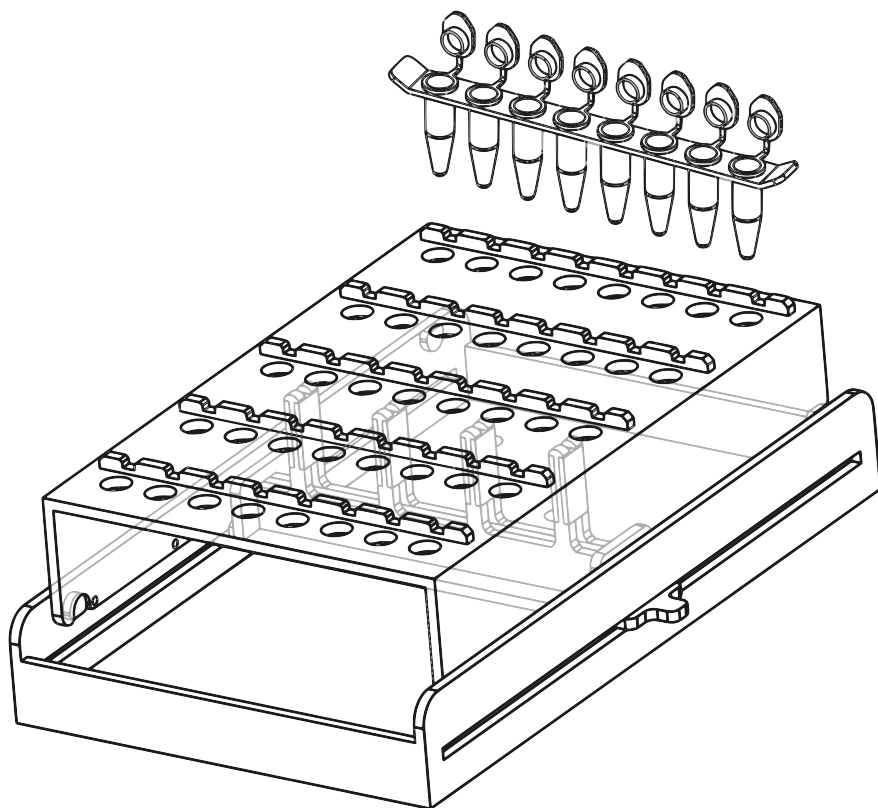


Magnetic rack Sileks MagRack40



User manual

Sileks GmbH, 2014

Table of contents:

1. Description	
1.1. Purpose	2
1.2. Description	2
1.3. The principle of operation	3
1.4. Main components and additional accessories	3
2. Safe operation instructions	
2.1. General safety rules	4
2.2. Transportation and operation safety rules	4
3. Device operation	
3.1. Preparing the device for work	5
3.2. Working with the magnetic rack	6
4. Troubleshooting	7

1.1. Purpose

Magnetic rack Sileks MagRack40 is designed to help to optimize laboratory tasks regarding operations with magnetic and paramagnetic micro- and nanoparticles ("magnetic particles") in standard 1.5 ml tubes.

The rack can be used to accelerate and simplify isolation procedures of DNA / RNA / proteins and other macromolecules from various biological materials using laboratory methods, based on magnetic particles. Using such methods allows to significantly increase the speed of isolation procedure compared to methods, based on nonmagnetic sorbents. One of the keypoints of the total procedure optimization is the elimination of centrifugation stages from standard isolation protocols. A centrifuge, that is regularly required for pelleting a sorbent, is replaced by the desktop magnetic rack. The magnetic rack provides fast separation of particles from a liquid phase. The particles are safely collected on a tube wall without centrifugation. Another advantage of such an approach is high reliability of particles collection. While the particles remain in the magnetic field of the rack, they do not return to the liquid phase. Particles of nonmagnetic sorbents, in contrary, often separate from a pellet and are aspirated into the pipette. It causes loss of isolated substance and may inhibit further reactions.

1.2. Description

The magnetic rack consists of some elements and can be assembled/disassembled. The rack's base (1) holds all other elements together. The magnetic collector (2) contains strong rare-earth magnets and provides particles collection. It is installed in corresponding slots of the rack's base. The tubes rack (3) is placed on top of the base. It is specially designed to assist in precision positioning of the magnetic collector on line with a row of tubes. Special "combs" are located on the top surface of the rack to prevent tubes from rotating around their vertical axes. The tubes are placed in special strips (4). The strips are useful for easy transfer of numbers of tubes between compatible devices (other racks, thermal blocks, tube depots etc).

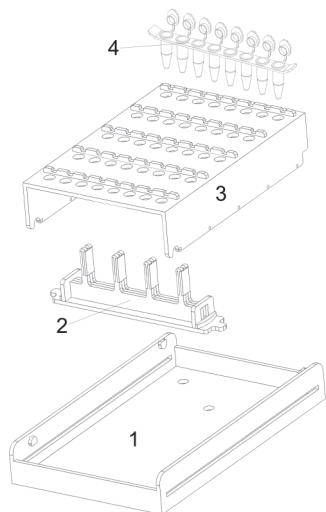


Fig. 1. Components of the magnetic rack.

- 1 - Base of the rack
- 2 - Magnetic collector
- 3 - Tubes rack
- 4 - Tube strip with tubes

1.3. The principle of operation

The magnetic rack allows to collect magnetic particles in any of its five rows of tubes. Each row may contain up to eight standard 1.5 ml tubes. The magnetic collector contains rare-earth neodymium magnets that are the strongest permanent magnets used at the present time in technics. These magnets provide very high collection speed and big retention force. It guarantees thorough particles collection and helps to avoid their leak from a formed pellet.

The magnetic collector that holds the magnets is a mobile element of the rack. It can move in the slots of the rack's base. When approached to some of the tubes' rows, the collector snaps to the correct position automatically. It has to be just pushed or pulled towards the row, where particles must be collected, and it will align with the row itself. The collector must remain under the tubes during liquid phase removal. If the collector is moved away, the particles will not hold on the tube wall and will be aspirated along with a liquid. When resuspending particles, the collector must be moved to some other row because its strong magnetic field may prevent thorough resuspension.

It is strongly recommended to use special tube strips to make your work more comfortable and efficient. When using the strips, you can at once transfer a whole row of tubes (up to 8 pcs.) to any other compatible module (tube depot, thermal block etc.). Such approach makes the rack an important element in modular complexes, intended for isolation of biological macromolecules (DNA, RNA, proteins).

1.4. Main components and additional accessories

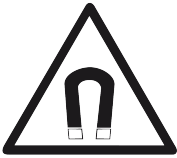
The standard set of MagRack40 magnetic rack includes:

Base of the rack	- 1 pcs.
Autopositioning magnetic collector	- 1 pcs.
Tubes rack with autopositioning system	- 1 pcs.
Tube strips TubeStrip81 (with grips)	- 5 pcs.
User manual	- 1 pcs.

Sold separately as accessories:

Tube strips TubeStrip81 (with grips)
Tube strips TubeStrip82 (without grips)
Tube depots and docks for tube strips

2.1. General safety rules



Strong neodymium magnets are used in the rack. Their magnetic field may damage sensitive and precision electronic and mechanic devices if they are put close to the rack. Do not place the rack near electronic and magnetic media storage, watches, precision balances and other magnetic-sensitive devices. Especial carefullnes is required when disassembling the rack. While in an assembled rack the magnetic field is mostly concentrated inside the rack compartment, when the magnetic collector is exposed, it can attract various metallic things, turning them into projectiles, or be attracted itself to massive metallic objects (steel boxes and tables). You should be always very carefull when exposing the magnetic collector. Neglegence to this warning may result in unrecoverable damage to the collector, surrounding sensitive devices and even in user's injuries caused by attracted metallic objects.

The rack is made of strong acrylic plastic. It can hold all necessary working loads. But it may be damaged in case of a hard strike or after falling down from working surface. The rack must be protected from applying strong mechanical force.

The plastic used in the rack has relative chemical resistance. But strong organic solvents (chloroform, tetraforomethylene etc.) and aggressive liquids (like acids and alcali) may cause the plastic to become dull. Avoid spilling aggressive liquids on the rack.

2.2. Transportation and operation safety rules

Avoid hard shocks and falls of the magnetic rack during its transporation and in daily work.

Follow precautions, described above, when transporting and using the magnetic rack. Do not store the rack near electronic and preccission mechanic devices. Always keep the rack and tube strips clean. Wash them only with warm water and soap in case they become dirty. Using dirty equipment significantly increases the risk of sampes cross-contamination during the isolation procedure. Do not wash the rack and its accessories with aggressive washing liquids and abrasive materials.

3.1. Preparing the device for work

The rack must be assembled prior to first use. Assembly components and order are shown on Figure 2.

Fig. 2a.

Set the base of the rack on a working surface away from electronic and mechanical devices and metallic objects.

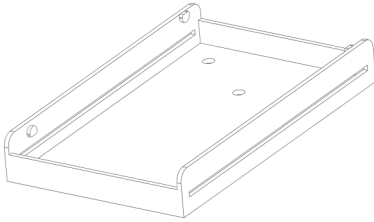


Fig. 2b.

Insert the magnetic collector in slots of the rack's base. The collector must be rotated around the vertical axis to fit into the sockets (as shown below).

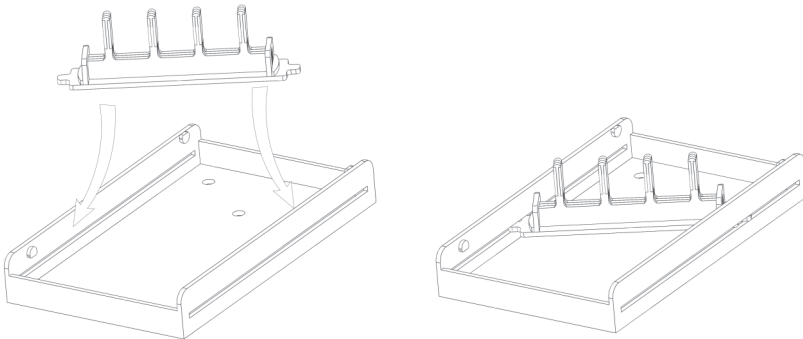
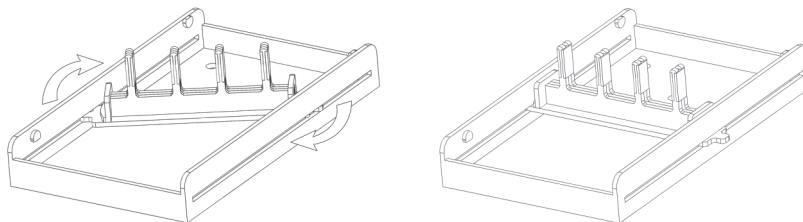


Fig. 2c.

Rotate the collector and set it to normal working position.



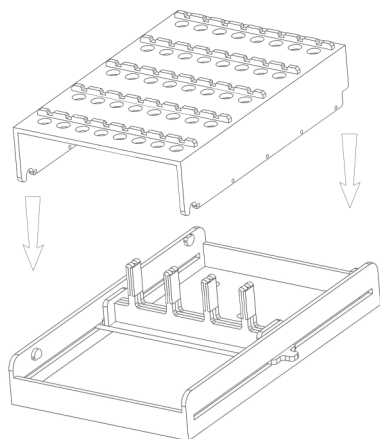
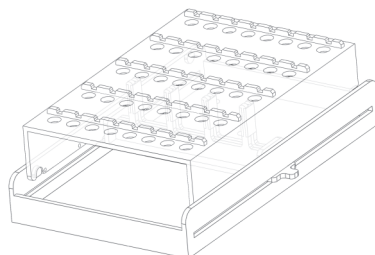


Fig. 2d.
Put the top transparent rack on the base. Tube strips with standard 1.5 ml tubes can be placed in this rack.



3.2. Working with the magnetic rack

To collect magnetic particles push/pull the magnetic collector towards the row of tubes that you wish to operate on. Collector's positioning assistance system will help to set the collector precisely on line with the row of tubes. Particles are separated very fast in the strong magnetic field of the collector. It must remain under the tubes during aspiration of a liquid phase. If the collector is moved away, the pellet of magnetic particles will be aspirated with the liquid. It is especially efficient to use a laboratory aspirator to remove the supernatant. But in a standard laboratory practice it can be done using a regular pipette with disposable plastic tips.

The collector must be moved away from the row of tubes when new solutions are added to the tubes or the the pellet of magnetic particles in the tubes is resuspended. The particles can be resuspended by manual pipetting. But it is much more efficient to use handheld laboratory mixer for achieving thorough resuspension.

If you use another devices, that has a compatible distance between tubes (18 mm between centers), strips, used with this magnetic rack, allow for easy transfer of tubes between such devices. It significantly optimizes and simplifies the work.

The top part of MagRack40 (transparent nonmagnetic rack) can be used as a standalone rack for tubes. It has special "combs" on its top surface that prevent tuber from rotating around the vertical axis during the work by holding the "stems" of the tubes' caps. It is especially usefull when using handheld mixer for resuspending particles, because the mixer transmits

its momentum to a tube when mixing. It can be very disturbing, when a tube starts rotating with the mixer when working with other racks that do not have such a protective feature.

When using the rack as a component of a modular complex and involving all its advantages, the work's productivity reaches its maximum and can be compared with the productivity of automated isolation complexes. The rack allows to process up to 40 samples in one isolation procedure. To optimize the sample treatment, special working schemes has to be designed. For example, a specific sequence of particles resuspension, incubation in a solution and separation can significantly increase efficiency of the whole isolation procedure. While the collector stays at one of the rows and the particles are being separated, samples in another row can be resuspended. When it is done, the particles at the collector are already separated and the liquid can be removed from these tubes and so on.

4. Troubleshooting

The tube is skewed in the rack

- Tube strip is not placed on the rack.

The rack is designed to work with tubes placed in strips. If the tube is set directly into the rack, it may be set not very tight and have some skew.

Difficulties during resuspension of magnetic particles

- The magnetic collector is not moved away from the tube.

The collector must be moved away from the row of tubes that is being processed when resuspending particles. Otherwise particles will be separated back from the suspension very fast.

The pellet of magnetic particles is captured when removing liquid phase

- The magnetic collector is not placed under the tube.

The collector must remain under the processed row of tubes during the whole procedure of discarding a supernatant. Physical properties of a particles pellet, produced by magnetic field, differ from a sorbent pellet, formed by centrifucation. The pellet of magnetic particles usually cannot remain on the tube wall if an external magnetic field is removed. The liquid phase must be removed in a magnetic field only.

Magnetic rack Sileks MagRack40

Sileks GmbH

phone: +49 7632-82-31964

fax: +49 7632-82-31996

e-mail: info@sileks.de

web: www.sileks.de

Read more about our product on our web-site. There you can find additional media information, video tutorials and new ideas for optimizing your work using our laboratory equipment.



<http://www.sileks.eu/shortlink/MagRack40>