



Thermo Scientific
Chromatography Columns
and Consumables 2016-2017

Connected chromatography solutions

Chromacol Vials and Closures

- Innovative products in micro- and precision sampling
- High quality, stringent manufacturing tolerances, have been extensively tested for comprehensive autosampler compatibility
- Products developed in close technical cooperation with the instrument manufacturers
- Detailed information regarding material specifications and compatibility
- Competent and experienced worldwide distributor network

Approximate Chemical Composition for Borosilicate Glass

Description	SiO ₂	B ₂ O ₃	Al ₂ O ₃	CaO	MgO	Na ₂ O	K ₂ O	BaO
33 expansion Glass	80%	13%	3%	0.1%	–	4%	0.1%	<0.1%
N-51A Glass	72%	12%	7%	1%	–	6%	2%	<0.1%
Clear Borosilicate-GOLD Grade	80.6%	13%	2.3%	–	–	4%	–	–

For autosampler compatibility visit www.thermoscientific.com/chromexpert



Chromacol 8mm Crimp Top Vials

- The SCI-VI system gives the chromatography user the ability to inject reproducibly from glass vials with residual volumes as low as 1µL to 5µL in a full range of autosampler instruments
- Precision-machined sleeves that allow the vials to be used in the vast majority of commercial autosamplers
- Sleeves are reusable and support the crimped, sealed vials in the correct position within both the autosampler carousel or racks
- Allow movement of the vials as a unit to injection positions in both GC and HPLC autosamplers
- Thermo Scientific™ Chromacol GOLD™ glass quality, a low expansion high purity glass with an extremely low concentration of active sites
- Available in both clear and amber glass these vials can be used with 8mm crimp and snap caps



Chromacol 8mm Crimp Top Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (µL)	Usable Volume (µL)	Residual (µL)	Cat. No.	Pack of
0.3mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Round Bottom	325	250	<5	03-CVG	500
0.2mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Conical	250	200	<5	02-CTVG	500
0.2mL Sci-Vi Crimp Top Vial	Amber	No	6x32	Conical	250	200	<5	02-CTV(A)	500
0.1mL Sci-Vi Crimp Top Vial – GOLD Grade Glass	Clear	No	6x32	Round Bottom	125	80	<1	01-CVG	500
1.2mL Crimp Top Vial	Clear	No	8x40	Flat Bottom	1300	1200	<75	1.2-CWV	500
1mL Crimp Top Tapered Vial	Clear	No	8x40	Conical	1180	1000	<5	1-CWV	500
0.8mL Crimp Top Vial	Clear	No	8x30	Flat Bottom	1000	800	<80	08-CV	500
	Clear	No	7x40	Flat Bottom	775	650	<70	08-CPV	500
	Amber	No	7x32	Round Bottom	700	600	<30	08-CRV(A)	500
0.7mL Crimp Top Tapered Vial	Clear	No	7x40	Conical	575	450	<5	07-CPV	500
	Amber	No	7x40	Conical	575	450	<5	07-CPV(A)	500



Chromacol 8mm Crimp Top Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (µL)	Usable Volume (µL)	Residual (µL)	Cat. No.	Pack of
0.6mL Crimp Top Tapered Vial	Amber	No	7x32	Conical	600	550	<5	06-CTV(A)	500
0.5mL Crimp Top Tapered Vial	Amber	No	7x30	Conical	500	450	<5	05-CTV(A)	500
PTFE Vial Support Sleeve for 6x32mm vials, fits most autosamplers	PTFE	No	12x31	Flat Bottom	–	–	–	SV-S1	50
PTFE Vial Support Sleeve for 6x32mm vials, fits robotic autosamplers	PTFE	No	12x32	Flat Bottom	–	–	–	SV-S11A	25
Glass Vial Support Sleeve for 6x32mm vials, fits robotic autosamplers	Clear	Yes	12x32	Flat Bottom	–	–	–	SV-S11G	25
PTFE Vial Support Sleeve for 7x32mm vials, fits most autosamplers	PTFE	No	12x32	Flat Bottom	–	–	–	WS-5	40

Sleeves adapt 6x32mm vials for use in autosamplers designed for 12x32mm vials. Use sleeve SV-S1 for autosamplers that do not lift the vial from the tray. Use SV-S11A or SV-S11G for autosamplers that move the vial during sampling. Use WS-5 for 06-CTV(A) and 08-CRV(A).

Chromacol 8mm Crimp Top Closures

- Aluminum crimp seals with prefitted septa
- Provide a secure leak-resistant seal
- Pre-assembled caps and septa are convenient and minimize contamination from handling

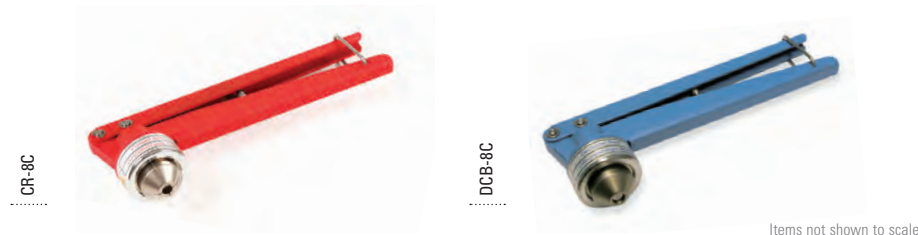


Chromacol 8mm Crimp Top Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8mm Crimp Cap, 4mm hole, Type 6 Rubber/PTFE Liner	Silver	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	8-AC6	1000
	Blue	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	8-AC6(B)	1000
	Red	Aluminum	Red Natural Rubber/Clear PTFE	38	1.0	8-AC6(R)	1000
8mm Crimp Cap, 4mm hole, Type 7 Rubber/PTFE Liner	Silver	Aluminum	Red Natural Rubber/Clear PTFE	60	1.0	8-AC7	1000
8mm Crimp Cap, 4mm hole	Silver	Aluminum	—	—	—	8-ACB	1000
	Silver	Aluminum	Gray Chlorobutyl Rubber/Clear PTFE	52	1.0	8-AC-CBT1	500
	Blue	Aluminum	Blue Silicone/Red PTFE	20	1.4	8-AC(B)-ST144	500
	Silver	Aluminum	White Silicone/Red PTFE	50	1.3	8-AC-ST15	500
	Silver	Aluminum	Blue Silicone/PTFE	30	1.0	8-AC-ST101	500
	Silver	Aluminum	Blue Silicone/PTFE, Pre-slit	30	1.0	8-AC-ST101X	500
	Silver	Aluminum	White Virgin PTFE, 0.01"	53	0.2	8-ACT	1000
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	57	1.0	8-AC-TST1	500
	8mm Snap Cap, Thinned penetration area	Clear	Polyethylene	Integral Molded In Polyethylene	—	—	8-PEC1
Clear		Polyethylene	Integral Molded In Polyethylene, Pre-cut	—	—	8-PEC1X	1000

Chromacol 8mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible secure closure
- High quality construction for durability and long life
- Fine textured surface (powder coated) for a better grip and corrosion resistance



Chromacol 8mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 8mm aluminum crimp seals	CR-8C	1
Manual Decrimper	Removes 8mm aluminum crimp seals without vial damage	DCB-8C	1

For electronic crimpers and decrimpers look on page **2-092**

Chromacol 2mL, 12x32mm Standard Opening Screw Thread Vials and Inserts

- 8-425 thread finish vials are best suited for most instruments where the vial remains in the sample tray during injection
- Manufactured from superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- GOLD grade glass quality is a low expansion high purity glass with an extremely low concentration of active sites
- Available with a graduated, write-on patch for convenient sample identification
- Small opening requires Micro-Inserts with a diameter of 5mm
- While maintaining the standard outer dimensions the internal volumes of these vials range from below 300µL to 2mL
- Where levels of inorganic ions have to be kept to an absolute minimum the use of plastics may be preferred to the more conventional glass vials

Recommended for the following instruments:

- Beckman
- CTC
- Gilson
- Knauer
- Shimadzu
- Spark Holland
- Varian
- VWR (Merck)/Hitachi

For autosampler compatibility visit

www.thermoscientific.com/chromexpert



Chromacol 2mL, 12x32 Standard Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
8-425 Screw Thread Vial	Clear	Yes	12x32	Flat Bottom	2.0	1.5	<170	2-SV	500
	Amber	Yes	12x32	Flat Bottom	2.0	1.5	<170	2-SV(A)	500
8-425 Screw Thread Vial – GOLD Grade Glass	Clear	No	12x32	Flat Bottom	2.0	1.5	<170	2-SVG	500
8-425 Screw Thread 1.1mL Vial – GOLD Grade Glass	Clear	No	12x32	Conical	1.2	1.1	<5	1.1-STVG	500
8-425 Screw Thread 0.3mL Vial	Polypropylene	No	12x32	Insert Vial	0.3	250µL	<3	03-PPSV	500
200µL Insert	Clear Glass	No	5x31	Flat Bottom	250µL	200µL	<12	02-NV	1000
	Clear Glass	No	5x30	Conical	200µL	160µL	<4	02-MTV	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	MTS-1	500
Support Sleeve for 1.1-STVG	PTFE	–	–	–	–	–	–	TTS-312	50

Support sleeve allows conical tip vial to be used in standard 12x32mm autosampler trays

Chromacol 8-425 Screw Thread Caps and Septa

- Open top caps are designed to be used with any of our 8mm septa
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Flanged caps are particularly suitable for Shimadzu and Tosoh autosamplers
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Closures are shipped in sealed polybags to prevent contamination during transport



Chromacol 8-425 Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
8mm Open Top Screw Cap, 8-425 thread, 5mm hole	Black	Polypropylene	–	–	–	8-SC	500
	Red	Polypropylene	–	–	–	8-SC(R)	500
	White	Polypropylene	–	–	–	8-SC(W)	500
8mm Open Top Screw Cap with flange, 8-425 thread, 5mm hole	Black	Polypropylene	–	–	–	8-SCJ	500
	White	Polypropylene	–	–	–	8-SCJ(W)	500
Septum for 8-425 Screw Caps	–	–	Red Natural Rubber/Clear PTFE	38	1.0	8-6RT1	1000
	–	–	White Silicone/Red PTFE	45	1.3	8-ST15	500
	–	–	Blue Silicone/PTFE	50	1.2	8-ST14	500
	–	–	Blue Silicone/PTFE, Pre-slitted	50	1.2	8-ST14X	500
	–	–	White Silicone/PTFE	20	1.4	8-ST143	500
	–	–	Blue Silicone/PTFE	30	1.0	8-ST101	500
	–	–	Red PTFE/White Silicone/Red PTFE	57	1.0	8-TST1	500
	–	–	White Virgin PTFE, 0.01"	53	0.3	8-T02	1000
	–	–	Blue Silicone/Red PTFE	20	1.4	8-ST144	500
8mm Open Top Screw Cap, 8-425 thread, 5mm hole, Type 8 Rubber/PTFE Liner	Black	Polypropylene	Red Natural Rubber/Clear PTFE	50	1.3	8-SC-8RT1	500
8mm Open Top Screw Cap, 8-425 thread, 5mm hole	Black	Polypropylene	White Silicone/Red PTFE	45	1.3	8-SC-ST15	500

Chromacol Standard Opening Screw Thread Vial Convenience and Instrument Select (IS) Kits

- Convenience kits save time during sample preparation
- Includes 100 vials and 100 caps with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



Convenience Kits

Items not shown to scale

Chromacol Standard Opening Screw Thread Vial Convenience and Instrument Select (IS) Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap/Septum Cat. No.	Cat. No.	Pack of
Convenience Kit, Standard Opening Screw Vial	Clear	Yes	White, flanged	Blue Silicone/PTFE	2-SV	8-SCJ(W) + 8-ST101	2-SVJ(W)101-CP	100
IS Kit, Standard Opening Screw Vial for Shimadzu LC Autosamplers	Clear	Yes	White, flanged	Blue Silicone/PTFE	2-SV	8-SCJ(W) + 8-ST101	SHL	100
IS Kit, Standard Opening Screw Vial for Thermo Scientific LC Autosamplers	Clear	Yes	Black	White Silicone/Red PTFE	2-SV	8-SC-ST15	TSL	100

Trying to decide what septum is right for you?

➤ Use our selection guide at www.thermoscientific.com/chromexpert

Chromacol 9mm Wide Opening Screw Thread Vials and Inserts

- SureStop 9mm vials as part of the Advanced Vial Closure System (AVCS)* offer the sealing and performance characteristics of a crimp top vial and remove any subjectivity in achieving optimal seal compression closing a vial by incorporating a definite stop point into the design of the vial finish. See pages **2-005** to **2-006**
- SureStop 9mm vials should be used with AVCS 9-SCK closures in order to get the best possible performance
- Available with a graduated, write-on patch for convenient sample identification
- Wide neck opening design, allows easy filling, requires Micro-Inserts with a diameter of 6mm
- Manufactured from superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts

Compatible with:

Most HPLC and GC autosamplers
For autosampler compatibility visit
www.thermoscientific.com/chromexpert



Chromacol 9mm Wide Opening Screw Thread Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
9mm SureStop Screw Thread Vial (AVCS) – GOLD Grade Glass	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-SVWGK	100
9mm SureStop Screw Thread Vial (AVCS)	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-SVWK(A)	100
9mm Screw Thread Vial	Clear	No	15x46	Flat Bottom	4.0mL	3.5mL	<500	4-SVQ	500
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-SVW	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-SVW(A)	500
9mm Screw Thread Vial, High Recovery with 30µL Reservoir	Clear	No	12x32	Tapered Base	1.5mL	1.3mL	<4	1.5-HRSV	100
9mm Screw Thread Vial, Ultra High Recovery with 10µL Reservoir	Clear	No	12x32	Mandrel Base	1.2mL	1.0mL	<2	1.2-UHRSV	100
9mm Screw Thread Vial 300µL, Fused Insert	Clear	Yes	12x32	Insert Vial	0.3mL	250µL	<3	03-FISV	500
	Amber	Yes	12x32	Insert Vial	0.3mL	250µL	<3	03-FISV(A)	500
9mm Screw Thread Vial 200µL, Fused Insert-GOLD grade glass	Clear	Yes	12x32	Insert Vial	0.2mL	180µL	<2	02-FISVG	500
300µL Insert	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	03-NV	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	02-MTVWG	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	MTS-1	500
9mm Screw Thread Vial	Polypropylene	No	12x32	Insert Vial, Mandrel	300µL	200µL	<4	03-PPSVW	500

* For information about AVCS see page **2-005**

Chromacol 9mm Screw Thread Closures

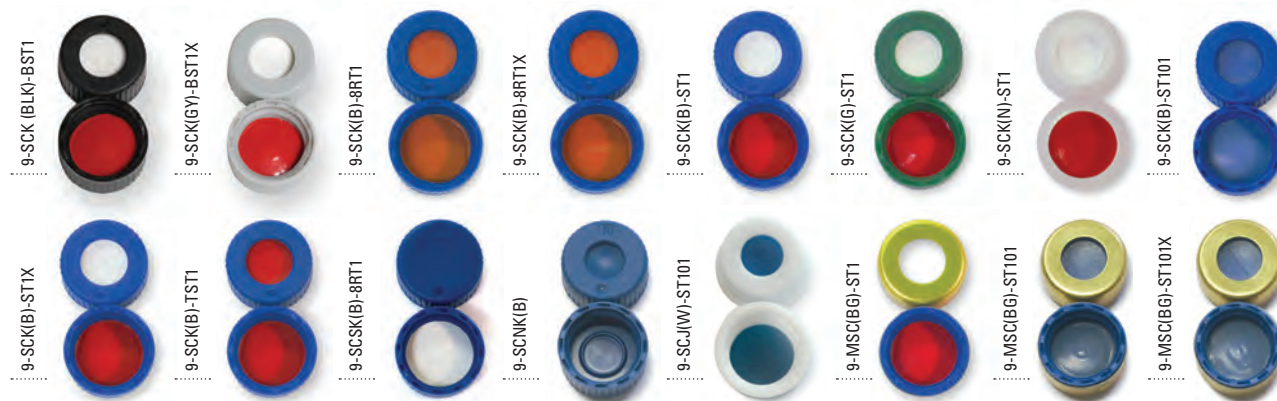


K-Series closures featuring AVCS technology (Advanced Vial Closure System)

- Septa push through virtually eliminated due to improved interior geometry
- Improved sealing capability
- Improved autosampler compatibility
- AVCS provides the freedom to select the best septum for your instrument and applications
- Cost efficient alternative to caps with bonded septa
- Optimized ergonomics, fine texturing and evenly spaced ribbing for superior handling

Further features are:

- Easy-on, easy-off convenience with just one turn
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Closures have the profile of a crimp or snap closure for compatibility with robotic autosamplers
- Closures are shipped in sealed polybags to prevent contamination during transport
- Special caps for magnetic transport autosamplers
- Flanged caps suitable for Shimadzu, Hitachi and Tosoh instruments



Chromacol 9mm Screw Thread Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
9mm Open Top Short Screw Cap, 6mm hole	Black	Polypropylene	Bonded Red PTFE/White Silicone	57	1.0	9-SCK (BLK)-BST1	500
	Gray	Polypropylene	Bonded Red PTFE/White Silicone, Pre-slit	45	1.2	9-SCK (GY)-BST1X	500
9mm Open Top Short Screw AVCS Cap, 6mm hole	Blue	Polypropylene	Red Rubber/Clear PTFE	58	1.0	9-SCK (B)-8RT1	500
	Blue	Polypropylene	Red Rubber/Clear PTFE, Pre-slit	58	1.0	9-SCK (B)-8RT1X	500
	Blue	Polypropylene	White Silicone/Red PTFE	57	1.0	9-SCK (B)-ST1	500
	Green	Polypropylene	White Silicone/Red PTFE	57	1.0	9-SCK (G)-ST1	500
	Clear	Polypropylene	White Silicone/Red PTFE	57	1.0	9-SCK (N)-ST1	500
	Blue	Polypropylene	Blue Silicone/PTFE	30	1.0	9-SCK (B)-ST101	500
	Blue	Polypropylene	White Silicone/Red PTFE, Y-Pre-slit	57	1.0	9-SCK (B)-ST1X	500
	Blue	Polypropylene	Red PTFE/White Silicone/Red PTFE	57	1.0	9-SCK (B)-TST1	500
9mm Solid Top Short Screw AVCS Cap	Blue	Polypropylene	Red Natural Rubber/Beige PTFE	58	1.0	9-SCSK (B)-8RT1	500
9mm Short Screw AVCS Cap with Integral PP-Membrane	Blue	Polypropylene				9-SCNK (B)	500
9mm Open Top Short Screw Cap with flange, 6mm hole	White	HDPE	Blue Silicone/PTFE	30	1.0	9-SCJ (W)-ST101	500
9mm Open Top Short Screw AVCS Cap, 6mm hole, magnetic	Blue/Gold	PP/Steel	White Silicone/Red PTFE	57	1.0	9-MSC (BG)-ST1	100
	Blue/Gold	PP/Steel	Soft septum, Blue Silicone/PTFE	30	1.0	9-MSC (BG)-ST101	100
	Blue/Gold	PP/Steel	Soft septum, Blue Silicone/PTFE, Pre-slit	30	1.0	9-MSC (BG)-ST101X	100

Chromacol 9mm Wide Opening Convenience and Instrument Select (IS) Kits

- Convenience kits save time during sample preparation
- Includes 100 vials and 100 caps with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



2-SVWGK8-CPK

Chromacol 9mm Wide Opening Screw Thread Vial Convenience and Instrument Select (IS) Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
SureStop Convenience Kit, GOLD Grade	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVWGK	9-SCK(B)-8RT1	2-SVWGK8-CPK	100
	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVWGK	9-SCK(B)-ST1	2-SVWGKST-CPK	100
SureStop Convenience Kit	Amber	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVWK(A)	9-SCK(B)-8RT1	2-SVWK(A)8-CPK	100
	Amber	Yes	Blue	White Silicone/Red PTFE	2-SVWK(A)	9-SCK(B)-ST1	2-SVWK(A)ST-CPK	100
SureStop IS Kit, GOLD Grade, for Thermo GC Autosampler	Clear	Yes	Blue	Blue Silicone/PTFE	2-SVWGK	9-SCK(B)-ST101	TTRGKK	100
AVCS Convenience Kit	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVW	9-SCK(B)-8RT1	2-SVW8-CPK	100
	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	2-SVWST-CPK	100
	Amber	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVW(A)	9-SCK(B)-8RT1	2-SVW(A)8-CPK	100
	Amber	Yes	Blue	White Silicone/Red PTFE	2-SVW(A)	9-SCK(B)-ST1	2-SVW(A)ST-CPK	100
AVCS IS Kit, for Agilent LC Autosampler	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-SVW	9-SCK(B)-8RT1	HPLSK	100
AVCS IS Kit, for Thermo GC Autosampler	Clear	Yes	Blue	Blue Silicone/PTFE	2-SVW	9-SCK(B)-ST101	TTRK	100
AVCS Convenience Kit, for Varian GC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	VAGK	100
AVCS IS Kit, for Varian LC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	VALK	100
AVCS IS Kit, for Waters Alliance® LC Autosampler	Clear	Yes	Blue	White Silicone/Red PTFE	2-SVW	9-SCK(B)-ST1	WALK	100
AVCS IS Kit, for PerkinElmer LC Autosampler	Clear	Yes	Green	White Silicone/Red PTFE, Pre-slit	2-SVW	9-SCK(G)-ST1X	PELK	100
AVCS IS Kit, for Waters Alliance LC Autosampler	Clear	Yes	Black	Bonded Red PTFE/White Silicone	2-SVW	9-SCK(BLK)-BST1	WALBK	100
Convenience Kit	Clear	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	2-SVW	9-SCK(GY)-BST1X	2-SVW BSTX-CPK	100
	Amber	Yes	Gray	Bonded Red PTFE/White Silicone, Pre-slit	2-SVW(A)	9-SCK(GY)-BST1X	2-SVW(A)BSTX-CPK	100

Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Closures

- Thermo Scientific Chromacol GOLD glass quality, a low expansion high purity glass with an extremely low concentration of active sites
- Manufactured from superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Available with a graduated, write-on patch for convenient sample identification
- Wide neck opening design, allows easy filling, requires Micro-Inserts with a diameter of 6mm
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Where levels of inorganic ions have to be kept to an absolute minimum the use of plastics may be preferred to the more conventional glass vials

Compatible with:

Most HPLC and GC autosamplers

For autosampler compatibility visit

www.thermoscientific.com/chromexpert



Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Crimp Top Vial, Wide Opening	Clear	Glass	15x46	Flat Bottom	4.0mL	3.5mL	<500	4-CV	500
	Clear	Glass	12x40	Flat Bottom	2.5mL	2.0mL	<170	2.5-CV	500
	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-CV	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-CV(A)	500
11mm Crimp Top Vial, Wide Opening – GOLD Grade Glass	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-CVG	500
11mm Crimp Top Vial, Wide Opening	Clear	Yes	12x32	Round Bottom	2.0mL	1.5mL	<170	2-CRV	500
11mm Crimp Top 1.5mL High Recovery Vial	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4µL	1.5-HRCV	100



Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Crimp Top 1.1mL Vial, Wide Opening – GOLD Grade Glass	Clear	No	12x32	Conical	1.4mL	1.1mL	<5	1.1-CTVG	500
11mm Crimp Top 1.1mL Vial, Wide Opening	Amber	No	12x32	Conical	1.4mL	1.1mL	<5	1.1-CTV(A)	500
11mm Crimp Top 0.9mL Vial, Wide Opening	Clear	No	10x32	Conical	1.0mL	850µL	<5	09-CTV	500
	Clear	No	12x32	Insert Vial	0.9mL	830µL	<3	09-FIV	500
11mm Crimp Top 0.3mL Vial, Fused Insert	Clear	Yes	12x32	Insert Vial	0.3mL	250µL	<3	03-FIV	500
	Amber	Yes	12x32	Insert Vial	0.3mL	250µL	<3	03-FIV(A)	500
11mm Crimp Top 0.2mL Vial, Fused Insert – GOLD Grade Glass	Clear	Yes	12x32	Insert Vial	0.2mL	180µL	<2	02-FIVG	500



Chromacol 2mL, 12x32mm, 11mm Crimp Top Vials and Inserts (Continued)

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
300µL Insert	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	03-NV	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	02-MTVWG	1000
Self-centering vial support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	MTS-1	500
PTFE Vial Support 1.1-CTVG	PTFE	–	–	–	–	–	–	TTS-312	50
Plastic Vial Support Sleeve for 09-CTV Only	Polyethylene	–	–	–	–	–	–	WS-6	100

Support sleeves allow conical tip vials to be used in standard 12x32mm autosampler trays

Chromacol 11mm Crimp Top Closures

- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Aluminum crimp closures provide a secure leak-resistant seal
- Aluminum seals must be applied with a crimping tool
- Closures are shipped in sealed polybags to prevent contamination during transport
- First crimp cap with assembled aluminum liner for interference free analysis of Elastomers, Polymers, Phthalates, Halogenated compounds and Silicones
- First crimp cap with tight PTFE sealing disk due to additional silicone ring



Chromacol 11mm Crimp Top Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
Septum for 11mm Crimp Caps	–	–	Silicone/PTFE for liquid – liquid extraction	–	0.2	11-LLX	100
11mm Crimp Cap, 6mm hole	Silver	Aluminum	Solid Aluminum Disk with Silicone sealing ring		0.06	11-AC-AL	100
11mm Crimp Cap, 6mm center hole	Silver	Aluminum	–	–	–	11-ACB	500
11mm Crimp Cap, 6mm center hole, Type 6 Rubber/PTFE	Silver	Aluminum	Red Chlorobutyl Rubber/Clear PTFE,	40	1.0	11-AC6	500
	Red	Aluminum	Sulphur free	40	1.0	11-AC6(R)	500
11mm Crimp Cap, 6mm center hole, Type 7 Rubber/PTFE	Silver	Aluminum	Red Natural Rubber/Clear PTFE	60	1.0	11-AC7	500
	Blue	Aluminum		60	1.0	11-AC7(B)	500
	Red	Aluminum		60	1.0	11-AC7(R)	500
	Green	Aluminum		60	1.0	11-AC7(G)	500
	Gold	Aluminum		60	1.0	11-AC7(GO)	500



Chromacol 11mm Crimp Top Closures (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Crimp Cap, 6mm center hole	Blue	Aluminum	Gray Chlorobutyl/PTFE	52	1.0	11-AC-CBT1	500
	Blue	Aluminum	Blue Silicone/Red PTFE	20	1.4	11-AC(B)-ST144	500
	Silver	Aluminum	White Silicone/Red PTFE	50	1.3	11-AC-ST15	500
	Silver	Aluminum	Blue Silicone/PTFE	30	1.0	11-AC-ST101	500
	Silver	Aluminum	Blue Silicone/PTFE, Pre-slit	30	1.0	11-AC-ST101X	500
	Silver	Aluminum	White Virgin PTFE, 0.01" with clear Silicone sealing ring	53	0.25	11-ACTS	1000
	Silver	Aluminum	White Virgin PTFE, 0.01"	–	0.25	11-ACT	1000
	Silver	Aluminum	Red PTFE/White Silicone/Red PTFE	57	1.0	11-AC-TST1	500



Chromacol 11mm Crimp Top Closures (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Crimp Cap, magnetic	Silver	Steel	White Silicone/Red PTFE	57	1.3	11-MC-ST15	500
11mm Crimp Cap, magnetic, Type 8 Rubber/PTFE	Silver	Steel	Red Natural Rubber/Clear PTFE	38	1.0	11-MC-8RT1	500
11mm Crimp Cap, magnetic	Silver	Steel	Blue Silicone/PTFE	30	1.0	11-MC-ST101	500
11mm Snap Cap for Crimp Vials	Clear	Polyethylene	–	–	–	11-PEC1	1000
11mm Snap Cap for Crimp Vials, Pre cut	Clear	Polyethylene	–	–	–	11-PEC1X	1000
11mm Snap Cap for Crimp Vials	Clear	Polyethylene	White Silicone/Red PTFE	57	1.0	11-PEC-ST1	500

Chromacol 11mm Crimp Top Convenience and Instrument Select (IS) Kits

- Convenience kits save time during sample preparation
- Include matched quantities of vials and aluminum seals with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



Items not shown to scale

Chromacol 11mm Crimp Top Convenience and Instrument Select (IS) Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Opening Crimp Top Vial	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV	11-AC7	2-CV7-CP	100
	Clear	Yes	Silver	White Silicone/Red PTFE	2-CV	11-AC-ST15	2-CVST-CP	100
	Amber	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV(A)	11-AC7	2-CV(A)7-CP	100
	Amber	Yes	Silver	White Silicone/Red PTFE	2-CV(A)	11-AC-ST15	2-CV(A)ST-CP	100
IS Kit, Wide Opening Crimp Top Vial for Agilent GC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV	11-AC7	HPG	100
IS Kit, Wide Opening Crimp Top Vial for Agilent LC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Type 7	2-CV	11-AC7	HPL	100
IS Kit, Wide Opening Crimp Top Vial for VWR(Merck)-Hitachi LC Autosampler	Clear	Yes	Silver	Blue Silicone/PTFE-Pre-Cut	2-CV	11-AC-ST101X	MEL	100
IS Kit, Wide Opening Crimp Top Vial for PerkinElmer GC Autosampler	Clear	Yes	Silver	Red Natural Rubber/Clear PTFE, Sulphur free, Type 6	2-CV	11-AC6	PEG	100
IS Kit, Wide Opening Crimp Top Vial for Shimadzu LC Autosampler	Clear	Yes	Silver	Blue Silicone/PTFE	2-CV	11-AC-ST101	SHG	100
IS Kit, Wide Opening Crimp Top Vial for Thermo Scientific GC Autosamplers	Clear	Yes	Silver	Blue Silicone/Red PTFE	2-CV	11-AC(N)-ST144	TQG	100
IS Kit, Wide Opening Crimp Top Vial for Thermo LC Autosampler	Clear	Yes	Silver	White Silicone/Red PTFE	2-CV	11-AC-ST15	TQL	100

Chromacol 11mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure for all 11mm vial and seal combinations
- Easy and convenient handling
- High quality construction for durability and long life
- Fine textured surface (powder coated) for a better grip and corrosion resistance



Chromacol 11mm Crimpers and Decrimpers

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 11mm aluminum crimp seals	CR-11C	1
Decapping Pliers	Removes 11mm aluminum crimp seals, Protective gloves recommended	DCR-11	1
Manual Decrimper	Removes 11mm aluminum crimp seals without vial damage	DCB-11C	1

For electronic crimpers and decrimpers look on page **2-092**

Chromacol 2mL, 12x32mm, 11mm Snap Cap Vials

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Available with a graduated, write-on patch for convenient sample identification
- Wide neck opening design, allows easy filling; requires Micro-Inserts with diameter of 6mm
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts
- Available silanized* (deactivated) for optimal recovery of critical polar, labile or chelating compounds.
- Snap-Cap vials can be used with snap caps or aluminum crimp seal closures

Compatible with:

Most HPLC and GC autosamplers
 For autosampler compatibility visit
www.thermoscientific.com/chromexpert



Chromacol 2mL, 12x32mm, 11mm Snap Vials and Inserts

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume	Usable Volume	Residual (µL)	Cat. No.	Pack of
11mm Snap Cap Vial	Clear	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-RV	500
	Amber	Yes	12x32	Flat Bottom	2.0mL	1.5mL	<170	2-RV(A)	500
11mm Snap Cap 1.5mL Vial	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4	1.5-HRRV	100
11mm Snap Cap 1.5mL Vial, silanized*	Clear	No	12x32	High Recovery	1.5mL	1.3mL	<4	1.5-HRRV(S)	100
11mm Snap Cap Vial, Ultra High Recovery with 10µL Reservoir	Clear	No	12x32	Mandrel Base	1.2mL	1mL	<2	1.2-UHRRV	100
11mm Snap Cap 300µL Vial, Fused Insert	Clear	Yes	12x32	Fused Conical	300µL	250µL	<3	03-FIRV	500
	Amber	Yes	12x32	Fused Conical	300µL	250µL	<3	03-FIRV(A)	500
11mm Snap Cap 200µL Vial, Fused Insert – GOLD grade glass	Clear	Yes	12x32	Fused Conical	200µL	180µL	<2	02-FIRVG	500
300µL Insert	Clear	–	6x31	Flat Bottom	300µL	200µL	<12	03-NV	1000
200µL Insert – GOLD Grade Glass	Clear	–	6x30	Pulled Point	200µL	160µL	<4	02-MTVWG	1000
Self-centering support device for tapered glass inserts	Polyethylene	–	–	–	–	–	–	MTS-1	500

* For information about silanized products visit www.thermoscientific.com/chromexpert

Chromacol 11mm Snap Closures

- New design of locking tabs provides easier application and removal of caps
- Enlarged open area allows for needle penetration across the entire vial opening
- Textured outer surface for easier gripping and improved detection by autosamplers with optical vial sensors
- Easy to apply and easy to remove from Snap vials without tools
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Snap caps eliminate the need for crimping or de-crimping tools
- Polyethylene caps are chemically inert and suitable for most chromatography applications
- Closures are shipped in sealed polybags to prevent contamination during transport
- Integral Molded Polyethylene cap is an economical choice for routine HPLC applications, but with low sealing properties and zero resealing capacity



Chromacol 11mm Snap Closures

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
11mm Snap Cap, thinned penetration area	Blue	Polyethylene	Integral Molded In Polyethylene	–	–	11-PSN(B)	500
11mm Snap Cap, 6mm hole	Blue	Polyethylene	Red Natural Rubber/Clear PTFE	58	1.0	11-PSN(B)-8RT1	500
	Blue	Polyethylene	White Silicone/Red PTFE	57	1.0	11-PSN(B)-ST1	500
	Blue	Polyethylene	Blue Silicone/PTFE	30	1.0	11-PSN(B)-ST101	500
	Blue	Polyethylene	White Silicone/Blue PTFE, Pre-slit	57	1.0	11-PSN(B)-ST1X	500
	Blue	Polyethylene	Red PTFE/White Silicone/Red PTFE	57	1.0	11-PSN(B)-TST1	500
	Red	Polyethylene	White Virgin PTFE, 0.01"	53	0.3	11-PSN(R)-T02	500
	Blue	Polyethylene	White Virgin PTFE, 0.01"	53	0.3	11-PSN(B)-T02	500

Chromacol 11mm Snap Cap Wide Opening Vial Convenience Kits

- Convenience kits save time during sample preparation
- Includes 100 vials and 100 caps with pre-assembled septa for added convenience during sample preparation
- Reusable two compartment trays protect vials and closure while keeping matching supplies together



Chromacol 11mm Snap Cap Wide Opening Vial Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, Wide Opening Snap Vial	Clear	Yes	Blue	White Silicone/Red PTFE	2-RV	11-PSN(B)-ST1	2-RVST-CP	100
	Clear	Yes	Blue	Red Natural Rubber/Clear PTFE	2-RV	11-PSN(B)-8RT1	2-RV8-CP	100

Chromacol 13mm Screw Vials, 13-425 Thread Finish

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Microsampling and High Recovery Vials allow maximum sample extraction without need for separate inserts



Compatible with:

The 4mL vials are preferentially used on instruments of the following manufacturers:

- Thermo Scientific
- Shimadzu
- Spark Holland, Varian
- VWR (Merck)/Hitachi
- Waters (Wisp 48 Position Carousel)

For autosampler compatibility visit www.thermoscientific.com/chromexpert

Images shown are 60% to scale
* 40% to scale

Chromacol 13mm Screw Vials, 13-425 Thread Finish

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
13-425 Screw Thread Vial	Clear	No	13x100	Round Bottom	10.0	8.5	<500	10-SV	125
	Clear	No	13x65	Round Bottom	5.0	4.5	<500	5-SV	125
	Clear	No	15x46	Flat Bottom	4.0	4.0	<800	4-SV	500
	Amber	No	15x46	Flat Bottom	4.0	4.0	<800	4-SV(A)	500
13-425 Screw Thread 3.5mL High Recovery Vial	Clear	No	15.25x46	High Recovery	3.5	3.0	<12	3.5-HRSV	250

Chromacol 13-425 Thread Caps and Septa

- Open top caps are designed to be used with any of our 12mm septa
- Polypropylene caps are chemically inert and suitable for most chromatography applications
- Pre-assembled caps and septa are convenient and minimize contamination from handling



Chromacol 13-425 Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
13mm Open Top Screw Cap, 13-425 thread, 8mm hole	Black	Polypropylene	–	–	–	12-SC	500
	White	Polypropylene	–	–	–	12-SC(W)	500
	Red	Polypropylene	–	–	–	12-SC(R)	500
	Yellow	Polypropylene	–	–	–	12-SC(Y)	500
13mm Solid Top Cap, 13-425 thread	Black	Polypropylene	–	–	–	12-SCS	500
PTFE Lined Solid Top Storage Cap for 13-425 Thread	White	Urea	PTFE/PE Foam Liner	–	–	13-SCST	100
Septum for 13-425 Screw Caps	–	–	Red Natural Rubber/Clear PTFE	38	1.0	12-6RT1	500
	–	–	White Silicone/Red PTFE	57	2.0	12-ST2	500
	–	–	Blue Silicone/PTFE	57	1.8	12-ST18	500
	–	–	Blue Silicone/PTFE	30	1.0	12-ST101	500
	–	–	White Virgin PTFE, 0.01"	53	0.25	12-T02	1000



Chromacol 13-425 Screw Thread Caps and Septa (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
13mm Open Top Screw Cap, 13-425 thread, 8mm hole	Black	Polypropylene	White Silicone/Red PTFE	57	1.3	13-SC-ST15	500
	Black	Polypropylene	Red Natural Rubber/Clear PTFE	58	1.0	12-SC-8RT1	500
	Black	Polypropylene	White Silicone/Red PTFE	57	2.0	12-SC-ST2	500

Chromacol Shell/Neckless Vials

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Polyethylene cap with starburst center design eases syringe needle penetration
- Convenience kits include equal quantities of vials and caps

Recommended for the following instruments:

- Alcott
- Gilson
- Shimadzu
- Waters (Wisp 96 and 48 Position Carousel)

For autosampler compatibility visit www.thermoscientific.com/chromexpert



Chromacol Shell/Neckless Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Usable Volume (mL)	Residual (µL)	Cat. No.	Pack of
1mL Neckless/Shell Vial	Clear	No	8x40	Flat Bottom	1.25	1.0	<80	1-NWV	500
1mL Neckless/Shell Vial with PE-Cap	Clear	No	8x40	Flat Bottom	1.25	1.0	<80	1-NWV-C	200
1mL Neckless/Shell Vial with PE-Cap	Amber	No	8x40	Flat Bottom	1.25	1.0	<81	1-NWV(A)-C	200
2mL Neckless/Shell Vial	Clear	No	12x32	Flat Bottom	2.5	2.0	<175	2.5-NV	500
4mL Neckless/Shell Vial with PE-Cap	Clear	No	15x46	Flat Bottom	5.5	4.0	<350	4-NWV-C	100
8mm PE-Cap/Plug for 1mL Shell-Vial	Polyethylene	–	–	–	–	–	–	8-NPWP	1000
12mm Polyethylene Plug for 2mL Shell-Vial	Polyethylene	–	–	–	–	–	–	12-NPEP4	1000

Trying to decide what glass quality is right for you?

Use our selection guide at www.thermoscientific.com/chromexpert

Chromacol Headspace Vials

Glass vials with 20mm crimp seal or 18mm screw thread finish are designed to fit most headspace autosamplers

- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber, meets all requirements of Pharm. US, EU, JPN
- Round bottom vials are compatible with most autosamplers and more easily handled by robotic arms that lift the vial from the tray
- Vials feature beveled edge 20mm crimp finish
- The bevel edge on the lip of the vial provides additional sealing power for greater leak resistance under high pressure
- Screw thread headspace vials are convenient and do not require tools
- Multiple turn threading maintains a tight seal through extreme heating cycles



Chromacol Headspace Vials

Description	Glass	Patched	Dimension (mm)	Finish	Profile	Total Volume (mL)	Usable Volume (mL)	Cat. No.	Pack of
20mm Headspace Crimp Vial	Clear	No	30x60	Beveled Edge	Flat Bottom	27	27	27-CV	100
	Clear	No	23x75	Beveled Edge	Round Bottom	22	20	22-CV	125
	Clear	No	22.5x75	Beveled Edge	Round Bottom	21	20	20-CV	125
	Amber	No	22.5x75	Beveled Edge	Round Bottom	21	20	20-CV(A)	125
	Clear	No	18x65	Beveled Edge	Round Bottom	12	10	12-CV	100



Chromacol Headspace Vials (Continued)

Description	Glass	Patched	Dimension (mm)	Finish	Profile	Total Volume (mL)	Usable Volume (mL)	Cat. No.	Pack of
20mm Headspace Crimp Vial	Clear	No	22.5x46	Beveled Edge	Round Bottom	12	10	10-CV	125
	Amber	No	22.5x46	Beveled Edge	Round Bottom	12	10	10-CV(A)	125
	Clear	No	18x50	Beveled Edge	Round Bottom	10	9	9-CV	100
	Clear	No	22x38	Beveled Edge	Round Bottom	8	6	6-CV	125
18mm Screw Top Headspace Vial	Clear	No	22.5x76	Screw Thread	Round Bottom	21	20	20-HSV	125
	Clear	No	22.5x46	Screw Thread	Round Bottom	12	10	10-HSV	125

Chromacol 20mm Crimping and Decrimping Tools

- Crimping tools provide a reproducible, secure vial closure for all 20mm vial and seal combinations
- Easy and convenient handling
- High quality construction for durability and long life
- Fine textured surface (powder coated) for a better grip and corrosion resistance



Items not shown to scale

Chromacol 20mm Crimping and Decrimping Tools

Description	Use	Cat. No.	Pack of
Manual Crimper	Attaches 20mm crimp seals	CR-20C	1
Decapping Pliers	Removes 20mm crimp seals, Protective gloves recommended	DCR-20	1
Manual Decrimper	Removes 20mm crimp seals without vial damage	DCB-20C	1

For electronic crimpers and decrimpers look on page **2-092**

Chromacol Headspace Caps and Septa

- Use magnetic seals with PAL/CTC/Leap Technologies, Gerstel and other magnetic transport autosamplers
- 20mm crimp seals must be applied with a crimping tool
- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Extended temperature range products for high-temperature headspace applications



Images shown are 50% to scale

Chromacol Headspace Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
20mm Crimp Cap, 9mm hole	Silver	Aluminum	–	–	–	20-ACB	500
20mm Magnetic Crimp Cap, 6mm hole	Silver	Tinplate	–	–	–	20-MCB	500
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	–	–	–	20-MCBC	500
	Red	Alu/Tinplate	–	–	–	20-MCBC(R)	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	–	–	–	18-MSC	125
Septum for 20mm Crimp Caps	–	–	20mm Gray Bromobutyl Stopper	55	3.0	20-B3P	500
	–	–	20mm Gray Butyl Freezer Bung	55	3.0	20-2FB3	2000
	–	–	20mm Molded Gray Chlorobutyl	52	3.0	20-CB3	1000
	–	–	20mm Molded Gray Bromobutyl/Gray PTFE	52	3.0	20-CBT3	1000
	–	–	20mm Molded Black Bromobutyl/Gray PTFE, Bellows Type	52	3.0	20-CBT3B	1000
	–	–	20mm Red Silicone/Aluminum Face Seal 3mm Thick, for >170°C.	45	3.0	20-ASH3	100
	–	–	20mm White Silicone/Aluminum Face Seal 3mm Thick, for <170°C.	45	3.0	20-AS3	100
	–	–	20mm Silicone/PTFE for liquid – liquid extraction	–	0.25	20-LLX	100
	–	–	20mm Blue Silicone/Natural PTFE	45	3.0	20-ST3	500
	–	–	20mm Red Silicone/Natural PTFE, high temperature	45	3.1	20-ST3HT	100
	–	–	20mm Blue Silicone/Red PTFE Seal 1.5mm Thick	20	1.5	20-ST15	500
	–	–	20mm Blue Silicone/PTFE	30	1.0	20-ST101	500



Chromacol Headspace Caps and Septa (Continued)

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
Septum for 18mm Screw Caps	–	–	18mm Blue Silicone/PTFE	30	1.0	18-ST101	125
20mm Composite Magnetic Crimp Cap, 8mm hole	Blue	Alu/Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	20-MCBC-ST3	500
	Red	Alu/Tinplate	20mm Molded Gray Chlorobutyl	52	3.0	20-MCBC(R)-CBT3	500
	Red	Alu/Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	20-MCBC(R)-ST3	500
20mm Magnetic Tinplate Crimp Cap	Silver	Tinplate	20mm Blue Silicone/Natural PTFE	45	3.0	20-MCB-ST3	500
20mm Crimp Cap, 9mm hole	Silver	Aluminum	20mm Molded Gray/Bromobutyl/Gray PTFE	52	3.0	20-AC-CBT3	500
	Silver	Aluminum	20mm Blue Silicone/Natural PTFE	45	3.0	20-AC-ST3	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Molded Blue Chlorobutyl/Gray PTFE	52	3.0	18-MSC-CBT3	125
	Silver	Steel	18mm Blue Silicone/PTFE, not prefitted	30	1.0	18-MSC-ST101	125
	Silver	Steel	18mm Blue Silicone/Natural PTFE	45	2.0	18-MSC-ST201	125
20mm Plug	Natural	Polyethylene	PE Membrane	–	–	20-PEPC5	250
20mm Composite Magnetic Crimp Cap, 8mm hole	Natural	Alu/Tinplate	20mm Red Silicone/Natural PTFE, high temperature (250°C)	45	3.1	20-MCBC(N)-ST3HT	500
20mm Magnetic Tinplate Crimp Cap	Silver	Tinplate	20mm Red Silicone/Natural PTFE, high temperature (300°C)	45	3.1	20-MCB-ST3HT	500
18mm Magnetic Screw Cap, 8mm hole	Silver	Steel	18mm Red Silicone/Natural PTFE, high temperature (250°C)	45	3.1	18-MSC-ST3HT	125

Chromacol Headspace Vial Convenience Kits

- Include matched quantities of vials and seals with pre-assembled septa for added convenience during sample preparation
- Convenience kits save time during sample preparation



20-HSVST201-CP



20-CVST3-CP

Items not shown to scale

Chromacol Headspace Vial Convenience Kits

Kit Type	Glass	Patched	Cap Color	Septum	Vial Cat. No.	Cap Cat. No.	Cat. No.	Pack of
Convenience Kit, 20mL Headspace Screw Vial, Round Bottom, Steel Screw Cap, 8mm hole	Clear	No	Silver	18mm Blue Silicone/ Natural PTFE	20-HSV	18-MS- ST201	20-HSVST201-CP	125
Convenience Kit, 20mL Headspace Crimp Vial, Beveled Edge, Round Bottom, Al Crimp Cap, 8mm hole	Clear	No	Silver	20mm Molded Blue Chlorobutyl/Gray PTFE	20-CV	20-AC-CBT3	20-CVCBT3-CP	125
Convenience Kit, 20mL Headspace Crimp Vial, Beveled Edge, Round Bottom, Al Crimp Cap, 8mm hole	Clear	No	Silver	20mm Blue Silicone/ Natural PTFE	20-CV	20-AC-ST3	20-CVST3-CP	125



Chromacol Sample Storage Screw Thread Vials

- Capacity range up to 40mL
- Superior quality 1st hydrolytic class glass (Type 1) in clear and amber
- Provide consistent pH for duration of sample storage life
- PTFE-Lined Solid-top storage caps



Caps and Septa images 50% to scale

Chromacol Sample Storage Screw Thread Vials

Description	Glass	Patched	Dimension (mm)	Profile	Total Volume (mL)	Capacity (DRAMS)	Cat. No.	Pack of
24-400 Screw Vial	Clear	No	28x95	Flat Bottom	40	8	40-SV	100
	Amber	No	28x95	Flat Bottom	40	8	40-SV(A)	100
20-400 Screw Vial	Clear	No	23x85	Flat Bottom	22	6	22-SV	200
18-400 Screw Vial	Clear	No	21x70	Flat Bottom	16	4	16-SV	200
	Amber	No	21x70	Flat Bottom	16	4	16-SV(A)	200
15-425 Screw Vial	Clear	No	19x65	Flat Bottom	12	3	12-SV	200
	Amber	No	19x65	Flat Bottom	12	3	12-SV(A)	200
15-425 Screw Vial	Clear	No	17x60	Flat Bottom	8	2	8-SV	200
	Amber	No	17x60	Flat Bottom	8	2	8-SV(A)	200

For smaller vials look at the previous sections



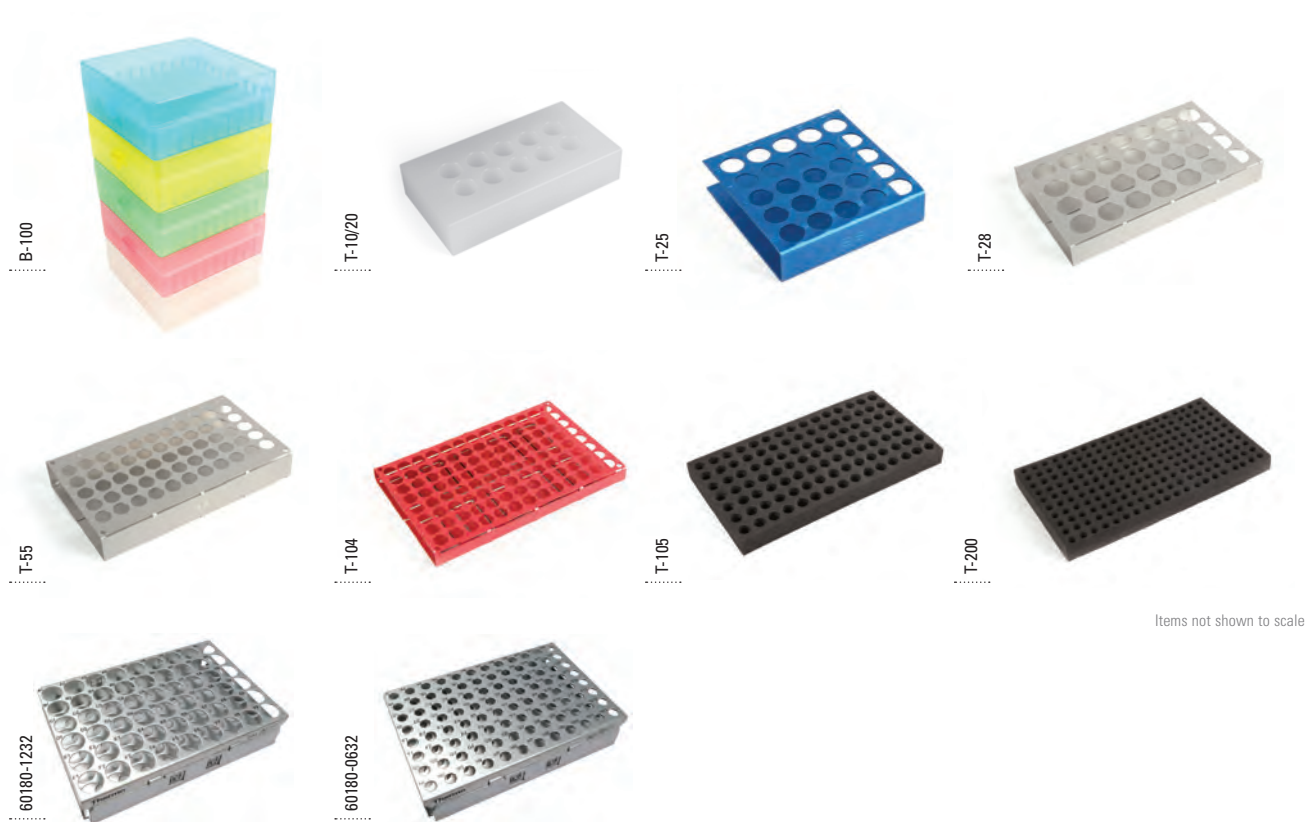
Caps and Septa images 50% to scale

Chromacol Sample Storage Screw Thread Caps and Septa

Description	Cap Color	Cap Material	Septum	Hardness °shore	Thickness (mm)	Cat. No.	Pack of
24-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	24-SCST	100
20-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	20-SCST	100
18-400 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	18-SCST	100
15-425 Screw Cap	White	Polypropylene	PTFE/PE Foam Liner	-	1.0	15-SCST	100
13-425 Screw Cap	White	Urea	PTFE/PE Foam Liner	-	1.0	13-SCST	100

Chromacol Vial Racks and Storage Boxes

- For a safe working position on the lab bench and during transport
- Ideal for space-saving storage in fridges
- Temperature resistant from -90°C to 121°C (except Foam)
- Chemically resistant and fairly robust; autoclavable (except Foam)



Items not shown to scale

Chromacol Vial Racks and Storage Boxes

Description	Color	Material	Dimension (mm)	No of Vials	OD of Vials (mm)	Stackable	Cat. No.	Pack of
Autoclavable freezer and storage box with lid, alphanumeric grid, -90°C to 121°C	5 assorted colors (red, yellow, blue, green, natural)	Polypropylene	155x140x5.5	100	12	Yes	B-100	5
Vial Tray	White	Polypropylene	195x103	10	22	No	T-10/20	1
Sci-Rack	Blue	Anodised Aluminum	85x85	25	12	No	T-25	1
	Silver	Anodised Aluminum	210x134	28	22	No	T-28	5
	Silver	Anodised Aluminum	210x134	55	15	Yes	T-55	5
	Red	Anodised Aluminum	210x134	104	12	Yes	T-104	5
Vial Tray	Black	Foam	210x134	105	12	No	T-105	5
	Black	Foam	210x134	200	8	No	T-200	5
SBS/ANSI standard footprint Vial Rack	Silver	Anodised Aluminum	127,8x85,5	54	12	No	60180-1232	1
	Silver	Anodised Aluminum	127,8x85,5	96	6	No	60180-0632	1

Chromacol EPA , TOC and Scintillation Screw Vials

Level 300 cleaned and certified

- Processed and packaged under a registered ISO Quality Management System
- Laboratory certified to meet U.S. EPA Super Fund Standards in accordance with the latest edition of EPA's "Specifications and Guidance for Contaminant Free Sample Containers"
- Every case of Level 300 product contains a Certificate of Analysis and is custody sealed to ensure reliable chain-of-custody

Level 200 cleaned

- Processed and packaged under a strict registered ISO Quality Management System in the same manner as Level 300 products
- Level 200 products are not certified
- Every case of product is labeled with its production number and is custody sealed to ensure reliable chain-of-custody

Level 100

- Level 100 products are not certified or pre-cleaned
- Every case of product is labeled with its production number and is custody sealed to ensure reliable chain-of-custody

TOC vials

- The only low-level certified vials in the market for Total Organic Carbon testing and sampling
- Major TOC instrument manufacturers recommend these vials when analysis of low levels of TOC requires low background level assurance
- Each lot of vials is tested and certified to contribute less than 10ppb TOC as background or for less stringent applications the 20ppb TOC version

- Certificate of Analysis is included with lot production numbers

Scintillation vials

- Provide the very lowest background count and benefit from very high optical clarity.
- Typical background count of 13CPM or lower, compared to an average 16-65CPM from competitive products
- Noise level of 2.28 and a quenching index factor of 349

Chromacol EPA Screw Vial Kits

Kit Type	Glass	Dimension (mm)	Total Volume (mL)	Level	Septum	Cat. No.	Pack of
EPA Screw Vial Assembled Kit Vials/Septa/Caps	Clear	28x95	40	Level 100	0.01" White PTFE/ 0.09" Clear Silicone	40-EPAVCS	100
	Clear	28x95	40	Level 200 Pre-cleaned		40-EPAVCS-PC	72
	Clear	28x95	40	Level 300 Pre-cleaned	40-EPAVCS-PC3	72	
	Amber	28x95	40	Level 100	40-EPAVCS(A)	100	
	Amber	28x95	40	Level 200 Pre-cleaned	40-EPAVCS(A)-PC	72	
	Clear	28x57	20	Level 100	20-EPAVCS	100	
	Amber	28x57	20	Level 100	20-EPAVCS(A)	100	
	Clear	28x140	60	Level 100	60-EPAVCS	72	

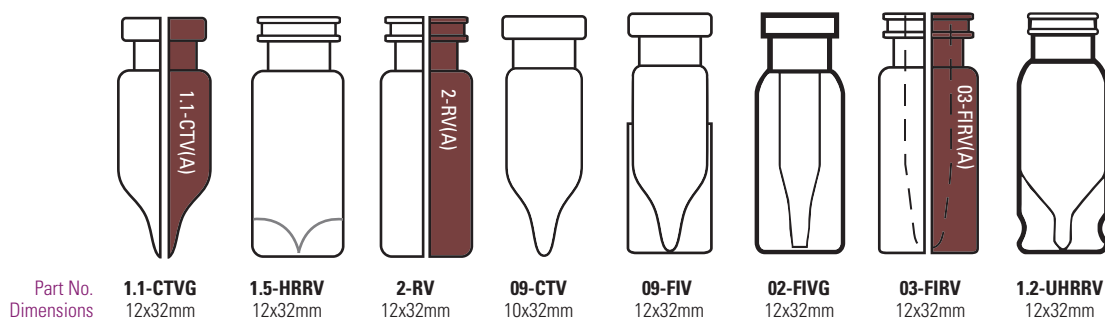
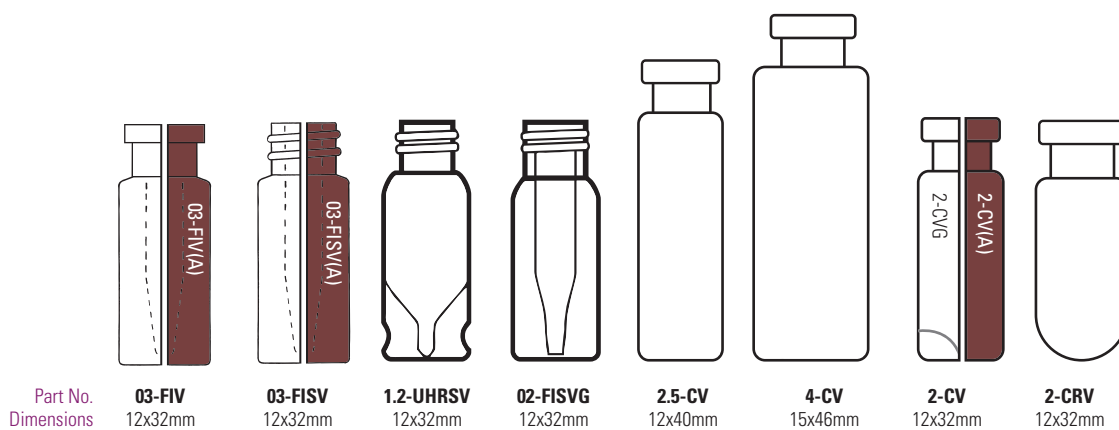
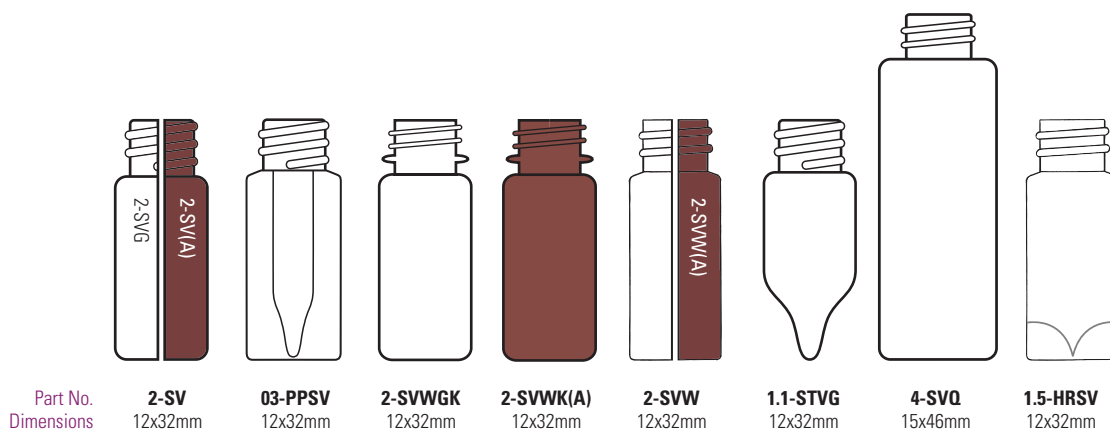
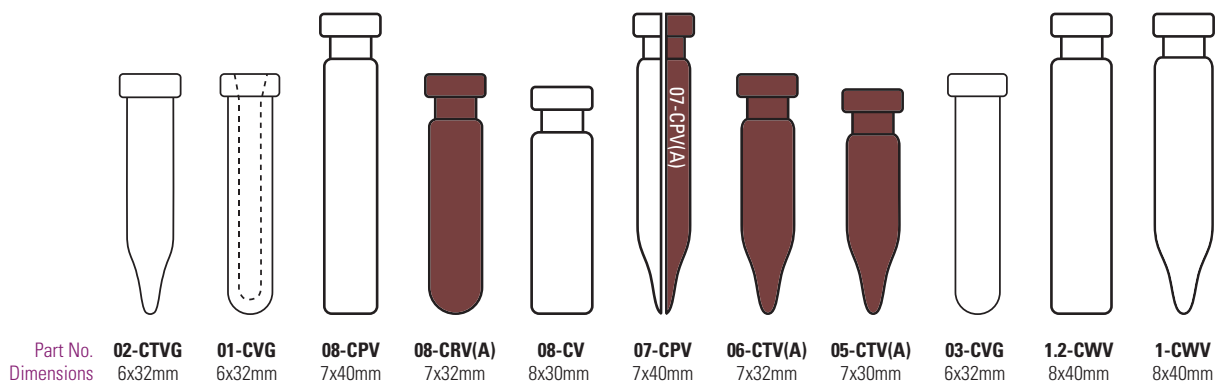
Chromacol TOC Vial Kits (Assembled)

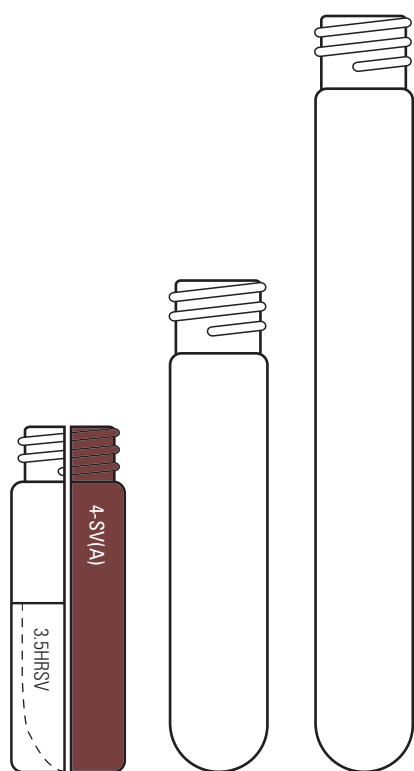
Description	Glass	Dimension (mm)	Total Volume (mL)	Cap Color	Cap Material	Septum	Cat. No.	Pack of
TOC clear vial with bonded cap cover, open top cap TOC 10ppb	Clear	28x96	40	White	Polypropylene	Beige PTFE/ White Silicone	40-TOCSV-10	72
TOC clear vial with cap bonded cover, open top cap TOC 20ppb	Clear	28x96	40	White	Polypropylene	Beige PTFE/ White Silicone	40-TOCSV-20	72

Chromacol Scintillation Vial Kit

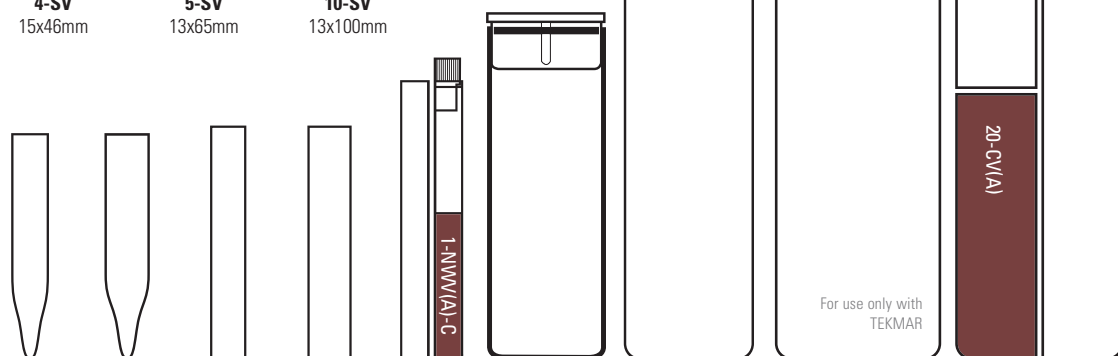
Description	Glass	Dimension (mm)	Total Volume (mL)	Noise	Background Count	Quenching Index Factor	Cat. No.	Pack of
20mL vial with foil lined caps	Clear	27x57	20	2.28	13 CPM	349	20-EPSVCA	500

Chromacol Vial Comparison Chart





Part No. Dimensions
4-SV 15x46mm
5-SV 13x65mm
10-SV 13x100mm



Part No. Dimensions
02-MTV 5x30mm
02-MTVWG 6x30mm
02-NV 5x31mm
03-NV 6x31mm
1-NWV 8x40mm
4-NWV-C 15x46mm
12-CV 18x65mm
22-CV 22x75mm
20-CV/20-HSV 22x75mm



Part No. Dimensions
9-CV 18x50mm
6-CV 22x38mm
20-EPSVCA 27x57mm
27-CV 30x60mm
10-CV/10-HSV 22x45mm

Chromacol Caps and Septa Comparison Chart

Part No. Dimensions	 *8-AC6 8x5mm	 8-AC7 8x5mm	 8-ACB 8x5mm	 8-AC-CBT1 8x5mm	 8-AC-ST15 8x5mm	 8-AC-ST101 8x5mm	 8-AC-ST101X 8x5mm	 8-AC(B)-ST144 8x5mm	
Part No. Dimensions	 8-ACT 8x5mm	 8-AC-TST1 8x5mm	 8-PEC1 8x5mm	 8-PEC1X 8x5mm	 *8-SC 8x9mm	 *8-SCJ 8x9mm	 8-SC-8RT1 8x9mm	 8-SC-ST15 8x9mm	
Part No. Dimensions	 8-ST14 8x1.4mm	 8-ST14X 8x1.4mm	 8-ST143 8x1.5mm	 8-ST144 8x1.4mm	 8-6RT1 8x1mm	 8-ST101 8x1mm	 8-T02 8x0.25mm	 8-TST1 8x1mm	 8-ST15 8x1.5mm
Part No. Dimensions	 9-MS(BG)-ST1 9x6.5mm	 *9-SCK(B)-8RT1 9x6.5mm	 9-SCK(B)-ST101 9x6.5mm	 *9-SCK(B)-ST1 9x6.5mm	 9-SCK(B)-TST1 9x6.5mm	 9-SCSK-8RT1 9x6.5mm	 9-SCJ(W)-ST101 12.9x7.9mm	 *11-AC6 11x6mm	
Part No. Dimensions	 *11-AC7 11x6mm	 11-ACB 11x6mm	 11-AC-CBT1 11x6mm	 11-AC-ST101 11x6mm	 11-AC-ST101X 11x6mm	 11-AC(B)-ST144 11x6mm	 11-AC-ST15 11x6mm	 11-ACT 11x6mm	
Part No. Dimensions	 11-AC-TST1 11x6mm	 11-LLX 11x3mm	 11-PEC1 11x6mm	 11-PEC1X 11x6mm	 11-PEC-ST1 11x7mm	 11-MC-ST15	 11-MC-8RT1	 11-MC-ST101	

* Cap available in alternative colors. See below for more details

Alternative Colors

8-AC6

-  8-AC6(R)
-  8-AC6(B)




8-SC

-  8-SC(R)
-  8-SC(W)






8-SCJ

-  8-SCJ(W)

9-SCK(B)-8RT1

-  9-SCK(G)-8RT1
-  9-SCK(N)-8RT1
-  9-SCK(B)-8RT1X

9-SCK(B)-ST1












































-  9-SCK(G)-ST1
-  9-SCK(N)-ST1
-  9-SCK(B)-ST1X
-  9-SC(BLK)-BST1
-  9-SC(GY)-BST1X

11-AC6

-  11-AC6(R)

11-AC7

-  11-AC7(R)
-  11-AC7(GO)
-  11-AC7(G)
-  11-AC7(B)

Part No. Dimensions	 11-PSN(B) 11x6.5mm	 11-PSN(B)-ST101 11x6.5mm	 *11-PSN(B)-T02 11x6.5mm	 11-PSN(B)-TST1 11x6.5mm	 11-PSN(B)-8RT1 11x6.5mm	 *11-PSN(B)-ST1X 11x6.5mm	 11-PSN(B)-ST1 11x6.5mm
Part No. Dimensions	 *12-SC 12x10mm	 12-SCS 12x10mm	 12-SC-ST2 12x10mm	 12-SC-8RT1 12x10mm	 13-SC-ST15 12x10mm	 13-SCST 12x10mm	
Part No. Dimensions	 12-ST2 12x2mm	 12-ST18 12x1.8mm	 12-6RT1 12x1mm	 12-ST101 12x1mm	 12-T02 12x0.25mm	 8-NPWP 8x9mm	 12-NPEP4 12x7mm
Part No. Dimensions	 18-MSC 18x13mm	 18-MSC-CBT3 18x13mm	 18-MSC-ST201 18x13mm	 20-ACB 20x7mm	 20-MCB 20x7mm	 *20-MCBC 20x7mm	
Part No. Dimensions	 20-MCBC(R)-CBT3	 *20-MCBC-ST3 20x7mm	 20-AC-CBT3 20x7mm	 20-AC-ST3 20x7mm	 20-CB3 20x3mm	 20-CBT3 20x3mm	
Part No. Dimensions	 20-CBT3B 20x3mm	 20-ASH3 20x1.5mm	 20-LLX 20x3mm	 20-ST3 20x3mm	 20-ST3HT 20x3.1mm	 20-ST15 20x1.5mm	
Part No. Dimensions	 20-ST101 20x1mm	 18-ST101 18x1mm	 20-B3P 20x9mm	 20-2FB3 20x13.4mm	 20-PEPC5 20x10mm		

* Cap available in alternative colors. See below for more details

Alternative Colors

11-PSN(B)-T02

■ 11-PSN(R)-T02

11-PSN(B)-ST1X

■ 11-PSN(G)-ST1X

12-SC

■ 12-SC(R)

□ 12-SC(W)

■ 12-SC(Y)

20-MCBC

■ 20-MCBC(R)

20-MCBC-ST3

■ 20-MCBC(R)-ST3

□ 20-MCBC(N)-ST3

Crimping and Decrimping Tools

Electronic crimpers and decrimpers provide an adjustable crimp with reproducible results.

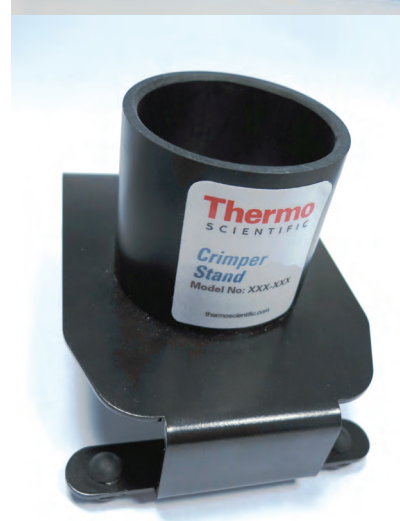
We offer electronic crimpers for crimping or removal of aluminum seals on 8, 11, 13 and 20mm vials. The crimper is a hand held device, which allows aluminum seals to be firmly attached to the vial while it remains in most sample trays with the touch of a button. A separate decrimper allows the removal of the seal just as easily. The instruments have an adjustment for septa of varying thicknesses. Power is supplied by rechargeable Lithium Ion Cells. The 7.5 volt DC power supply comes with a set of plug adaptors to fit power outlets for most countries.

Electronic Crimpers and Decrimpers

- One hand, secure, reproducible crimps of 8, 11, 13 and 20mm vials with the push of a button
- Reduces hand strain compared to manual crimper operation
- Quick and easy removal of aluminum seals with the push of a button
- Ergonomic design eliminates wrist strain
- Vials can be crimped while they remain in most standard removable sample trays
- Adjustable crimp settings for compatibility with most vial/septum/seal combinations
- Fully rechargeable Lithium Ion Battery
- Provided with universal power supply/recharger and international plug adaptors

Electronic Hand-Held Crimpers and Decrimpers

Description	Cat. No.	Pack of
Electronic Hand-held Crimper for 8mm Crimp Caps, Generation 3	ECR-8C	1
Electronic Hand-held Crimper for 11mm Crimp Caps, Generation 3	ECR-11C	1
Electronic Hand-held Crimper for 13mm Crimp Caps, Generation 3	ECR-13C	1
Electronic Hand-held Crimper for 20mm Crimp Caps, Generation 3	ECR-20C	1
Electronic Hand-held Decrimper for 11mm Crimp Caps, Generation 3	EDCB-11C	1
Electronic Hand-held Decrimper for 13mm Crimp Caps, Generation 3	EDCB-13C	1
Electronic Hand-held Decrimper for 20mm Crimp Caps, Generation 3	EDCB-20C	1
Replacement Battery, 6.4V Lithium Ion, For Generation 3 Electronic Crimpers and Decrimper	ECR-CBATT	1
Table/Wall Holder for Electronic Hand-held Crimper	ECR-HOLDER	1



Programmable Electronic High Power Crimp Station

Fully programmable with quick exchange crimp and decrimp heads

We now offer a new fully programmable electronic Thermo Scientific High Power Crimper (HPC) station with adjustable accessory base, external power supply and exchangeable jaw sets for crimping or decrimping of aluminum and stainless steel seals on 8, 11, 13 and 20mm diameter vials. The crimper is a bench top tool, including a versatile height adjustable stand which frees both hands for faster crimping operations. The crimper can be used on the stand or as a hand-held device. For each set of crimping or decrimping jaws up to 10 individual programs can be easily saved, in order to automatically preset the correct head-adjustment for different cap/septum/vial combinations. Special jaws are available for 13mm and 20mm flip-off seals. The crimping force is higher than on battery powered units and is not limited by battery life or charge state. Power is supplied by the included 12 volt power supply (110 – 240V) for unlimited, consistent operation, superior compared to every similar hand held device.



Product features and benefits

- Adjustable crimp settings for compatibility with most vial/septum/seal combinations including aluminum, steel and bi-metal seals
- Crimp-force sensing automatically determines when a proper seal has been formed and opens the jaws to release the vial
- Higher power, perfect for steel caps
- Exchangeable crimp and decrimp heads can be removed or installed in seconds
- For each head, a set of up to 10 adjustment programs are available and can be saved
- Fully electric operation eliminates the need for pressurized air supplies at the operation location

Programmable Electronic High Power Crimp Station

Description	Cat. No.	Pack of
Programmable Electronic High Power Crimper* <i>Includes the basic high power crimper and the 12 volt DC supply with the power cord. (Accessory Base is not included)</i>	ECRH-B	1
Programmable Electronic High Power Crimper 11mm Kit* <i>Includes the basic high power crimper, the 12 volt DC supply with the power cord and a set of crimp heads: 1x11mm crimp head and 1x11mm decrimp head. (Accessory Base is not included)</i>	ECRH-11KIT	1
Programmable Electronic High Power Crimper 20mm Kit* <i>Includes the basic high power crimper, the 12 volt DC supply with the power cord and a set of crimp heads: 1x20mm crimp head and 1x20mm decrimp head. (Accessory Base is not included)</i>	ECRH-20KIT	1

Replacement and Optional Parts

Description	Cat. No.	Pack of
Accessory Base for Electronic Crimpers (base plate and bar) <i>Adjustable in height, base plate is solvent resistant Dimensions: 37.6 × 25.4 × 17.7cm</i>	ECRH-STAND	1
8mm Crimper Jaw Set	ECMJ-8	1
11mm Crimper Jaw Set	ECMJ-11	1
11mm Decrimper Jaw Set	ECDJ-11	1
13mm Crimper Jaw Set	ECMJ-13	1
13mm Decrimper Jaw Set	ECDJ-13	1
13mm Flip-Off Crimper Jaw Set (for circular rim flip caps)	ECMJ-13FO	1
20mm Crimper Jaw Set	ECMJ-20	1
20mm Decrimper Jaw Set	ECDJ-20	1
20mm Flip-Off Crimper Jaw Set (for circular rim flip caps)	ECMJ-20FO	1

* Crimping jaws for other seals available on request.

Terms and Conditions of Sale

UNLESS OTHERWISE EXPRESSLY AGREED IN WRITING, ALL SALES ARE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. **GENERAL.** Thermo Fisher Scientific ("Seller") hereby offers for sale to the buyer named on the face hereof ("Buyer") the products listed on the face hereof (the "Products") on the express condition that Buyer agrees to accept and be bound by the terms and conditions set forth herein. Any provisions contained in any document issued by Buyer are expressly rejected and if the terms and conditions in this Agreement differ from the terms of Buyer's offer, this document shall be construed as a counter offer and shall not be effective as an acceptance of Buyer's document. Buyer's receipt of Products or Seller's commencement of the services provided hereunder will constitute Buyer's acceptance of this Agreement. This is the complete and exclusive statement of the contract between Seller and Buyer with respect to Buyer's purchase of the Products. No waiver, consent, modification, amendment or change of the terms contained herein shall be binding unless in writing and signed by Seller and Buyer. Seller's failure to object to terms contained in any subsequent communication from Buyer will not be a waiver or modification of the terms set forth herein. All orders are subject to acceptance in writing by an authorized representative of Seller.

2. **PRICE.** All prices published by Seller or quoted by Seller's representatives may be changed at any time without notice. All prices quoted by Seller or Seller's representatives are valid for thirty (30) days, unless otherwise stated in writing. All prices for the Products will be as specified by Seller or, if no price has been specified or quoted, will be Seller's price in effect at the time of shipment. All prices are subject to adjustment on account of specifications, quantities, raw materials, cost of production, shipment arrangements or other terms or conditions which are not part of Seller's original price quotation.

3. **TAXES AND OTHER CHARGES.** Prices for the Products exclude all sales, value added and other taxes and duties imposed with respect to the sale, delivery, or use of any Products covered hereby, all of which taxes and duties must be paid by Buyer. If Buyer claims any exemption, Buyer must provide a valid, signed certificate or letter of exemption for each respective jurisdiction.

4. **TERMS OF PAYMENT.** Seller may invoice Buyer upon shipment for the price and all other charges payable by Buyer in accordance with the terms on the face hereof. If no payment terms are stated on the face hereof, payment shall be net thirty (30) days from the date of invoice. If Buyer fails to pay any amounts when due, Buyer shall pay Seller interest thereon at a periodic rate of one and one-half percent (1.5%) per month (or, if lower, the highest rate permitted by law), together with all costs and expenses (including without limitation reasonable attorneys' fees and disbursements and court costs) incurred by Seller in collecting such overdue amounts or otherwise enforcing Seller's rights hereunder. Seller reserves the right to require from Buyer full or partial payment in advance, or other security that is satisfactory to Seller, at any time that Seller believes in good faith that Buyer's financial condition does not justify the terms of payment specified. All payments shall be made in U.S. Dollars.

5. **DELIVERY; CANCELLATION OR CHANGES BY BUYER.** The Products will be shipped to the destination specified by Buyer, F.O.B. Seller's shipping point. Seller will have the right, at its election, to make partial shipments of the Products and to invoice each shipment separately. Seller reserves the right to stop delivery of Products in transit and to withhold shipments in whole or in part if Buyer fails to make any payment to Seller when due or otherwise fails to perform its obligations hereunder. All shipping dates are approximate only, and Seller will not be liable for any loss or damage resulting from any delay in delivery or failure to deliver which is due to any cause beyond Seller's reasonable control. In the event of a delay due to any cause beyond Seller's reasonable control, Seller reserves the right to terminate the order or to reschedule the shipment within a reasonable period of time, and Buyer will not be entitled to refuse delivery or otherwise be relieved of any obligations as the result of such delay. Products as to which delivery is delayed due to any cause within Buyer's control may be placed in storage by Seller at Buyer's risk and expense and for Buyer's account. Orders in process may be canceled only with Seller's written consent and upon payment of Seller's cancellation charges. Orders in process may not be changed except with Seller's written consent and upon agreement by the parties as to an appropriate adjustment in the purchase price therefor. Credit will not be allowed for Products returned without the prior written consent of Seller.

6. **TITLE AND RISK OF LOSS.** Notwithstanding the trade terms indicated above and subject to Seller's right to stop delivery of Products in transit, title to and risk of loss of the Products will pass to Buyer upon delivery of possession of the Products by Seller to the carrier; provided, however, that title to any software incorporated within or forming a part of the Products shall at all times remain with Seller or the licensor(s) thereof, as the case may be.

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