

Herolab

The High Speed Heroes



Tubes and Bottles For centrifugation



70 mm wide-neck

Ready for your application:

from 10 ml up to 1,000 ml Filling capacity

from different Plastic materials:

PPCO, PC, PE, PF

autoclavable (PPCO, PC, PF)

tested for tightness and max. RCF



Tubes and Bottles for centrifugation

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- On request, we are happy to manufacture special plastic containers if there is a correspondingly high demand. Talk to us!

Note: Herolab reserves the right to change technical specifications without prior notice.

1. Selection Criteria

1.1 Volume

We offer tubes and bottles from 10 ml up to 1,000 ml. When selecting the tubes/bottles, please note the outer diameter of the tubes/bottles or the diameter of the rotor bores and the length/height. You will find the details of the tubes/bottles listed with the catalogue no.

1.2 Chemical resistance - refer also to resistance table page 14

Chemical Groups	PPCO Polypropylene- Copolymer	PP Polypropylene	PE Polyethylene	PC Polycarbonate	PF Polyflor
Acids, diluted	S	S	S	S	S
Acids, strong	S	S	S	U	S
Alcohols and bases	S	S	S	U	S
Aldehydes and oxidising agents	M	M	M	M	S
Esters	M	M	M	U	S
Hydrocarbons Aliphatic (i. e. Hexane)	M	S	U	U	S
Hydrocarbons halogenated or aromatic (i. e. phenol, chloroform)	M	M	M	U	S
Ketones (i. e. Acetone)	M	M	M	U	S
Salts	S	S	S	M	S

1.3 Thermal resistance

Temperature Range	PPCO	PP	PE	PC	PF
< +4°C	S	U	S	S	S
+4°C bis +20°C	S	M	S	S	S
+20°C bis +40°C	S	S	S	S	S
Autoclavable	S	S	U	S	S

S	Satisfactory
M	Marginal, test runs recommended
U	Unsuitable, not recommended

1. Selection Criteria

1.4 Sterilisation options

Sterilisation	PPCO	PP	PE	PC	PF
Autoclave	x	x		x	x
Dry heat					x
Gas	x	x	x	x	x
Chemical	x	x	x	x	x
Ultraviolet light					x

PPCO, PC and PF tubes and bottles can be autoclaved repeatedly for 20 minutes at 121°C and 103 kPa (1.03 bar = 15 psi).

In the case of PC, the sterilisation time under these conditions should not be exceeded. Frequent sterilisation reduces the mechanical strength of PC, but also of all other plastics.

Autoclaving instructions :

- All containers must be thoroughly rinsed with distilled water prior to autoclaving as detergent residues may cause cracking, discoloration and staining.
- **Caps of bottles and tubes must be completely removed before autoclaving to avoid damage during cooling.**
- Autoclaved containers should be inspected for cracks and deformation before next use.

1.5 Transparency

Transparency Range	PPCO	PP	PE	PC	PF
Transparent				x	
Translucent	x	x			x
Opaque			x		



2. Material Short description

- For resistance table see page 14 -

1. PPCO Polypropylene-Copolymer

Polypropylene copolymer is a polyallomer consisting of polypropylene and polyethylene units. It is a transparent material with good chemical and thermal resistance. It is therefore widely used.

Temperature range: from -40°C up to 121°C

2. PC Polycarbonate

Polycarbonate is a transparent, rigid and non-pierceable material. It is compatible with neutral salts and weak acids. PC is extremely sensitive to organic solvents, alcohols, oils, DMSO and alkaline solutions. The tubes are reusable. Use only rubber-coated spatulas and soft brushes.

Temperature range: from -40°C up to 121°C

3. PE Polyethylene

The PE offered is a HD-PE (high density PE). Polyethylene is a milky polymer. It is particularly suitable for applications where acetone, acetic acid or hydrochloric acid is used. Elasticity is greater than most other plastics. It is suitable for cutting, piercing and low temperature applications. For high speed operation, PE tubing must be fully filled and sealed. PE cannot be autoclaved.

Temperature range: from -80°C up to +70°C

4. PF Polyflor

Polyflor is a translucent material with excellent chemical resistance. It is inert to acids, bases, salts and organic solvents at normal centrifugation temperatures. At higher temperatures, however, this fluorocarbon is attacked by some organic solvents. The material is slightly elastic. Tubes must be completely filled and sealed when running at the maximum permitted speeds.

Temperature range: from -60°C up to 140°C

5. PP Polypropylene

Polypropylene PP-H (homopolymer) is a transparent material with good thermal resistance. However, it becomes brittle at low temperatures. Homopolymer does not have the good chemical resistance of polypropylene copolymer.

Temperature range: from -30°C up to 125°C

3. Centrifuge Tubes

3.1 AOR Advanced Oak Ridge-Tubes

Advantages of AOR tubes :

- The unique combination of a screw cap with three self-seal pressure rings, a conical stopper and an o-ring ensures that the tubes are gas-tight and cannot be overturned.

- The tubes can be used for applications where **high speed** is required.

- The tubes are **reusable**.
(PE is not autoclavable.)

- The dimensions correspond to the usual **standard**. That means they fit all rotors and adapters of the major centrifuge manufacturers.



Cat. No. Tubes with caps	Nominal Volume	Filling Volume	Dimension (mm) Ø x Length	Material	Tested up to ... min ⁻¹	Tested up to ... x g	Pieces per pack
25 24 01	10 ml	9 ml	16 x 80	PC	24,000	57,960	10
25 24 11	10 ml	8 ml	16 x 80	PPCO	24,000	57,960	10
25 24 41	10 ml	9 ml	16 x 80	PE	18,000	32,600	10
25 24 51	10 ml	9 ml	16 x 80	PF	20,000	40,250	2
25 29 51	30 ml	27 ml	25 x 92	PC	24,000	64,397	10
25 29 61	30 ml	25 ml	25 x 92	PPCO	24,000	64,397	10
25 29 65	30 ml	24 ml	25 x 92	PE	10,000	11,180	10
25 29 71	30 ml	26 ml	25 x 92	PF	24,000	64,397	2
25 32 01	50 ml	40 ml	29 x 103	PC	24,000	69,549	10
25 32 11	50 ml	38 ml	29 x 103	PPCO	24,000	69,549	10
25 32 15	50 ml	38 ml	29 x 103	PE	12,000	17,387	10
25 32 21	50 ml	42 ml	29 x 103	PF	18,000	39,121	2
25 32 41	80 ml	73 ml	38 x 105	PC	20,000	50,086	10
25 32 45	80 ml	76 ml	38 x 105	PPCO	20,000	50,086	10
25 32 47	80 ml	69 ml	38 x 105	PE	12,000	18,031	10
25 32 49	80 ml	73 ml	38 x 105	PF	15,000	28,174	2

3. Centrifuge Tubes

3.2 Plastic tubes without cap or with cap with loop

In the fixed-angle rotor, these tubes must always be filled at least 80 % and sealed with the push-in stopper. Always check the tubes for cracks before centrifugation and do not use them again if they are cracked.

Cat. No. Tubes	Nominal Volume	Fill Volume	Dimension Ø x Length mm	Material and Form	Tested up to... rpm	Tested up to... x g	Pieces per Pack
25 22 30	4.5 ml	4.5 ml	12 x 75	PP-RB	20,000	36,000	1.000
25 25 70	14 ml	11.3 ml	18 x 75	PC-RB	20,000	49,461	10
25 25 90	14 ml	10.7 ml	18 x 75	PF-RB	20,000	49,461	2
25 26 60	14 ml	11.5 ml	18 x 75	PE-RB	15,000	23,449	10
25 26 90	14 ml	10.8 ml	18 x 75	PPCO-RB	20,000	49,461	10
25 27 00	16 ml	15.5 ml	18 x 100	PC-RB/FL	20,000	49,461	10
25 27 20	16 ml	14.5 ml	18 x 100	PPCO-RB/FL	20,000	49,461	10
25 27 40	16 ml	15.0 ml	18 x 100	PE-RB/FL	15,000	23,449	10
25 27 51	16 ml	14.5 ml	18 x 100	PF-RB/FL	20,000	49,461	2
25 31 00	50 ml	42.8 ml	29 x 103	PC-RB/FL	20,000	49,461	10
25 31 05	50 ml	42.8 ml	29 x 103	PC-RB/FL/LC	20,000	49,461	10
25 31 30	50 ml	40.9 ml	29 x 103	PE-RB/FL	15,000	23,449	10
25 31 45	50 ml	42.1 ml	29 x 103	PPCO-RB/FL/LC	20,000	49,461	10
25 31 51	50 ml	40.0 ml	29 x 103	PF-RB/FL	20,000	49,461	2
25 31 60	50 ml	42.1 ml	29 x 103	PPCO-RB/FL	20,000	49,461	10
25 33 00	100 ml	100.0 ml	40 x 115	PC-RB/G	8,000	8,586	2

PPCO Polypropylene-Copolymer
 PF Polyflor
 PE Polyethylene
 PC Polycarbonate

G Graduated tubes
 RB Round bottom
 LC = Loop cap



Caps

Cat. No.	Details	Suitable for:		Pieces per Pack
25 45 50	Caps for 14 ml-tubes (PPCO, PC, PF, PP) and for 16 ml -tubes (PPCO, PF, PC)	25 26 90 25 25 70 25 25 90	25 27 00 25 27 51 25 27 20	10
25 45 51	Caps for 14 ml + 16 ml -tubes (PE)	25 26 60	25 27 40	10
25 46 00	Caps for 50 ml-Tubes (LC - Cap with Loop)	25 31 00 25 31 30 25 31 51 25 31 60		10

4. Centrifuge Bottles

Here is a small selection of the tubes and bottles.
The wide-neck bottles with 70 mm opening can be found on pages 10 and 11.
Tubes and bottles made of PPCO, PC and PF are autoclavable.



4. Centrifuge Bottles

4.1. Centrifuge Bottles with Caps

Cat. No. Bottles with cap	Nominal Volume	Filling Volume	Dimensions (mm) Ø x Length	Material and Form	Tested up to ... min ⁻¹	Tested up to ... x g	Pieces per pack
25 33 71	200 ml	186 ml	56 x 112	PC - FB/W	10,000	16,323	6
25 33 73	200 ml	168 ml	56 x 112	PPCO-FB/W	10,000	16,323	6
25 33 75	200 ml	179 ml	56 x 112	PC - CB/W	10,000	16,323	6
25 33 77	200 ml	156 ml	56 x 112	PPCO-CB/W	10,000	16,323	6
25 34 01	250 ml	232 ml	62 x 122	PC - FB/W ¹	14,400	33,847	6
25 34 12	250 ml	227 ml	62 x 122	PPCO/black-FB/W ¹	13,000	27,585	6
25 34 21	250 ml	225 ml	62 x 122	PPCO-FB/W ¹	14,400	33,847	6
25 34 31	250 ml	239 ml	62 x 122	PE - FB/W ¹	13,500	29,749	6
25 34 39	250 ml	231 ml	62 x 122	PF - FB/W ¹	12,000	23,505	2
25 34 41	250 ml	203 ml	62 x 122	PC - RB/W ¹	14,400	33,847	6
25 34 45	250 ml	213 ml	62 x 122	PPCO-RB/W ¹	14,400	33,847	6
25 34 47	250 ml	213 ml	62 x 122	PE - RB/W ¹	13,500	29,749	6
25 34 49	250 ml	213 ml	62 x 122	PF - RB/W ¹	12,000	23,505	2
25 34 81	290 ml	273 ml	62 x 137	PC - FB/W ³	14,400	33,847	6
25 34 87	290 ml	275 ml	62 x 137	PE - FB/W ³	13,500	29,749	6
25 35 01	500 ml	432 ml	70 x 165	PC - FB/W ²	10,500	20,560	6
25 35 12	500 ml	430 ml	70 x 165	PPCO/black- FB/W ²	10,500	20,560	6
25 35 21	500 ml	432 ml	70 x 165	PPCO-FB/W ²	10,500	20,560	6
25 35 31	500 ml	431 ml	70 x 165	PE - FB/W ²	7,500	10,226	6
25 35 39	500 ml	431 ml	70 x 165	PF - FB/W ²	5,200	6,240	2
25 35 51	500 ml	503 ml	98 x 114 S	PPCO-FB/W	5,200	5,290	4
25 37 65 new	500 ml	500 ml	98 x 112 S	PPCO-FB/W 70	4,100	5,394	4
25 35 90	650 ml	670 ml	98 x 136	PC - FB/W	4,000	4,936	4
25 35 91	650 ml	668 ml	98 x 136	PPCO - FB/W	4,000	4,936	4

¹ Use the 250/290 ml bottles with bottom pad adapter:

25 51 81 for Flat bottom

Not for fixed angle rotors AF 6.250 (Herolab),

HFA-14.290 (Heraeus) and JA-14 (Beckman).

Not for Swing-out Rotors

25 51 90 for Round bottom

² The 500 ml bottles for fixed-angle rotors always use with collar support ring 25 52 41.

The bottles cannot be used in the JA-10 (Beckman)!

³ The 290 ml bottles do not fit into the rotors

AF 6.250 (Herolab) and JA-14 (Beckman).

S For Swing-out Rotor W Wide-mouth



4. Centrifuge Bottles

4.1. Centrifuge Bottles with Caps - Continued

Cat. No Bottles with Cap	Nominal Volume	Filling Volume	Dimensions (mm) Ø x Length	Material and Form	Tested up to ... min ¹	Tested up to ... x g	Pieces per pack
25 35 80	750 ml	760 ml	98 x 152	PC - FB/W	4,000	4,936	4
25 35 81	750 ml	762 ml	98 x 152	PPCO - FB/W	4,000	4,936	4
25 37 70	750 ml	745 ml	98 x 136 S	PPCO - FB / W 70	4,100	5,394	4
25 37 30	750 ml	750 ml	100 x 143 F	PPCO - FB / W 70	8,000	12,042	4
25 37 35	750 ml	750 ml	100 x 130 S	PPCO - FB / W 70	4,100	5,394	4
25 37 40	950 ml	925 ml	100 x 169 F	PPCO - FB / W 70	8,000	12,042	4
25 37 45	950 ml	925 ml	100 x 155 S	PPCO - FB / W 70	4,100	5,394	4
25 35 62	1,000 ml	900 ml	98 x 175	PC - FB/W	4,000	4,936	4
25 35 65	1,000 ml	900 ml	98 x 175	PC - FB/W / SR	8,000	12,042	4
25 35 72	1,000 ml	887 ml	98 x 175	PPCO - FB/W	4,000	4,936	4
25 35 75	1,000 ml	885 ml	98 x 175	PPCO - FB/W / SR	8,000	12,042	4
25 37 50	1,000 ml	1,010 ml	100 x 181 F	PPCO - FB / W 70	8,000	12,042	4
25 37 55	1,000 ml	1,010 ml	100 x 168 S	PPCO - FB / W 70	4,100	5,394	4
25 37 80	1,000 ml	1,010 ml	98 x 190 F	PPCO - FB / W 70	8,000	12,042	4
25 37 85	1,000 ml	1,010 ml	98 x 173 S	PPCO - FB / W 70	4,100	5,394	4

S for Swing-out rotors
F for Angle rotors

PPCO - Polypropylene-Copolymer
PE - Polyethylene
PC - Polycarbonate
PF - Polyflor

W - Wide Neck

FB - Flat Bottom
CB - Conical bottom

RB - Round bottom
SR - Support Ring



Bottles made of PC, PPCO, PE, PF



W 70: Wide-neck Bottles with 70 mm opening

4. Centrifuge Bottles

4.2. Overview of the 70 mm wide-neck bottles

PPCO-Bottles 70 mm opening	Volume	Dimensions / tested up to	Cat. No. Bottles with caps	Cat.No. Bottles without Caps	Cat. No. Caps
Blue Caps / bottles Ø 100 mm 	750 ml	Ø 100 x 145 mm For Angle Rotors 8,000 rpm / 12,042 x g	25 37 30	23 37 30 (PPCO)	25 46 80 made of POM-C + PP-30 GF + FKM o-Ring
	950 ml	Ø 100 x 169 mm For Angle Rotors 8,000 rpm / 12,042 x g	25 37 40	23 37 40 (PPCO)	25 46 80 made of POM-C + PP-30 GF + FKM o-Ring
	1,000 ml	Ø 100 x 181 mm For Angle Rotors 8,000 rpm / 12,042 x g	25 37 50	23 37 50 (PPCO)	25 46 80 made of POM-C + PP-30 GF + FKM o-Ring
As above but White caps / bottles Ø 98 mm	1,000 ml	Ø 98 x 190 mm For Angle Rotors 8,000 rpm / 12,042 x g	25 37 80	23 37 80 (PPCO)	25 46 73 made of POM-C + PP-30 GF + FKM o-Ring
Nature color Caps 	750 ml	Ø 100 x 131 mm <i>For Swing-out Rotors</i> 4,100 rpm / 5,394 x g	25 37 35	23 37 30 (PPCO)	25 46 79 made of PP + FKM o-Ring
	950 ml	Ø 100 x 155 mm <i>For Swing-out Rotors</i> 4,100 rpm / 5,394 x g	25 37 45	23 37 40 (PPCO)	25 46 79 made of PP + FKM o-Ring
	1,000 ml	Ø 100 x 167 mm <i>For Swing-out Rotors</i> 4,100 rpm / 5,394 x g	25 37 55	23 37 50 (PPCO)	25 46 79 made of PP + FKM o-Ring
	500 ml	Ø 98 x 112 mm <i>For Swing-out Rotors</i> 4,100 rpm / 5,394 x g	25 37 65	23 37 60 (PPCO)	25 46 79 made of PP + FKM o-Ring
	750 ml	Ø 98 x 136 mm <i>For Swing-out Rotors</i> 4,100 rpm / 5,394 x g	25 37 70	23 37 70 (PPCO)	25 46 79 made of PP + FKM o-Ring
	1,000 ml	Ø 98 x 173 mm <i>Only for Swing-out Rotors</i> AS 4.1000 Herolab 4,100 rpm / 5,394 x g	25 37 85	23 37 80 (PPCO)	25 46 79 made of PP + FKM o-Ring

Materials: PPCO Polypropylene-Copolymer
PP-30 GF Polypropylene + 30 % glass fibre

POM-C Polyoxymethylene copolymer
FKM Fluororubber (Viton, FDA grade)

5. Compatibility with Rotors of other manufacturers

Volume	approx. Ø of Rotor bore x max. Length (mm)	The tubes will fit into the next larger sized rotor with adapters from all manufacturers. Swing-out rotors are listed without bucket or adapter numbers. Manufacturers not listed have in most cases an identical size of the rotor compartment. The information given is as accurate as possible. Errors or incompleteness could be contained. Herolab is not responsible for any damage caused by the given information! Herolab reserves the right to modify any part without prior notice.
10 ml	16.1 x 80	Herolab AFH 20.180 or AF 20.10 Sigma 12111, 12141, 12157 and 12168 Beckman JA-21, JS-24.15, F1010 and S0410
30 ml	25.3 x 92	Sigma 12139, 12158 and 12172 Beckman JS-24.38, F0630 Hermle 220.76 V02, 220.76 V03 and 221.10 V02
50 ml	28.7 x 103	Herolab AF 8.50.1, A 8.24, AF 8.50.2, A 12.17, AS 4.7 and AS 4.13 Sigma 12150, 12156 and 12160 Jouan AK(L) 50.22, AK(L) 50.17 and FAJ-20C Sorvall SS-34, SA-300, SA-600, F-28/50, A-500, A/S-400, LA/S-400, SL-50RT, HB-4 and HB-6 Beckman JA-20, JA-12, JA-17, JA-25.50, JA-30.50Ti, JS-13, JS-13.1, F0650, F0850 and TA-14-50 Fiberlite F21(B.S or J)8x50(y) and F18(B.S or J)12x50(y) Hermle 220.80 V02, 220.80 V03 and 221.22 V01
80 ml	38.1 x 105	Herolab AFH 6.180 or AF 6.94 (6.80), A 8.20 and AS 4.13 Sigma 121559, 12159 and 12165 Jouan AG 100.18, AG 100.14, AK(L) 100.21, SWK 100.13 und SWG 100.9 Sorvall SA-800 Beckman JA-18, F0485, F0685 and FX6100 Fiberlite F20(B.S or J)6x100 Hermle 220.78 V02, 220.78 V03, 221.18 V01 and 221.20 V01
200 ml	56.5 x 112	Herolab ASH 4.055, AS 4.500 or TS 4.200 Sigma 11133, 11140, 11150, 11156, 11180, 11650, 11800 and 11801
250 ml	61.8 x 122	Herolab AF 6.250, AF 8.250, A 6.14, AFH-4.090 and AS 4.7 Sigma 11150, 11180, 11650, 11800, 11801, 12256 and 12258 Jouan AG 290.9, AK(L) 250.14 and FAJ-14C Sorvall GSA, SLA-1000, SLA-1500, SLC-1500, H-1000B, RTH-250, H-2000B and HS-4 Beckman JA-14, JLA-16.250, TA-10.250, JS-7.5 and SX4250 Fiberlite F14(B.S or J)6x250(y) and F16(B.S or J)4x250(y) Hermle 221.21 V01, 221.08 V01 and 221.15 V01
290 ml	61.8 x 137	Herolab A 6.14 Sorvall GSA and SLA-1500 Jouan AG 290.9 and AK 250.14 Beckman JA-14, JLA-16.250 and JS-7.5
500 ml	69.5 x 165	Herolab AF 6.500, AF 8.500 and A 6.9 Sigma 11150, 11650, 11800, 11801, 12500 and 12505 Jouan FAJ-10C and AK(L) 500.11 Sorvall GS-3, SLA-3000, SLC-3000 Beckman JLA-10.500 Fiberlite F10(B.BA.S or J)6x500(y) and F12S6x500y
500 ml	97.5 x 114	Herolab AS 4.500
650 ml	97.5 x 136	Herolab AS 4.750 Sigma 11650, 11800 and 11801
750 ml	97.5 x 152	Herolab AS 4.750 Sigma 11650, 11800 and 11801 Sorvall SH-3000, TTH-750 and RTH-750 Beckman JS-4.3 SX4750 SX4750A Hermle 220.70 V06
1.000 ml	97.5 x 175	Herolab AF 4.1000, AF 6.1000 and AS 4.1000 Sigma 12510, 11800 and 11801 Sorvall SLC-4000, SLC-6000, HL-4, HG-4L, H-4000, H-6000 Beckman JS-4.0 Fiberlite F(7S.8B, 9B.9S.9J)4x1000y, F6(B.S or J)6x1000y and F8(B.BA.S or J)6x1000y Hermle 220.70 V05

6. Ultracentrifuge Tubes

Cat. No. Tubes without Caps	Nominal Volume	Filling Volume	Dimensions (mm) Ø x Länge	Material and Form	Speed max... min ⁻¹ (full)	Pieces per pack	Cat No. Order cap separately 1 Piece	Fits directly into the following rotors:
25 20 20	2.0 ml	0.6 ml	8 x 51	PC - thick-walled	45,000	50	./.	TFT 80.2. TST 60.2
25 21 40	4.4 ml	3.3 ml	11 x 60	PPCO - thin-walled	80,000	50	./.	TFT 80.4. TST 60.4 SW 60Ti. SW 56Ti
25 22 20	4.4 ml	2.7 ml	11 x 60	PC - thick-walled with thread	50,000	50	25 46 94	
25 21 90	5.0 ml	5.0 ml	13 x 51	PPCO - thin-walled	55,000	50	./.	TST 55.5. AH-650. SW 65
25 22 40	5.0 ml	3.4 ml	13 x 51	PC - thick-walled	55,000	50	./.	SW 55Ti. SW 50.1. SW 50 SW 39. TLA 100-3
25 23 50	6.5 ml	2.8 ml	13 x 64	PPCO-thick-walled	35,000	50	./.	TFT 45.6 / 50.4Ti / 50.3Ti / 40.3
25 23 40	6.5 ml	5.8 ml	13 x 64	PPCO-thin-walled	45,000	50	./.	
25 22 80	6.5 ml	2.8 ml	13 x 64	PC-thick-walled	40,000	50	./.	
25 23 90	13.2 ml	11.3 ml	14 x 89	PPCO-thin-walled	41,000	50	./.	TST 41.13 SW 41 Ti
25 24 80	13.5 ml	8.5 ml	16 x 76	PC-thick-walled	40,000	50	./.	TFT 80.13. TFT 75.13. TFT 65.13 TFT 60.13 TFT 50.13 TFT 32.13 80Ti 75Ti 70.1Ti 65. 50Ti 40.SW36
25 24 90	13,5 ml	9,5 ml	16 x 76	PC - thick-walled with thread	40,000	50	25 46 88	
25 25 60	14.0 ml	9.0 ml	14 x 95	PC-thick-walled	30,000	50	./.	TST 41.14 SW 40 Ti
25 26 20	17.0 ml	15.8 ml	16 x 102	PPCO-thin-walled	28,000	50	./.	TST 28.17. AH-629 SW 27.1 SW 28.1
25 30 50	38.5 ml	34.0 ml	25 x 89	PPCO-thin-walled	70,000	50	./.	TFT 70.38 TFT 65.38 TFT 55.38TFT 50.38.
25 30 40	38.5 ml	29.0 ml	25 x 89	PC-thick-walled	50,000	50	./.	TST 28.38. AH-629 70Ti 60Ti 55.2Ti 30.2Ti 42.1 SW 27.
25 30 20	38.5 ml	32.5 ml	25 x 89	PC - thick-walled with thread	50,000	50	25 46 85	(SW 28 Without Cap)
25 32 60	94.0 ml	77.0 ml	38 x 102	PPCO Thick-walled	45,000	25	./.	TFT 45.94. 45Ti. 35
25 32 80	94.0 ml	77.0 ml	38 x 102	PC-thick-walled	45,000	25	./.	
25 32 90	94.0 ml	88.0 ml	38 x 102	PC - thick-walled with thread	40,000	25	25 46 82	
25 34 25 Bottles with white Cap*	250 ml	191.5 ml	60 x 122	PPCO - Bottles	20,000	6	25 46 65 Delrin Neopren-Ring	TFA 20.250 Typ 19

* This ultra-centrifuge bottle has other dimensions than a high-speed bottle with the same volume.

Tubes have been tested at 4°C for 24 hours. As there are many factors that may affect the performance and life of the centrifuge tubes, the above information has been compiled as a general guideline, but it is in no way an absolute guarantee of product performance in a laboratory situation.

7. Chemical resistance (page 15-18)

On the following pages you will find the chemical resistances of the plastics PPCO, PP, POM, PC, PE and PF.

Important information :

This resistance table has been compiled from a number of sources! The resistance data is intended only as a guide to the correct selection of tube material. Binding chemical resistance data for materials under centrifugation stress do not exist. If in doubt, preliminary tests are highly recommended.

Abbreviations :

- S** Satisfactory
- S¹** Satisfactory, may cause discoloration
- M** Marginal; may be satisfactory for use in a centrifuge depending on length of exposure and speed. We recommend tests close to the application!
- U** Unsatisfactory; not recommended
- Effects unknown. Tests recommended

Personal notes:

7. Chemical resistance 1/4

	PPCO	PC	PE	PF	PP	POM-C
acetaldehyde	M	U	M	M	M	-
acetic acid (5%)	S	S	S	S	S ¹	U
acetic acid (60%)	S	U	S	S	M	S
acetic acid (glacial)	S	U	M	S	U	U
acetone	S	U	S	M	S	S
acetonitril	U	U	S	U	M	-
Alconox®	S	M	S	-	S	-
allyl alcohol	S	S	S	-	S	-
aluminium chloride	S	S	S	S	S	S
aluminium fluoride	S	U	S	S	S	-
ammonia	S	U	U	S	S	-
ammonium acetate	S	S	S	-	S	-
ammonium carbonate	S	U	S	S	S	-
ammonium hydroxide (10%)	S ¹	U	S	S	S ¹	-
ammonium hydroxide (28%)	S ¹	U	S	S	S ¹	-
ammonium hydroxide (cone.)	S ¹	U	S	S	S ¹	-
ammonium phosphate	S	S	S	S	S	-
ammonium sulfate	S	S	S	S	S	-
ammonium sulphide	S	U	-	S	S	-
amyl alcohol	M	S	S	S	M	S
aniline (benzenamine)	U	U	U	S	M	-
Aqua Regia	U	U	U	-	U	-
barium salts	S	S	S	S	S	-
benzene	U	U	U	S	U	U
benzyl alcohol	U	U	U	S	U	-
boric acid	S	S	S	S	S	M
n-butyl alcohol	S	M	M	S	S	-
calcium chloride	S	M	S	S	S ¹	S
calcium hydrochloride	S	M	S	S	S	-
carbon tetrachloride	U	U	U	-	U	S
cesium acetate	S	S	S	-	S	-
cesium bromide	S	S	S	S	S	-
cesium chloride	S	S	S	S	S	-
cesium formate	S	S	S	-	S	-
cesium iodide	S	S	S	-	S	-
cesium sulfate	S	S	S	S	S	-
cesium trifluoroacetate	S	S	S	-	S	-
chlorine water	S	S	M	S	S	-
chlorobenzene	U	U	U	S	U	M
chloroform	M	U	M	S	M	U
chromic acid (10%)	S	M	U	S	S	-
chromic acid (50%)	S ¹	U	U	S	S	-
citric acid (10%)	S	S	S	S	S	M
cresol	M	U	U	-	U	-
cyclohexane	U	U	U	S	U	S

7. Chemical resistance 2/4

	PPCO	PC	PE	PF	PP	POM-C
cyclohexanol	S	M	S	S	S	S
deoxycholate	S	S	S	-	S	-
dextran (dextran sulfate)	S	S	S	S	S	-
diacetone	S	-	S	S	S	-
diethylether	M	U	U	S	M	S
diethyl ketone	U	U	M	-	M	-
diethylpyrocarbonate	S	U	S	-	S	-
N,N-dimethylformamide	S	U	S	U	S	-
Dimethylsulfoxide (DMSO)	S	U	U	-	S	-
dioxane	M	U	S	M	M	M
ethanol (5%)	S	U	S	S	S	S
ethanol (50%)	S	U	S	S	S	S
ethanol (70%)	S	U	S	S	S	S
ethanol (95%)	S	U	M	S	S	-
ethyl acetate	M	U	U	S	U	U
ethylene dichloride	U	U	U	S	U	-
ethylene glycol	S	U	S	S	S	-
ethylene oxide	S	M	S	S	S	-
ethylene	M	U	U	-	M	-
fatty acids, saturated	S	S	U	S	S	-
fatty acids, unsaturated	S	S	U	S	S	-
ferric chloride	S	—	S	S	—	-
Ficoll-Paque	S	S	S	-	S	-
fluoroboric acid	S	-	S	-	S	-
formaldehyde (5%)	S	S	S	S	S	-
formaldehyde (40%)	S	S	S	S	S	S
formic acid (3%)	S	U	S	-	S	S
formic acid (10%)	S	U	S	-	S	S
gallic acid	S	-	S	S	S	-
glycerol	S	S	S	S	S	S
guanidine hydrochloride	S	U	S	-	S	-
guanidine isothiocyanate	S	U	-	-	-	-
Haemo-Sol	S	S	S	-	S	-
2-heptyl	S	-	S	S	S	-
hexane	M	U	U	S	S	-
hydrochloric acid (5%)	S	S	S	S	S	U
hydrochloric acid (10%)	S	U	S	S	S	U
hydrochloric acid (37%)	M	U	S	S	M	U
hydrochloric acid (50%)	M	U	S	S	M	U
hydrochloric acid (cone.)	M	U	-	S	S	U
hydroformic acid (100%)	S	-	S	-	S	-
hydrogen peroxide (3%)	S	S	S ¹	S	S	S
hydrogen peroxide (100%)	S	S	S ¹	S	S	-
isobutanol	S	S	S	-	S	-
isopropanol	S	U	S	-	S	S

7. Chemical resistance 3/4

	PPCO	PC	PE	PF	PP	POM-C
kerosene	U	U	U	S	U	-
lactic acid (20%)	S	S	M	S	S	S
lactic acid (50%)	S	S	M	S	S	S
lactic acid (100%)	S	S	M	S	S	S
lauryl alcohol	S	-	S	-	S	-
lead acetate	S	-	S	S	S	-
magnesium chloride	S	S	S	S	S	-
magnesium hydroxide	S	U	S	S	S	-
maleic acid	S	—	S	S	S	-
manganese salts	S	-	S	-	S	-
mercaptoacetic acid	S	U	U	-	U	-
2-mercaptoethanol	S	U	-	-	S	-
methanol	S	U	S	S	S ¹	S
methyl ethyl ketone	S	U	U	M	S	M
methylene chloride	U	U	U	S	U	U
metrizamide	S	S	S	-	S	-
nickel salts	S	S	S	S	S	-
nitric acid (10%)	S ¹	S	S	S	S	U
nitric acid (50%)	S ¹	M	U	S	M	U
nitric acid (95%)	M	U	U	S	M	U
oils (petroleum)	S	U	U	S	U	-
oils (other)	S	U	U	S	S	-
oleic acid	S	S	S	-	S	-
oxalic acid	S	U	S	S	S	U
perchloric acid (10%)	S	U	M	S	M	-
perchloric acid (70%)	M	U	M	S	M	-
phenol (5%)	S	U	M	S	S	-
phenol (50%)	M	U	M	S	M	-
phenylethyl alcohol	S	-	S	-	S	-
phosphoric acid (10%)	S	S	S	S	S	-
phosphoric acid (85%)	S	S	S	S	S	-
phosphoric acid (cone.)	M	U	S	S	M	-
phosphorus trichloride	S	U	S	S	S	-
physiologic fluids	S	S	S	S	S	-
picric acid	S	S	S	S	S	-
potassium acetate	S	M	S	-	S	-
potassium bromide	S	S	S	S	S	-
potassium carbonate	S	U	S	S	S	-
potassium chlorate	S	S	S	S	S	-
potassium chloride	S	S	S	S	S	-
potassium hydroxide (5%)	S	U	S	S	S	M
potassium hydroxide (45%)	S	U	S	S	U	M
potassium hydroxide (cone.)	S	U	S	S	U	M
potassium permanganate	S	S	S	S	S	-

7. Chemical resistance 4/4

	PPCO	PC	PE	PF	PP	POM-C
2-propanol	S	U	S	S	S	S
pyridine (50%)	M	U	U	M	S	-
rubidium bromide	S	S	S	-	S	-
rubidium chloride	S	S	S	-	S	-
silver cyanide	S	-	S	S	S	-
silver nitrate	S	S	S	S	S	-
sodium bisulphate	S	S	S	S	S	-
sodium borate	S	S	S	-	S	-
sodium bromide	S	S	S	S	S	-
sodium carbonate	S	U	S	S	S	-
sodium chloride (10%)	S	S	S	S	S	S
sodium chloride, saturated	S	S	S	S	S	-
sodium dichromate	S	-	S	-	S	-
sodium dodecyl sulfate	S	S	S	S	S	-
sodium hydroxide (1%)	S	U	S	-	S	S
sodium hydroxide (10%)	S	U	S	-	S	S
sodium hydroxide (cone.)	M	U	S	-	M	-
sodium hypochlorite	S ¹	S	U	S	U	-
sodium iodide	S	S	S	-	S	-
sodium nitrate	S	U	S	S	S	-
sodium peroxide	S	-	S	S	S	-
sodium sulfate	S	S	S	S	S	-
sodium sulfite	S	S	S	S	S	-
sodium sulphide	S	U	S	S	S	-
sodium thiosulphate	S	S	S	S	S	-
Solution 555 (20%)	S	S	S	-	S	-
sucrose	S	S	S	S	S	-
sucrose, alkaline	S	U	S	-	S	-
sulfuric acid (10%)	S	S	M	S	S	U
sulfuric acid (50%)	S	U	M	S	S	U
sulfuric acid (cone.)	S ¹	U	S	S	S ¹	U
tannic acid	S	-	S	-	S	-
tetrahydrofuran	U	U	U	M	U	M
toluene	U	U	U	S	U	S
trichloroacetic acid	S	M	U	-	S	-
trichlorethane	U	U	S	S	U	M
trisodium phosphate	S	-	S	S	S	-
Triton X-100	S	S	S	-	S	-
turpentine	M	U	U	-	M	-
urea	S	S	S	S	S	-
water	S	S	S	S	S	S
xylene	U	U	U	S	U	S
Zephiran chloride (1%)	S	S	S	-	S	-
zinc chloride	S	S	S	S	S	-
zinc sulfate	S	S	S	S	S	-

8. Important information

- For centrifugation in the fixed-angle rotor, fill centrifuge tubes or bottles to at least 80% to avoid the risk of tube collapse at full speed.
- In case of 250 ml-/290 ml bottles always use a pad (for round-bottom bottles: 25 51 90, for flat-bottom bottles: 25 51 81) to prevent wear and damage.

Exceptions:

With a Herolab AF 6.250, Beckmann JA 14 or JS 7,5 and Heraeus 14.290 rotor do not use a pad.

For the 250 ml-/290 ml-bottles the cover support ring of 500 ml bottles (25 52 41) may be used to tighten the cover, but must be removed before the run.

- The **500 ml-bottles** must always be equipped with the cover **support ring 25 52 41** (during the runs)!
- Always check tubes and bottles to be sure that there are no hair cracks. If there are cracks these tubes or bottles cannot be used for centrifugation anymore.
- Please note that chemicals which are not dangerous to the plastics normally, can behave differently during centrifugation.
- Our plastics PPCO, PP, PF and PC are autoclavable (20 min at 121 °C and 1 bar). The lifetime of PC is shortened by autoclaving. **PE are not autoclavable.**
- Tube or bottle caps must be completely removed prior to autoclaving.
- In general, the reusable tubes and bottles can be used for 50 runs before fatigue of material is detected.

Note: Herolab reserves the right to change technical specifications without prior notice.

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