Revolutionary Rocket Synergy

Rocket Evaporators use patented vacuum technology to evaporate solutions to dryness, or a concentrate, rapidly and safely. The latest Synergy series offers integrated, flexible solutions for processing a wide range of sample volumes. Interchangeable rotors will accommodate tubes, flasks and batch volumes of up to 100L.

Two models are offered:

Rocket Synergy, will evaporate samples in flasks, tubes, or a variety of innovative Genevac sample holders such as the SampleGenie. The removable rotor may be replaced with a 316 stainless steel vessel for batch processing of up to 5L.

Rocket 4D Synergy is designed primarily to evaporate large sample volumes, with autofeed for volumes >5L. The Rocket 4D Synergy can also be fitted with a removable flask rotor to accommodate the full range of Rocket Sample handling solutions such as flasks, tubes and SampleGenie.

Rocket technology

Using a single, common vacuum pump, the Rocket creates two vacuum environments:

1. a low vacuum causes the solvents in the sample to boil at a low temperature, often below 0°C;
2. a second vacuum environment boils deionised water to make low temperature, low pressure steam. The temperature of the steam heating the vessel or flasks in the Rocket is controlled in this way, while the temperature of the aluminium outer chamber is also carefully controlled at the user’s set temperature.

Solvents boiling in the flasks or vessel will cause cooling, therefore the steam created by the Rocket will condense on the cold outer surface of the flask or vessel.

Condensation of steam releases energy into the samples to speed evaporation, without heating the samples themselves: Condensed steam is thrown off due to the rotational force and re-boiled to make more steam.

Features of the Rocket 4D Synergy only:

A. Autofeed coupling enables large volumes of solvent to be fed into the evaporation vessel under control of the evaporator, to ensure safe, rapid evaporation or concentration.

B. Autofeed option with sample feed via centre of inner lid.

Features common to both the Rocket and Rocket 4D Synergy:

C. Removable 316 stainless steel vessel – holds up to 5 litres of sample (batch mode; Rocket and Rocket 4D Synergy), or can be used to evaporate larger samples with autofeed (Rocket 4D Synergy).

D. Removable flask rotor will accommodate the full range of sample handling solutions including tubes, flasks and SampleGenie.

E. Auto-draining frost-free solvent condenser, collects all solvents as liquids. Plastic coated glass for safety and visibility.

F. Easy to use controls. Select the method for the solvents to be evaporated, set the maximum safe temperature and start.
USB upload of new methods and software and download of recorded data.

Waste solvent drains.

High power heaters with temperature control for outer chamber.

Strobe viewing window and strobe controls enable monitoring of the progress of evaporation, without stopping to open the lid. Each flask may be viewed separately, in real time.

Glass evaporation/SampleGenie flasks.

Deionised water in sump – used to make low temperature, low pressure steam for efficient high speed evaporation.

Direct drive motor for high rotational speeds of 500 x gravity or more, to control boiling and help eliminate bumping and foaming.

Inner chamber lid separates the outer steam environment from the samples.

Outer chamber lid.

Low temperature, low pressure steam fills the outer chamber and heats the vessel/flasks directly.

The secret of perfect results

Rocket software monitors the temperature of coolant entering the condenser and compares it with the temperature of that leaving the condenser. The difference (Delta T) equates to the heat energy transferred from the evaporated solvent to the condenser and is proportional to the flow rate of solvent vapour entering the condenser. As samples approach concentration or dryness, the change in Delta T is used to determine the auto stop point.
The Rocket Synergy high speed evaporator is designed to dry or concentrate up to six flasks, each containing a maximum of 450ml of solvent, or 18 ASE® vials, with no user intervention or attention. The removable flask rotor may also be replaced with a 5 litre stainless steel vessel for batch processing (see Rocket 4D Synergy section for more details).

It is five times faster than other ‘intelligent’ evaporators and is capable of replacing several rotary evaporators, saving valuable bench space.

Rocket controls are very easy to use. Load your samples, select the correct method, press start and walk away. The evaporator is equipped with high performance features that prevent foaming, bumping and cross contamination. A built-in cold trap provides very high levels of solvent recovery, even with volatile organic solvents. Auto-draining, under the control of the Rocket, ensures optimal solvent recovery is maintained under all conditions.

Using SampleGenie™ or Flip-Flop™ sample handling systems further extends the scope of the Rocket Synergy. These enable up to 400ml to be concentrated or dried directly into a smaller vial, increasing sample recovery and inter-sample reproducibility, while eliminating the drudgery associated with manual transfers. Methods on every Rocket Synergy can easily be optimised, and new methods uploaded via USB key. Data is downloaded in the same way.

The Rocket has an on-board strobe that allows each of the six flask positions to be viewed separately in real time.

Further information on how to concentrate with the Rocket can be found at:
www.Genevac.com/CFA

See the Rocket demonstration at:
www.Genevac.com/movie/Rocket
Innovative Rocket sample handling choices – what else?

**Evaporation Flasks**
For drying or concentrating up to 450ml solvent.
- 450ml volume
- Dried sample is re-dissolved and removed using a pipette

**250ml SampleGenie™**
For drying the sample directly into a range of vials from 12mm to 28mm diameter and up to 70mm tall. SampleGenie™ eliminates the need for manual transfers, saving time and preventing sample handling errors.
- 250ml volume plus vial
- Direct drying of sample into vial
- Eliminates manual transfers

**Puck**
Enables up to 18 ASE® vials to be dried in one operation, in place of flasks.

**Flip-Flop™**
is for users of ASE® vials who wish to concentrate their samples and also have them presented in a GC autosampler vial. It consists of a special double-ended tube with SampleGenie™ adaptor and 2ml GC vial.
- Works in combination with the Puck to enable direct concentration into a 2ml GC vial

**400ml SampleGenie™**
for concentrating the sample directly into 2ml GC autosampler vials. The vial is protected from the steam, so that only the solvent in the flask evaporates.
- Insulated vial
- Sample in the flask evaporates – not in the vial
- Eliminates manual transfers, graduated washing steps and errors

**400ml SampleGenie™**
For concentrating the sample directly into 2ml GC autosampler vials. The vial is protected from the steam, so that only the solvent in the flask evaporates.
- Insulated vial
- Sample in the flask evaporates – not in the vial
- Eliminates manual transfers, graduated washing steps and errors

- Works in combination with the Puck to enable direct concentration into a 2ml GC vial
Rocket 4D Synergy is a fully automated system for drying or concentrating very large volumes with no user intervention and in complete confidence – no bumping, foaming or sample loss. Simply load your sample, select the correct method, press start, and walk away – the system will do the rest.

The Rocket 4D Synergy can also be fitted with a removable flask rotor to accommodate the full range of Rocket Sample handling solutions such as flasks, tubes and SampleGenie (see Rocket Synergy section for more details).

Fitted with the 5 litre stainless steel bowl rotor, Rocket 4D Synergy can process any volume from just a few litres to as many as 100. It uses Rocket technology to heat a single product vessel accurately with low temperature, low pressure steam.

Solvents in the vessel are boiled under a separate vacuum and so will be at much lower temperature than the steam surrounding the vessel. By spinning the product vessel at high speed, the g-forces generated control the pattern of boiling so that bumping and foaming are eliminated.
Rocket 4D Synergy’s 5 litre 316 stainless bowl rotor has detachable handles and is easily lifted into and out of the evaporator. Access to the dried or concentrated product in the vessel is very easy. Dried products can be scooped out, or re-dissolved while the vessel is still in the system. Liquid products can be easily drained via a drain port in the side of the rotor, using a dedicated pouring stand.

Users wishing to dry volumes larger than five litres should choose the ‘Autofeed’ option, which enables the Rocket 4D Synergy to draw in product from the user’s own external supply. The Rocket 4D Synergy controls product feed, drying and the discharge of condensed waste solvent without any external intervention.

The autofeed system has an integrated rinse circuit, which washes the system through with compatible clean solvent and then air, to prevent drying of product in the autofeed mechanism. Dried products may be automatically re-dissolved in a small volume of solvent at the end of the process, using solvent from the rinse system. Alternatively, the same circuit can be used under manual control for solvent exchange by substituting a different solvent for re-dissolve.

Cleaning the Rocket 4D Synergy between cycles is very straightforward. The PTFE feed tubing is easily detached for cleaning or replacement and the vessel can be readily cleaned, wiped, inspected and even put in a dishwasher. It’s all so easy compared with handling large glass evaporator flasks!

**Easily controlled emptying**

A typical Rocket 4D Synergy autofeed system, with recirculating chiller option.

Perfect drying of volumes up to 100 litres
**Mechanical data**

Blue = Rocket Synergy. Red = Rocket 4D Synergy. Black = both.

- **Maximum rotor speed**: 1760rpm
- **Maximum G-force**: 700g
- **Drive system**: Direct drive
- **Maximum sample load**: 6 x 450ml / 5 litres

**Vacuum system**

- **Pressure display**: 0-1200mbar
- **Pressure control**: Automatic / 3mbar / 0.5mbar to atmosphere
- **System ultimate vacuum**: 3mbar / < 1mbar
- **Bumping / foaming protection**: Dri-Pure®

**Temperature and control**

- **Control range**: Ambient +7°C to 60°C
- **Control accuracy**: ±1°C
- **Temperature sensing**: Via thermistor
- **Display range**: 0°C to 60°C
- **End of method**: Time or automatic
- **Process visualisation**: Strobe & Delta T

**Solvent compatibility**

- **Boiling point range**: 40°C to 160°C at ambient
- **Includes**: Alcohols, DCM/methylene chloride, DMF, ethyl acetate, water
- **HCl**: Not compatible
- **Diethyl ether**: Requires Inert Gas Purge option (compatible with flask rotor only) / N/A

**Dimensions**

- **Width x Depth x Height**: 780 x 640 x 530mm
- **Height with lid open**: 782mm
- **Weight**: 75kg / 65kg

**Services**

- **Rocket Synergy requires one mains power outlet,**
- **Rocket 4D Synergy requires two separate mains power outlets** (excluding chiller)

**UK & Europe**

- **230V (±10%), 50Hz, 13A**
- **USA**
  - **120V (±10%), 60Hz, 15A**
- **Japan**
  - **100V (±10%), 50Hz or 60Hz, 15A**
- **USB A**
  - For data upload and download

**For chamber water**

- approx. 50ml per day

**Recirculating chiller**

- Powerful recirculating chillers are available for the Rocket Synergy and Rocket 4D Synergy evaporation systems. The systems can control the chillers via RS232 links, thereby providing improved solvent recovery and better drying of samples compared with using a static cooled supply. Connection kits with insulated pipe work are available to accompany the chillers.

**Cold trap cooling requirement**

- **Temp range**: –15°C to +10°C dependent upon application
- **Heat removal**: 700 Watts at +10°C
  - 1500 Watts at +10°C
- **Flow rate**: 1.5 to 2.5 l/min
- **Pressure**: 8mm nylon hardwall tube for Genevac supplied chiller
  - Quick connect coupling to chiller or female M16 fine thread to other sources ¼ inch (6.5mm) hose barb for cold water connection (standard).

**Maintenance**

All seals are durable consumables and user replaceable. Easy access is provided to the pump, which can be maintained by trained users.

**Safety**

Complies with BS EN 61010-1:2010 and is CE marked.

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