

Rotor 64MG5



The new high throughput rotor for method development and combinatorial synthesis comprises up to 64 disposable glass vials in 16 groups of four. Reliable PTFE seals in PEEK screw caps allow reaction conditions up to 200 °C and 20 bar.

Method development is one of the major applications for microwave reactors in organic synthesis. However, this requires only small reagent amounts, which are usually somewhat difficult to handle in large multimode instruments such as the Synthos 3000. The new Rotor 64MG5 not only allows processing of small quantities (0.3 to 3 mL) but also offers the possibility to prepare 64 derivatives in a single run. This high-throughput capacity significantly increases the efficiency of a microwave batch reactor.

For the processing, inexpensive disposable standard glass vials (Wheaton® 15×46 mm, Cap 13-425) are used. To guarantee tightness and stability at elevated temperature and pressure special PEEK screw caps and disposable PTFE seals are employed. A borehole in the screw cap enables release of overpressure and sample withdrawal easily with a syringe. Furthermore, the standard-size vessel can be directly used in e.g. autosampler racks for appropriate analytics.

Reaction control is achieved by IR sensing the temperature of the vessel surface. The proper arrangement in groups of four ensures similar conditions for all vessels in one group. Thus, it is sufficient to sense only one vessel in order to know the temperature of all four. In general the temperature homogeneity is excellent, showing a deviation less than 2 °C over all 64 positions.

For proper admixing small magnetic stir bars (e.g. 5×10 mm, egg-shaped) can be added to vials.

Benefits

- Inexpensive, readily available, disposable reaction vials
- Disposable PTFE seals
- Easy-to-handle effective screw cap sealing
- Rapid heating & efficient cooling
- Simplified high-throughput applications
- Vials applicable in standard autosamplers

Fields of Application

- Method development
- Derivatization
- Library generation
- Protein hydrolysis
- Preparation of nano particles

This rotor type is useful for all synthesis applications, which require only small quantities or have the need for a larger amount of samples. The small glass vials allow mimicking of rapid heating and cooling ramps even in a fully equipped rotor. Transformation of methods from small scale monomode reactions works easy and reliable.

Limitations

Since no active pressure sensing is applied, care has to be taken adjusting the temperature limits in the individual runs. Depending on the solvent used the resulting pressure varies at a certain temperature. As we can just guarantee vessel stability up to 20 bar with the described Wheaton® vials, the temperature limit of 200 °C is only applicable for high boiling solvents. More volatile ones such as ethanol or THF may only be used at a lower temperature level. For a detailed description of applicable temperature ranges of various solvents see the corresponding instruction manual (C49IB11).

The utilized glass vials (Fig. 1) are meant to be disposable, as pressure stability upon frequent use cannot be guaranteed. We highly recommend only to use the corresponding Wheaton® vials (15×46 mm, thread $\varnothing = 8.5$ mm) as vials from any other supplier are not be manufactured in similar quality and with identical thread. The screw caps and seals have to be special items, as the regular offered caps are not applicable at elevated temperatures.



Fig. 1. Disposable Reaction Vials MG5

The PTFE seals are special manufactured disposable liptype seals (Mat. No. 41186), which should be perforated after the reaction to release eventually remaining pressure. Upon re-use proper sealing cannot be guaranteed. Perforation/venting can be achieved manually for any individual vial with a syringe or you may use the optional available handling tool (Mat. No. 41219), which enables simultaneous venting and handling of four vials.

Note: Software v2.0 or higher is required to operate Rotor 4×48MC Well Plate.

Ordering Information

40422 Rotor 64MG5

Fully equipped Rotor (body and lid) with a package of 200 disposable Wheaton® glass vials (41214), 64 PEEK screw caps (41188) and 200 disposable PTFE seals (41186)

40218 Rotor 64MG5

Rotor body with corresponding rotor lid, no accessories included.

41214 Vial MG5

Package of 200 screw-able Wheaton® glass vials (15×46 mm)

41188 Screw Cap MG5

PEEK screw cap for use with Mat. No. 41214. Equipped with a corresponding borehole for appropriate venting and sample withdrawal

41186 Seal MG5

Package of 200 disposable PTFE seals for use with Mat. No. 41214 and 41188

41185 Vial Holder MG5

PTFE insert for 4 glass vials (Mat. No. 41214) to be used in Rotor 64MG5. Two PEEK screws for fixing on the rotor top plate included.

Optional:

41219 Vial Handling Tool

Combined venting- and lifting tool for simultaneous handling of 4 vials (Mat. No.41214).

41151 Gripper

Central handling tool of Mat. No. 41219, made of PEEK

41227 Injection Needle

Proper needle with Luer adaptor (\varnothing 0.7 mm, l = 30 mm) for use with Mat. No. 41219



Fig.2. Vial Handling Tool