



Thermo Scientific 10 x 5 mL Rotor

with ClickSeal Biocontainment Lid

for Microcentrifuges 17 / 21 Series

Instruction Manual

50146395-c • 07 / 2020

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WEEE Compliance

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU. It is marked with the following symbol:

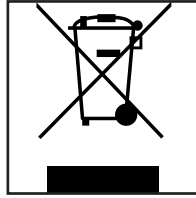


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Preface

Before starting to use a rotor, read through this instruction manual carefully and follow the instructions.

Failure to follow the instructions and safety information in this instruction manual will result in the expiration of the sellers warranty.

Intended Use

The rotor is used in combination with the according centrifuge as a laboratory product to separate substance mixtures of different densities.

If the rotor is used in a manner not specified by the manufacturer, the protection given by the equipment can decrease.

This rotor has to be operated by trained specialists only.

Precautions

To operate the Thermo Scientific™ 10 x 5 mL rotor safe, follow these general safety regulations:

- Do not remove components of the rotor.
- Do not use rotors which show any signs of corrosion and/or cracks. Do not touch the electronic components of the centrifuge and do not make any changes to the electronic or mechanical components.
- Use only with rotors which have been loaded properly.
- Never overload these rotors.
- Use only accessories which have been approved by Thermo Fisher Scientific. Exceptions to this rule are commercially available glass or plastic centrifuge tubes, provided they have been approved for the speed or the RCF value of the rotor.
- Observe the safety instructions.

Pay particular attention to the following aspects:

- Rotor installation: Check that the rotor is locked properly into place before operating the centrifuge.
- Always balance the samples.

Maximum sample density at maximum speed: $1.2 \frac{g}{cm^3}$

Symbols Used in the manual



This symbol refers to general hazards.

CAUTION means that material damage could occur.

WARNING means that injuries or material damage or contamination could occur.



This symbol refers to biological hazards.

Obey the safety information contained in the instruction manual to keep you and your environment safe.

Thermo Scientific Rotor Specifications

10 x 5 mL

Items Supplied

Article No.	Item	Quantity
75003465	10 x 5 mL Rotor	1
76003500	O-Ring Grease	1
75003405	O-Ring Set	1
50146395	Instruction Manual	1

If any parts are missing, please contact the nearest Thermo Fisher Scientific representative.

Technical Data

17 Series Microcentrifuges			
Centrifuge Frequency	230 V	120 V	100 V
Weight (empty)	0.5 kg	0.5 kg	0.5 kg
Maximum Permitted Load	10 x 9 g	10 x 9 g	10 x 9 g
Maximum Speed $n_{\max}$	13300 rpm	13300 rpm	13300 rpm
Maximum RCF-Value at $n_{\max}$	16414 x g	16414 x g	16414 x g
K-Factor at $n_{\max}$	975	975	975
Radius max. / min.	83 mm / 42 mm	83 mm / 42 mm	83 mm / 42 mm
Angle	41°	41°	41°
Acceleration / Braking Time	11 s / 12 s	11 s / 12 s	11 s / 12 s
Sample Temperature at Max. Speed (Ambient temperature of 23 °C, run time 90 minutes)	33 °C	33 °C	33 °C
Aerosol-tight	Yes	Yes	Yes
Permitted Autoclave Temperature	121 °C (20 Cycles)	121 °C (20 Cycles)	121 °C (20 Cycles)

21 Series Microcentrifuges			
Centrifuge Frequency	230 V	120 V	100 V
Weight (empty)	0.5 kg	0.5 kg	0.5 kg
Maximum Permitted Load	10 x 9 g	10 x 9 g	10 x 9 g
Maximum Speed $n_{\max}$	14800 rpm	14800 rpm	14800 rpm
Maximum RCF-Value at $n_{\max}$	20326 x g	20326 x g	20326 x g
K-Factor at $n_{\max}$	788	788	788
Radius max. / min.	83 mm / 42 mm	83 mm / 42 mm	83 mm / 42 mm
Angle	41°	41°	41°
Acceleration / Braking Time	13 s / 13 s	13 s / 13 s	13 s / 13 s
Sample Temperature at $n_{\max}$ (Ambient temperature of 23 °C, run time 60 minutes)	36 °C	36 °C	36 °C
Aerosol-tight	Yes	Yes	Yes
Permitted Autoclave Temperature	121 °C (20 Cycles)	121 °C (20 Cycles)	121 °C (20 Cycles)

17R Series Microcentrifuges			
Centrifuge Frequency	230 V	120 V	100 V
Weight (empty)	0.5 kg	0.5 kg	0.5 kg
Maximum Permitted Load	10 x 9 g	10 x 9 g	10 x 9 g
Maximum Speed $n_{\max}$	13300 rpm	13300 rpm	13300 rpm
Maximum RCF-Value at $n_{\max}$	16414 x g	16414 x g	16414 x g
K-Factor at $n_{\max}$	975	975	975
Radius max. / min.	83 mm / 42 mm	83 mm / 42 mm	83 mm / 42 mm
Angle	41°	41°	41°
Acceleration / Braking Time	10 s / 12 s	10 s / 12 s	10 s / 12 s
Sample Temperature at $n_{\max}$ (Ambient temperature of 23 °C, spin time 60 minutes)	≤ 0 °C	≤ 0 °C	≤ 0 °C
Aerosol-tight	Yes	Yes	Yes
Permitted Autoclave Temperature	121 °C (20 Cycles)	121 °C (20 Cycles)	121 °C (20 Cycles)

21R Series Microcentrifuges			
Centrifuge Frequency	230 V	120 V	100 V
Weight (empty)	0.5 kg	0.5 kg	0.5 kg
Maximum Permitted Load	10 x 9 g	10 x 9 g	10 x 9 g
Maximum Speed $n_{\max}$	14800 rpm	14800 rpm	14800 rpm
Maximum RCF-Value at $n_{\max}$	20326 x g	20326 x g	20326 x g
K-Factor at $n_{\max}$	788	788	788
Radius max. / min.	83 mm / 42 mm	83 mm / 42 mm	83 mm / 42 mm
Angle	41°	41°	41°
Acceleration / Braking Time	12 s / 13 s	12 s / 13 s	12 s / 13 s
Sample Temperature at $n_{\max}$ (Ambient temperature of 23 °C, run time 60 minutes)	≤ 0 °C	≤ 0 °C	≤ 0 °C
Aerosol-tight	Yes	Yes	Yes
Permitted Autoclave Temperature	121 °C (20 Cycles)	121 °C (20 Cycles)	121 °C (20 Cycles)

Operation

Before a Run

1. Read and observe the precautions and the safety instructions in this manual and in the instruction manual of the centrifuge.
2. Check the rotor and all accessory parts for damages such as cracks, scratches or traces of corrosion.
3. Check the rotor chamber, the centrifuge spindle and the Auto-Lock.
4. Check the rotor suitability. ([“Chemical Compatibility Chart”](#) on page 29)

Rotor Temperature Range

	CAUTION
Operate the rotor in a temperature range between -9 °C and +40 °C only. Pre-tempering the rotor in a freezer below -9 °C is not allowed.	

NOTICE
The rotors can warm up in ventilated centrifuges at high ambient temperatures. Temperature above 45 °C blood samples can be damaged. Let the rotor cool down between two runs.

Rotor Installation

	CAUTION
Unapproved or incorrectly combined accessories can cause serious damage to the centrifuge.	

Use the rotor only in centrifuges that are listed in this manual.

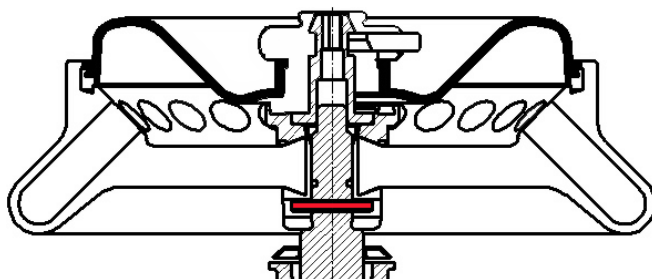
The wrench (20360104) is needed for the rotor installation.

Do not install the rotor when the temperature difference between shaft and rotor lock is >20 °C. Otherwise the rotor might jam during the installation.

Proceed as follows:

1. Open the door of the centrifuge and if necessary remove any dust, foreign objects or residue from the chamber.
Thread and O-ring must be clean and undamaged.
2. Turn the rotor so that the notch for the engaging the shaft points downwards.
3. Place the rotor onto the shaft so that the notch of the rotor is placed precisely above the retaining pin.

The two bars in the labeling on the upper side of the rotor indicate the position of the notch. These bars help you to position the rotor.



Examine the correct installation of the rotor. Lift it slightly on the handle or from below the rotor. If you can pull the rotor up, it must be reconnected to the centrifuge spindle.

Rotor Lid

Open

1. Place the rotor lid centered on the rotor nut.
2. Press the rotor lid down until you see and hear the lock closing.

If the lid cannot be closed at all or only by using force, check whether the O-rings are placed correctly. Clean and grease them if necessary. Check the lid mechanism for dirt and proper functionality. Damaged parts must be replaced immediately.

Close

1. Put the rotor lid on the rotor nut.
2. Push the rotor lid down until you see and hear the lock click.

If the lid does not close at all or only by force, make sure that the O-rings are correctly in position. Clean and lubricate them if necessary. Examine the lid mechanism for dirt and correct functionality. Replace Damaged parts immediately.

Operation without Lid

	WARNING
Loose parts might damage the centrifuge.	

If you plan to operate the rotor without the lid, please bear the following in mind:

- Remove the aerosol-tight seals. They are no longer fixed without the lid.
- Always close the tubes. The caps might tear off.

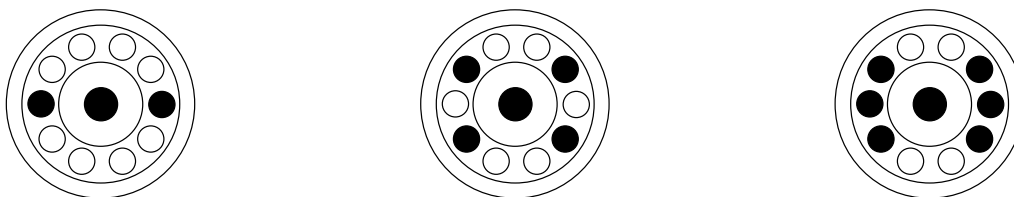
Rotor Loading

	CAUTION
Failure to load all buckets may lead to damage or accident. All buckets and sleeves must be in place before starting the rotor.	

Always balance opposite loads. Balance opposite loads in number of tubes and by position to ensure safe and smooth operation.

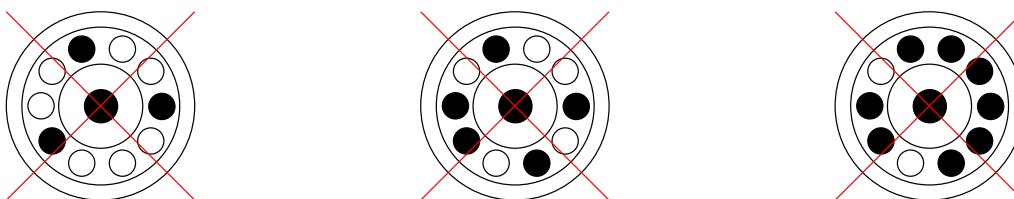
Correct Balances

Fixed Angle Rotors



Incorrect Balances

Fixed Angle Rotors



Maximum Loading

The rotor can run at high speeds. Each rotor is specifically designed to run at its maximum speed with a defined load. For further details please refer to the rotor manual supplied with the rotor.

The safety system of the centrifuge requires that you do not overload the rotor.

The rotors are designed to work with solution with a density of up to 1.2 g/ml. Above this density or if total load is above the maximum weight the following steps should be taken:

- Reduce the fill level.
- Reduce the speed.

Use the table or the formula:

$$n_{adm} = n_{max} \sqrt{\frac{\text{Maximum permissible Load}}{\text{Effective Load}}}$$

n_{adm} = admissible speed

n_{max} = maximum speed

Explanation of RCF-Value

The relative centrifugal force (RCF) is given as a multiple of the force of gravity g . It is a unitless numerical value which is used to compare the separation or sedimentation capacity of various centrifuges, since it is independent of the type of device. Only the centrifuging radius and the speed are used for calculation:

$$RCF = 11.18 \times \left(\frac{n}{1000}\right)^2 \times r$$

r = centrifuging radius in cm

n = rotational speed in rpm

The maximum RCF value is related to the maximum radius of the tube opening.

Remember that this value is reduced depending on the tubes and adapters used.

This can be accounted for in the calculation above if required.

Once the rotor has been properly installed, the main switch turned on and the centrifuge door closed, you may start centrifuging.

Use of Tubes and Consumables

Care should be taken to ensure that the tubes and bottles used in the centrifuge are:

- Rated to or above the selected rcf to be spun at;
- They are being used at or above their minimum fill volume;
- They are not being used above their design life (age or number of runs);
- They are inspected for damage;

Please refer to manufacturers data sheets for further information.

Rotor Lifetime

The rotor has no life-time restrictions. For safety reasons please bear the following in mind:

- UV rays reduce the stability of plastics. Do not subject the centrifuge, rotors and plastic accessories to direct sunlight.
- If the rotor shows signs of decoloration, deformation, wear or imbalance it must be replaced.



WARNING

Replace the rotor when the specified number of cycles is reached. Due to the mechanical load a rotor can break and damage the centrifuge. Replace the rotor and buckets when the specified number of cycles is reached.

The lifetime of rotors and buckets is dependent on the amount of mechanical load. Do not exceed the number of cycles recommended for rotors and buckets.

Service Life Examples

Usage profile	Maximum service life at 50,000 cycles
Frequent use 20 runs / day 220 days / year	7 years

Aerosol-tight Applications

Basic Principles

	CAUTION
Biological seals are part of bio-containment systems as specified in international and national bio-safety guidelines, and cannot be relied on as the only means of safeguarding workers and the environment when handling pathogenic micro-organisms. Mind the “Laboratory Biosafety Manual” of the World Health Organization (WHO) and the regulations in your country.	

	CAUTION
When centrifuging hazardous samples, do not open aerosol-tight rotors or buckets unless placed in a safety cabinet. Always bear in mind the maximum permitted fill levels.	

	WARNING
Be sure to check all seals before starting any aerosol-tight applications.	

Check that the sample containers are well suited for the desired centrifugation process.

Fill Level

The tubes are only to be filled to a level which ensures that the sample is unable to reach the top of the tube during centrifugation. Therefore, fill the tube only 2/3 of the rated level.

Checking the Aerosol-Tightness

The aerosol tightness testing of the rotors and buckets took place according to the microbiological test process in accordance with the EN 61010-2-020 Appendix AA.

Whether or not a rotor is aerosol-tight depends primarily on proper handling.

Check as needed to make sure your rotor is aerosol-tight.

The careful inspection of the seals and seal surfaces for signs of wear and damage such as cracks, scratches and embrittlement is extremely important.

Aerosol-tight applications are not possible if the bucket tops are open.

Aerosol-tightness requires the correct operation when filling the sample vessels and closing the rotor lid.

Quick Test

As a quick test, it is possible to test the aerosol-tight beaker and fixed-angle rotors using the following process:

1. Lubricate all seals lightly.

Always use the special grease (part no. 76003500) when lubricating the seals.

2. Fill the bucket or the rotor with approx. 10 ml of carbonated mineral water.
3. Close the rotor as explained in the handling instructions.
4. Shake the rotor vigorously using your hands.

This releases the carbonic acid gas which is bound in the water, resulting in excess pressure. Do not apply pressure to the lid when doing so!

Leaks can be detected by escaping water or the sound of escaping gas.

Replace the seals if you detect any leaks. Then repeat the test.

5. Dry the rotor, rotor cover and the cover seal.



CAUTION

Prior to each use, the seals in the rotor are to be inspected in order to assure that they are correctly seated and are not worn or damaged.

Damaged seals are to be replaced immediately.

Replacement seals are supplied with the rotors and can also be re-ordered as a spare parts set.

When loading the rotor, ensure that the rotor lid closes securely.

Damaged or clouded rotor covers are to be replaced immediately.

Removing of Aerosol-tight Rotors

For your protection when using an aerosol tight lid the rotor should only be removed with the lid closed.

Maintenance and Care

Cleaning Intervals

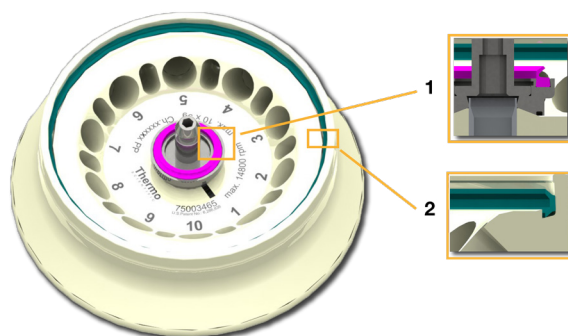
For the sake of personal, environmental, and material protection, it is your duty to clean and if necessary disinfect the centrifuge on a regular basis.

Maintenance	Recommended Interval
Rotor Chamber (Bowl)	Daily or when polluted
Rotor	Daily or when polluted
Accessories	Daily or when polluted

	CAUTION
Refrain from using any other cleaning or decontamination procedure than those recommended here, if you are not entirely sure that the intended procedure is safe for the equipment. Use only approved cleansers. If in doubt, contact Thermo Fisher Scientific.	

Replace Sealing

1. Grease the seals (75003405) before inserting.
2. Press the smaller V-seal into the groove of the rotor collar (1).
3. Press the larger C-seal in the outer groove of the rotor body (2).



Basics

	CAUTION
Not rated procedures or agents could deteriorate the materials of the centrifuge and lead to malfunction. Refrain from using any other cleaning or decontamination procedure than those recommended here, if you are not entirely sure that the intended procedure is safe for the equipment. Use only approved cleansers. If in doubt, contact Thermo Fisher Scientific.	

- Use warm water with a neutral detergent that is suitable for use with the materials of the centrifuge. If in doubt contact the manufacturer of the cleaning agents.
- Never use caustic cleaning agents such as soap suds, phosphoric acid, bleaching solutions or scrubbing powder.
- Remove rotor and clean bowl with a small amount of cleaning agent, applied to a clean cloth.
- Use a soft brush without metal bristles to remove stubborn residue.
- Afterwards rinse with a small amount of distilled water and remove any excess with absorbent towels.
- Use only disinfectants with a pH of 6-8.

Rotor and Accessories Inspection

After thoroughly cleaning rotors, they should be inspected for damage, wear and corrosion.

Metal Parts

Ensure that the black protective coating is complete. It can be removed through wear and chemical attack and can lead to unseen corruptions. Any signs of corruptions, such as rust or white / metallic pitting, the rotor or accessories should be immediately removed from service. Particular attention should be taken with the bottom of buckets on swing out rotors and tube cavities on fixed angle rotors.

Plastic Parts

Check for signs of plastic crazing, fading, bruising or cracking.

	CAUTION
Do not run any rotor or accessories with sign of damage. Ensure that the rotor, buckets and accessories are within the service life and number of cycles. It is recommend that you have rotors and accessories inspected yearly as part of your routine service to ensure safety.	

Cleaning

	CAUTION
Before using any cleaning methods except those recommended by the manufacturer, users should check with the manufacturer of the cleaning agents that the proposed method will not damage the equipment.	

Clean as follows:

1. Clean rotor, buckets and accessories outside of the centrifuge bowl.
2. Separate all rotors, buckets, lids, adapters and tubes to allow thorough cleaning.
3. Rinse rotor and all accessories with warm water and a neutral detergent that is suitable for use with the materials of the centrifuge. If in doubt contact the manufacturer of the cleaning agents. Ensure grease on rotor trunnions (pivot point for swinging buckets) is cleaned away.
4. Use a soft brush without metal bristles to remove stubborn residue.
5. Rinse rotor and all accessories with distilled water.
6. Place the rotors on a plastic grate with their cavities pointing down, to allow to fully drain and dry.
7. Dry all of the rotors and accessories after cleaning with a cloth or in a warm air cabinet at a maximum temperature of 50 °C. If drying boxes are used, the temperature must never exceed 50 °C, since higher temperatures could damage the material and shorten the lifetime of the parts.

Once clean and dry, inspect the rotor and accessories.

After cleaning, treat the entire surface of aluminum parts including the cavities with corrosion protection oil (70009824).

Treat the bolt of the swing out rotor with bolt grease (75003786).

	CAUTION
Drive and lid lock can be damaged by entering liquids. Do not allow liquids, especially organic solvents, to get on the drive shaft, the drive bearings or the centrifuge door locks.	
Organic solvents break down the grease in the motor bearing. The drive shaft could lock up.	

Disinfection



WARNING

A hazard of infection is possible when touching the contaminated rotor and centrifuge parts. Infectious material can get into the centrifuge when a tube breaks or as a result of spills.

In case of contamination, make sure that others are not put at risk.

Disinfect the affected parts immediately.



CAUTION

Equipment can be damaged by inappropriate disinfection methods or agents.

Before using any cleaning or disinfection methods except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment.

Observe the safety precautions and handling instructions for the cleaning agents used.

The rotor chamber and the rotor should be treated preferably with a neutral disinfectant.

Contact the Service Department of Thermo Fisher Scientific for questions regarding the use of other disinfectants.

For details check ["Basics" on page 18](#).

Disinfect as follows:

1. Disinfect rotor, buckets and accessories outside of the centrifuge bowl.
2. Separate all rotors, buckets, lids, adapters and tubes to allow thorough disinfection.
3. Treat the rotor and accessories according to the instructions for the disinfectant. Adhere strictly to the given application times.
Be sure the disinfectant can drain off the rotor.
4. Rinse the rotor and accessories thoroughly with water and then rub down.
5. Place the rotors on a plastic grate with their cavities pointing down, to allow to fully drain and dry.
6. Dispose the disinfectant according to the applicable guidelines.

Clean the rotor after disinfecting as described in ["Cleaning" on page 19](#).

Decontamination

	WARNING
Radiation is possible when touching the contaminated rotor and centrifuge parts. Radioactive material can get into the centrifuge when a tube breaks or as a result of spills. In case of contamination, make sure that others are not put at risk. Decontaminate the affected parts immediately.	

	CAUTION
Equipment can be damaged by inappropriate decontamination methods or agents. Before using any cleaning or decontamination methods except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment. Observe the safety precautions and handling instructions for the cleaning agents used.	

For general radioactive decontamination use a solution of equal parts of 70 % ethanol, 10 % SDS (Sodium Dodecyl Sulfate) and water.

Decontaminate as follows:

1. Decontaminate rotor, buckets and accessories outside of the centrifuge bowl.
2. Separate all rotors, buckets, lids, adapters and tubes to allow thorough decontamination.
3. Treat the rotor and accessories according to the instructions for the decontamination solution. Adhere strictly to the given application times.
Be sure the decontamination solution can drain off the rotor.
4. Rinse the rotor first with ethanol and then with deionized water.
Adhere strictly to the given application times.
5. Be sure the decontamination solution can drain off the rotor.
6. Rinse the rotor and accessories thoroughly with water.
7. Place the rotors on a plastic grate with their cavities pointing down, to allow to fully drain and dry.
8. Dispose of the decontamination solution according to the applicable guidelines.
Clean the rotor after disinfecting as described in [“Cleaning” on page 19](#).

Autoclaving

	CAUTION
Never exceed the permitted temperature and duration when autoclaving.	

NOTE
No chemical additives are permitted in the steam.

1. Before autoclaving clean rotor and accessories as described above.
2. Place the rotor on a flat surface.
 - Rotors and adapters can be autoclaved at 121 °C.
 - The maximum permissible autoclave cycle is 20 minutes at 121 °C.

Clean the rotor before autoclaving and rinse it with distilled water. Remove all accessories (tubes, adapters) from the rotor. Place the rotor on a flat surface.

Service of Thermo Fisher Scientific

Thermo Fisher Scientific recommends having the centrifuge and accessories serviced once a year by an authorized service technician. The service technicians check the following:

- electrical equipment safety;
- suitability of the set-up site;
- door lock, imbalance and safety system;
- rotor;
- fixation of rotor and drive shaft.

Before service, centrifuge and rotors should be thoroughly cleaned and decontaminated to ensure full and safe inspection can be completed.

Thermo Fisher Scientific offers inspection and service contracts for this work. Any necessary repairs are performed for free during the warranty period and afterwards for a charge.

This is only valid if the centrifuge has only been maintained by an authorized Thermo Scientific service technician.

Storage

Any moisture left on a metal rotor can initiate corrosion, so after cleaning ensure proper storage:

- Remove all adapters from rotor cavities when not in use.
- Dry and store upside-down on a plastic matting to allow for airflow or a ventilated shelf to avoid gathering condensation in the cavity or bucket bottom.

Shipping and Disposal



WARNING

When removing the centrifuge and accessories from use for disposal you have to clean and if necessary disinfect or decontaminate the entire system. In doubt contact the Thermo Fisher Scientific customer service.

For the disposal of the centrifuge mind the regulations in your country, contact the Thermo Fisher Scientific Customer Service for the disposal of the centrifuge. For contact information check the backpage of this manual or visit www.thermofisher.com/centrifuge.

For the countries of the European Union the disposal is regulated by the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2012/19/EU. ("WEEE Compliance" on page 2)



RCF-Values

Speed (rpm)	Radius min	Radius max	RCF R _{min}	RCF R _{max}
300	4.2	8.3	4	8
400	4.2	8.3	8	15
500	4.2	8.3	12	23
600	4.2	8.3	17	33
700	4.2	8.3	23	45
800	4.2	8.3	30	59
900	4.2	8.3	38	75
1000	4.2	8.3	47	93
1100	4.2	8.3	57	112
1200	4.2	8.3	68	134
1300	4.2	8.3	79	157
1400	4.2	8.3	92	182
1500	4.2	8.3	106	209
1600	4.2	8.3	120	238
1700	4.2	8.3	136	268
1800	4.2	8.3	152	301
1900	4.2	8.3	170	335
2000	4.2	8.3	188	371
2100	4.2	8.3	207	409
2200	4.2	8.3	227	449
2300	4.2	8.3	248	491
2400	4.2	8.3	270	534
2500	4.2	8.3	293	580
2600	4.2	8.3	317	627
2700	4.2	8.3	342	676
2800	4.2	8.3	368	728
2900	4.2	8.3	395	780
3000	4.2	8.3	423	835
3100	4.2	8.3	451	892
3200	4.2	8.3	481	950
3300	4.2	8.3	511	1011
3400	4.2	8.3	543	1073
3500	4.2	8.3	575	1137
3600	4.2	8.3	609	1203
3700	4.2	8.3	643	1270
3800	4.2	8.3	678	1340
3900	4.2	8.3	714	1411
4000	4.2	8.3	751	1485

Speed (rpm)	Radius min	Radius max	RCF R _{min}	RCF R _{max}
4100	4.2	8.3	789	1560
4200	4.2	8.3	828	1637
4300	4.2	8.3	868	1716
4400	4.2	8.3	909	1796
4500	4.2	8.3	951	1879
4600	4.2	8.3	994	1964
4700	4.2	8.3	1037	2050
4800	4.2	8.3	1082	2138
4900	4.2	8.3	1127	2228
5000	4.2	8.3	1174	2320
5100	4.2	8.3	1221	2414
5200	4.2	8.3	1270	2509
5300	4.2	8.3	1319	2607
5400	4.2	8.3	1369	2706
5500	4.2	8.3	1420	2807
5600	4.2	8.3	1473	2910
5700	4.2	8.3	1526	3015
5800	4.2	8.3	1580	3122
5900	4.2	8.3	1635	3230
6000	4.2	8.3	1690	3341
6100	4.2	8.3	1747	3453
6200	4.2	8.3	1805	3567
6300	4.2	8.3	1864	3683
6400	4.2	8.3	1923	3801
6500	4.2	8.3	1984	3921
6600	4.2	8.3	2045	4042
6700	4.2	8.3	2108	4166
6800	4.2	8.3	2171	4291
6900	4.2	8.3	2236	4418
7000	4.2	8.3	2301	4547
7100	4.2	8.3	2367	4678
7200	4.2	8.3	2434	4810
7300	4.2	8.3	2502	4945
7400	4.2	8.3	2571	5081
7500	4.2	8.3	2641	5220
7600	4.2	8.3	2712	5360
7700	4.2	8.3	2784	5502
7800	4.2	8.3	2857	5646
7900	4.2	8.3	2931	5791
8000	4.2	8.3	3005	5939
8100	4.2	8.3	3081	6088
8200	4.2	8.3	3157	6239
8300	4.2	8.3	3235	6393
8400	4.2	8.3	3313	6548
8500	4.2	8.3	3393	6704
8600	4.2	8.3	3473	6863
8700	4.2	8.3	3554	7024
8800	4.2	8.3	3636	7186
8900	4.2	8.3	3719	7350

Speed (rpm)	Radius min	Radius max	RCF R _{min}	RCF R _{max}
9000	4.2	8.3	3803	7516
9100	4.2	8.3	3888	7684
9200	4.2	8.3	3974	7854
9300	4.2	8.3	4061	8026
9400	4.2	8.3	4149	8199
9500	4.2	8.3	4238	8375
9600	4.2	8.3	4327	8552
9700	4.2	8.3	4418	8731
9800	4.2	8.3	4510	8912
9900	4.2	8.3	4602	9095
10000	4.2	8.3	4696	9279
10100	4.2	8.3	4790	9466
10200	4.2	8.3	4885	9654
10300	4.2	8.3	4982	9845
10400	4.2	8.3	5079	10037
10500	4.2	8.3	5177	10231
10600	4.2	8.3	5276	10426
10700	4.2	8.3	5376	10624
10800	4.2	8.3	5477	10823
10900	4.2	8.3	5579	11025
11000	4.2	8.3	5682	11228
11100	4.2	8.3	5785	11433
11200	4.2	8.3	5890	11640
11300	4.2	8.3	5996	11849
11400	4.2	8.3	6102	12060
11500	4.2	8.3	6210	12272
11600	4.2	8.3	6318	12486
11700	4.2	8.3	6428	12703
11800	4.2	8.3	6538	12921
11900	4.2	8.3	6649	13141
12000	4.2	8.3	6762	13362
12100	4.2	8.3	6875	13586
12200	4.2	8.3	6989	13811
12300	4.2	8.3	7104	14039
12400	4.2	8.3	7220	14268
12500	4.2	8.3	7337	14499
12600	4.2	8.3	7455	14732
12700	4.2	8.3	7574	14967
12800	4.2	8.3	7693	15203
12900	4.2	8.3	7814	15442
13000	4.2	8.3	7936	15682
13100	4.2	8.3	8058	15924
13200	4.2	8.3	8182	16168
13300	4.2	8.3	8306	16414
13400	4.2	8.3	8431	16662
13500	4.2	8.3	8558	16912
13600	4.2	8.3	8685	17163
13700	4.2	8.3	8813	17417

Speed (rpm)	Radius min	Radius max	RCF R _{min}	RCF R _{max}
13800	4.2	8.3	8942	17672
13900	4.2	8.3	9072	17929
14000	4.2	8.3	9203	18188
14100	4.2	8.3	9335	18448
14200	4.2	8.3	9468	18711
14300	4.2	8.3	9602	18975
14400	4.2	8.3	9737	19242
14500	4.2	8.3	9872	19510
14600	4.2	8.3	10009	19780
14700	4.2	8.3	10147	20052
14800	4.2	8.3	10285	20326

Chemical Compatibility Chart

CHEMICAL	MATERIAL	ALUMINUM	ANODIC COATING for ALUMINUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELRI TM	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORLY TM	NYLON	PET ¹ , POLYCLEAR TM , CLEARCRIMP TM	POLYALLUMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYETHERIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A TM , TEFLON TM	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON TM	VITON TM
2-mercaptoethanol		S	S	U	/	S	M	S	/	S	U	S	S	U	S	S	/	S	S	S	S	U	S	S	S	S	S	S
Acetaldehyde		S	/	U	U	/	/	/	M	/	U	/	/	/	M	U	U	U	M	M	/	M	S	U	/	S	/	U
Acetone		M	S	U	U	S	U	M	S	S	U	U	S	U	S	U	U	U	S	S	U	U	S	M	M	S	U	U
Acetonitrile		S	S	U	/	S	M	S	/	S	S	U	S	U	M	U	U	/	S	M	U	U	S	S	S	S	U	U
Alconox TM		U	U	S	/	S	S	S	/	S	S	S	S	S	S	M	S	S	S	S	S	S	S	S	S	S	S	U
Allyl Alcohol		/	/	/	U	/	/	S	/	/	/	/	S	/	S	S	M	S	S	S	/	M	S	/	/	S	/	/
Aluminum Chloride		U	U	S	S	S	S	U	S	S	S	S	M	S	S	S	S	/	S	S	S	S	S	M	U	U	S	S
Formic Acid (100 %)		/	S	M	U	/	/	U	/	/	/	/	U	/	S	M	U	U	S	S	/	U	S	/	U	S	/	U
Ammonium Acetate		S	S	U	/	S	S	S	/	S	S	S	S	S	S	S	U	/	S	S	S	S	S	S	S	S	S	S
Ammonium Carbonate		M	S	U	S	S	S	S	S	S	S	S	S	S	S	U	U	/	S	S	S	S	S	S	M	S	S	S
Ammonium Hydroxide (10 %)		U	U	S	U	S	S	M	S	S	S	S	S	/	S	U	M	S	S	S	S	S	S	S	S	S	M	S
Ammonium Hydroxide (28 %)		U	U	S	U	S	U	M	S	S	S	S	S	U	S	U	M	S	S	S	S	S	S	S	S	S	M	S
Ammonium Hydroxide (conc.)		U	U	U	U	S	U	M	S	/	S	/	S	U	S	U	U	S	S	S	/	M	S	S	S	S	/	U
Ammonium Phosphate		U	/	S	/	S	S	S	S	S	S	S	S	/	S	S	M	/	S	S	S	S	S	S	M	S	S	S
Ammonium Sulfate		U	M	S	/	S	S	U	S	S	S	S	S	S	S	S	S	/	S	S	S	S	S	S	U	S	S	U
Amyl Alcohol		S	/	M	U	/	/	S	S	/	M	/	S	/	M	S	S	S	S	M	/	/	/	U	/	S	/	M
Aniline		S	S	U	U	S	U	S	M	S	U	U	U	U	U	U	U	/	S	M	U	U	S	S	S	S	U	S
Sodium Hydroxide (<1 %)		U	/	M	S	S	S	/	/	S	M	S	S	/	S	M	M	S	S	S	S	S	S	M	S	S	/	U
Sodium Hydroxide (10 %)		U	/	M	U	/	/	U	/	M	M	S	S	U	S	U	U	S	S	S	S	S	S	M	S	S	/	U
Barium Salts		M	U	S	/	S	S	S	S	S	S	S	S	S	S	S	M	/	S	S	S	S	S	S	M	S	S	S
Benzene		S	S	U	U	S	U	M	U	S	U	U	S	U	U	U	M	U	M	U	U	U	S	U	U	S	U	S
Benzyl Alcohol		S	/	U	U	/	/	M	M	/	M	/	S	U	U	U	U	U	U	U	/	M	S	M	/	S	/	S
Boric Acid		U	S	S	M	S	S	U	S	S	S	S	S	S	S	S	S	U	S	S	S	S	S	S	S	S	S	S
Cesium Acetate		M	/	S	/	S	S	S	/	S	S	S	S	/	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Cesium Bromide		M	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Cesium Chloride		M	S	S	U	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S

CHEMICAL	MATERIAL	ALUMINIUM	ANODIC COATING for ALUMINIUM	BUNAN	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELFIN™	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL™	NYLON	PET ¹ , POLYCLEAR™, CLEARCRIMP™	POLYALLOMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYMERIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A™, TEFLON™	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON™	VITON™
Cesium Formate		M	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Cesium Iodide		M	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Cesium Sulfate		M	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Chloroform		U	U	U	U	S	S	M	U	S	U	U	M	U	M	U	U	U	M	M	U	U	S	U	U	U	M	S
Chromic Acid (10 %)		U	/	U	U	S	U	U	/	S	S	S	U	S	S	M	U	M	S	S	U	M	S	M	U	S	S	S
Chromic Acid (50 %)		U	/	U	U	/	U	U	/	/	/	S	U	U	S	M	U	M	S	S	U	M	S	/	U	M	/	S
Cresol Mixture		S	S	U	/	/	/	S	/	S	U	U	U	U	U	U	/	/	U	U	/	U	S	S	S	S	U	S
Cyclohexane		S	S	S	/	S	S	S	U	S	U	S	S	U	U	U	M	S	M	U	M	M	S	U	M	M	U	S
Deoxycholate		S	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	S	S	S	S
Distilled Water		S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Dextran		M	S	S	S	S	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	S	S	S
Diethyl Ether		S	S	U	U	S	S	S	U	S	U	U	S	U	U	U	U	U	U	U	U	U	S	S	S	S	M	U
Diethyl Ketone		S	/	U	U	/	/	M	/	S	U	/	S	/	M	U	U	U	M	M	/	U	S	/	/	S	U	U
Diethylpyro-carbonate		S	S	U	/	S	S	S	/	S	S	U	S	U	S	U	/	/	S	S	S	M	S	S	S	S	S	S
Dimethylsulfoxide		S	S	U	U	S	S	S	/	S	U	S	S	U	S	U	U	/	S	S	U	U	S	S	S	S	U	U
Dioxane		M	S	U	U	S	S	M	M	S	U	U	S	U	M	U	U	/	M	M	M	U	S	S	S	S	U	U
Ferric Chloride		U	U	S	/	/	/	M	S	/	M	/	S	/	S	/	/	/	S	S	/	/	/	M	U	S	/	S
Acetic Acid (Glacial)		S	S	U	U	S	S	U	M	S	U	S	U	U	U	U	U	M	S	U	M	U	S	U	U	S	/	U
Acetic Acid (5 %)		S	S	M	S	S	S	M	S	S	S	S	S	M	S	S	S	S	S	S	S	M	S	S	M	S	S	M
Acetic Acid (60 %)		S	S	U	U	S	S	U	/	S	M	S	U	U	M	U	S	M	S	M	S	M	S	M	U	S	M	U
Ethyl Acetate		M	M	U	U	S	S	M	M	S	S	U	S	U	M	U	U	/	S	S	U	U	S	M	M	S	U	U
Ethyl Alcohol (50 %)		S	S	S	S	S	S	M	S	S	S	S	S	U	S	U	S	S	S	S	S	S	S	S	M	S	M	U
Ethyl Alcohol (95 %)		S	S	S	U	S	S	M	S	S	S	S	S	U	S	U	/	S	S	S	M	S	S	S	U	S	M	U
Ethylene Dichloride		S	/	U	U	/	/	S	M	/	U	U	S	U	U	U	U	U	U	U	/	U	S	U	/	S	/	S
Ethylene Glycol		S	S	S	S	S	S	S	S	S	S	S	S	/	S	U	S	S	S	S	S	S	S	S	M	S	M	S
Ethylene Oxide Vapor		S	/	U	/	/	U	/	/	S	U	/	S	/	S	M	/	/	S	S	S	U	S	U	S	S	S	U
Ficoll-Hypaque™		M	S	S	/	S	S	S	/	S	S	S	S	/	S	S	/	S	S	S	S	S	S	S	M	S	S	S
Hydrofluoric Acid (10 %)		U	U	U	M	/	/	U	/	/	U	U	S	/	S	M	U	S	S	S	S	M	S	U	U	U	/	/
Hydrofluoric Acid (50 %)		U	U	U	U	/	/	U	/	/	U	U	U	U	S	U	U	U	S	S	M	M	S	U	U	U	/	M
Hydrochloric Acid (conc.)		U	U	U	U	/	U	U	M	/	U	M	U	U	M	U	U	U	/	S	/	U	S	U	U	U	/	/
Formaldehyde (40 %)		M	M	M	S	S	S	S	M	S	S	S	S	M	S	S	S	U	S	S	M	S	S	S	M	S	M	U
Glutaraldehyde		S	S	S	S	/	/	S	/	S	S	S	S	S	S	S	/	/	S	S	S	/	/	S	S	S	/	/
Glycerol		M	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	/	S	S	S	S	S	S	S	S	S	S
Guanidine Hydrochloride		U	U	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	U	S	S	S
Haemo-Sol™		S	S	S	/	/	/	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	S	S	S	S
Hexane		S	S	S	/	S	S	S	/	S	S	U	S	U	M	U	S	S	U	S	S	M	S	U	S	S	U	S

CHEMICAL	MATERIAL	ALUMINIUM	ANODIC COATING for ALUMINIUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELFIN™	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL™	NYLON	PET*, POLYCLEAR™, CLEARCRIMP™	POLYALLOMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYIMIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A™, TEFLON™	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON™	VITON™
Isobutyl Alcohol		/	/	M	U	/	/	S	S	/	U	/	S	U	S	S	M	S	S	S	/	S	S	S	/	S	/	S
Isopropyl Alcohol		M	M	M	U	S	S	S	S	S	U	S	S	U	S	U	M	S	S	S	S	S	S	S	M	M	M	S
Iodoacetic Acid		S	S	M	/	S	S	S	/	S	M	S	S	M	S	S	/	M	S	S	S	S	S	M	S	S	M	M
Potassium Bromide		U	S	S	/	S	S	S	/	S	S	S	S	S	S	S	S	S	S	S	/	S	S	S	M	S	S	S
Potassium Carbonate		M	U	S	S	S	S	S	/	S	S	S	S	S	S	U	S	S	S	S	S	S	S	S	S	S	S	S
Potassium Chloride		U	S	S	/	S	S	S	S	S	S	S	S	S	S	S	/	S	S	S	S	S	S	S	U	S	S	S
Potassium Hydroxide (5 %)		U	U	S	S	S	S	M	/	S	S	S	S	/	S	U	S	S	S	S	S	S	S	M	U	M	S	U
Potassium Hydroxide (conc.)		U	U	M	U	/	/	M	/	M	S	S	/	U	M	U	U	U	S	M	/	M	U	/	U	U	/	U
Potassium Permanganate		S	S	S	/	S	S	S	/	S	S	S	U	S	S	S	M	/	S	M	S	U	S	S	M	S	U	S
Calcium Chloride		M	U	S	S	S	S	S	S	S	S	S	S	S	S	M	S	/	S	S	S	S	S	S	M	S	S	S
Calcium Hypochlorite		M	/	U	/	S	M	M	S	/	M	/	S	/	S	M	S	/	S	S	S	M	S	M	U	S	/	S
Kerosene		S	S	S	/	S	S	S	U	S	M	U	S	U	M	M	S	/	M	M	M	S	S	U	S	S	U	S
Sodium Chloride (10 %)		S	/	S	S	S	S	S	/	/	/	/	S	S	S	S	S	/	S	S	S	S	/	S	S	M	/	S
Sodium Chloride (sat'd)		U	/	S	U	S	S	S	/	/	/	/	S	S	S	S	S	/	S	S	/	S	/	S	S	M	/	S
Carbon Tetrachloride		U	U	M	S	S	U	M	U	S	U	U	S	U	M	U	S	S	M	M	S	M	M	M	M	U	S	S
Aqua Regia		U	/	U	U	/	/	U	/	/	/	/	/	U	U	U	U	U	U	U	/	/	/	/	/	S	/	M
Solution 555 (20 %)		S	S	S	/	/	/	S	/	S	S	S	S	S	S	S	/	/	S	S	S	/	S	S	S	S	S	S
Magnesium Chloride		M	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	S	S	S
Mercaptoacetic Acid		U	S	U	/	S	M	S	/	S	M	S	U	U	U	U	/	S	U	U	S	M	S	U	S	S	S	S
Methyl Alcohol		S	S	S	U	S	S	M	S	S	S	S	S	U	S	U	M	S	S	S	S	S	S	S	M	S	M	U
Methylene Chloride		U	U	U	U	M	S	S	U	S	U	U	S	U	U	U	U	U	M	U	U	U	S	S	M	U	S	U
Methyl Ethyl Ketone		S	S	U	U	S	S	M	S	S	U	U	S	U	S	U	U	U	S	S	U	U	S	S	S	S	U	U
Metrizamide™		M	S	S	/	S	S	S	/	S	S	S	S	/	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Lactic Acid (100 %)		/	/	S	/	/	/	/	/	/	M	S	U	/	S	S	S	M	S	S	/	M	S	M	S	S	/	S
Lactic Acid (20 %)		/	/	S	S	/	/	/	/	/	M	S	M	/	S	S	S	S	S	S	S	M	S	M	S	S	/	S
N-Butyl Alcohol		S	/	S	U	/	/	S	/	/	S	M	/	U	S	M	S	S	S	S	M	M	S	M	/	S	/	S
N-Butyl Phthalate		S	S	U	/	S	S	S	/	S	U	U	S	U	U	U	M	/	U	U	S	U	S	M	M	S	U	S
N, N-Dimethyl-formamide		S	S	S	U	S	M	S	/	S	S	U	S	U	S	U	U	/	S	S	U	U	S	M	S	S	S	U
Sodium Borate		M	S	S	S	S	S	S	S	S	S	S	U	S	S	S	S	/	S	S	S	S	S	S	M	S	S	S
Sodium Bromide		U	S	S	/	S	S	S	/	S	S	S	S	S	S	S	S	/	S	S	S	S	S	S	M	S	S	S
Sodium Carbonate (2 %)		M	U	S	S	S	S	S	S	S	S	S	S	S	S	U	S	S	S	S	S	S	S	S	S	S	S	S

CHEMICAL	MATERIAL	ALUMINIUM	ANODIC COATING for ALUMINIUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELFIN™	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL™	NYLON	PET*, POLYCLEAR™, CLEARCRIMP™	POLYALLOMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYIMIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A™, TEFLON™	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON™	VITON™
Sodium Dodecyl Sulfate		S	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	S	S	S	S	S	S	S	S	S	S	S
Sodium Hypochlorite (5 %)		U	U	M	S	S	M	U	S	S	M	S	S	S	M	S	S	S	S	M	S	S	S	M	U	S	M	S
Sodium Iodide		M	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Sodium Nitrate		S	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	/	S	S	S	S	S	U	S	S	S	S
Sodium Sulfate		U	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	S	S	S
Sodium Sulfide		S	/	S	S	/	/	/	S	/	/	/	S	S	S	U	U	/	/	S	/	/	/	S	S	M	/	S
Sodium Sulfite		S	S	S	/	S	S	S	S	M	S	S	S	S	S	S	M	/	S	S	S	S	S	S	S	S	S	S
Nickel Salts		U	S	S	S	S	S	/	S	S	S	/	/	S	S	S	S	/	S	S	S	S	S	S	M	S	S	S
Oils (Petroleum)		S	S	S	/	/	/	S	U	S	S	S	S	U	U	M	S	M	U	U	S	S	S	U	S	S	S	S
Oils (Other)		S	/	S	/	/	/	S	M	S	S	S	S	U	S	S	S	S	U	S	S	S	S	/	S	S	M	S
Oleic Acid		S	/	U	S	S	S	U	U	S	U	S	S	M	S	S	S	S	S	S	S	S	S	M	U	S	M	M
Oxalic Acid		U	U	M	S	S	S	U	S	S	S	S	S	U	S	U	S	S	S	S	S	S	S	S	U	M	S	S
Perchloric Acid (10 %)		U	/	U	/	S	U	U	/	S	M	M	/	/	M	U	M	S	M	M	/	M	S	U	/	S	/	S
Perchloric Acid (70 %)		U	U	U	/	/	U	U	/	S	U	M	U	U	M	U	U	U	M	M	U	M	S	U	U	S	U	S
Phenol (5 %)		U	S	U	/	S	M	M	/	S	U	M	U	U	S	U	M	S	M	S	U	U	S	U	M	M	M	S
Phenol (50 %)		U	S	U	/	S	U	M	/	S	U	M	U	U	U	U	U	S	U	M	U	U	S	U	U	U	M	S
Phosphoric Acid (10 %)		U	U	M	S	S	S	U	S	S	S	S	U	/	S	S	S	S	S	S	S	S	S	U	M	U	S	S
Phosphoric Acid (conc.)		U	U	M	M	/	/	U	S	/	M	S	U	U	M	M	S	S	S	M	S	M	S	U	M	U	/	S
Physiologic Media (Serum, Urine)		M	S	S	S	/	/	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Picric Acid		S	S	U	/	S	M	S	S	S	M	S	U	S	S	S	U	S	S	S	S	U	S	U	M	S	M	S
Pyridine (50 %)		U	S	U	U	S	U	U	/	U	S	S	U	U	M	U	U	/	U	S	M	U	S	S	U	U	U	U
Rubidium Bromide		M	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Rubidium Chloride		M	S	S	/	S	S	S	/	S	S	S	S	S	S	S	/	/	S	S	S	S	S	S	M	S	S	S
Sucrose		M	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sucrose, Alkaline		M	S	S	/	S	S	S	/	S	S	S	S	S	S	U	S	S	S	S	S	S	S	S	M	S	S	S
Sulfosalicylic Acid		U	U	S	S	S	S	S	/	S	S	S	U	S	S	S	/	S	S	S	/	S	S	S	U	S	S	S
Nitric Acid (10 %)		U	S	U	S	S	U	U	/	S	U	S	U	/	S	S	S	S	S	S	S	S	S	M	S	S	S	S
Nitric Acid (50 %)		U	S	U	M	S	U	U	/	S	U	S	U	U	M	M	U	M	M	M	S	S	S	U	S	S	M	S
Nitric Acid (95 %)		U	/	U	U	/	U	U	/	/	U	U	U	U	M	U	U	U	U	M	U	U	S	U	S	S	/	S
Hydrochloric Acid (10 %)		U	U	M	S	S	S	U	/	S	S	S	U	U	S	U	S	S	S	S	S	S	S	S	U	M	S	S
Hydrochloric Acid (50 %)		U	U	U	U	S	U	U	/	S	M	S	U	U	M	U	U	S	S	S	S	M	S	M	U	U	M	M
Sulfuric Acid (10 %)		M	U	U	S	S	U	U	/	S	S	M	U	S	S	S	S	S	S	S	S	S	S	U	U	U	S	S
Sulfuric Acid (50 %)		M	U	U	U	S	U	U	/	S	S	M	U	U	S	U	U	M	S	S	S	S	S	U	U	U	M	S
Sulfuric Acid (conc.)		M	U	U	U	/	U	U	M	/	/	M	U	U	S	U	U	U	M	S	U	M	S	U	U	U	/	S
Stearic Acid		S	/	S	/	/	/	S	M	S	S	S	S	/	S	S	S	S	S	S	S	S	S	M	M	S	S	S
Tetrahydrofuran		S	S	U	U	S	U	U	M	S	U	U	S	U	U	U	/	M	U	U	U	U	S	U	S	S	U	U

CHEMICAL	MATERIAL	ALUMINIUM	ANODIC COATING for ALUMINIUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELRIN™	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL™	NYLON	PET ¹ , POLYCLEAR™, CLEARCRIMP™	POLYALLOMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYTHERMIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A™, TEFLON™	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON™	VITON™
Toluene		S	S	U	U	S	S	M	U	S	U	U	S	U	U	U	S	U	M	U	U	U	S	U	S	U	U	M
Trichloroacetic Acid		U	U	U	/	S	S	U	M	S	U	S	U	U	S	M	/	M	S	S	U	U	S	U	U	U	M	U
Trichloroethane		S	/	U	/	/	/	M	U	/	U	/	S	U	U	U	U	U	U	U	U	U	S	U	/	S	/	S
Trichloroethylene		/	/	U	U	/	/	/	U	/	U	/	S	U	U	U	U	U	U	U	U	U	S	U	/	U	/	S
Trisodium Phosphate		/	/	/	S	/	/	M	/	/	/	/	/	/	S	/	/	S	S	S	/	/	S	/	/	S	/	S
Tris Buffer (neutral pH)		U	S	S	S	S	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Triton X/100™		S	S	S	/	S	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Urea		S	/	U	S	S	S	S	/	/	/	/	S	S	S	M	S	S	S	S	/	S	S	S	M	S	/	S
Hydrogen Peroxide (10 %)		U	U	M	S	S	U	U	/	S	S	S	U	S	S	S	M	U	S	S	S	S	S	S	M	S	U	S
Hydrogen Peroxide (3 %)		S	M	S	S	S	/	S	/	S	S	S	S	S	S	S	S	M	S	S	S	S	S	S	S	S	S	S
Xylene		S	S	U	S	S	S	M	U	S	U	U	U	U	U	U	M	U	M	U	U	U	S	U	M	S	U	S
Zinc Chloride		U	U	S	S	S	S	U	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	U	S	S	S
Zinc Sulfate		U	S	S	/	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Citric Acid (10 %)		M	S	S	M	S	S	M	S	S	S	S	S	S	S	S	S	M	S	S	S	S	S	S	S	S	S	S

¹Polyethyleneterephthalate**Key**

S – Satisfactory.

M – Moderate attack, may be satisfactory for use in centrifuge depending on length of exposure, speed involved, etc.; suggest testing under actual conditions of use.

U – Unsatisfactory, not recommended.

/ – Performance unknown; suggest testing, using sample to avoid loss of valuable material.

NOTICE

Chemical resistance data is included only as a guide to product use. Because no organized chemical compatibility data exists for materials under the stress of centrifugation, when in doubt we recommend pretesting sample lots.

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Shown pictures within the manual are examples and may differ considering the set parameters and language. Pictures of the user interface within the manual are showing the English version as example.

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