

Pumping Tips

Colfax's technical experts have accumulated the following pumping tips and recommendations through years of field experience.

1. If installation includes main and standby pumps, **rotate their usage** at least once a month. Pumps and drivers not operated for prolonged periods frequently fail on startup. Rust, water accumulation, sediment accumulation and other factors contribute to a lack of reliability. If pumps are frequently started and stopped, have each start use the next sequential pump.
2. If main and standby pumps are operating in a **hot liquid system**, consider bleeding a small amount of discharge flow back through the non-operating pump to keep it at system temperature. Be careful to avoid pressurization of the system suction side.
3. Do not expose a cold, rotary positive displacement (PD) pump to hot liquids or vice versa. Internal pump clearances cannot change uniformly very quickly, so such operation risks pump seizure. Especially avoid cold liquid flush of a batch hot liquid pump. **Thermal shock** can cause serious pump damage.
4. If applying **heat tracing** (thermal wire, steam/hot oil tubing, etc.), be sure to avoid heat tracing bearing areas and timing gears as these items usually need to operate well below 200° F (98° C).
5. Pipeline pumps and others may need "**soft start**" systems to allow a large volume of liquid within the line to accelerate in a controlled fashion until normal velocity. Soft start is most commonly achieved using an electric motor driven, open bypass valve around the pump or back to the supply tanks.

It is closed slowly (typically 30 to 60 seconds) so flow is gradually diverted from recirculation to entering the pipeline. Other soft start systems have used fluid couplings to slowly increase pump speed as the pipeline can accept flow or other variable speed drive arrangements.

6. Any loading or unloading facility (truck terminals, rail cars, barges, ships, etc.) should be sure to detect when the supply of liquid stops flowing to the transfer pumps. **Dry running** most pumps can cause damage, especially to the shaft seals.

7. **Pipe strain** can be particularly hard on rotary PD pumps since their internal clearances are smaller than centrifugal pumps.

8. Be careful of **low differential pressure**/high viscosity operation if the pump design relies on differential pressure to provide shaft seal internal flush. Close running clearances may require alternate seal flush arrangements.

9. Static testing of pumps under **high vacuum** may cause damage to mechanical seals. Consult your pump or seal vendor before such testing.

10. If field **hydrostatic testing**, either block out the pumps or be sure that the pump suction side is rated for the test pressure. This is especially true for high-pressure pumps since their inlet side may be designed to handle only several atmospheres of pressure.

11. If at all possible, do not salvage/reuse **antifriction bearings**. Their removal usually entails some fairly heavy pulling and pushing on the wrong races. Internal damage or deterioration can appreciably affect the bearing life. New bearings are not so expensive that saving their cost is worth the unknown life reduction, let alone the cost of premature downtime.

12. If you are **electric arc welding** near pumps, be certain that a solid ground is near the weld location and away from the pump. Otherwise, arcing may occur inside close pump clearances. This can damage pump parts and cause catastrophic failure on startup.

13. You should vent pump discharge on **initial startup** to help the pump gain initial prime. If liquid is dangerous, arrange to contain any leakage from venting. Internally wetted pumps prime faster than dry.

14. One of the problems often experienced in pump maintenance, especially in remote and aggressive plant environments, is that pump **name plates** can become corroded and unreadable after several years in service. In fact, even when they are readable, their location is often so inaccessible that they become very difficult to see. As a result, ordering and obtaining spare parts can become a nightmare. In these situations it is very difficult to identify the exact pump model, serial number and year of manufacture.

A solution is to take photos of the pump name plates when they are new and then archive these images, identified with their tag number and the piping or equipment plant layout drawings.

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