



Thermo Fisher Scientific

HIGHConic II

Instruction Manual

50120039-4

October 2009

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Centre of Emergency Preparedness and Response
Health Protection Agency
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United Kingdom



Certificate of Containment Testing

Containment Testing of Thermo Scientific rotor 75003620

Report No. 59-08 F

Report prepared for: Thermo Fisher
Issue Date: 15th January 2009

Test Summary

A Thermo Scientific 75003620 contained rotor (Max speed 10,350 rpm) was supplied by Thermo Fisher and containment tested at 10,350 rpm, using the method described in Annex AA of EN 61010-2-020. The rotor was shown to contain a spill when tested in triplicate.

Report Written By

A handwritten signature in blue ink, written over a horizontal dashed line.

Report Authorised By

A handwritten signature in blue ink, written over a horizontal dashed line, followed by the date "(28/1/09)" in parentheses.

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Preface

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

The information contained in these instruction manual is the property of Thermo Fisher Scientific; it is forbidden to copy or pass on this information without explicit approval.

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

Scope of Supply

Article Number		Quantity	Check
75003620	HIGHConic II	1	<input type="checkbox"/>
76003500	Rubber seal grease	1	<input type="checkbox"/>
70009824	Anti-corrosion oil	1	<input type="checkbox"/>
50120039	Instruction Manual	1	<input type="checkbox"/>

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

Precautions

In order to ensure safe operation of the HIGHConic II, the following general safety regulations must be followed:

- Do not remove the magnet at the rotor bottom
- Do not use rotors which show any signs of corrosion and/or cracks.
- Use only with rotors that have been loaded properly.
- Never overload the rotor.

Preface

- 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.
- Please observe the safety instructions.

Please 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: $1,2 \frac{g}{ml}$



This symbol refers to general hazards.

ATTENTION means that material damage could occur.

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



This symbol refers to biological hazards.

Observe the information contained in the instruction manual to keep yourself and your environment safe.

Rotor Specifications

Contents

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Heraeus

Table 1-1. 230V 50Hz/60Hz ventilated

Centrifuge	Heraeus Multifuge X3	Heraeus Multifuge X3F	Heraeus Multifuge X1
Catalog #	75004500	75004530	75004210
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	50 / 50	50 / 50	50 / 50
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	13	13	14
Aerosol-tight*	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

* tested by HPA, Porton-down, UK

Centrifuge	Heraeus Megafuge 40	Heraeus Megafuge 16
Catalog #	75004503	75004230
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	40 / 45	35 / 40
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	9	11
Aerosol-tight*	yes	yes
Permissible temperature range autoclavable °C	121	121

* tested by HPA, Porton-down, UK

Table 1-2. 230V 50Hz/60Hz refrigerated

Centrifuge	Heraeus Multifuge X3R	Heraeus Multifuge X3FR	Heraeus Multifuge X1R
Catalog #	75004515	75004536	75004250
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	50 / 50	50 / 50	50 / 50
Aerosol-tight *	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

* tested by HPA, Porton-down, UK

Centrifuge	Heraeus Megafuge 40R	Heraeus Megafuge 16R
Catalog #	75004518	75004270
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	45 / 45	35 / 40
Aerosol-tight *	yes	yes
Permissible temperature range autoclavable °C	121	121

* tested by HPA, Porton-down, UK

1 Rotor Specifications

Heraeus

Table 1-3. 120V 60Hz ventilated

Centrifuge	Heraeus Multifuge X3	Heraeus Multifuge X3F	Heraeus Multifuge X1
Catalog #	75004501	75004531	75004211
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	55 / 50	55 / 50	60 / 55
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	13	13	15
Aerosol-tight*	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

*tested by HPA, Porton-down, UK

Centrifuge	Heraeus Megafuge 40	Heraeus Megafuge 16
Catalog #	75004504	75004231
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	45 / 45	40 / 45
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	9	13
Aerosol-tight*	yes	yes
Permissible temperature range autoclavable °C	121	121

*tested by HPA, Porton-down, UK

Table 1-4. 120V 60Hz refrigerated

Centrifuge	Heraeus Multifuge X3R	Heraeus Multifuge X3FR	Heraeus Multifuge X1R
Catalog #	75004516	75004537	75004251
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	55 / 50	55 / 50	60 / 55
Aerosol-tight *	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

*tested by HPA, Porton-down, UK

Centrifuge	Heraeus Megafuge 40R	Heraeus Megafuge 16R
Catalog #	75004519	75004271
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	50 / 45	40 / 45
Aerosol-tight *	yes	yes
Permissible temperature range autoclavable °C	121	121

*tested by HPA, Porton-down, UK

1 Rotor Specifications

Sorvall

Sorvall

Table 1-5. 230V 50Hz/60Hz ventilated

Centrifuge	Sorvall Legend XT	Sorvall Legend XF	Sorvall Legend X1
Catalog #	75004505	75004532	75004220
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	50 / 50	50 / 50	50 / 50
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	13	13	14
Aerosol-tight*	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

*tested by HPA, Porton-down, UK

Centrifuge	Sorvall ST 40	Sorvall ST 16
Catalog #	75004509	75004240
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	40 / 45	35 / 40
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	9	11
Aerosol-tight*	yes	yes
Permissible temperature range autoclavable °C	121	121

*tested by HPA, Porton-down, UK

Table 1-6. 230V 50Hz/60Hz refrigerated

Centrifuge	Sorvall Legend XTR	Sorvall Legend XFR	Sorvall Legend X1R
Catalog #	75004520	75004538	75004260
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	50 / 50	50 / 50	50 / 50
Aerosol-tight *	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

* tested by HPA, Porton-down, UK

Centrifuge	Sorvall ST 40R	Sorvall ST 16R
Catalog #	75004524	75004280
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	45 / 45	35 / 40
Aerosol-tight *	yes	yes
Permissible temperature range autoclavable °C	121	121

* tested by HPA, Porton-down, UK

1 Rotor Specifications

Sorvall

Table 1-7. 120V 60Hz ventilated

Centrifuge	Sorvall Legend XT	Sorvall Legend XF	Sorvall Legend X1
Catalog #	75004506	75004533	75004221
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	55 / 50	55 / 50	60 / 55
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	13	13	15
Aerosol-tight*	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

*tested by HPA, Porton-down, UK

Centrifuge	Sorvall ST 40	Sorvall ST 16
Catalog #	75004510	75004241
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	45 / 45	40 / 45
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	9	13
Aerosol-tight*	yes	yes
Permissible temperature range autoclavable °C	121	121

*tested by HPA, Porton-down, UK

Table 1-8. 120V 60Hz refrigerated

Centrifuge	Sorvall Legend XTR	Sorvall Legend XFR	Sorvall Legend X1R
Catalog #	75004521	75004539	75004261
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	55 / 50	55 / 50	60 / 55
Aerosol-tight *	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

* tested by HPA, Porton-down, UK

Centrifuge	Sorvall ST 40R	Sorvall ST 16R
Catalog #	75004525	75004281
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	50 / 45	40 / 45
Aerosol-tight *	yes	yes
Permissible temperature range autoclavable °C	121	121

* tested by HPA, Porton-down, UK

1 Rotor Specifications

Sorvall

Table 1-9. 100V 50Hz/60Hz ventilated

Centrifuge	Sorvall Legend XT	Sorvall Legend XF	Sorvall Legend X1
Catalog #	75004507	75004534	75004223
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	55 / 50	55 / 50	65 / 55
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	13	13	15
Aerosol-tight*	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

* tested by HPA, Porton-down, UK

Centrifuge	Sorvall ST 40	Sorvall ST 16
Catalog #	75004511	75004243
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	13,000	12000
Maximum RCF value at n_{max}	18,516	15,777
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	45 / 40	45 / 45
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	9	13
Aerosol-tight*	yes	yes
Permissible temperature range autoclavable °C	121	121

* tested by HPA, Porton-down, UK

Table 1-10. 100V 50Hz/60Hz refrigerated

Centrifuge	Sorvall Legend XTR	Sorvall Legend XFR	Sorvall Legend X1R
Catalog #	75004522	75004540	75004263
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	10,350	10,350	10,350
Maximum RCF value at n_{max}	15,090	15,090	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	55 / 50	55 / 50	65 / 55
Aerosol-tight *	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

* tested by HPA, Porton-down, UK

Centrifuge	Sorvall ST 40R	Sorvall ST 16R
Catalog #	75004526	75004283
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	50 / 45	45 / 45
Aerosol-tight *	yes	yes
Permissible temperature range autoclavable °C	121	121

* tested by HPA, Porton-down, UK

Thermo Scientific

Table 1-11.230V 50Hz/60Hz ventilated

Centrifuge	Thermo Scientific SL 40	Thermo Scientific SL 16	Thermo Scientific SL 40 F
Catalog #	75004512	75004000	75004542
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500	10,350
Maximum RCF value at n_{max}	10,178	10,178	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	40 / 40	35 / 40	50 / 50
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	9	11	13
Aerosol-tight*	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

*Tested by HPA, Porton-down, UK

Table 1-12.230V 50Hz/60Hz refrigerated

Centrifuge	Thermo Scientific SL 40R	Thermo Scientific SL 16R	Thermo Scientific SL 40 FR
Catalog #	75004527	75004030	75004543
Weight of empty rotor[kg] [kg]	3.6	3.6	3.6
Max. cycle number	50,000	50,000	50,000
Maximum permissible load [g]	6x140	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500	10,350
Maximum RCF value at n_{max}	10,178	10,178	15,090
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45	45
Accel. / braking time [s]	45 / 45	35 / 40	50 / 50
Aerosol-tight*	yes	yes	yes
Permissible temperature range autoclavable °C	121	121	121

*Tested by HPA, Porton-down, UK

Table 1-13. 120V 60Hz ventilated

Centrifuge	Thermo Scientific SL 40	Thermo Scientific SL 16
Catalog #	75004513	75004001
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	45 / 45	40 / 45
Minimum temperature at n_{max} [°C] relating to ambient temperature 23 °C, run time 60 min	9	13
Aerosol-tight*	yes	yes
Permissible temperature range autoclavable °C	121	121

*tested by HPA, Porton-down, UK

Table 1-14. 120V 60Hz refrigerated

Centrifuge	Thermo Scientific SL 40R	Thermo Scientific SL 16R
Catalog #	75004528	75004031
Weight of empty rotor[kg] [kg]	3.6	3.6
Max. cycle number	50,000	50,000
Maximum permissible load [g]	6x140	6x140
Maximum speed n_{max} [rpm]	8,500	8,500
Maximum RCF value at n_{max}	10,178	10,178
Radius max. / min. [cm]	12.6 / 6.1	12.6 / 6.1
Pitch angle [°]	45	45
Accel. / braking time [s]	50 / 45	40 / 45
Aerosol-tight*	yes	yes
Permissible temperature range autoclavable °C	121	121

*tested by HPA, Porton-down, UK

Accessories

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- „Accessories“ on page 2-2

Thermo Scientific General Purpose Rotors

HIGHConic II

HIGHConic II Fixed Angle Aluminum Rotor



Rotor Specifications		
Capacity (ml)	6 x 94	
Tube Dimensions (mm)	38 x 105	
Angle °	45	
Maximum Speed (rpm)	10,350*	
K Factor	1,713	
Net Weight (kg)	3.6	
* Max Speed may vary depending on centrifuge unit.		
RCF/Radius	RCF (x g)	Radius (cm)
Maximum	15,090	12.6
Minimum	7,306	6.1



HIGHConic II

Cat. No.	Description
75003620	HIGHConic II Fixed Angle Rotor

Accessories

Cat. No.	Description
75003058	O-ring Refresher Kit

Tube Ordering Information

Cat. No.	Tube Vol. (ml)	Vol. Fill (ml)	Description	Qty.	Max. Speed (rpm)	Dims ØxL (mm)	Sealing Assembly Required:			Adapters Required:			Accessories Required:		
							Cat. No.	Qty /Pkg	Description	Cat. No.	Qty /Pkg	No. of Places	Cat. No.	Qty /Pkg	No. of Places
3118-0085	85	70	PC Oak Ridge T	10	10.350	38x105	Included	10	PP Sealing	-	-	-	-	-	-
334959	50	50	Nunc Conical	25	-	30x121	Included	25	PP Sealing	75003103	1	1	-	-	-
3139-0050	50	50	PP Oak Ridge Tube	10	10.350	29x114	Included	10	PP Sealing	75003102	1	1	-	-	-
3138-0050	50	50	PC Oak Ridge Tube	10	10.350	29x114	Included	10	PP Sealing	75003102	1	1	-	-	-
3114-0050	50	50	Teflon Oak Ridge Tube	2	10.350	29x114	Included	2	PP Sealing	75003102	1	1	-	-	-
-	30	-	Glass Tube	-	-	24x105	-	-	-	75003094	1	1	-	-	-
366036	15	15	Nunc Conical	50	-	17x120	Included	50	PP Sealing	75003095	1	1	-	-	-
-	10	-	Blood Collection	-	-	16X100	-	-	-	75002906	1	1	-	-	-
3139-0010	10	8	PP Oak Ridge Tube	10	10.350	16x82	Included	10	PP Sealing	75003093	1	2	-	-	-
3138-0010	10	8	PC Oak Ridge Tube	10	10.350	16x82	Included	10	PP Sealing	75003093	1	2	-	-	-
-	7	-	Blood Collection	-	-	13x100	-	-	-	75003092	1	2	-	-	-
-	5	-	Blood Collection	-	-	13x75	-	-	-	75003092	1	2	-	-	-
-	5	-	RIA Tubes	-	-	13x75	-	-	-	75003092	1	2	-	-	-
-	3,5	-	Round Bottom Tube	-	-	11x100	-	-	-	75003091	1	4	-	-	-
-	1.5/2	-	Microtube	1	-	11 x 42	-	-	-	76002905	1	4	-	-	-

AutoLock™

Contents

- “Rotor Installation” on page 3-2
- “Removing the Rotor” on page 3-3

Rotor Installation



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

This rotor is equipped with an AutoLock™-system.

This system is used to automatically lock the rotor to the centrifuge spindle. The rotor does not have to be bolted onto the centrifuge spindle.

Proceed as follows:

1. Open the lid of the centrifuge and if necessary remove any dust, foreign objects or residue from the chamber.
AutoLock™ and o-ring must be clean and undamaged.

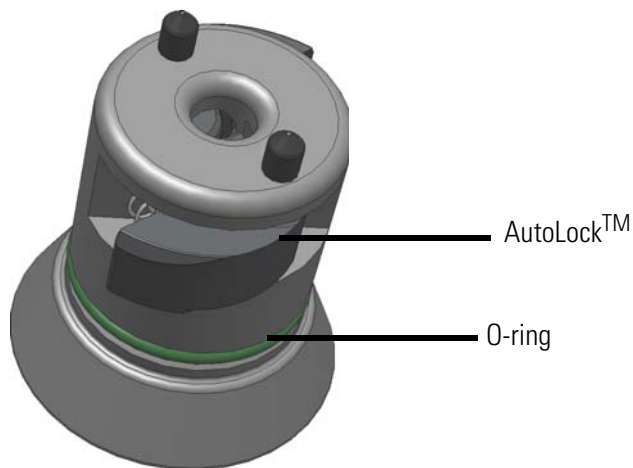


Figure 3-1. AutoLock™

2. Hold the rotor over the centrifuge spindle and let it slide slowly down the centrifuge spindle. The rotor clicks automatically into place.



CAUTION Do not force the rotor onto the centrifuge spindle. If the rotor is very light, then it may be necessary to press it onto the centrifuge spindle with a small amount of pressure.

3. Check if the rotor is properly installed by lifting slightly on the handle. If the rotor can be pulled up, then it must be reclamped to the centrifuge spindle.



WARNING If the rotor cannot be properly locked in place after several attempts, then the AutoLock™ is defective and you are not permitted to operate the rotor. Check for any damage to the rotor, damaged rotors must not be used. Keep the hub area clear of objects.



CAUTION Check that the rotor is properly locked on the centrifuge spindle before each use by pulling it a its handle.



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

4. Close the centrifuge door.

Removing the Rotor

To remove the rotor, proceed as follows:

1. Open the centrifuge door.
2. Grab the rotor handle with both hands and press against the green AutoLock™ button. At the same time, pull the rotor directly upwards with both hands and remove it from the centrifuge spindle. Make sure not to jam the rotor while doing this.



Figure 3-2. Handling of AutoLock™

Aerosol-tight rotors



CAUTION Rotors supplied with a lid for aerosol-tight applications come with a mandril, which belongs to the AutoLock™. Be sure not to place the lid onto this mandril to prevent it from being damaged.

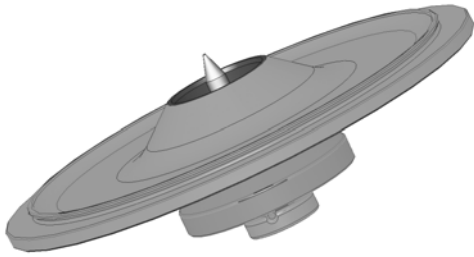


Figure 3-3. AutoLock™-lid for aerosol-tight rotors



WARNING Mind the AutoLock™-mandril inside the lid. Do not touch.

Rotor Loading

Contents

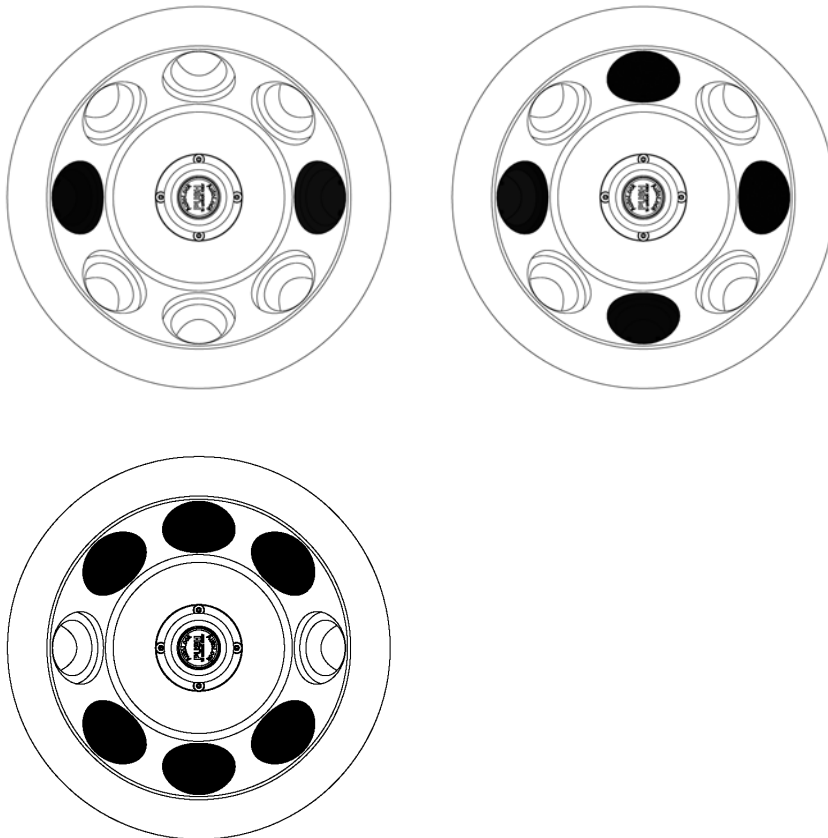
- “Before Run” on page 4-2
- “Proper Loading” on page 4-2
- “Improper loading” on page 4-3
- “Maximum Loading” on page 4-3

Before Run

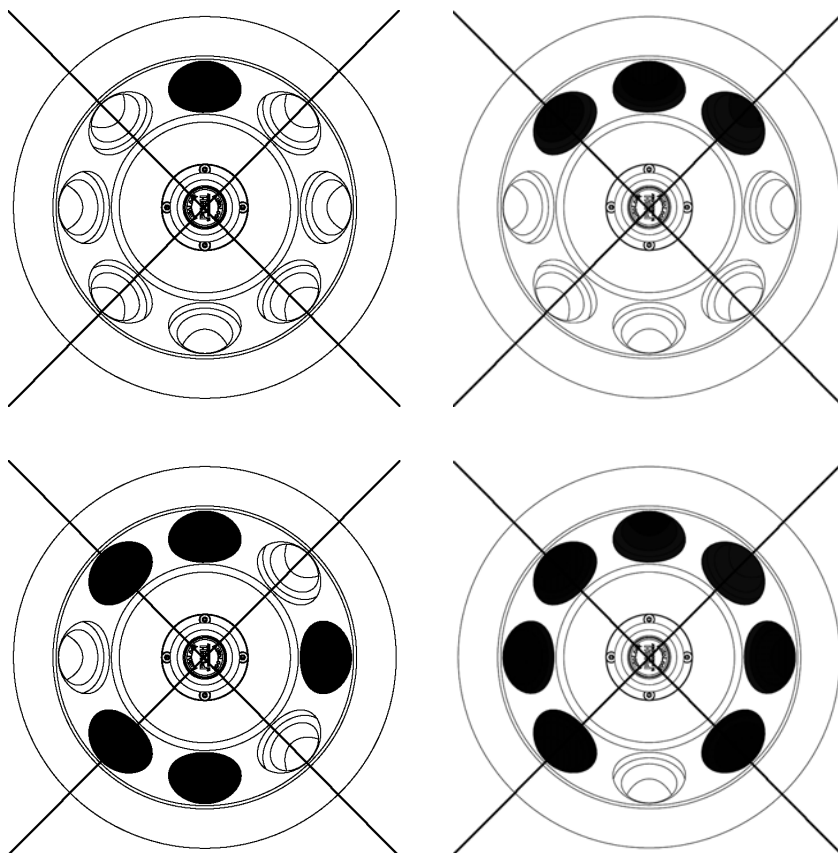
1. Please read and observe the safety instructions contained in these operating instructions and in the instructions for use.
2. Check the rotor and all accessory parts for damages such as cracks, scratches or traces of corrosion.
3. Check the rotor chamber, the centrifuge spindle and the AutoLock™.
4. Check the rotor's suitability using the chemical compatibility chart on [page B-1](#).
5. Make sure the tubes or bottles do not touch the lid.

Proper Loading

To ensure safe operation of the centrifuge, the rotor must be evenly loaded at all times.



Improper loading



Maximum Loading

The rotor can run at high speeds. The rotor design has sufficient reserve stability even when spinning at top speed.

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

There are two options available for centrifuging samples whose weight, including adaptor, exceeds the maximum permissible load:

- Reduce the fill level.
- Reduce the speed.

Use the table or the formula:

Actual Load (g/cavity)	RPM _{max}
140	10350
160	9682
180	9128
200	8659
220	8256

Actual Load (g/cavity)	RPM _{max}
240	7905
260	7595
280	7319
300	7070
320	6846
340	6641
360	6454
380	6282
400	6123
420	5976
440	5838

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

n_{adm} = admissible speed
 n_{max} = maximum speed

Cycle Counter

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.

The maximum number of cycles is given in the rotor table in the rotor specification section.

The maximum number of cycles for buckets is marked on the buckets themselves.



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

Service life examples

Usage profile	Maximum service life at 30,000 cycles
frequent use 20 runs / day 220 days / year	7 years

Aerosol-tight Applications

Contents

- “Basic Principles” on page 5-2
- “Fill Level” on page 5-2
- “Checking the Aerosol-Tightness” on page 5-2

Basic Principles



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.



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 depend on 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 lids 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-tightness of fixed-angle rotors using the following process:

1. Lubricate all seals lightly.
Always use the special grease 7600 3500 when lubricating the seals.
2. Fill the cavities 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 lid 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. When loading the rotor, ensure that the rotor lid closes securely. Damaged or clouded rotor covers are to be replaced immediately.

Maintenance and Care

Contents

- “Cleaning Intervals” on page 6-2
- “Cleaning” on page 6-2
- “Disinfection” on page 6-3
- “Decontamination” on page 6-4
- “Autoclaving” on page 6-5
- “Service of Thermo Fisher Scientific” on page 6-6

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
Clean rotor chamber	daily or when polluted
Clean rotor	daily or when polluted
Accessories	daily or when polluted
Cabinet	Once per month
Ventilation holes	Every six months



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.

Cleaning

When cleaning centrifug

- Use warm water with a neutral solvent.
- Never use caustic cleaning agents such as soap suds, phosphoric acid, bleaching solutions or scrubbing powder.
- Rinse the cavities out thoroughly.
- Use a soft brush without metal bristles to remove stubborn residue.
- Afterwards rinse with distilled water.
- Place the rotors on a plastic grate with their cavities pointing down.
- 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.
- Use only disinfectants with a pH of 6-8.
- Dry aluminum parts off with a soft cloth.
- After cleaning, treat the entire surface of aluminum parts with corrosion protection oil (7000 9824). Also treat the cavities with oil.
- Store the aluminum parts at room temperature or in a cold-storage room with the cavities pointing down.



CAUTION 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.

Clean centrifuge and accessories as follows:

1. Open the centrifuge.
2. Turn off the centrifuge.
3. Pull out the power supply plug.
4. Grasp the rotor with both hands and lift it vertically off the centrifuge spindle.
5. Remove the centrifuge tubes and adaptors.
6. Use a neutral cleaning agent with a pH value between 6 and 8 for cleaning.
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.
8. Clean the housing of the centrifuge as needed.
 - After cleaning, treat the entire surface of aluminum parts with corrosion protection oil (7000 9824). Also treat the cavities with oil.
 - Tread the bold of the swing out rotor with bold grease (75003786).



CAUTION When cleaning, do not allow liquids, especially organic solvents, to get on the drive shaft, the bearings, the AutoLock™ or the locks. Organic solvents break down the grease in the motor bearing. The drive shaft could freeze up.

After some applications there might be ice in the rotor chamber. Let the ice melt and drain it off. Clean the rotor chamber as described above.

Disinfection

Disinfect the centrifuge immediately whenever infectious material has spilled during centrifugation.



WARNING Infectious material can get into the centrifuge when a tube breaks or as a result of spills. Keep in mind the risk of infection when touching the rotor and take all necessary precautions. In case of contamination, make sure that others are not put at risk. Decontaminate the affected parts immediately. Take other precautions if need be.

Use a sprayer whenever possible so that all surfaces are covered evenly.

The rotor chamber and the rotor should be treated preferably with a neutral disinfectant. A disinfectant spray would be most suitable for this purpose so that the rotor and accessory surfaces are covered evenly.



CAUTION 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.

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

Disinfect the rotor and accessories as follows:

1. Open the centrifuge.
2. Turn off the centrifuge.
3. Pull out the power supply plug.
4. Grasp the rotor with both hands and lift it vertically off the centrifuge spindle.
5. Remove the centrifuge tubes and adaptors and dispose of them or disinfect them.
6. Treat the rotor and accessories according to the instructions for the disinfectant (spray or soak in solution). Adhere strictly to the given application times.
7. Be sure the disinfectant can drain off the rotor.
8. Rinse the rotor and rotor lid thoroughly with water and then rub down.
9. Dispose of the disinfectant according to the applicable guidelines.
10. 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.
 - After cleaning, treat the entire surface of aluminum parts with corrosion protection oil (7000 9824). Also treat the cavities with oil.
 - Treat the bolt of the swing out rotor with bolt grease (75003786).

Decontamination

Decantamine the centrifuge immediately whenever radioactive material has spilled during centrifugation.



WARNING Radioactive material can get into the centrifuge when a tube breaks or as a result of spills. Keep in mind the risk of infection when touching the rotor and take all necessary precautions.

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

Decontaminate the affected parts immediately.

Take other precautions if need be.



CAUTION 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.

For general radioactive decontamination use a solution of equal parts of 70% ethanol, 10% SDS and water.

Disinfect the rotor and accessories as follows:

1. Open the centrifuge.
2. Turn off the centrifuge.

3. Pull out the power supply plug.
4. Grasp the rotor with both hands and lift it vertically off the centrifuge spindle.
5. Remove the centrifuge tubes and adaptors and dispose of them or disinfect them.
6. Rinse the rotor first with ethanol and then with de-ionized water.
 - Adhere strictly to the given application times.
7. Be sure the decontamination solution can drain off the rotor.
8. Rinse the rotor and accessories thoroughly with water.
9. Dispose of the decontamination solution according to the applicable guidelines.
10. 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.
 - After cleaning, treat the entire surface of aluminum parts with corrosion protection oil (7000 9824). Also treat the cavities with oil.
 - Tread the bolt of the swing out rotor with bolt grease (75003786).

Autoclaving

1. Before autoclaving clean rotor and accessories as described above.
2. Place the rotor on a flat surface.
 - Rotors and adapter 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.

Note No chemical additives are permitted in the steam.



CAUTION Never exceed the permitted temperature and duration when autoclaving. If the rotor shows signs of corrosion or wear, it must be replaced.

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:

- the electrical equipment
- the suitability of the set-up site
- the lid lock and the safety system
- the rotor
- the fixation of the rotor and the drive shaft

Thermo Fisher Scientific offers inspection and service contracts for this work.

RCF-Values

Speed (rpm)	R _{min}	R _{max}	RCF R _{min}	RCF R _{max}
300	6.1	12.6	6	13
400	6.1	12.6	11	23
500	6.1	12.6	17	35
600	6.1	12.6	25	51
700	6.1	12.6	33	69
800	6.1	12.6	44	90
900	6.1	12.6	55	114
1000	6.1	12.6	68	141
1100	6.1	12.6	83	170
1200	6.1	12.6	98	203
1300	6.1	12.6	115	238
1400	6.1	12.6	134	276
1500	6.1	12.6	153	317
1600	6.1	12.6	175	361
1700	6.1	12.6	197	407
1800	6.1	12.6	221	456
1900	6.1	12.6	246	509
2000	6.1	12.6	273	563
2100	6.1	12.6	301	621
2200	6.1	12.6	330	682
2300	6.1	12.6	361	745
2400	6.1	12.6	393	811
2500	6.1	12.6	426	880
2600	6.1	12.6	461	952
2700	6.1	12.6	497	1027
2800	6.1	12.6	535	1104
2900	6.1	12.6	574	1185
3000	6.1	12.6	614	1268

Speed (rpm)	R _{min}	R _{max}	RCF R _{min}	RCF R _{max}
3100	6.1	12.6	655	1354
3200	6.1	12.6	698	1442
3300	6.1	12.6	743	1534
3400	6.1	12.6	788	1628
3500	6.1	12.6	835	1726
3600	6.1	12.6	884	1826
3700	6.1	12.6	934	1928
3800	6.1	12.6	985	2034
3900	6.1	12.6	1037	2143
4000	6.1	12.6	1091	2254
4100	6.1	12.6	1146	2368
4200	6.1	12.6	1203	2485
4300	6.1	12.6	1261	2605
4400	6.1	12.6	1320	2727
4500	6.1	12.6	1381	2853
4600	6.1	12.6	1443	2981
4700	6.1	12.6	1506	3112
4800	6.1	12.6	1571	3246
4900	6.1	12.6	1637	3382
5000	6.1	12.6	1705	3522
5100	6.1	12.6	1774	3664
5200	6.1	12.6	1844	3809
5300	6.1	12.6	1916	3957
5400	6.1	12.6	1989	4108
5500	6.1	12.6	2063	4261
5600	6.1	12.6	2139	4418
5700	6.1	12.6	2216	4577
5800	6.1	12.6	2294	4739
5900	6.1	12.6	2374	4904
6000	6.1	12.6	2455	5071
6100	6.1	12.6	2538	5242
6200	6.1	12.6	2622	5415
6300	6.1	12.6	2707	5591
6400	6.1	12.6	2793	5770
6500	6.1	12.6	2881	5952
6600	6.1	12.6	2971	6136
6700	6.1	12.6	3061	6324

Speed (rpm)	R _{min}	R _{max}	RCF R _{min}	RCF R _{max}
6800	6.1	12.6	3153	6514
6900	6.1	12.6	3247	6707
7000	6.1	12.6	3342	6903
7100	6.1	12.6	3438	7101
7200	6.1	12.6	3535	7303
7300	6.1	12.6	3634	7507
7400	6.1	12.6	3735	7714
7500	6.1	12.6	3836	7924
7600	6.1	12.6	3939	8137
7700	6.1	12.6	4043	8352
7800	6.1	12.6	4149	8570
7900	6.1	12.6	4256	8792
8000	6.1	12.6	4365	9016
8100	6.1	12.6	4474	9242
8200	6.1	12.6	4586	9472
8300	6.1	12.6	4698	9704
8400	6.1	12.6	4812	9940
8500	6.1	12.6	4927	10178
8600	6.1	12.6	5044	10419
8700	6.1	12.6	5162	10662
8800	6.1	12.6	5281	10909
8900	6.1	12.6	5402	11158
9000	6.1	12.6	5524	11410
9100	6.1	12.6	5647	11665
9200	6.1	12.6	5772	11923
9300	6.1	12.6	5898	12184
9400	6.1	12.6	6026	12447
9500	6.1	12.6	6155	12713
9600	6.1	12.6	6285	12982
9700	6.1	12.6	6417	13254
9800	6.1	12.6	6550	13529
9900	6.1	12.6	6684	13806
10000	6.1	12.6	6820	14087
10100	6.1	12.6	6957	14370
10200	6.1	12.6	7095	14656
10300	6.1	12.6	7235	14945
10350	6.1	12.6	7306	15090

Chemical Compatibility Chart

CHEMICAL	MATERIAL																										
	ALUMINUM	ANODIC COATING for ALUMINUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELRIN®	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL®	NYLON	PET, POLYCLEAR®, CLEARCRIMP®, CCCLEARCRIMP®	POLYALLOMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYETHERIMIDE	POLYRTHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A®, TEFLON®	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON®	VITON®
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®	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	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	S	M
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	S	M
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	M	-	S	S	S	S	S	S	M	S	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

B Chemical Compatibility Chart

CHEMICAL	MATERIAL																										
	ALUMINUM	ANODIC COATING for ALUMINUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELRIN®	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL®	NYLON	PET®, POLYCLEAR®, CLEARCRIMP®, CCCCLEARCRIMP®	POLYALLUMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYETHERIMIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A®, TEFLON®	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON®	VITON®
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
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	U	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
Diethylpyrocarbonate	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

CHEMICAL	MATERIAL	ALUMINUM	ANODIC COATING for ALUMINUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELRIN®	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL®	NYLON	PET®, POLYCLEAR®, CLEARCRIMP®, CIRCLECRIMP®	POLYALLUMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYETHERIMIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A®, TEFLON®	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON®	VITON®
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	
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	M	S	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	U	M	U	U	U	S	S	M	U	U	

B Chemical Compatibility Chart

CHEMICAL	MATERIAL	ALUMINUM	ANODIC COATING for ALUMINUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELRIN®	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL®	NYLON	PET®, POLYCLEAR®, CLEARCRIMP®, CCCCLEARCRIMP®	POLYALLUMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYETHERIMIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A®, TEFLON®	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON®	VITON®
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	M	-	U	U	S	U	S	M	M	S	U	S	
N, N-Dimethylformamide		S	S	S	U	S	M	S	-	S	S	U	S	U	S	U	U	-	S	S	U	U	S	M	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	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	M	S	S	S	
Sodium Carbonate (2%)		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	
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	
Sodium Hypochlorite (5%)		U	U	M	S	S	M	U	S	S	M	S	S	S	M	S	S	S	S	M	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	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	
Sodium Sulfate		U	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	M	S	S	S	S	PET®, POLYCLEAR®, CLEARCRIMP®, CCCCLEARCRIMP®	S	S	M	-	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	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	
Oils (Other)		S	-	S	-	-	-	S	M	S	S	S	S	U	S	S	S	S	U	S	S	S	S	-	S	S	M	
Oleic Acid		S	-	U	S	S	S	U	U	S	U	S	S	M	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	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	-	
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	
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	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	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	
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	-	
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	
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	

CHEMICAL	MATERIAL																										
	ALUMINUM	ANODIC COATING for ALUMINUM	BUNA N	CELLULOSE ACETATE BUTYRATE	POLYURETHANE ROTOR PAINT	COMPOSITE Carbon Fiber/Epoxy	DELRIN®	ETHYLENE PROPYLENE	GLASS	NEOPRENE	NORYL®	NYLON	PET®, POLYCLEAR®, CLEARCRIMP®, CIRCLECRIMP®	POLYALLUMER	POLYCARBONATE	POLYESTER, GLASS THERMOSET	POLYETHERIMIDE	POLYETHYLENE	POLYPROPYLENE	POLYSULFONE	POLYVINYL CHLORIDE	RULON A®, TEFLON®	SILICONE RUBBER	STAINLESS STEEL	TITANIUM	TYGON®	VITON®
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
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	U	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	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

B Chemical Compatibility Chart

*Polyethyleneterephthalate

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.

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

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