

## hemical Resistances

Centrifugation Products Beckman Coulter



The information provided here is from references, from current literature, or from research done by your laboratory safety officer. trated or dry, or are toxic, caustic, allergenic, or carcinogenic. Observe proper handling as outlined by on these recommendations is expressed or implied. Many of the chemicals are explosive when concen-Beckman Coulter, Inc., and is only a guide for the selection of materials. No guarantee of safety based

#### INTRODUCTION

combination of S and U resistances chemical—either satisfactory (S), marginally satisfactory (M), unsatisfactory (U), or unknown (X). Marginal resistance listings may be a Beckman Coulter centrifuges and accessories. You can select a chemical and determine the resistance of listed materials to the selected This table indicates the general chemical resistances of various materials to a number of chemicals commonly used in procedures involving

millimolar) concentrations. Materials that have unsatisfactory or marginal resistance to the high concentrations used for these tests may be usable in very low (that is, name is shown beneath a trivial chemical name. Chemicals are either undiluted liquids or saturated (unless otherwise noted) aqueous solutions gradient-forming materials, solvents, detergents, and other). Where applicable, an IUPAC (International Union of Pure and Applied Chemistry) Materials are listed alphabetically. Chemicals are listed alphabetically by their most common name within seven categories (acids, bases, salts,

# TEST YOUR SOLUTION UNDER OPERATING CONDITIONS IF MATERIAL PERFORMANCE IS UNCERTAIN

actual run conditions is strongly advised. containers, ethanol will destroy these tubes in a short period of high-speed centrifugation. This combination of material and chemical is therefore listed as U in the table. Not all combinations have been tested under the stress of centrifugation, however. Again, pretesting under performance under centrifugation. Thus, although alcohols (for example) may be stored satisfactorily in polycarbonate or in Ultra-Clear Soak tests at  $1 \times g$  (at 20°C) established the data for most of the materials. In some cases the resistances of tube materials also reflect their

minutes. Satisfactory resistance under long-term exposure should not be assumed. The data for centrifuge and rotor finishes is derived mainly from splash tests in which the finish was exposed to the chemical for a matter of

# DECONTAMINATION OF ALUMINUM ROTORS AND ACCESSORIES

for use on anodized aluminum. Beckman Coulter has tested a number of solutions and found two that do not harm anodized aluminum: While a number of solutions are commercially marketed for use in removing radioactivity from contaminated materials, many are too harsh

- IsoClean Solution (for soaking) or RadCon Surface Spray (In U.S.A., contact Nuclear Associates [New York]; in Eastern Europe and Commonwealth States, contact Victoreen GmbH [Munich]; in South Pacific, contact Gammasonics Pty. Ltd. [Australia]; in Japan, contact Toyo Medic Co. Ltd. [Tokyo].)
- Radiacwash (In U.S.A., contact Biodex Medical Systems [Shirley, New York]; internationally, contact the U.S. office to find the dealer nearest you.)

or implied. Consult your laboratory safety officer regarding the proper decontamination methods to use While Beckman Coulter has tested these methods and found that they do not damage components, no guarantee of decontamination is expressed

outlined by your laboratory safety officer If a rotor and/or accessories are contaminated with toxic or pathogenic solutions, follow appropriate sterilization or disinfection procedures as

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<sup>=</sup> satisfactory resistance

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<sup>6</sup>nonaqueous

M = marginal resistance

 $<sup>\</sup>subset$ unsatisfactory resistance

<sup>=</sup> unknown

or with materials which could react chemically with sufficient vigor to use with materials capable of developing flammable or explosive vapors, either during normal centrifugation or under failure conditions. contacts. Depending on the centrifuge type, such exposure could occur them near the centrifuge. Vapors may be ignited by exposure to electrical cause a HAZARD. Do not centrifuge such materials nor handle or store  $\bigcirc$  = Flammability hazard. The Centrifuge instrument is not designed for

<sup>&</sup>lt;sup>1</sup>discoloration

<sup>&</sup>lt;sup>2</sup>below 26°C only

家explosion hazard due to possible material/chemical reaction under rotor failure conditions

<sup>4</sup>dilute solutions satisfactory

<sup>5</sup>below 21°C only

<sup>&</sup>lt;sup>7</sup>most aluminum components have anodic coating finishes

<sup>8</sup> avoid high temperatures at high concentrations

<sup>&</sup>lt;sup>9</sup>nickel acetate unsatisfactory

<sup>10</sup> vegetable oils may be marginal or unsatisfactory

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= satisfactory resistance

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= marginal resistance

unsatisfactory resistance

= unknown

contacts. Depending on the centrifuge type, such exposure could occur them near the centrifuge. Vapors may be ignited by exposure to electrica cause a HAZARD. Do not centrifuge such materials nor handle or store or with materials which could react chemically with sufficient vigor to use with materials capable of developing flammable or explosive vapors  $^{(\!\!\!\!)}$  = Flammability hazard. The Centrifuge instrument is not designed for either during normal centrifugation or under failure conditions.

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Chemicals

acelal copolymet (celcon)

elimina (A)203) aluminum

anodic coaling?

ninie nober (Buna N)

Scelal Borropolymer (Deltin) Synthetic rubber (EDUM)

. eposy resin/carbon composite to the policy of the policy

Polyethylere telephilatale polyetter film

polyphenyene oxide (PRO) (Non))

Polyethylere terephilalate (PET)

Powethylene (HDPE) polyethelene (LDPE) PONOFODYIENE Polystyrene Polysulfone

guanidine hydrochloride 1-aminomethanamidine	calcium chloride	barium salts	ammonium sulfate	ammonium phosphate	ammonium carbonate	ammonium acetate ammonium ethanoate	aluminum chloride	SALTS (aq)	sodium hydroxide (>1%)	sodium hydroxide (1%)	pyridine (50%) azabenzene	potassium hydroxide (45%)	potassium hydroxide (5%)	aniline benzenamine	ammonium hydroxide (28%)	BASES (aq) (continued)	IUPAC Name
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<sup>=</sup> satisfactory resistance

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hydrochloride

M = marginal resistance

U = unsatisfactory resistance

X = unknown

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#### Chemicals **IUPAC Name**

acetel copolyner (celcon)

alumina (Akog)

anodic Sollings

nume rubber 18 une No

acetal honopolitic 13 Synthetic rubber (EPDM)

Sport Sinfer to the composition of the state of the state

DONG TESTING TOOM COMPOSITE FOR ESTENTING

Dosolerviore oxide (PPO) (Nory))

PONOHNIERE (HOPE)

polyethelene (Lope)

PON Propylene

Polysbrene

Polysulfone

aluminum?

cesium bromide	cesium acetate cesium ethanoate	GRADIENT FORMING MATERIALS (aq)	zinc sulfate	zinc chloride	sodium sulfite	sodium sulfate	sodium nitrate	sodium chloride	sodium carbonate	sodium borate	silver nitrate	potassium permanganate	potassium chloride	potassium carbonate	potassium bromide	nickel salts	magnesium chloride	SALTS (aq) (continued)
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ഗ = satisfactory resistance

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<sup>&</sup>lt;sup>1</sup>discoloration

<sup>&</sup>lt;sup>2</sup>below 26°C only

<sup>💥</sup> explosion hazard due to possible material/chemical reaction under rotor failure conditions

<sup>4</sup>dilute solutions satisfactory

<sup>5</sup>below 21°C only

<sup>&</sup>lt;sup>6</sup>nonaqueous

<sup>&</sup>lt;sup>7</sup>most aluminum components have anodic coating finishes

<sup>&</sup>lt;sup>8</sup>avoid high temperatures at high concentrations

<sup>&</sup>lt;sup>9</sup>nickel acetate unsatisfactory

<sup>10</sup> vegetable oils may be marginal or unsatisfactory

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Polyellylene toon composite espenialate polyester flux

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<sup>=</sup> satisfactory resistance

α-D-glucopyranoside

M = marginal resistance

U = unsatisfactory resistance

<sup>=</sup> unknown

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¹ discoloration

<sup>&</sup>lt;sup>2</sup>below 26°C only

溪 explosion hazard due to possible material/chemical reaction under rotor failure conditions

<sup>4</sup>dilute solutions satisfactory

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<sup>&</sup>lt;sup>6</sup>nonaqueous

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<sup>=</sup> satisfactory resistance

M = marginal resistance S

U = unsatisfactory resistance

X = unknown

 $<sup>\</sup>frac{\partial S}{\partial t}$  = Flammability hazard. The Centrifuge instrument is not designed for either during normal centrifugation or under failure conditions. contacts. Depending on the centrifuge type, such exposure could occur them near the centrifuge. Vapors may be ignited by exposure to electrical cause a HAZARD. Do not centrifuge such materials nor handle or store or with materials which could react chemically with sufficient vigor to use with materials capable of developing flammable or explosive vapors

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<sup>&</sup>lt;sup>9</sup>nickel acetate unsatisfactory

<sup>10</sup> vegetable oils may be marginal or unsatisfactory

acetal coloolymer (celcon)

alunina (Also) aluminum?

anodic coaling?

ninie rubber (Bune Ny

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POON TESTINGETOON COMPOSITE

Stroy Testification Composite
Name of the State Police of the Police of

Polyphenylene oxide (PPO) (Noni)

Powernylene (HOPE) polyemelene (LDDE) PON Dropylene Polystyrene

Polysulfone

toluene methylbenzene 🖑	tetrahydrofuran	phenol (50%)	phenoi (5%)	methyl ethyl ketone 2-butanone	methylene chloride dichloromethane	methanol	kerosene 👭	isopropyl alcohol 2-propanol	hexane 🕚	ethylene glycol 1,2-ethanediol	ethyl acetate ethyl ethanoate	ether	ethanol (95%) 👏	SOLVENTS (continued) ethanol (50%)	- Address de la company de
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<sup>&</sup>lt;sup>9</sup>nickel acetate unsatisfactory

<sup>10</sup> vegetable oils may be marginal or unsatisfactory

<sup>11</sup> satisfactory resistance when exposed to phenol (70%)

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<sup>=</sup> satisfactory resistance

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M = marginal resistance

U = unsatisfactory resistance

X = unknown

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<sup>&</sup>lt;sup>1</sup>discoloration

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<sup>&</sup>lt;sup>9</sup>nickel acetate unsatisfactory

<sup>10</sup> vegetable oils may be marginal or unsatisfactory

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<sup>10</sup> vegetable oils may be marginal or unsatisfactory

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### GLOSSARY OF TERMS

anodized coating a thin, hard layer of aluminum oxide formed electrochemically on aluminum rotor and/or accessory surfaces as a

protective coating for corrosion resistance

Buna N black nitrile rubber used for O-rings and gaskets in rotor assemblies

Delrin thermoplastic material (acetal homopolymer) used for most tube adapters

**EPDM** ethylene propylene rubber used for O-rings and pad adapters

HDPE high density polyethylene used for adapters

LDPE low density polyethylene used for tubes and bottles

neoprene black synthetic elastomer used for O-rings in some tube caps and bottle cap assemblies

Noryl modified thermoplastic polyphenylene oxide (PPO) used for floating spacers (part of the g-Max system) and some

polycarbonate bottle caps

PET polyethylene terephthalate used in some adapters

Polyphenylene Sulfide (PPS) used in cap closures and other products as specified

Radel polyphenylsulfone (PPSU) used in plugs, cap closures, cannisters, and other accessories

Ultem polyetherimide (PEI) used in adapters, covers, and spacers

Viton fluorocarbon elastomer used in high-temperature applications

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