

PERFECT MATCH

Vials, closures and more
for chromatography applications



**DURAN
WHEATON
KIMBLE**

Excellence in your hands

DWK LIFE SCIENCES – THE NEW NAME FOR PREMIUM LABORATORY PRODUCTS

DWK Life Sciences combines the expertise of the acclaimed product brands DURAN®, WHEATON® and KIMBLE®. As one of the world's leading manufacturers of premium lab glass, DWK Life Sciences offers its customers a complete range of high-quality laboratory glassware – from the classic disposables to reusable precision glassware. Additionally, DWK Life Sciences develops and produces a wide range of plastic labware and specialty products for life science applications as well as packaging and storage solutions for the pharmaceutical industry.

The DWK Life Sciences product portfolio comprises over 30,000 products manufactured at 11 sites in Europe, North America and Asia. Globally, more than 1,700 employees work on the development and production of innovative products and services to meet the high expectations of customers in laboratories around the world – inspired by the company slogan “Excellence in your hands”.

Get in touch with us! Our experienced product managers and sales staff will be delighted to answer your questions. For details of your contacts at DWK Life Sciences and specialist dealers, as well as plenty of other information, please see our website: www.DWK.com



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PERFECT MATCH

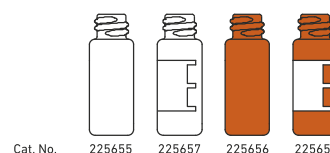
In order to help you finding the right vial and closure combination for your application, all closures are located on the corresponding vial page. Please refer to the technical part at the end of this brochure for further information about how to choose the right vial and closure, correct crimping and much more.



SCREW NECK VIALS

- Available in two standard sizes:
12 x 32 mm (ND8/ND9) and 15 x 45 mm (ND13).
- Short threaded ND9 vials can be used on almost all autosamplers.
They have a 40% larger opening, which improves sample accessibility and reduces the risk of autosampler needle damage.
- Use solid top closures for long-term sample storage applications.
- Optional white ceramic writing patch and fill marks for easy labeling.
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class B requirements.

ND 8



Screw Neck Vials 12 x 32 mm						
Color	Patch	Neck Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	–	ND8	11.6 x 32	1.5	100	225655
Clear	Yes	ND8	11.6 x 32	1.5	100	225657
Amber	–	ND8	11.6 x 32	1.5	100	225656
Amber	Yes	ND8	11.6 x 32	1.5	100	225658

PP Caps for Screw Neck Vials 12 x 32 mm					
Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Black	Open Top	ND8	Silicone white / PTFE red	100	225784
Black	Open Top	ND8	Silicone white / PTFE red / pre-slit (single)	100	225785
Black	Open Top	ND8	PTFE red / Silicone white / PTFE red	100	225786





225659 225661 225660 225662 Cat. No.

ND9

Screw Neck Vials 12 x 32 mm

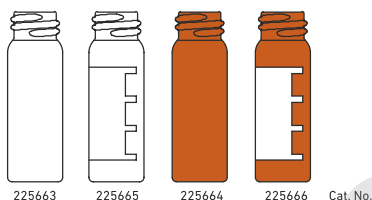
Color	Patch	Neck Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	–	ND9	11.6 x 32	1.5	100	225659
Clear	Yes	ND9	11.6 x 32	1.5	100	225661
Amber	–	ND9	11.6 x 32	1.5	100	225660
Amber	Yes	ND9	11.6 x 32	1.5	100	225662

PP Caps for Screw Neck Vials 12 x 32 mm

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Blue	Open Top	ND9	Red Rubber / PTFE clear	100	225787
Blue	Open Top	ND9	Silicone white / PTFE red	100	225788
Blue	Open Top	ND9	PTFE red / Silicone white / PTFE red	100	225789
Blue	Open Top	ND9	Silicone white / PTFE blue / pre-slit (single)	100	225790
Blue	Open Top	ND9	Red Rubber / PTFE white	100	225795
White	Open Top	ND9	Red Rubber / PTFE clear	100	225791
White	Open Top	ND9	Silicone white / PTFE red	100	225792
White	Open Top	ND9	PTFE red / Silicone white / PTFE red	100	225793
White	Open Top	ND9	Silicone white / PTFE blue / pre-slit (single)	100	225794

Limited Volume Inserts for Screw Neck Vials 12 x 32 mm

Color	Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	Conical	6 x 31	0.1	100	225800
Clear	Flat Bottom	6 x 31	0.2	100	225801



225663 225665 225664 225666 Cat. No.

ND13

Screw Neck Vials 15 x 45 mm

Color	Patch	Neck Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	–	ND13	14.7 x 45	4	100	225663
Clear	Yes	ND13	14.7 x 45	4	100	225665
Amber	–	ND13	14.7 x 45	4	100	225664
Amber	Yes	ND13	14.7 x 45	4	100	225666

PP Caps for Screw Neck Vials 15 x 45 mm

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Black	Open Top	ND13	Red Rubber / PTFE clear	100	225796
Black	Open Top	ND13	Silicone white / PTFE red	100	225797
Black	Solid Top	ND13	Red Rubber / PTFE clear	100	225798
Black	Solid Top	ND13	Silicone white / PTFE red	100	225799

CRIMP TOP VIALS

- Standard vials for GC and HPLC applications.
- Crimp top vials provide an excellent seal for long term sample storage and analyses involving high volatile solvents.
- 40% larger opening improves sample accessibility and reduces the risk of autosampler needle damage.
- Optional white ceramic writing patch and fill marks for easy labeling.
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class B requirements.

ND11



Cat. No. 225600 225602 225601 225603

Crimp Top Vials 12 x 32 mm

Color	Patch	Neck Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	–	ND11	11.6 x 32	1.5	100	225600
Clear	Yes	ND11	11.6 x 32	1.5	100	225602
Amber	–	ND11	11.6 x 32	1.5	100	225601
Amber	Yes	ND11	11.6 x 32	1.5	100	225603

Aluminum Caps for Crimp Top Vials 12 x 32 mm

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Silver	Open Top	ND11	Silicone white / PTFE red	100	225681
Silver	Open Top	ND11	PTFE red / Silicone white / PTFE red	100	225682
Silver	Open Top	ND11	Natural Rubber red / FEP clear	100	225683
Silver	Open Top	ND11	Red Rubber / PTFE clear	100	225684
Silver	Open Top	ND11	Red Rubber / PTFE white	100	225685

Limited Volume Inserts for Crimp Top Vials 12 x 32 mm

Color	Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	Conical	6 x 31	0.1	100	225800
Clear	Flat Bottom	6 x 31	0.2	100	225801

Have a look at the **WHEATON® Crimpers and Decappers** the ideal supplement to our crimp neck and snap ring vials
[>> PAGE 12-13](#)

[>> Crimp Top Vials](#)

[>> Snap Ring Vials](#)



SNAP RING VIALS

- Recommended for HPLC applications, only.
- Snap ring vials eliminate the need for crimping and decapping tools.
- Use snap caps or 11 mm aluminum seals.
- 40% larger opening improves sample accessibility and reduces the risk of autosampler needle damage.
- Optional white ceramic writing patch and fill marks for easy labeling.
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class B requirements.
- **Safety Note:** Snap ring vials cannot be pressurized!



ND11

Snap Ring Vials 12 x 32 mm

Color	Patch	Neck Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	–	ND11	11.6 x 32	1.5	100	225673
Clear	Yes	ND11	11.6 x 32	1.5	100	225675
Amber	–	ND11	11.6 x 32	1.5	100	225674
Amber	Yes	ND11	11.6 x 32	1.5	100	225676

Aluminum Caps for Snap Ring Vials 12 x 32 mm

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Silver	Open Top	ND11	Silicone white / PTFE red	100	225681
Silver	Open Top	ND11	PTFE red / Silicone white / PTFE red	100	225682
Silver	Open Top	ND11	Natural Rubber red / FEP clear	100	225683
Silver	Open Top	ND11	Red Rubber / PTFE clear	100	225684
Silver	Open Top	ND11	Red Rubber / PTFE white	100	225685

PP Caps for Snap Ring Vials 12 x 32 mm

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Clear	Open Top	ND11	Red Rubber / PTFE clear	100	225780
Clear	Open Top	ND11	Silicone white / PTFE red	100	225781
Clear	Open Top	ND11	Silicone white / PTFE blue / pre-slit (cross)	100	225782
Clear	Open Top	ND11	PTFE red / Silicone white / PTFE red	100	225783

Limited Volume Inserts for Snap Ring Vials 12 x 32 mm

Color	Type	d x h [mm]	Working Volume [mL]	Pack Unit	Cat. No.
Clear	Conical	6 x 31	0.1	100	225800
Clear	Flat Bottom	6 x 31	0.2	100	225801

HEADSPACE VIALS

- Available with rounded or flat bottom and DIN crimp neck or beveled top (HS finish).
- Rounded bottoms and shoulders are more sturdy and allow for even heating and safer operation at high temperatures.
- Increased wall thickness (1.2 mm) compared to standard chromatography vials (0.9 mm).
- Can be used in combination with standard aluminum seals, magnetic seals or pressure release seals. Pressure release seals are characterized by incorporated bridges and scorelines, which allow the internal pressure to be released when 3.0 ± 0.5 bar has been exceeded. Magnetic seals are compatible with magnetic transport autosamplers.
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class B requirements.





ND20

Cat. No.

Headspace Vials

Color	Patch	Neck Type	d x h [mm]	Working Volume [mL]	Bottom Design	Finish	Special	Pack Unit	Cat. No.
Clear	–	ND20	22 x 38.5	5	Round	HS	–	100	225605
Clear	–	ND20	22 x 38	5	Flat	HS	–	100	225606
Clear	–	ND20	20 x 38	5	Flat	DIN	–	100	225607
Clear	–	ND20	22.5 x 46	10	Round	DIN	–	100	225608
Clear	–	ND20	22.5 x 46	10	Flat	DIN	Long Neck	100	225609
Clear	–	ND20	20 x 54.5	10	Flat	DIN	–	100	225610
Clear	–	ND20	22.5 x 75.5	20	Flat	DIN	Long Neck	100	225611
Clear	–	ND20	22.5 x 75.5	20	Round	DIN	Long Neck	100	225612
Clear	–	ND20	22.75 x 75.5	20	Round	HS	–	100	225613
Clear	Yes	ND20	22.75 x 75.5	20	Round	HS	–	100	225614

Standard Caps for Headspace Vials

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Silver	Open Top	ND20	Butyl grey / PTFE natural	100	225691
Silver	Open Top	ND20	Butyl black	100	225693
Silver	Open Top	ND20	Silicone transblue / PTFE white	100	225695
Silver	Open Top	ND20	Butyl grey / PTFE natural (PharmaFix)	100	225698

Pressure Release Caps for Headspace Vials

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Silver	Open Top	ND20	Butyl grey / PTFE natural	100	225692
Silver	Open Top	ND20	Butyl black	100	225694
Silver	Open Top	ND20	Silicone transblue / PTFE white	100	225696
Silver	Open Top	ND20	Butyl grey / PTFE natural (PharmaFix)	100	225697

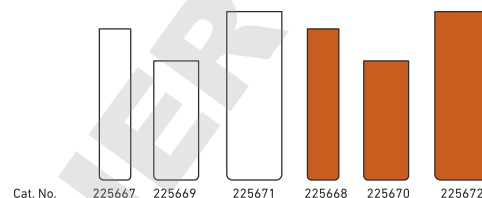
Magnetic Caps for Headspace Vials

Color	Cap Design	Neck Type	Liner	Pack Unit	Cat. No.
Gold	Open Top	ND20	Butyl grey / PTFE natural	100	225699
Gold	Open Top	ND20	Silicone transblue / PTFE white	100	225700



SHELL VIALS

- Economical choice for many HPLC applications.
- Used in combination with polyethylene (PE) push-in caps.
- Caps are packaged separately.
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class B requirements.



Shell Vials with Polyethylene Plug Caps

Color	Neck Size [mm]	d x h [mm]	Working Volume [mL]	Cap Design	Pack Unit	Cat. No.
Clear	8	8.1 x 40	1	Polyethylene Plug	100	225667
Clear	12	11.6 x 31.5	2	Polyethylene Plug	100	225669
Clear	15	14.7 x 44.5	4	Polyethylene Plug	100	225671
Amber	8	8.1 x 40	1	Polyethylene Plug	100	225668
Amber	12	11.6 x 31.5	2	Polyethylene Plug	100	225670
Amber	15	14.7 x 44.5	4	Polyethylene Plug	100	225672



VIAL PACKAGING

All DWK Life Sciences chromatography vials are packed in re-closable, dust- and fiber-free PP boxes. The lower part of the box is shrink-wrapped to provide tamper evidence and to protect the vials against contamination during transportation and storage. Batch numbers on every box allow for 100% traceability.

SNAP CAP VIALS

- Ideal for collecting, storing and exhibiting samples in the lab or field.
- Snap cap ensures easy opening and closing.
- Caps are packaged separately.
- Manufactured from soda-lime glass that conforms to USP Type III requirements.



225650 225651 Cat. No.

ND18

Snap Cap Vials with Caps 20 x 40 mm / 22 x 50 mm

Color	Neck Type	d x h [mm]	Working Volume [mL]	Cap Design	Pack Unit	Cat. No.
Clear	ND18	19 x 40	5	LDPE Snap Cap	200	225650
Clear	ND18	22 x 45	10	LDPE Snap Cap	200	225651



225652 225653 Cat. No.

ND22

Snap Cap Vials with Caps 26 x 48 mm / 26 x 65 mm

Color	Neck Type	d x h [mm]	Working Volume [mL]	Cap Design	Pack Unit	Cat. No.
Clear	ND22	26 x 48	15	LDPE Snap Cap	200	225652
Clear	ND22	26 x 65	25	LDPE Snap Cap	200	225653

SCINTILLATION VIALS

- For scintillation counting and standard storage applications.
- Packaged in convenient utility trays, for easy sample storage.
- Use vials with PP cap and metal foil / pulp liner for applications involving hydrocarbons, oils, ketones and alcohol. Not recommended for acids or alkalis.
- Urea caps with PE cone liner offer superior torque retention and excellent sealing characteristics.
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class A requirements.



225677 / 225678 225679 / 225680 Cat. No.

22-400

Scintillation Vials with Caps

Color	Neck Type	d x h [mm]	Working Volume [mL]	Cap Material	Liner	Cap	Pack Unit	Cat. No.
Clear	22-400	27.5 x 57.5	20	Polyethylene	Metal Foil / Pulp	Separate	500	225677
Clear	22-400	27.5 x 57.5	20	Urea	PE Cone	Separate	500	225678
Clear	22-400	27.5 x 61*	20	Polyethylene	Metal Foil / Pulp	Attached	500	225679
Clear	22-400	27.5 x 61*	20	Urea	PE Cone	Attached	500	225680

* Measurement taken with cap attached

WHEATON® CRIMPERS and DECAPPERS

WHEATON® Crimpers and Decappers are an ideal supplement to our crimp neck and snap ring vials. The **E-Z Crimper™** and **E-Z Decapper™** allow for easy manual attachment and removal of aluminum seals to all vials with crimp finish.

- Cushioned ergonomic handle reduces hand fatigue.
- Polished crimping jaws provide consistent sealing.

Battery powered unit



Our **automatic crimping tools** provide secure, reproducible crimps and quick removal of aluminum seals to and from all vials with crimp finish. The tools are ergonomically designed to reduce strain and arm injury associated with many manual crimping tools.

The **battery powered unit** comes with a long lasting battery with lithium ion technology, which allows for up to 800 crimps per charge. A warning light indicates when recharging is necessary. The tool can be recharged in one to two hours with the universal power supply included. The power supply includes a plug set for operation in most countries. The unit can be operated while charging.

High performance crimping tool



The **high performance crimping tool** is the fastest and most powerful WHEATON® crimping tool. It is strong enough for all steel and magnetic caps. Designed with external power source and cord (no battery). The high performance tool uses interchangeable jaw sets, so that you only need one tool and purchase the size crimper and decappers needed for your laboratory. This crimping tool has the ability to store up to nine separate programs for different caps and cap sizes.



>> WHEATON® E-Z Crimper™

>> WHEATON® E-Z Decapper™

>> WHEATON® High Performance Crimper

WHEATON® E-Z Crimpers™ & Decappers™

Description	Size [mm]	Pack Unit	Cat. No.
WHEATON® E-Z Crimper™	8	1	W225300
WHEATON® E-Z Crimper™	11	1	W225301
WHEATON® E-Z Crimper™	13	1	W225302
WHEATON® E-Z Crimper™	20	1	W225303
WHEATON® E-Z Decapper™	8	1	W225350
WHEATON® E-Z Decapper™	11	1	W225351
WHEATON® E-Z Decapper™	13	1	W225352
WHEATON® E-Z Decapper™	20	1	W225353



WHEATON® automatic crimping tools (battery powered)

Description	Size [mm]	Pack Unit	Cat. No.
Battery Powered Crimper	8	1	W225808
Battery Powered Crimper	11	1	W225811
Battery Powered Crimper	13	1	W225813
Battery Powered Crimper	20	1	W225820
Battery Powered Decapper	11	1	W225812
Battery Powered Decapper	13	1	W225814
Battery Powered Decapper	20	1	W225821
Battery Powered Flip Cap Crimper	13	1	W225815
Battery Powered Flip Cap Crimper	20	1	W225822



WHEATON® automatic crimping tools (high performance)

Description	Jaws	Size [mm]	Pack Unit	Cat. No.
High Performance Crimper	–	–	1	W225830-C *
High Performance Crimper	Yes	20	1	W225831-C *
High Performance Crimper & Decapper	Yes	20	1	W225832-C *
High Performance Flip Cap Crimper & Decapper	Yes	20	1	W225833-C *

* Cat. No. listed with the European plug style. Please refer to the specifications on the right for other plug styles.

Plug Style

* Specification

- A North America, 120 V
- B Japan, 100 V
- C Europe, 230 V
- D UK, 230 V
- F Australia / China, 240 V
- G Italy / Chile, 230 V
- J India, 230 V

Jaw sets for WHEATON® high performance crimping tools

Description	Size [mm]	Pack Unit	Cat. No.
High Performance Crimper Jaw Set	8	1	W225741
High Performance Crimper Jaw Set	11	1	W225751
High Performance Crimper Jaw Set	13	1	W225761
High Performance Crimper Jaw Set	20	1	W225771
High Performance Decapper Jaw Set	11	1	W225752
High Performance Decapper Jaw Set	13	1	W225762
High Performance Decapper Jaw Set	20	1	W225772
High Performance Flip Cap Crimper Jaw Set	13	1	W225763
High Performance Flip Cap Crimper Jaw Set	20	1	W225773



Accessories for automatic crimping tools

Description	Pack Unit	Cat. No.
Crimping Tool Stand	1	W225701
Replacement Battery for battery powered unit	1	W225705



WHEATON® VIAL RACKS

- Manufactured from polypropylene.
- Easy to clean and autoclavable.
- Alphanumeric indexing indicated on rack.
- The racks are sturdy and stackable, even when the vials are in place.
- Each well has an opening in the bottom to facilitate drainage.
- **Note:** When selecting the proper rack, the vial OD cannot exceed the well ID dimension.



WHEATON® Vial Rack					
Description	Well ID [mm]	No. of Wells	Dimensions (L x W x H) [mm]	Pack Unit	Cat. No.
50-Position Rack	12.5	5 deep x 10 wide	190 x 100 x 22	5	985800
48-Position Rack	15.5	4 deep x 12 wide	266 x 94 x 28	5	868804
36-Position Rack	23.1	3 deep x 12 wide	322 x 91 x 28	5	868805
50-Position Rack	28.1	5 deep x 10 wide	330 x 170 x 30	5	868806

DURAN® HPLC RESERVOIR BOTTLE GL 45

with conical base



- DURAN® reservoirs feature one central cavity for the inlet filter to allow the **most efficient delivery** of mobile phase to high-performance liquid chromatography (HPLC) analyzers.
- The conical bottom reservoirs allow a greater recovery of solvent, without having to tilt the reservoir and risk a solvent spill.
- On the two larger sizes, the central cavity can accommodate magnetic stir bars for improved mixing.
- Side vent / drain hole in the base for ultrasonic bath degassing, or water drainage after cleaning.
- Retrace Code and certificate for manufacturing lot traceability.
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class A requirements.
- **Note:** Bottle is provided without cap! Please order cap separately.

EXPLORE THE DURAN®
BOTTLE SYSTEM

www.duran-bottle-system.com



DURAN® HPLC reservoir bottle GL 45 with conical base

Description	Volume [mL]	d [mm]	h [mm]	Pack Unit	Cat. No.
DURAN® HPLC reservoir bottle, clear, conical base, GL 45	1000	110	295	1	218415407
DURAN® HPLC reservoir bottle, clear, conical base, GL 45	2000	145	309	1	218416309
DURAN® HPLC reservoir bottle, clear, conical base, GL 45	5000	190	386	1	218417305
DURAN® HPLC reservoir bottle, clear, conical base, GL 45	10000	235	481	1	218418601

Accessories for the DURAN® HPLC reservoir bottle GL 45

Description	Pack Unit	Cat. No.
DURAN® 3-port GL 45 HPLC delivery cap 1/4"-28 thread for 3.2 mm OD tubing PTFE complete with three 1/4"-28 ETFE plugs and TFE/propylene O-ring	1	292312801
DURAN® ETFE blanking plug 1/4"-28 thread for 3-port HPLC GL 45 delivery cap	1	292310003

TECHNICAL INFORMATION

Choosing the right vial and closure is vital in order to guarantee trouble-free autosampler operation and reliable, reproducible results in chromatographic analyses. The following information will help you to get an overview of the most important factors that need to be taken into account in order to prevent

- Mechanical damage to your autosampler/needle damage
- Chemical incompatibility between your sample and the vial/septum, which may result in extra peaks in your chromatogram
- Evaporation or gas-venting during long-term storage
- Degradation of light-sensitive samples
- Vacuum formation during sample draw
- Crimping issues

01

CHOOSING THE RIGHT CHROMATOGRAPHY VIAL

What are the most common vial styles for chromatography?

Chromatography vials can be distinguished based on size and finish (thread, crimp, snap). They come in clear and amber glass and with or without writing patch.

If not stated otherwise, all DWK Life Sciences chromatography vials are made from clear or amber borosilicate glass, which conforms to USP Type I and ASTM E438, Type I, Class B requirements.

HPLC The most common vial sizes for liquid chromatography vials are 12 x 32 mm as well as 15 x 45 mm. Depending on the resource, 12 x 32 mm vials will also be described as 1.5 mL, 1.8 mL or 2.0 mL vials.

GC Vials for gas chromatography (headspace vials) are available in different sizes and come with crimp or screw finish. Headspace vials have to withstand high internal pressure. Therefore, the wall thickness of headspace vials is higher compared to standard vials for liquid chromatography: 1.2 mm versus 0.9 mm. Furthermore, headspace vials are available with flat and rounded bottom. The rounded bottom is more sturdy and therefore more resistant to the high pressure which builds up inside the vial during the heating process. The design also simplifies the transport with automated systems: vials with rounded bottom will drop more easily into heating blocks and racks.

How to find the right vial for your autosampler?

DWK Life Sciences chromatography vials and accessories are designed for trouble-free operation in most autosamplers. Our autosampler compatibility and cross-reference chart will help you to find the right vial for your equipment. If you need further support, please do not hesitate to get in touch! You can either send us the specifications or a sample of the vial you are currently using and we will come back to you with a recommendation from the DWK Life Sciences line of chromatography vials. Needless to say that we will provide some free-of-charge samples for testing.

Please contact us via technical@DWK-LifeSciences.com

Working with light-sensitive samples?

When working with light-sensitive samples, usage of amber chromatography vials is strongly recommended. Amber glass is formulated to absorb light in the ultraviolet region of the electromagnetic spectrum and therefore provides excellent protection for your valuable samples.

Most vial styles from the DWK Life Sciences line of chromatography vials are available in clear and amber Type I borosilicate glass.

Working with small-volume samples?

If your sample volume should be too small to be analyzed using standard chromatography vials, limited volume inserts (LVI) might be your means of choice. The DWK Life Sciences line of chromatography vials offers two different LVI styles: flat bottom, and conical.

Need a writing patch?

Writing patches offer an easy option for sample labeling. Most vial styles from the DWK Life Sciences range of chromatography vials are available with or without writing patch.

What is the difference between Type I and Type III glass?

USP Type I classification is a borosilicate glass with superior chemical resistance. This class of glass represents the least reactive glass containers available. Typically, this glass can be used for most applications, including packaging for parenteral and non-parenteral products. Type I glass may be used to package acidic, neutral and alkaline products. Water for injection, unbuffered products, chemicals, sensitive lab samples and those requiring sterilization are commonly packaged in Type I borosilicate glass. Type I glass can be subject to chemical attack under certain conditions, thus container selection must be made carefully for very low and very high pH applications. Most glass laboratory apparatus are Type I borosilicate glass.

USP Type III is a soda-lime glass with moderate chemical resistance. It is typically acceptable for packaging dry powders that will be dissolved into solutions or buffers that are insensitive to alkali. Type III glass may not be suitable for autoclaved products because the autoclaving process will accelerate the glass corrosion reaction. Dry heat sterilization processes are typically not a problem for Type III containers.

TECHNICAL INFORMATION

02

CHOOSING THE RIGHT CLOSURE SYSTEM

Choosing the right septa and closures for your analysis is critical to ensure chemical compatibility with your sample and solvents, protect sample integrity and prevent contamination.

Screw and snap caps are usually made of plastic (mostly polypropylene or polyethylene), whereas seals for crimp top vials are made from aluminum. For applications involving automated transport of vials, magnetic caps are used. The cap liner or septa is the part of the cap which establishes a tight seal with the vial. It is also the part of the cap which will be pierced by the autosampler syringe needle to extract the sample from the vial for analysis.

Most septa are made of silicone or butyl rubber. They can be laminated with PTFE on one or both sides which results in a high chemical resistance and a nearly inert barrier between sample and septa material prior to injection.

Table 1 can be used as a reference point when selecting the right closure system for your analysis. It summarizes the chemical compatibility of the most common septa materials with chemicals and solvents used in many standard chromatography applications. Please note that **Table 1** indicates septa compatibility **post-injection**, this means after piercing with an autosampler syringe needle.

Table 1
Septa compatibility
post-Injection

	PTFE	Rubber	Silicone	Butyl Rubber
Acids
Acids, diluted
Acetone
Alcohols
Benzene
Chloroform
Dioxane
Ethyl Acetate
Ethyl Alcohol
Halogenated Hydrocarbons
Hexane
Ketones
Methanol
Pentane
Sulphuric Acid
Surfactants
Toluene
Water

.... Excellent ... Good .. Fair . Poor

Will your application require repeat injections from the same vial?	Take into account that resealing characteristics vary amongst septa and that repeat injections may cause coring and/or tearing of some septa. In general, septa made of PTFE / Silicone / PTFE demonstrate excellent resealing characteristics. They are the product of choice for repeated injections and sample storage. Septa made of PTFE / Rubber are a more economical solution for single injection applications that do not require long-term sample storage.
Do you want to use your chromatography vial for long-term sample storage? Are you afraid of gas venting?	<p>In order to prevent evaporation from a closed autosampler vial, the right closure system should be chosen with deliberation. In general, crimp caps, which are attached / removed using crimping / decapping tools, provide best quality seals for long-term sample storage. If you are looking for a convenient closure system that does not require additional tools, screw caps can offer a good compromise of secure fit and ease of use. Note: Keep in mind that the quality of a crimp is dependent on the correct calibration of the crimping tool. A too tight or too loose crimp will impair the quality of the seal. Please refer to section 3 "Correct Crimping" for further information on how to produce high-quality crimps.</p> <p>In contrast to crimp top and screw cap vials, snap cap vials are chosen strictly for convenience. Snap caps may be adequate for applications that do not require heating of the sample above room temperature and where some cap cracking and moderate sealing performance can be tolerated.</p> <p>When it comes to septa selection, take into account that silicone rubber is usually thicker than natural rubber and therefore provides a tighter seal even after punctuation with a needle.</p>
What type of autosampler needle are you using?	When using a thin, fragile needle your application will require soft and thin septa, such as Silicone / PTFE. Usage of a blunt, thick needle implies usage of pre-cut septa in order to facilitate needle penetration and to prevent coring. In general, silicone septa are more easily pierced than red rubber or butyl.
Facing trouble with vacuum formation during sample draw?	Try using pre-slit septa to provide proper venting of the vial during sample draw.
In which direction does the PTFE membrane in PTFE / Silicone and PTFE / Rubber caps face?	The main function of the PTFE part of the liner is to create a nearly inert barrier between sample and septa material prior to injection. Therefore, it always faces in the direction of the sample.
What does the information "Shore A 45°" mean?	<p>The hardness of a material is called durometer and measured in ° Shore. Different scales are used to specify what type of substance is described. E.g., the "A" in "Shore A 45°" refers to the scale for flexible mold rubbers / plastic. Numbers go from 0 to 100. A high shore grade describes a hard liner whereas a low shore grade refers to a softer liner.</p> <p>The typical hardness for septa materials used in chromatography is Shore A 45°±5, but can also be Shore A 35°±5 or Shore A 50°±5.</p> <p>Both the thickness of a liner as well as the shore grade are important numbers to take into account when choosing the right type of needle for your application.</p>

TECHNICAL INFORMATION

03

CORRECT CRIMPING

Crimp closures are generally known for excellent sealing characteristics even when it comes to long-term sample storage. It has to be noted, however, that the quality of a crimp seal is strongly dependent on the right calibration of the crimping tool used to apply the closure to the vial. To maintain good results, make sure to re-calibrate your crimping tool regularly and check the quality of the seal every time you crimp.

Is the vial properly crimped?

The best way to know if your vial has been crimped properly is to visually inspect the overall appearance of the crimp. An optimal crimp result is characterized by the following features:

- The cap surface is flat.
- The sides of the cap fit tightly around the vial neck and do not show any deformations.
- The septa is not being sucked into the vial nor does it emerge out of the center hole.

Many customers like to use the so-called "turning test" or "twist test" to verify the crimp result. To test the quality of the crimp, the vial is held in one hand while the other hand is used to test whether the crimped cap can be turned or not. A cap which does not turn would mean a good crimp. Please be aware that this test is not very meaningful for two reasons:

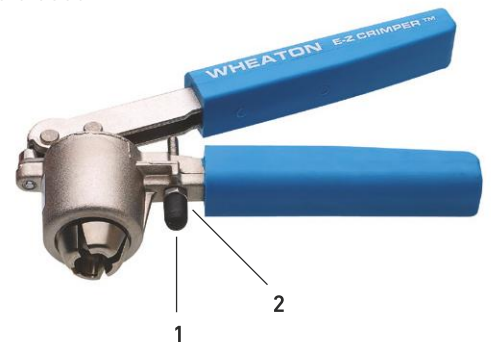
1. Many septa come with a PTFE lamination. Due to the smooth surface of the PTFE membrane, the cap can be turned even if the cap was crimped correctly.
2. An overcrimped closure which passes the turning test will have impaired sealing characteristics due to the deformation of the cap and septa.

WHEATON® E-Z Crimpers

Our WHEATON® E-Z Crimpers provide a manual stop that can be adjusted to provide a reproducible endpoint when the crimper handles are closed.

For lower crimping pressure, turn the adjustment screw **(1)** clockwise.

For higher crimping pressure, turn the adjustment screw **(1)** counter clockwise. You can fix the setting of the screw by using the adjusting screw lock nut **(2)**.



04

QUALITY & CERTIFICATION

What measures are taken to guarantee high-quality products?

Only high-quality raw materials are used for the production of DWK Life Sciences vials and caps. Rigorous quality control according to DIN/ISO standards, including visual and cosmetic in-process control as well as final quality inspection, provides dimensional consistency from batch to batch and assures product safety. Batch numbers on all products allow for 100% traceability.

What measures are taken to prevent contamination of vials and caps during production and transport?

All chromatography vials are packed in re-closable, tamper-proof evident PP-boxes. All boxes are made from dust- and fiber-free material, which protects against contamination during transportation and storage. Caps are packed in zip-lock PE-bags with tear-off foil strip to ensure tamper-evidence and re-closeability.

Are the DWK Life Sciences chromatography vials and caps ISO certified?

Our customers require us to develop and manufacture reliable and safe products in accordance with the highest possible quality standards. This factor is at the very center of our quality policy.

Working in close cooperation with all our staff and with the active involvement of our customers and suppliers, DWK Life Sciences has established a quality management system that conforms to DIN EN ISO 9001 and which is integrated into daily practice.

This quality management system determines all the steps that our products have to go through: from the customer's initial inquiry, through to order processing and delivery, and up to customer feedback. We value the success of DWK Life Sciences products as a sign that our customers trust our quality system, our logistics and our service.

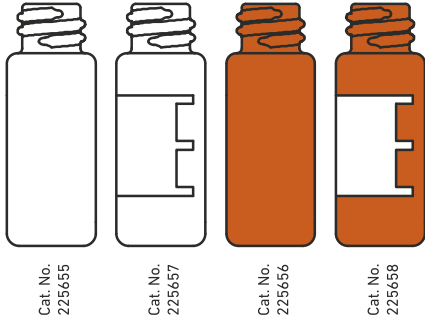
What certification is available for DWK Life Sciences chromatography vials?

A batch-specific certificate of conformity for all items from the DWK Life Sciences chromatography vial line can be handed out on request. To obtain your certificate, please provide the item number of your product together with the batch number printed on the product label to technical@DWK-LifeSciences.com

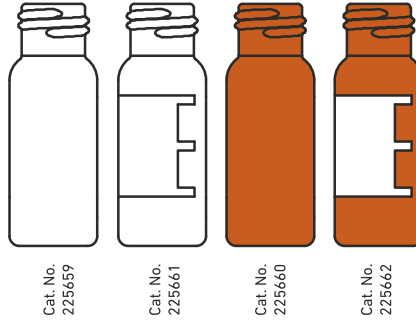
VIALS AT A GLANCE (APPROXIMATE SIZE)

Screw Cap Vials ND8 (1.5 mL)

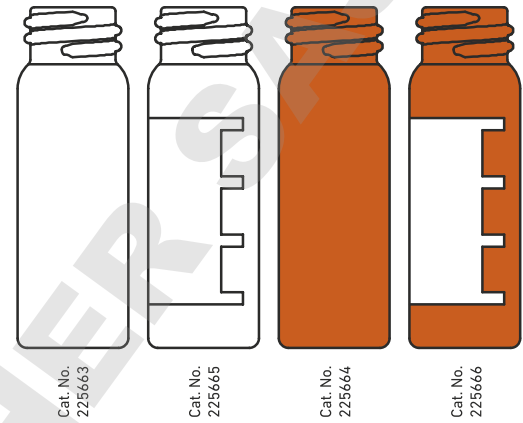
>> PAGE 04-05



ND9 (1.5 mL)

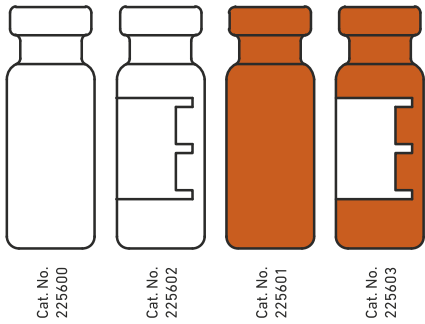


ND13 (4 mL)



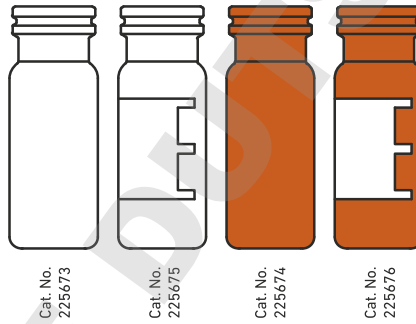
Crimp Top Vials ND11 (1.5 mL)

>> PAGE 06



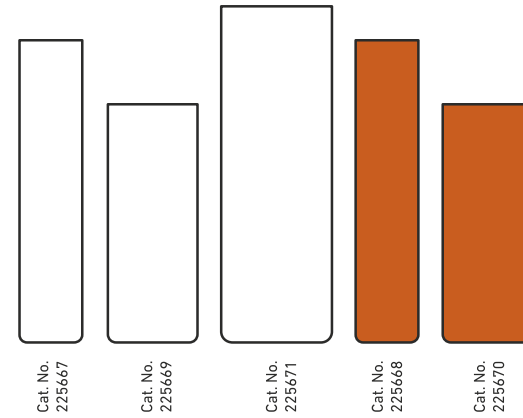
Snap Ring Vials ND11 (1.5 mL)

>> PAGE 07



Shell Vials (1, 2 and 4 mL)

>> PAGE 10



Headspace Vials (with DIN/HS Finish) ND20 (5, 10 and 20 mL)

>> PAGE 08



SCREW CAP VIALS (ND8 / ND9 / ND13)

- Available in two standard sizes: 12 x 32 mm (ND8/ND9) and 15 x 45 mm (ND13)
- ND9 vials have a 40% larger opening, which improves sample accessibility and reduces autosampler needle damage
- Use solid top closures for long-term sample storage

CRIMP TOP VIALS (ND11)

- Crimp top vials provide excellent seal for long term sample storage and analyses involving high volatile solvents
- 40% larger opening improves sample accessibility and reduces autosampler needle damage

SNAP RING VIALS (ND11)

- Snap ring vials eliminate the need for crimping and decapping tools
- Use snap caps or 11 mm aluminum seals in combination with snap ring vials
- 40% larger opening improves sample accessibility and reduces autosampler needle damage

SHELL VIALS

- Economical choice for many HPLC applications
- Used in combination with polyethylene push-in caps

HEADSPACE VIALS (ND20)

- Headspace vials feature rounded bottoms and shoulders for even heating and safer operation at high temperatures
- Can be used in combination with pressure release seals, which allow internal pressure to be released when 3.0 +/-0.5 bar has been exceeded

SCINTILLATION VIALS

- For scintillation counting and standard storage applications
- Available with caps attached or caps separately
- Packaged in convenient utility trays, which serve as an easy way for sample storage
- Background counts are consistent and low, ultraviolet transmission is high
- Made from borosilicate glass conforming to USP Type I and ASTM E438, Type I, Class A requirements

SNAP CAP VIALS (ND18 / ND22)

- Ideal for collecting, storing and exhibiting samples in the lab or field
- Manufactured from soda-lime glass that conforms to USP Type III requirements

Unless otherwise stated, all vials are made from clear and amber borosilicate glass which conforms to USP Type I and ASTM E438, Type I, Class B requirements.

CAPS AND CLOSURES

DWK Life Sciences completes your vial with the right closure. We provide a wide variety of caps and seals to ensure a perfect fit for your container. Our DWK Life Sciences vial portfolio offers closures suited for a wide range of standard and special applications.

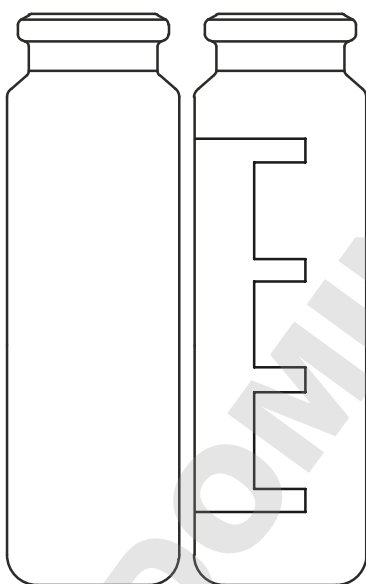
Products include: Screw Caps, Lined Aluminum Seals, Snap Caps, Pressure Release & Magnetic Caps

Scintillation Vials (20 mL)

>> PAGE 11

Snap Cap Vials ND18 (5 and 10 mL) and ND22 (15 and 25 mL)

>> PAGE 11



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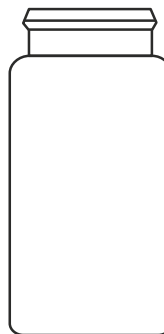
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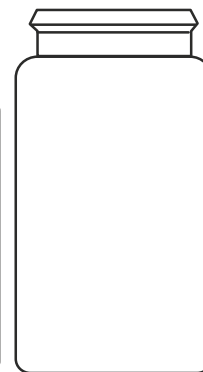
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Cat. No. 225651



Cat. No. 225652



Cat. No. 225653

Cat. No. 225672



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