heidolph
AN ATS COMPANY

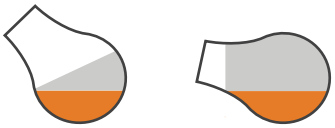
ROTARY EVAPORATION

# MADE EASY GUIDE

## Flask Operation

For efficient evaporation, fill flask to 1/3 volume, and adjust angle to allow maximum wetted surface.

**Flask Angle:**



Less wetted surface inside the flask

Always 1/3 fill



More wetted surface inside the flask

## How To

Use vacuum to control evaporation — lower vacuum gradually until evaporation starts, then continue to adjust vacuum until vapor reaches the upper ¾ of the condenser. As we close in on operation parameters, watch for overboiling, bumping, or foaming. Reduce vacuum and pull more gradually, or use a bump/foam trap.

### The 3/4 Rule

Keep condensation below the top ¾ of the condenser. If it rises higher, solvent can reach your vacuum pump, causing damage and product loss.

## Before Your First Run

**Choose the proper evaporation flask size**

- You want your working volume to be 1/3 the volume of the flask, if it is filed more than 1/3 the volume it becomes easier to contaminate clean solvent and leads to reduced evaporation due to lower surface area.

**Check your chiller performance**

- You want to maintain a chiller temperature of 20 degrees below vapor temperature. As a general guideline, this will be about 40 degrees lower than bath temperature. While you can set it cooler – chillers have reduced performance at lower temperature, and this can lead to rising in your chiller temperature during operation.

# Pro Tips

### Avoiding bumping and foaming:

- If you know your evaporation parameters, pull vacuum to operating pressure **BEFORE** lowering the flask into the bath to warm up. This will bypass most of the foaming stage of evaporation.
- Utilize a vacuum pump with an adjustable vacuum pull, also known as RPM regulated pumps. These are both gentler through the foaming phase and when maintaining operation pressure.

### Increase evaporation speeds:

- You will evaporate much quicker by utilizing the upper end of your rotary evaporators rotation speed. 200-280 RPM is ideal in most benchtop circumstances.
- Larger evaporation flasks = more surface area = faster evaporation

### Prevent over evaporation:

- While fast evaporation is important, we do not want to pull vapor into our lab. Aim to achieve an evaporation speed at the ¾ line on your condenser to ensure all vapors are recondensed and stay inside the system.

### Delta 20 Rule

The optimal conditions for evaporation involve a ΔT of 20°C between:

- The heating bath temperature
- The vapor temperature
- The chiller temperature


# Top 5 Solvents

| | Solvents | Molecular Formula | Vacuum (mbar) |
|---|---|---|---|
| 40°C Bath Temp | Dichloreomethane (Methylene chloride) | $CH_2Cl_2$ | 451 |
| | Ethyl Acetate | $C_4H_8O_2$ | 95 |
| | Hexane | $C_6H_{14}$ | 156 |
| | Methanol | $CH_4O$ | 43 |
| 60 °C | Acetonitrile | $C_2H_3N$ | 230 |

# Maintenance at a Glance

Checklist to optimize the lifespan of your evaporator:

- [ ] **Vacuum Pump Check**
  - Run unconnected for 5 min, then reconnect and confirm 12–15 mbar. If not achieved, flush the line with ethanol or acetone for 20–30 min.
- [ ] **Clean All Glassware**
  - Disassemble, scrub with acetone or ethanol, lay flat to dry. Dip caps and vacuum seals in solvent for 10 sec, wipe, and dry.
- [ ] **Refresh the Water Bath**
  - Refill with fresh water + a small amount of citric acid. Run at 50°C, 80–120 rpm for 30–60 min, then empty and wipe down.
- [ ] **Drain and Refill the Chiller**
  - Empty old fluid, refill with 60% glycol / 40% water mixture. Replace tubing if discolored.
- [ ] **Wipe Down the Exterior**
  - Use water + detergent, alcohol wipes, or acetone on the housing. Clean the rotating drive and vapor tube sleeve with a damp rag.

**For full step-by-step instructions, view the detailed guide on our website.**

### Contact Us:

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