

Hercules Hi-Shear Viscometer Model DV-10

Cup, Cup Holder and Bob Safety Guide

This guide outlines the basic operating instructions to prevent damage to the instrument cup, bobs and the highly sensitive torque sensor. We recommend that all DV-10 operators read these instructions thoroughly.

1. The torque sensor's maximum limit is 20 inch/pounds (18,000 kilodynes) which in practice is actually a very small amount of torque. A person can easily twist the cup or cup holder by hand to 3 or 4 times greater than the limit, permanently damaging the torque sensor.
2. The DV-10 should be powered on whenever removing or installing the cup. The instrument has a built in safety warning that will beep and illuminate the TORQUE OVERLOAD light on the display panel if the torque sensor is forced to the maximum limit. **Always stop immediately if these warnings turn on!**
3. Always remove the cup and bob soon after each test. Never let the sample dry or harden with the bob and cup in place. If this happens, rotate the cup and spindle by hand clockwise to unlock it from the cup holder, carefully raise the stuck cup and bob together, then unscrew the bob from the spindle. Soak both in a solution that will dissolve the sample so they can be separated without damage.
4. If you anticipate a sample will be dilatent or shear blocking (change to a solid at a certain RPM) you should use the EE or FF bob and **never** the A, E or H bobs. The test parameters should always be set to **RAMP TO MAX TORQUE** and **AFTER MAX – STOP IMMEDIATELY**. This is especially important when testing any sample that will not reach the peak RPM due to high viscosity.
5. If the cup becomes hard to remove, always hold the cup holder with one hand while turning the cup clockwise with the other hand. This will prevent the force of unlocking the cup from damaging the torque sensor. If the instrument beeps or the TORQUE OVERLOAD light comes on, stop immediately.
6. Never remove the screw from the cup holder. It is designed to always stay in the same position to minimize the wear on both the screw and the cam-lock groove on cup. A screw that is loose does not penetrate the groove deep enough and may deform the screw and groove.
7. Inexperienced operators should practice installing and removing the cup before actually operating the machine. The cup should be rotated counter-clockwise finger tight before each test. After installing the cup, check the rear side (opposite the screw) for any gaps. If there is an uneven gap between the cup and cup holder from front to back, then the cup is not installed correctly. It should be evenly seated all the way around with no gap at all when it is properly locked into place.
8. Never leave the bob on the spindle when cleaning or when not in use. The spindle is steel and will corrode if the bob is left screwed on for extended periods.
9. **Never use any type of pliers to remove the bob.** These bobs are made of a 303 stainless steel and will be damaged easily if metal tools are used to remove them, especially at the top lip of the bob. If the top lip of the bob gets deformed or dented it will cause it to wobble which will effect the alignment of the cup and bob. This situation can cause poor laminar flow during a test and will effect calibration.

If you have any questions or concerns on how to use the instrument, please contact Kaltec Support Department we will be more than happy to assist.