

# You Have Safety Questions? We Have Safety Answers!

## ««« By STAO Safety Committee

The STAO Safety Committee welcomes enquiries, with respect to safety issues, from STAO members. Please send your questions to the Safety Committee Chair (ralph\_chou@stao.org). Your questions and the STAO Safety Committee responses may be published in Crucible, particularly if the information is deemed of general interest to other STAO members. Anonymity will be guaranteed.

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### **Question# 35**

We have just taken possession of our new science wing and are looking at getting a dishwasher to put in our preparation room for glassware cleaning. Do you know what type of dishwasher would be best suited for our needs and who can I contact regarding purchasing it? Also, do we require a certain type of piping or any other materials due to the fact that it will be encountering chemicals from the glassware? Some guidance would be greatly appreciated.

### **Response**

There are perhaps two possibilities. A school can invest in a sophisticated laboratory glassware cleaner or purchase a much less expensive domestic dishwasher.

Laboratory glassware cleaners are available from laboratory equipment suppliers. They cost much more than domestic dishwashers because they are designed to withstand the corrosive action of laboratory chemicals; for example, a more inert grade of stainless steel is used. A supplier that has experience with the use of these machines in laboratories will be able to offer reliable technical advice. However, because of their prohibitive cost, laboratory glassware cleaners are rarely, if ever, found in schools.

Domestic dishwashers are obviously available from local stores. It is assumed that more expensive machines will

tend to last longer. Note, however, that retailers may be unwilling to honour warranty agreements, arguing that the equipment will be exposed to a harsher chemical environment than anticipated by the manufacturer. For this reason, it may also be difficult to arrange a service contract for a domestic dishwasher.

Installation and plumbing requirements should be checked before purchase. Most dishwashers used in schools are plumbed only into the cold-water supply but even quite minor additions to the existing plumbing can cost more than twice the price of a domestic dishwasher! A hot-water supply will make the washing cycle quicker but it is important to check that the water temperature is below the maximum recommended for the equipment to be installed.

In addition to the provision of a hot and/or cold-water supply, further costs may be incurred in providing mains electricity and connection to the drainage system if the machine's chosen location has no adjacent electrical socket or is more than 1 m from an effluent pipe. All the necessary services must be fitted before the equipment is to be installed.

### **Additional Comments**

- Domestic dishwashers are designed for plates, cups, cutlery etc. They are supplied with inserts but these

are not suited to laboratory glassware; some improvisation will be required!

- Organic solvents, salt crystals, metal fragments, acids, alkalis and solutions of salts [in particular, chlorides, copper(II) and iron(III)] can cause pitting on stainless-steel linings and damage rubber or plastic connections used in domestic dishwashers. To maximize the life of a dishwasher, it is therefore important to remove any solids and/or rinse glassware before loading it into the machine. With the cooperation of teaching staff and students, there is no reason why the rinsing of glassware should not be done at the end of a lesson. A cursory glance will then show if any solid is retained in the glassware.
- Heavily-stained glass items and those with 'gungy' deposits will usually require a preliminary hand wash. Such difficult items include test tubes used for food tests and those carrying tarry deposits or soot on the outside. Glassware stained after use with Benedict's reagent, or made cloudy with a carbonate deposit

should be cleaned with dilute acid and rinsed before being machine washed.

- Tall apparatus, such as pipettes or large measuring cylinders, may not fit in a domestic washer because of the rotating vanes.
- If laboratory plasticware is to be washed in a dishwasher, some items may become distorted by the hot water.

An increasing number of schools have found the resources to install a domestic dishwasher in their prep room. Some science teachers believe that access to a dishwasher enables them to spend much less time on the important, but menial, task of cleaning and drying glassware. However, others believe that using a dishwasher does not give good results. Typical negative responses include: "You may as well do it by hand", "It's not good on dirty test-tubes", and "Carbon deposits cannot be removed."

