

**Phoenix 3D d68**

for 0.5L bottles

Phoenix 3D d68m

modular, for 0.5L bottles

Phoenix 3D d78

for 1L bottles

Phoenix 3D d78m

modular, for 1L bottles

Our 3D printed Recovery System has an unibody design which means there are no edges which could be problematic for the parachute ejection. The door of the mechanism is flush with the rest of the casing in order to prevent that it is torn away by the wind during the acceleration phase. We offer two different versions of Phoenix 3D right now:

Variants of Phoenix 3D

Phoenix 3D d68:

The smallest version of the Phoenix 3D is designed for pressure vessels based on 0.5L bottles. The nosecone is included directly in the case, which ensures good aerodynamics. Despite the clearly smaller system, the parachute chamber offers enough space for large parachutes.

Phoenix 3D d68m:

A slightly modified version with identical parachute chamber, but the system is slightly larger overall and thus offers space for an altimeter. In addition, the tip can be plugged off so that electronics can be easily switched on and off.

Phoenix 3D d78:

This variant is suitable for pressure vessels made of typical 1L bottles (e.g. Apollinaris). The parachute chamber is integrated directly into an aerodynamically optimized nosecone and offers a very generous volume, which is also suitable for large parachutes.

Phoenix 3D d78 m:

This variant also fits pressure vessels made of typical 1L bottles (e.g. Apollinaris). The tip is printed separately from the rest of the housing and has a screw-on thread. The screw tip makes it easy to replace onboard electronics or to add another module like a payload fairing mechanism.

Please note:

The parachute systems are generally designed with holes for mounting a Tommy Timer (mechanical wind-up motor). For some variants, a STL file with holes for mounting servo motors is also available. However, each model can be adapted to your own requirements in FreeCAD. For the d68 and d68m variants, there is a version with a camera mount for the DVR 808 KeyChain Camera available.



3D printing the components

The components are offered as printable STL files but also as editable and customizable CAD files. You can use the free software FreeCAD to optimize the components for your own needs.

▶ [Download FreeCAD for free](#)



You have to convert the STL files with software (depends on your 3D printer or 3D printing shop) to a printer specific format. It is maybe necessary to rotate and to move the components before printing. You also have to optimize the printing settings so that an optimum print quality is ensured.

The correct operation of a 3D printer requires experience and knowledge of the materials and print settings used. Incorrect print settings can cause damage to the printer and inoperable components. The print process should therefore only be controlled by persons with enough experience. DLR_next and DLR_School_Lab Lampoldshausen/Stuttgart cannot guarantee the functionality of the components, as the 3D printing of the parts cannot be influenced more controlled. Before usage, detailed tests should always be done in a safe environment.

Assembly

Important: You need some other materials to complete the construction of your recovery system. All build steps despite the ones focusing on the casing are identical to this tutorial.

▶ [Tutorial: Building a Recovery System for your Water Rocket](#)

Important note

All 3D components offered on this site were designed and tested in DLR_School_Lab Lampoldshausen/Stuttgart with the help of Raketfued Rockets. The German Aerospace Center (DLR) is one of Europe's largest and most modern research institutions and offers children and young people an opportunity to discover for themselves the fascinating world of research. After filling in the application form, students and classes can visit the School_Labs, which are located at many DLR sites in Germany, for free. To succeed with the construction of a water rocket, you will have to work very precisely and carefully. Especially some of the adhesives are pretty dangerous. Thus, please wear gloves when working with adhesive or epoxy and don't breathe in the gases. It is recommended to work outside whenever toxic gases could develop. The launch of a water rocket may need permission from the competent authority, depending on your location. You need the permission of the landowner if you launch on foreign territory. Please wear safety goggles when pressure testing or launching your rocket. Keep a safe distance to the pressurized rocket. We can not guarantee the accuracy, completeness or feasibility of any our tutorials. We are not responsible for any damage or harm on objects, animals or humans. We do not guarantee that the information provided on this web site is complete, accurate and always current. This applies also to all links cited on this website points, either directly or indirectly. We are not responsible for any damage or harm to objects or individuals.