

Choose a Benchtop Microcentrifuge with Safety Considerations



Centrifuge is a piece of equipment widely used in biological laboratories that applies centrifugal force and sedimentation principles to filtrate or separate substances for experimental purposes such as DNA and RNA purification, protein extraction or bio-molecules separation. However, this lab helper can become quite dangerous if not properly used or maintained or if the product is not well-designed with safety considerations for users.

A common danger seen in labs is that lab researchers get hurt when they open the lid of a benchtop centrifuge and the lid drops immediately on their hands or fingers.

A swollen and red finger is not the worst thing when it comes to centrifuge hazards inflicted upon researchers, considering that the operation of centrifuge often involves high-speed spinning enabled by rotor, high temperatures generated by the motor and hazardous (infectious/radioactive/chemical) materials contained in the tubes.

More miserable outcomes might happen when the centrifuge rotors and tubes are not well-seated and balanced, and the lid is not put on securely, or a researcher accidentally

opens the lid during operation or before the run is completely stopped, which might result in flyaways of the rotors and tubes driven by centrifugal force. The metal rotors, sharp-edged debris, hazardous materials and aerosols could bring casualties.

Less dangerous but still harmful and annoying is the noise created by high-speed operation during a centrifuge run if the centrifuge is not designed and manufactured with noise-reduction considerations.

Choose a Centrifuge with Safety Designs to Avoid Lab Dangers

Therefore, when deciding on the purchase of a centrifuge, the users, in addition to considering on the types of machines that will meet the lab purposes and associated requirements for functions, capacity and speed, they should also take safety designs of the products into account.

Addressing the afore-said pain-points of users discovered in market investigations and researches, some centrifuge manufacturers have tried to add designs to their products to make it safer for users during operations.

For example, Blue-Ray Biotech, a company whose centrifuge products focus on the category of high speed benchtop microcentrifuge, has a number of innovative designs addressing user's safety and convenience.

Lid Drop Protection and Motorized Dual Lock

Their flagship centrifuge TurboFuge (24-place capacity/21,400 x g max. RCF/15,000 rpm max. speed), which has been added with Lid Drop Protection which will hold the lid at 5 - 60 ° during openness to allow easy loading and unloading of tubes and avoid accidental lid drops and injuries (Figure 1).



Figure 1. Lid Drop Protection allows easy loading and unloading of tubes and avoid accidental lid drops and injuries.

Secondly, Motorized Dual Lock is applied to the lid instead of the conventional solenoid lock design, so that the lid will be safely locked during centrifugation operation to eliminate the chance of leaks, spills and flyaways and their deadly results (Figure 2).

Imbalance Detection

Loads imbalance is often cited as one of the main reason for rotor flyaways, so the TurboFuge manufacturer has added a Rotor Imbalance Sensor beneath the chamber and near the motor, so that the centrifuge will be automatically turned off once imbalance is detected (Figure 3) and the user will be immediately notified to adjust the loads. The innovative intelligent design is extremely useful to eliminate imbalances potentially caused by user errors in their loading practices.

Aerosol-Tight Rotor Cover and Robust Metallic Chamber

The potential dangers associated with centrifugation are not limited in direct contact with hazardous materials; the exposure to chemical or bio-hazardous aerosols is lethal alike. Therefore, the innovative Aerosol Tight Rotor Cover can be chosen for the rotor (Figure 4), so that even when leaks and spills occur inside the chamber, the researchers will be protected from the dispersal of hazardous aerosols.

Last but not least, the interior of the chamber, or the bucket, is constructed with metal material which will reduce noise, facilitate heat dissipation and provide solid protection against flying metal rotor (Figure 4).



Figure 2. Motorized Dual Lock ensures the safety in operation.

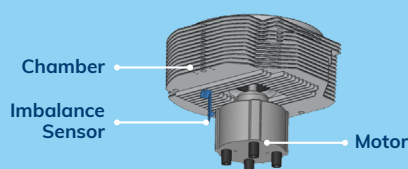


Figure 3. Imbalance Sensor turns the centrifuge off immediately if rotor imbalance is detected.



Figure 4. Aerosol-Tight Rotor Cover and Robust Metallic Chamber.



Figure 5. The Robust Ventilation Design prevents heat accumulation at high speed to protect sensitive samples.

Autoclavability and Robust Ventilation Provides Protection to Samples

The protection of samples is also important for ensuring the success of centrifugation and the quality of experimental results. The TurboFuge is also made with sample protection designs.

First, the metal lid and rotor of the TurboFuge are made autoclavable so that they can be detached and treated in an autoclave for pressurized and heated sterilization to avoid contamination of centrifugation samples.

Secondly, enhanced ventilation design (Figure 5) is applied to reduce the temperature created during high-speed rotation, so that even when the TurboFuge is run at its maximum speed of 15,000 rpm for as long as an hour, the interior temperature of the instrument will not exceed 40° C and will not affect temperature-sensitive samples.

These design highlights have reflected the market trend that biotechnology equipment manufacturers, while making every bit of effort to improve the functions and performance of their products to satisfy customer needs, have put more emphases on user's convenience, health and safety as selling points of their products.

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