

BEST PRACTICES in Maintaining Extruders *(For an optimum working condition)*



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STEER has pioneered and patented the fractional-lobed technology for intelligent compounding of materials. For the extruders to work in an optimum condition, there are several best practices, which we recommend.

(a) Check-list of Maintenance Tools

For any extruder to deliver its optimum output, it is imperative that it is maintained properly through periodical checks. We recommend a check-list of tools that should be readily available with compounders. These maintenance tools make maintenance work on twin-screw extruder platforms quick, easy and hassle-free. One can minimise downtime and ensure that the platform remains in perfect working condition.

STEER has its own sets of TSE maintenance tools. They include Wear Limit Gauges, Shaft Cleaning Tools, Internal Element Cleaning Tools, Shaft Rollers, Shaft Drive Spline Nuts, Shaft Holding Fixtures, Shaft Pulling Tools, Manual Element Removal Tools and Shaft Stacking Tools. Made with the right metallurgy, STEER TSE maintenance tools are trusted by some of the top players. Such tools must be available with compounders all the time to attend to any maintenance issue.

(b) Inspection of excessive wear on elements

Extruder elements must be periodically examined for routine wear and tear. If the extruder element is still within wear tolerances, then the element will not slide into the gauge. If the wear has exceeded the wear tolerances, then the element will slide into the gauge and needs to be replaced. A wear limit gauge tool comes in handy to check the excessive wear. The tool is designed with an inside diameter, bored to the recommended minimum diameter for your specific model. It has a length of 1.5 times the extruder diameter, a knurled outside diameter, and is engraved with the extruder model.

(c) Clean shaft regularly

The extruder shaft must be regularly cleaned and checked for residual polymer using a "Shaft Cleaning Tool." The tool closely matches the shaft profile and helps with the easy removal of any residual or degraded polymer. It is designed with a gentle taper of the cleaning teeth, outward. The teeth are made from hardened steel and the ends are made from brass to prevent damage to the shafts or elements. The tool's weight allows for the momentum to aid in easily cleaning the shafts, which allows you to remove elements that are stuck.

(d) Clean internal elements

The internal elements should also be cleaned regularly using Table Top and Hand-Held model tools. While the Table Top model helps slide the element down the tool to clean it out, the Hand-Held model enables the maintenance staff to hold the element in one hand and then push the tool through the element. Both designs reduce the time-consuming method of cleaning elements with wire brushes.

(e) Check extruder shafts for correct configuration

Time and again, it must be ascertained whether the extruder shafts are correctly configured using Shaft Rollers. They allow the shafts to be easily rolled together, maintaining centreline distance and confirm that the shafts are correctly configured with no interference between elements. If the shafts are not checked before the extruder is started, this can cause the extruder shafts to lock up and break elements and/or shafts.

(f) Gear Box & Feeder Maintenance

For an extruder to perform better, the stability of the gear box is critical. STEER recommends an oil-cooled gearbox, and the oil lubrication system must include heat exchanger, oil filter and oil circulation pump. Protections must be built into the system to prevent operation under low oil levels, high oil temperature and low oil pressure. All these must be monitored daily and today there are in-built sensors that will create alerts whenever the performance of the gear box is affected.

To ensure that the gear box is in a good condition, the following checks have to be performed daily: consumption of lubricants; leakage of lubricant; gear case oil reservoir; condensation inside gear oil, which otherwise could result in oil foam or sludge; condition of oil; and stability of lubricant. Further, depending on dirt, metals, moisture, and viscosity, it is to be determined whether oil reservoir needs cleaning. Whenever lubricant must be replaced, it is recommended that oil present in the reservoir is completely drained when the unit is still warm (helps remove contaminated oil leading to foaming later).

Similarly, the gravimetric and volumetric feeders should be checked daily. The mouth of the feeders should be closed when not in use to prevent entry of foreign objects.
