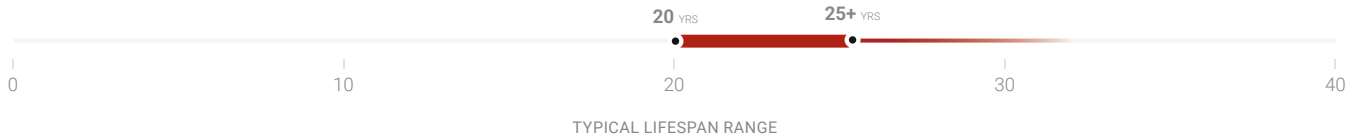




Generators

(Diesel & Natural Gas)

TYPICAL LIFESPAN
10,000-30,000
hrs of runtime
High Maintenance



Approximate Calendar Life

20-25 years (10,000-25,000 hours)

Heavy-Duty Centrifugal Pumps

Up to 30,000+ hours with exceptional maintenance

Standby-Only

Longer calendar life, shorter if run constantly

How to Make It Last

- Regular oil and filter changes (interval-based on load)
- Maintain proper fuel quality (diesel degradation monitoring)
- Load-test regularly (avoid running unloaded too long)
- Control operating temperature
- Battery maintenance and replacement
- Coolant system monitoring
- Fuel system cleaning and stabilization
- Regular exercise/testing (monthly/quarterly runs recommended)
- Proper ventilation and cooling
- Inspect electrical connections
- Avoid sustained overload operation
- Storage preparation if idle extended periods

Material Options



Cast Iron Engine Block (standard)



Aluminum Radiators (heat dissipation)



Copper Wiring (electrical systems)



Stainless Steel Fasteners (longevity in damp conditions)





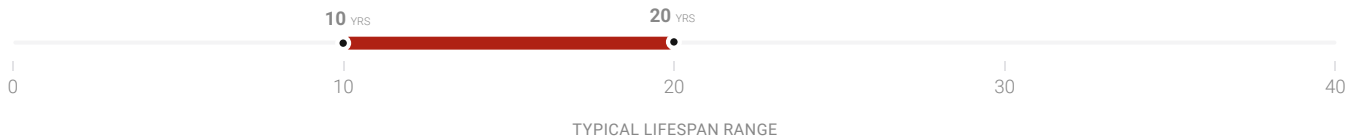
Centrifuges

TYPICAL LIFESPAN

10-20 years

Varies by type and application

 High Maintenance



How to Make It Last

- Disc stack replacement every 2-3 years (for heavy use)
- Replace vibration dampers regularly
- Maintain bearing lubrication
- Clean bowl regularly to prevent buildup
- Replace O-rings and gaskets as needed
- Monitor vibration levels
- Control bowl speed within limits
- Proper thermal management
- Prevent abrasive particle accumulation
- Regular intermediate and major services

Material Options

- Stainless Steel 304 (general duty)
- Stainless Steel 316/316L (corrosion-prone fluids)
- Duplex Stainless (high corrosion resistance)
- Carbon Steel with coatings (non-critical applications)





Mixers

TYPICAL LIFESPAN

10-15 years

Industrial mixers; some units reach 20+ years

Medium Maintenance



How to Make It Last

- Regular bearing inspections and lubrication
- Seal replacement before failure
- Proper impeller/blade balance
- Control operating speed and load
- Prevent cavitation and over-torque conditions
- Monitor motor/gearbox temperatures
- Regular alignment checks (shaft/coupling)
- Prevent excessive vibration
- Manage fluid properties (viscosity, abrasiveness)
- Repair corrosion spots immediately

Material Options

	304/316 Stainless Steel (general duty)
	Carbon Steel + Coating (general duty)
	Duplex Stainless (high-corrosion environments)
	Exotic Alloys (extreme chemical compatibility)





Separators

(Clarifiers, Decanters, Nozzle Separators)

TYPICAL LIFESPAN

10-15 years

Well-maintained units; some reach 20+ years

 High Maintenance



How to Make It Last

- Regular vibration monitoring
- Disc stack/bowl replacement every 2-3 years
- Bearing and seal maintenance (every 2-3 years)
- Oil/coolant analysis
- Regular cleaning and sanitation
- Prevent bowl clogging and fouling
- Monitor operating speed
- Replace wear parts proactively
- Proper inlet/outlet flow management
- Temperature control

Material Options

-  Stainless Steel 304/316 (food, chemical)
-  Super Duplex/6Mo Stainless (aggressive separations)
-  Carbon Steel (non-critical applications)
-  Exotic Alloys (pharmaceutical-grade requirements)





Packaging Equipment

TYPICAL LIFESPAN

8-15 years

Highly dependent on application

Medium Maintenance



How to Make It Last

- Regular seal/gasket replacement
- Maintain proper calibration
- Clean filling heads and nozzles regularly
- Monitor pneumatic/hydraulic systems
- Proper lubrication of moving parts
- Control temperature in thermal applications
- Regular preventive maintenance schedules
- Replace wear rings and bearings as needed
- Product cleanliness management

Material Options

- Stainless Steel 304 (food/beverage)
- Stainless Steel 316 (salt/corrosive products)
- Cast Iron (mechanical components, non-contact)
- Plastics/Elastomers (specific product compatibility)
- Aluminum (lightweight frames, non-corrosive)

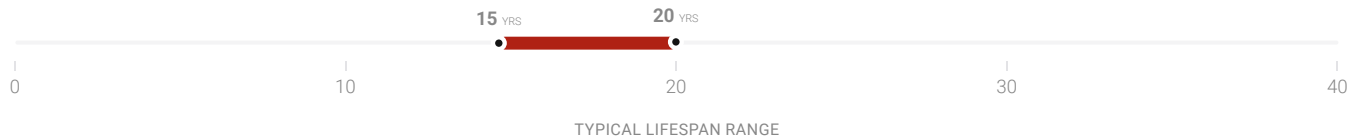


Generators & Compressors

(Continued specifics)

TYPICAL LIFESPAN
15-20 years

Low Maintenance



How to Make It Last

- Routine pressure testing
- Regular impeller/propeller inspection
- Bearing condition monitoring
- Seal replacements on schedule
- Thermal management
- Coolant system maintenance
- Vibration analysis monitoring

Material Options

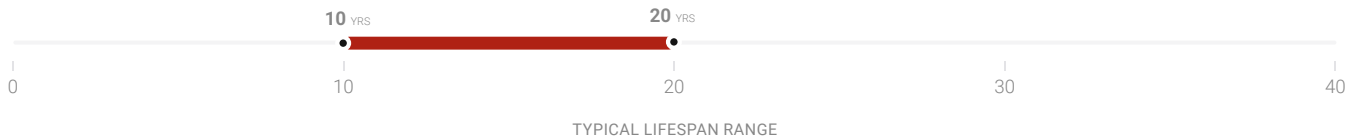
	Ductile Iron/Cast Iron (housings)
	Aluminum (impellers, lightweight designs)
	Stainless Steel Alloys (corrosive applications)
	Bronze (seawater/brackish environments)





Water Treatment Systems

TYPICAL LIFESPAN
10-20 years
Media-dependent
High Maintenance



How to Make It Last

- Regular media replacement/regeneration
- Backwash and cleaning schedules
- Monitor flow rates
- Control inlet water quality
- Replace filter cartridges on schedule (6-12 months typical)
- Vessel inspection for coating degradation
- O-ring and gasket replacement every 3-5 years
- Proper chemical feed system maintenance
- Control system calibration

Material Options

☐	Carbon Steel Vessels (housings)
☐	Stainless Steel 304/316 (salt-water/corrosive)
☐	Fiberglass Reinforced Plastic (FRP) (lightweight, non-metallic)
☐	Concrete (large retention basins, treated surfaces)



Refurbishment Expectations for Used Equipment

When LCEC sells reconditioned equipment, typical reconditioning includes:

- Pressure/leak testing
- Bearing and seal replacement
- Gasket and elastomer replacement
- Ultrasonic shell thickness testing
- Paint/coating restoration
- Complete disassembly inspection
- Electrical systems testing
- Heat exchanger plate cleaning/restoration
- Glass-lining inspection (if applicable)
- Mechanical functionality testing

TYPICAL RESULT

Equipment restored to near “like-new” condition with expected life close to original design specifications.

