

***Research  
Quality  
is our  
Standard***



**CARGILLE LABORATORIES 55 COMMERCE ROAD CEDAR GROVE, NJ 70009 USA**



Services to the Sciences Since 1924

SP0197

## Sales Policy

### PLACING ORDERS

Written confirmations, clearly marked as confirmations, are required on orders placed verbally for \$500 USD or over. For established accounts in good standing, shipments will be made prior to receipt of written confirmation at customer's risk. On non-established accounts, shipments will be made on receipt of advance payment or on a Credit card. No orders will be honored from delinquent accounts. Telephone orders may be placed between **8:15 AM & 4:30 PM Monday through Thursday and 8:15 AM to 11:45 AM on Friday**, EST. No collect calls will be accepted. Faxed and Email orders will be accepted 24 hours.

### CONDITIONS OF SALE

**SHIPPING POINT:** Cedar Grove, NJ 07009 USA

**F.O.B. POINT:** Cedar Grove, NJ 07009 USA

**SHIPPING CHARGES:** Prepaid and added to invoice except truck which is shipped collect.

**REMITTANCE:** US funds

#### PAYMENT TERMS:

Established Accounts –

USA, Canada, Mexico.....Net 30 days / Credit Card

International.....10 days AOG (Arrival of Goods) / Credit Card

Non-Established Accounts –

Cash in Advance / C.O.D / Credit Cards (Am Ex, MasterCard, Visa).

**MINIMUM ORDER AND HANDLING CHARGE:** All minimum order values apply to list prices. Purchases below the minimum order requirements are subject to a handling charge-

	Minimum Order	Handling Charge
USA, Canada, Mexico:	\$50.00	The difference between
International:	\$70.00	the minimum and your order total

#### DOCUMENTATION AND COLLECTION CHARGES:

Bank collection charges.....\$25.00 to \$30.00

Invoices issued to firms outside USA will contain an additional charge for converting foreign to US funds. This charge may be deducted from invoice if remittance is drawn on a US bank and encoded for US Federal Reserve System.

Other documentation and/or forwarding fees.....At Cost

**CANCELLATIONS:** Accepted only on unshipped items. If shipped, see RETURNS.

**DAMAGED GOODS:** Report damage within 10 days of date received. Hold all materials and packing for inspection and instructions. If condition of package (mess, odor, etc.) makes holding inadvisable, call carrier (e.g. trucker, post office, UPS or air carrier) immediately and request inspection and disposition. NOTE- take name of inspector or advisor for future reference.

**RETURNS:** Custom Liquids made to your specifications are not returnable. Other products are returnable prepaid within 3 months only with a Return Authorization (R/A) number issued in advance. Do not return any goods without proper authorization. Returned goods received in a salable condition are subject to a 15% minimum re-stocking charge calculated on net price billed plus charges for repacking, reconditioning or special handling. Note: Please pack returns carefully.

**PLEASE NOTE THAT PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.**

### CARGILLE LABORATORIES

55 Commerce Road, Cedar Grove, NJ 07009 – 1289 USA

PH: (973) 239-6633 / FAX: (973) 239-6096

www.CARGILLE.com

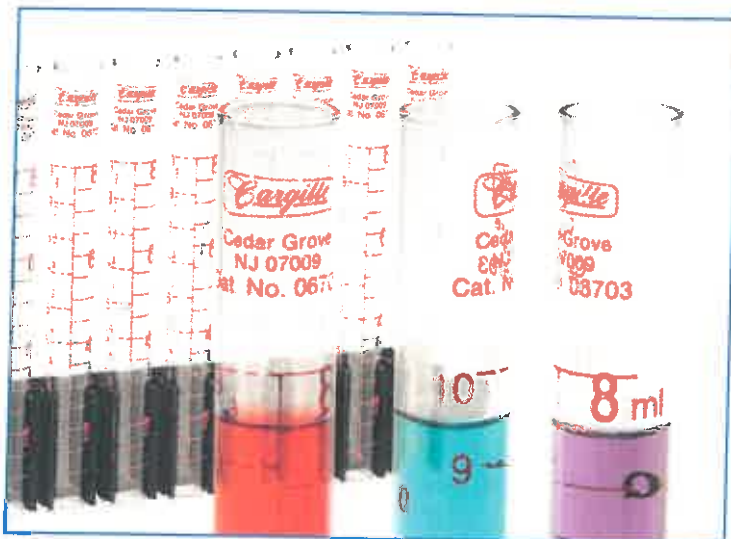
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## STIRRING RODS





# CARGILLE LABORATORIES



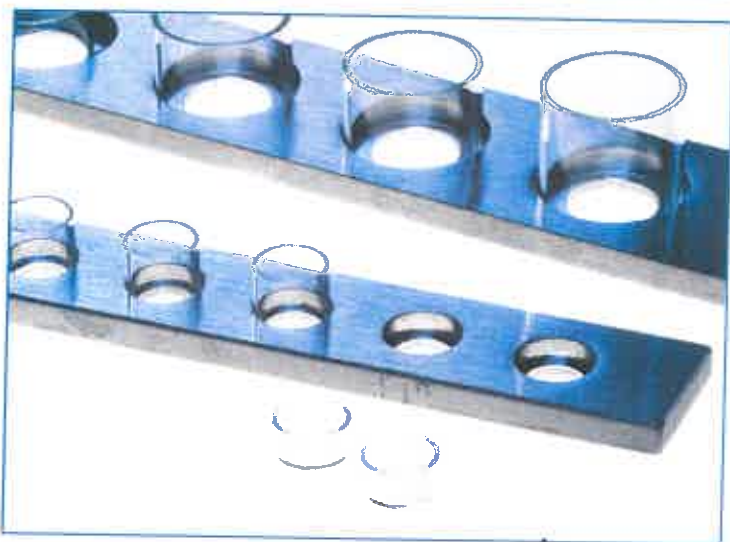
## 8-10 TUBES *racks available*

Graduated to 8 mL and in 10 equal parts

- Clear Glass – low expansion non-borosilicate
- 8 Milliliters, 10 equal parts
- Permanent graduations
- Ideal for measuring small volumes
- Disposable – avoid contamination

*available*

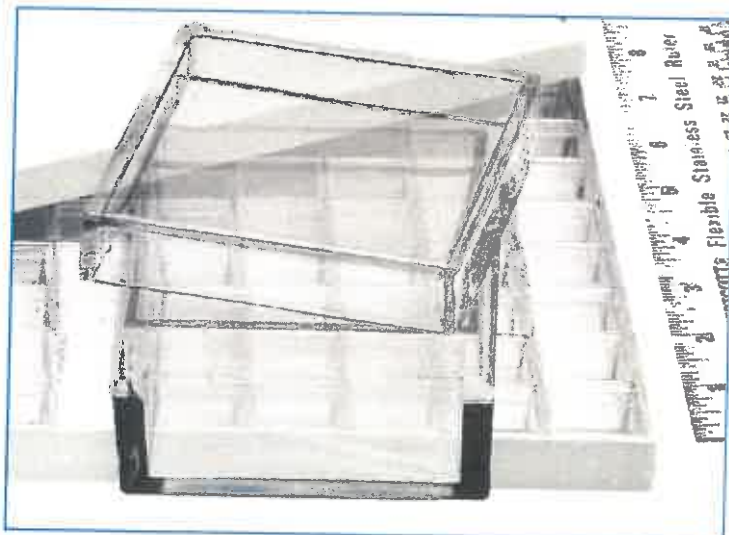
Racks • Corks • PolyPlugs



## MICROBEAKERS *racks available*

- Clear Glass • Durable
- Versatile • Sterilizable and Disposable
- Process Micro-Samples • Color comparisons
- Iodine Number Deteriorations
- Ideal for micro volumes from .5 mL to 7.5 mL
- Weighing • Evaporating
- Optical Examination • Dust Covers
- Custom Size Options

*Ask for Microbeakers Datasheet*



## MICRO PLASTIC BOXES *tray boxes available*

Tray Boxes of 100 3/4" x 1/2"

- Clear Styrene Plastic
- Inexpensive
- Ideal for high volume Micro-Specimen Storage
- Fiberboard Tray Box also available alone
- Disposable – avoid contamination

*Also See Tray Sets on Plastic Boxes Datasheet for other sizes*



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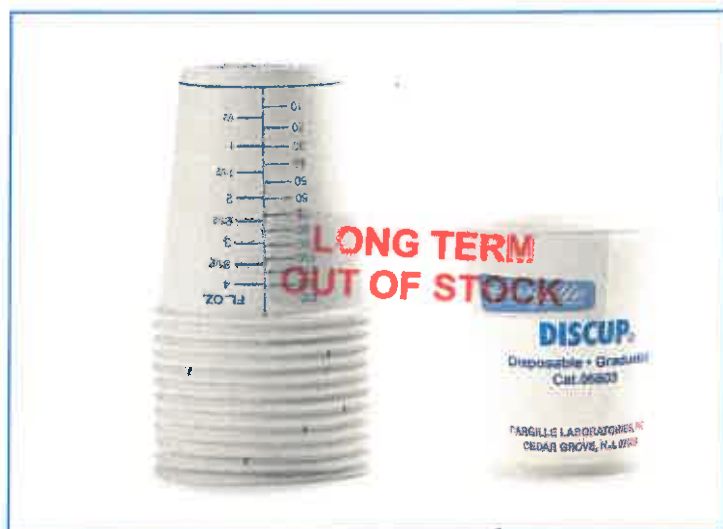
# CARGILLE LABORATORIES



## STACCUPS® Graduated Beakers

Polypropylene Large 500 cc, Small 120 cc

- Sterilizable and "Deep Freeze-able"
- Chemically Un-reactive  
Resistant to most solvents, acids, alkalies, salts, organics and biologicals
- Leak-Proof, seamless, E-Z Pour 360° Spout
- Stable – Unique underside rim provides maximum stability
- Stackable – external non-stick ribs for thorough blending, easier cleaning



## DISCUPS® Graduated Beakers 120 cc

Customers demanded the return of the paper beaker: plain finish uncoated paper does things plastic can't. DISCUPS® are for those who need the benefits of paper and for those who prefer a choice

- Graduated in English and Metric units:  
4 fl.oz. at 1/2 fl.oz. int., and 120 cc at 10 cc int.
- Constructed of unwaxed, plain-finish paper
- Disposables priced for one-time use

## DISPENSERS Stainless Steel, Large & Small

- Supply window
- Top-loading, bottom-dispensing
- Hardware for wall-mounting



## WOOD STIRRING RODS 8"

Strong, sturdy for all types of lab, experimental and formulation work. 3/8" OD x 8"

- One end flat for mashing, the other end pointed for reaching corners and pin-point stirring
- Easy-to-use and disposably priced for one-time use



Tel: 973-239-6633 • Fax: 973-239-6096 • Cedar Grove NJ 07009-1289 USA

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# DISPOSABLES PRICE LIST

Replaces: DSP-PL-196

Effective: January 15, 2021

## DISCUPS® 120 cc Graduated Paper Beakers

Cat.# 06803: grad. to 4 fl oz / 120 cc 100 / pkg 2400 / case: shipping wt. 16.5 lbs  
 ( 2400 in a case ..... #VALUE! )

				ECONOMICAL CASE LOTS:		
QUANTITY:	100	500	1 M	2.4 M	4.8 M	9.6 M
DISCUPS:	LONG TERM OUT OF STOCK					

## STACCUPS® 120 cc and 500 cc Graduated Polypropylene Beakers

Cat.# 06604 - SMALL: grad. to 4 fl oz / 120 cc 25 / pkg 1000 / case: shipping wt. 30 lbs  
 ( 1000 in a case ..... \$ 502.50 )

Cat.# 06619 - LARGE: grad. to 17 fl oz / 500 cc 25 / pkg 500 / case: shipping wt. 40 lbs  
 ( 500 in a case ..... \$ 398.75 )

QUANTITY:	50	100	500	ECONOMICAL CASE LOTS:		
				1 M	5 M	10 M
SMALL	\$ 56.00 /50	\$ 69.00 /C	\$ 58.25 /C	\$ 50.25 /C	\$ 43.50 /C	\$ 37.25 /C
LARGE	\$ 64.00 /50	\$ 108.75 /C	\$ 79.75 /C	ECONOMICAL CASE LOTS:		
				\$ 66.75 /C	\$ 57.00 /C	\$ 53.75 /C

## STACCLIDS™ for 500 cc Beakers

Cat.# 06518 500 cc 25 / pkg 600 / case: shipping wt. 13 lbs

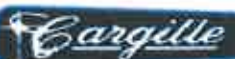
500 cc	Disposable Polyethylene, Dust-Cover Lids: 25 /pkg 600/case:			ECONOMICAL CASE LOTS:		
	QUANTITY	50	100	600	1.2 M	3 M
	# 06518	\$ 62.50 /50	\$ 86.50 /C	\$ 85.25 /C	\$ 77.00 /C	\$ 75.50 /C

## DISPENSERS for 120 cc or 500 cc Beakers

Small ( 120 cc / 4 fl oz )	Cat.# 06405	Stainless Steel	99.00 ea.
Large ( 500 cc / 17 fl oz )	Cat.# 06416	Stainless Steel	104.25

\* Free dispenser upon request with an order of 1,000 or more STACCUPS or DISCUPS for that dispenser.

SEE OTHER SIDE FOR WOOD STIRRING RODS AND 8-10 DISPOSABLE CYLINDERS



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# DISPOSABLES PRICE LIST

## 8 - 10 TUBES

Disposable Graduated Cylinders 8 mL & 10 equal parts  
Clear low expansion glass, not Borosilicate

QUANTITY:	1/2 gross	1 gross	6 gross
Cat.# 06703	\$ 51.75 /lot	\$ 107.00 /gr	\$ 106.00 /gross

CLOSURES	CORK	Cat.# 36135	\$18.50 /gross
AVAILABLE:	POLYPLUG	Cat.# 36225	\$21.50 /gross

## WOOD STIRRING RODS

Disposable 8" Long, 3/8" Diameter Round Skewers

SPECIFY PACKAGING AND TOTAL QUANTITY

Prices Per Box & Per Hundreds in Quantities of:

Catalog	# 06388 / 100	# 06388 / 250	# 06388 / 2000
Packagin	BOXES OF 100	BOXES OF 250	CASES OF 2,000
WOOD STIRRIN G RODS	100 \$ 53.25 /C	1 x 250 \$ 90.75 /bx	1 x 2,000 \$ 412.50 /cs
	600 \$ 49.75 /C	2 x 250 \$ 79.75 /bx	2 x 2,000 \$ 370.00 /cs
	1200 \$ 48.75 /C	4 x 250 \$ 72.00 /bx	5 x 2,000 \$ 330.75 /cs
Shipping	2.2 lbs / bx	5.5 lbs / bx	42.5 lbs / cs

PRICES SUBJECT TO CHANGE WITHOUT NOTICE SEE POLICY FOR FULL TERMS  
FOB & SHIPPING POINT: CEDAR GROVE, NEW JERSEY  
MINIMUM ORDER: USA, CANADA, MEXICO - \$ 50.00 • INTERNATIONAL - \$ 70.00

Ph: 973-239-6633: 8:15 AM - 4:45 PM Mon - Thurs. 8:00 AM - 12:00 PM Fri. ET  
Fax: 24-hour 973-239-6096 / [www.Cargille.com](http://www.Cargille.com)  
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## CARGILLE LABORATORIES

SEE PAGE ONE FOR DISPOSABLE GRADUATED BEAKERS AND LIDS

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[WWW.CARGILLE.COM](http://WWW.CARGILLE.COM)



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### D I S P O S A B L E

#### CARGILLE "8 - 10" GLASS GRADUATED CYLINDERS

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WE ARE INTRODUCING OUR "8-10" CYLINDERS, WHICH ARE MADE OF CLEAR, LOW EXPANSION GLASS, BUT NOT BOROSILICATE. THEY ARE MARKED IN 10 EQUAL PARTS, AND UP TO 8 MILLILITERS. CARGILLE "8-10" CYLINDERS CAN BE USED LIKE TEST TUBES AND READ IN VOLUMES LIKE GRADUATED CYLINDERS.

THEY ARE IDEAL FOR MEASURING SMALL VOLUMES, FOR BLENDING DEFINITE PROPORTIONS OF LIQUIDS OR POWDERS, FOR RAPID QUANTITATIVE CHECK-UPS ON MISCIBILITIES, COMPATIBILITIES, AND SOLUBILITIES OF SUBSTANCES.

THE "8-10" CYLINDERS ARE CONVENIENT BECAUSE THEY ARE INEXPENSIVE ENOUGH TO BE CONSIDERED DISPOSABLE. THIS CAN ELIMINATE THE TIME AND COST OF CLEANING THE TUBES TO AVOID THE RISK OF CONTAMINATION.

##### "8 - 10" CYLINDERS:

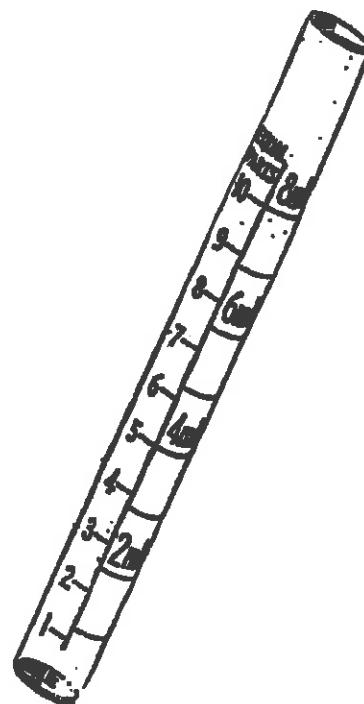
CATALOG NO. 06703	1/2 GROSS .....	\$	51.75 / ½ gr.
	1 GROSS .....	\$	107.00 / gr.
	6 GROSS .....	\$	106.00 / gr.

##### CORK CLOSURES:

CATALOG NO. 36135	1 GROSS .....	\$	18.50 / gr.
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##### POLY PLUG CLOSURES:

CATALOG NO. 36225	1 GROSS .....	\$	21.50 / gr.
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TERMS: NET 30 / FOB & SHIPPING POINT: CEDAR GROVE, NJ 07009 - USA  
MINIMUM ORDER - USA, CANADA, MEXICO: \$ 50.00 ◆ INTERNATIONAL: \$ 70.00  
SEE SALES POLICY FOR FULL TERMS / PRICES SUBJECT TO CHANGE WITHOUT NOTICE





Services to the Science Since 1924

## Cargille Laboratories

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# PRICE SCHEDULE

## CARGILLE PRECISION-CALIBRATED HEAVY LIQUIDS

TO DETERMINE PRICE: Find the density range and read across under the appropriate quantity column.

WHEN ORDERING: Specify catalog number, specific density of liquid, and tolerance required.

STANDARD TEMPERATURE IS 23 °C — STANDARD TOLERANCE IS  $\pm 0.005$  g/cc\*

Keep in mind - A single liquid may have only one density.

### AQUEOUS SERIES

#### INORGANIC SALTS

#### PRICE PER LIQUID

Cat. No.	Density: g/cc	1 oz. (30cc)	4 oz. (120cc)	2 x 4 oz.(240cc)	1 pt. (475cc)	2 x1pt.(950cc)
#12110	1.00 - 1.24	\$ 68.00	\$ 136.75	\$ 116.00 / 4 oz	\$ 297.50	\$ 289.50 / pt
#12120	1.25 - 1.49	\$ 68.00	\$ 136.75	\$ 116.00 / 4 oz	\$ 297.50	\$ 289.50 / pt
#12130	1.50 - 1.74	\$ 69.25	\$ 138.00	\$ 117.25 / 4 oz	\$ 305.25	\$ 299.50 / pt
#12140	1.75 - 1.99	\$ 69.25	\$ 138.00	\$ 117.25 / 4 oz	\$ 305.25	\$ 299.50 / pt
#12150	2.00 - 2.24	\$ 69.50	\$ 144.00	\$ 118.50 / 4 oz	\$ 314.50	\$ 305.25 / pt
#12160	2.25 - 2.49	\$ 69.50	\$ 144.00	\$ 118.50 / 4 oz	\$ 314.50	\$ 305.25 / pt

**NOTE:** The Inorganic Salts are slightly acidic, relatively non-toxic, and water soluble

### ORGANIC SERIES

#### PRICE PER LIQUID

Cat. No.	Density: g/cc	1 oz. (30cc)	4 oz. (120cc)	2 x 4 oz.(240cc)	1 pt. (475cc)	2 x1pt.(950cc)
#12410	.80 - 1.99	\$ 64.50	\$ 123.75	\$ 90.75 / 4 oz	\$ 247.50	\$ 188.25 / pt
#12420	2.00 - 2.49	\$ 65.75	\$ 131.50	\$ 93.75 / 4 oz	\$ 264.75	\$ 205.50 / pt
#12430	2.50 - 2.94	\$ 65.75	\$ 131.50	\$ 93.75 / 4 oz	\$ 264.75	\$ 205.50 / pt
#12440	2.95 - 2.99	\$ 69.75	\$ 142.25	\$ 101.50 / 4 oz	\$ 297.50	\$ 234.25 / pt
#12450	3.00 - 3.04	\$ 80.50	\$ 166.00	\$ 121.25 / 4 oz	\$ 376.50	\$ 308.00 / pt
#12460	3.05 - 3.09	\$ 87.00	\$ 183.00	\$ 139.75 / 4 oz	\$ 427.50	\$ 360.50 / pt
#12470	3.10 - 3.14	\$ 95.00	\$ 217.00	\$ 167.25 / 4 oz	\$ 541.00	\$ 473.50 / pt
#12480	3.15 - 3.19	\$ 104.00	\$ 245.00	\$ 190.75 / 4 oz	\$ 721.00	\$ 547.50 / pt
#12490	3.20 - 3.24	\$ 106.75	\$ 266.00	\$ 209.25 / 4 oz	\$ 690.50	\$ 615.75 / pt
#12491	3.25 - 3.31	\$ 121.25	\$ 302.50	\$ 240.75 / 4 oz	\$ 811.75	\$ 727.50 / pt

\* For other temperatures & tolerances, see ADJUSTMENT CHARGES

## UNCALIBRATED HEAVY LIQUIDS for ADJUSTING ORGANIC SERIES LIQUIDS

#### PRICE PER LIQUID

Cat. No.	Density: g/cc	1 oz. (30cc)	4 oz. (120cc)	2 x 4 oz.(240cc)	1 pt. (475cc)	2 x1pt.(950cc)
#12800	.80 approx.	\$ 56.75	\$ 83.00	\$ 69.75 / 4 oz	\$ 166.50	\$ 118.50 / pt
#12802	1.00 approx.	\$ 56.75	\$ 83.00	\$ 69.75 / 4 oz	\$ 166.50	\$ 118.50 / pt
#12804	3.31 approx.	\$ 84.25	\$ 204.00	\$ 188.25 / 4 oz	\$ 672.50	\$ 627.75 / pt

**CAUTION:** Take normal precautions against contact and inhalation of halogenated organics

**NOTE:** Formulated from organic liquids. Low end member is stable and non-toxic.  
High end members are halogenated organic compounds. Miscible with most organic solvents.

## CARGILLE PRECISION-CALIBRATED HEAVY LIQUID SETS

For mineralogists and gemologists, three sets of Heavy Liquids are available for quick, easy identifications, or classifying and separating specimens into groups. About 15cc of Organic Series Heavy Liquids, supplied in convenient wide mouth bottles.

Calibrated to  $\pm .005$  g/cc. **Note: Much tighter tolerances than sets available elsewhere.**

Cat. No.	CARGILLE PRECISION HEAVY LIQUID SETS - 30 cc's EACH LIQUID		Price /Set
#12806	Adjusting Liquid for: Gemology Sets #1 and #2, Mineralogy Sets and Organic Series 1.00 – 3.31 (2 liquids: approximately $D = 1.00$ , $D = 3.31 +$ )		\$ 138.00
#12840	Gemology Heavy Liquid Set #1	( 5 liquids )	\$ 364.50
#12850	Gemology Heavy Liquid Set #2	( 10 liquids )	\$ 668.25
#12860	Mineralogy Heavy Liquid Set	( 7 liquids )	\$ 427.50
#12870	Mineralogy / Gemology #2 Heavy Liquid Set	( 13 liquids )	\$1,036.75

### DENSITIES IN SETS AND EACH PRICE FOR INDIVIDUAL LIQUID

Cat.#	Density	Gemology Set #1	Gemology Set #2	Mineralogy Set	Per 1 Fluid Oz
12410	1.20	---	1.20	--	\$ 64.50
	1.36	--	1.36	--	
	1.48	--	--	1.48	
	1.75	--	1.75	1.75	
12420	2.00	--	2.00	2.00	\$ 65.75
	2.25	--	2.25	--	
	2.33	---	---	2.33	
	2.43	--	2.43	--	
12430	2.57	2.57	--	---	\$ 65.75
	2.60	--	2.60	2.60	
	2.62	2.62	--	--	
	2.67	2.67	---	---	
	2.87	--	2.87	--	
12450	3.00	--	---	3.00	\$ 80.50
12460	3.05	3.05	---	--	\$ 87.00
	3.09	--	3.09	--	
12491	3.30	---	3.30	3.30	\$121.25
	3.31	3.31	--	--	

Cat. No	ADJUSTMENT CHARGES	
#12610	TEMPERATURE CHARGE (23 °C is standard) 18 °C to 30 °C: For other temperatures, readings and / or coefficients - contact the Cargille Technical Department	\$112.75

### TOLERANCE SPECIFIED

### ADDED CHARGE

---	$\pm 0.005$	n/c
#12609	$\pm 0.0005$	\$ 87.00

Cat. No.	ACCESSORIES	EACH	1 pkg of 6	2 or more
#12911	TWEEZERS, Stainless Steel, serrated, 5½" long (140 mm)	\$ 9.00	\$ 8.25	
#12925	WIDE MOUTH GLASS JARS, with CHEMICAL-RESISTANT POLY SEAL LINED PLASTIC SCREW CAPS: 1 oz. (30cc), 1-3/8" o.d. x 2-5/8" h. (35 x 67 mm)	---	\$ 43.75	\$ 36.50
#12930	POLYETHYLENE AMBER BOTTLE WITH CAP, 16 oz., 21mm, ID mouth	---	\$ 43.75	\$ 36.50

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## CARGILLE LABORATORIES

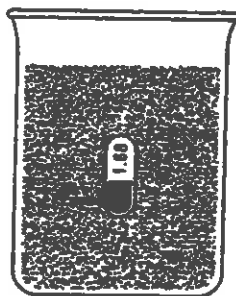
55 Commerce Road • Cedar Grove NJ 07009-1289 • USA  
 Ph: (973) 239-6633 8:15 AM - 4:45PM M-Th 8:00 AM - 12:00 PM Fri. ET  
 FAX: (973) 239-6096 • WWW.CARGILLE.COM

# SINK-FLOAT<sup>®</sup> STANDARDS

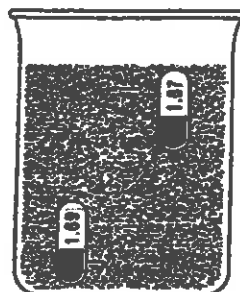
## For Measuring and Monitoring Liquid Densities

Sink-Float Standards are weighted, hermetically sealed, amber glass capsules for visually measuring and monitoring the density of liquids. Each Sink-Float Standard is precisely calibrated at 23°C (73.4°F) to measure a specific density of a liquid within a 0.7 gm/cc to 7.50 gm/cc range. The Standards are ¼" (6.4 mm) in diameter and usually ¾" (19 mm) in length; for higher densities, the lengths may be longer. Each Sink-Float Standard is also permanently marked for identification.

Density is determined by simply observing the position of a Sink-Float Standard in a liquid. When a Sink-Float is swirled in a liquid and thoroughly wet, it will either float in a more dense medium, sink in a less dense medium or stay suspended when the densities match. Continuous monitoring of liquid densities is performed by keeping a Sink-Float in the liquid. Since a Sink-Float will have a normal position (up, down or suspended), any change of position will signal a change in density.



"Sink-Float" suspended in density liquid indicates float and liquid match.



A pair of "Sink-Floats" selected for density limits. If both sink or float, liquid is out of allowable range.

## METHODS OF USING SINK-FLOATS

### BEAKER METHOD

The most common technique for using Sink-Floats is the "beaker" method. A transparent container such as a lab beaker, cylinder, or battery jar is employed to hold the density liquid, or filled with product for quality control testing.

In general, where a series of separations are to be made by adjusting the liquid, it is better to start with a low density. The surface can then be skimmed to separate the floatsam from the sinksam. After increasing density, the surface can be skimmed again to remove new floaters. A series of Sink-Floats makes adjusting the liquid, by bringing the next heavier Sink-Float into suspension, a simple procedure.

### SEMI-CONTINUOUS MONITORING

This method is primarily for use with tank and piping systems. When frequent testing is required, it may

justify setting up a vertical sight gauge to contain the Sink-Floats. If flow cannot be stopped long enough for the Sink-Floats to indicate the density, a by-pass can be arranged.

Tanks or pipes equipped with by-passes must provide continuous flow through the by-pass so the sample in the Sink-Float chamber is the same as in the tank or pipe line.

To make a density determination, close valves or shut off mixers, or other agitating systems, to permit the test chamber to come to equilibrium and the Sink-Floats to respond to the density of the liquid.

The sight gauge system must be equipped with screens to prevent the Sink-Floats from being washed through. For accurate testing, the temperature of the batch, or at least the test section must be controlled. Broader temperatures are allowed if three or more floats are used as described.



## USING ONE, TWO, OR MORE SINK-FLOATS

### ONE SINK-FLOAT

- (a) Gives the most accurate control when kept suspended in the liquid.
- (b) Indicates minimum density when liquid is higher. A drop in liquid density causes Sink-Float to sink.
- (c) Indicates maximum density when liquid is lower. A rise in density causes the Sink-Float to float.

### TWO SINK-FLOATS

Sink-Floats indicate when a liquid changes beyond the minimum or maximum when a density range is permissible. For a liquid within limits, one Sink-Float sinks, the other floats. If both sink or float, liquid is beyond limits.

### THREE SINK-FLOATS, OR MORE

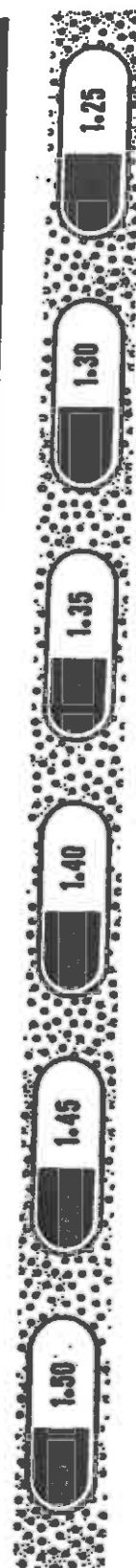
(a) The density of a liquid will vary with temperature. Rather than take time to bring temperature of a liquid or liquid product to the standard temperature, select Sink-Floats for the test at the liquid temperature. A table can show the Sink-Floats to be selected.

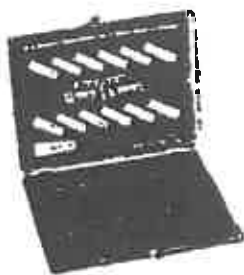
TYPICAL TABLE	
TEMPERATURE	SINK-FLOAT, gm/cc
21.1°C (70°F)	2.225
22.7°C (73°F)	2.220
24.4°C (76°F)	2.215
28.1°C (79°F)	2.210

**EXAMPLE:** Liquid is 75°F, Sink-Floats 2.215 and 2.220 would be used as minimum and maximum limits for acceptance.

**NOTE:** If 4 Sink-Floats are used as listed in table, all can be put in the test liquid. For 75°F the density would be satisfactory if two sink and two float.

(b) A series of Sink-Floats can also be used to adjust a liquid through steps for a series of skim separation. If all Sink-Floats are put in the container and the lowest density is used first, as the density is raised to the next point, one Sink-Float will become suspended.





Density Liquids, although correct when made or purchased, are subject to change due to evaporation or contamination. They can also be "off" if not used at the proper temperature. In the ambient temperature range, Sink-Floats, for practical purposes, are temperature stable.

## APPLICATIONS

### MAKING AND ADJUSTING DENSITY LIQUIDS

Density liquids can be made by mixing appropriately selected liquids until the proper Sink-Float remains suspended in the liquid. The same Standard can be left in the liquid as a monitor, and adjustments made by adding the appropriate end member or varying the temperature if the density of the liquid should change.

### SEPARATION

**EXAMPLE:** Separating gems. Since the possibilities are known, a density liquid or series of liquids can be selected that lie between the densities of the gems being separated.

A single Sink-Float will control the liquid, but a pair will require less operator attention. The pair should be selected to give the widest range for variation of the liquid consistent with clean separation between types of stones.

### IDENTIFICATION

**EXAMPLE:** Diamonds. If in the extraction process a number of crystalline materials are found and the diamond is wanted to the exclusion of all other materials, two liquids would be required. If the diamonds range from 3.50 to 3.54, a liquid of 3.50 would float any crystals of lower density and the diamonds would sink. In liquid of 3.54 the diamonds would float and heavier materials would sink.

### CONCENTRATION CONTROL

**EXAMPLE:** Solution preparation. When a solution is to be prepared from a concentrate, and the diluent has a different density than the concentrate, the concentration may be controlled by density, using one or a pair of Sink-Floats.

### CONTAMINATION CONTROL

Materials being separated by a density liquid may carry minute amounts of liquids into the density liquid. Monitoring with Sink-Floats will indicate a change in density due to addition of the contaminants.

### PRODUCT CONTROL

**EXAMPLE:** Liquid product to be separated from solvent. Where a solvent process is used in manufacture and the solvent is distilled off, a Sink-

Float can be used to indicate when a minimum density or maximum density is reached. The accuracy depends on the density difference between the solvent and the product. Distillation would continue until a Sink-Float just sinks, just floats, stays suspended, or, using a pair to establish an acceptance density range, one sinks and one floats.

### PURITY CONTROL

When a liquid product's purity can be related to maximum or minimum density, an appropriately selected Sink-Float will indicate whether the desired purity has been reached, or has changed by contamination or deterioration.

### QUALITY CONTROL

**EXAMPLE:** Dielectric properties of ceramic parts. Porosity (air inclusion) of pressed parts affect dielectric constants. By use of density liquids, parts with excessive air inclusions can be separated. One Sink-Float would give critical control; a pair of Sink-Floats would allow a small range of control of the liquid that would reduce operator time in adjusting the density liquid, and yet avoid the possibility of extreme change of density liquid without operator knowledge.

### REACTION CONCENTRATION CONTROL

When a reaction process consumes a material in solution and the drop in concentration changes density, a test with a properly selected Sink-Float will show when concentration has dropped below minimum level.

### SOLDER FLUXES

The solvents and diluents in fluxes used with automatic soldering equipment slowly evaporate during use and must be replaced to maintain uniform fluidity. Also, the flux solids are depleted during application and must be replaced. Density is commonly used to control fluidity since there are measurable differences between the stable (denser) components and the lighter solvent. Sink-Floats are used to monitor densities and to immediately alert the user to a change in density and that fluidity may be approaching a "problem level".

## SUGGESTIONS FOR ACCURACY

1. Temperature changes cause density changes in liquids. The operator must know the degree to which a temperature change will affect his result. Density varies inversely with temperature.
2. The simplest method of temperature control is to standardize tests, when possible, at average room temperature. Any adjustments, if they must be made, are then minor.
3. Changing the temperature of the liquid can be avoided by preparing a table and using several Sink-Floats. Once the temperature of the liquid is taken, the appropriate Sink-Floats can be selected. A liquid product can then be tested, or a test liquid adjusted by addition of end members. See typical table.
4. A liquid can be protected from sharp temperature changes caused by air circulation or cold drafts by putting the beaker inside a larger beaker. Greater temperature stability is achieved by filling the space between the beakers with water or clean oils. This technique also assists when tests are conducted at elevated or lowered temperatures.
5. Faster response to the density of the liquid can be accomplished by stirring or swirling the liquid and watching the Sink-Floats come to equilibrium.
6. Small changes in density can be made by changing the temperature of the liquid. This avoids constant additions to adjust the liquid. Sink-Floats will indicate when the new density has been reached.
7. For a given low viscosity liquid an operator can develop a feel for the density difference indicated by the rate a Sink-Float may rise or drop. This technique can be used to keep a liquid within a narrow range with one Sink-Float, or to keep the temperature of the liquid within a narrow range.

## SELECTING

Most commonly used Sink-Floats are in the range .700 to 3.00 gm/cc. These are also the most readily available and the least expensive.

A tolerance of  $\pm 0.005$  is the most widely used, having proved highly satisfactory for quality control testing, identification and separation work.

The most precise Sink-Floats, having a tolerance of  $\pm 0.0005$ , are generally used in research, and precision analytical work, or where concentration, contamination and purity control is dependent on very minor density changes.

Sink-Floats are stocked by intervals dependent on the tolerance as follows:

TOLERANCE	SMALLEST INTERVAL	EXAMPLE OF SERIES
$\pm 0.01$	0.01	4.00, 4.01, 4.02
$\pm 0.005$	0.005	2.000, 2.005, 2.010
$\pm 0.0005$	0.0005	2.0000, 2.0005, 2.0010

For control of a liquid with one Sink-Float, order one matching the density of the liquid.

For control of a liquid with a pair of Sink-Floats, order one above and one below the liquid density, representing minimum and maximum limits.

For series separations, or product density quality control at the temperature of the product, the proper series of Sink-Floats must be selected according to the application.

Sink-Floats are available with densities from 0.70 to 7.5 gm/cc. Available tolerances vary with the density of the Sink-Float. Tolerance is indicated by an extra mark above or below density number, as follows:

RANGE, gm/cc	TOLERANCE	EXTRA MARK
0.700 to 4.00	$\pm 0.005$	None
0.700 to 4.00	$\pm 0.0005$	Below No.
4.000 to 7.50	$\pm 0.01$	Above No.

### SPECIFICATIONS

Weighted, hermetically sealed, amber glass capsules;  $\frac{1}{8}$ " (6.4 mm) OD,  $\frac{1}{4}$ " (19 mm) long, slightly longer for higher densities; permanently marked for identification; precisely calibrated at 23°C (73.4°F) unless otherwise specified.

### ORDERING INFORMATION

Sink-Floats are usually selected to meet specific density liquid monitoring or individual liquid density requirements by ordering singly, in pairs, or in series by Catalog No. PURCHASE ORDERS MUST SPECIFY EXACT DENSITY AND TOLERANCE. IF TOLERANCE IS OMITTED, THE WIDEST TOLERANCE WILL BE SUPPLIED.

### SINK-FLOAT SCREENING SETS

To meet the needs of research, development, and test laboratories the Sink-Float Screening Sets, listed below, are available in series commonly used in making quick estimates of densities.

CATALOG No. 13550, SINK-FLOAT SCREENING SET • WIDE RANGE—7 Standards—1.00 to 4.00 gm/cc—Interval 0.5—Tolerance  $\pm 0.005$

CATALOG No. 13600, SINK-FLOAT SCREENING SET • LIMITED RANGE—9 Standards—1.00 to 3.00 gm/cc—Interval 0.25—Tolerance  $\pm 0.005$

CATALOG No. 13650, SINK-FLOAT SCREENING SET • COMMON RANGE—11 Standards—1.00 to 2.00 gm/cc—Interval 0.1—Tolerance  $\pm 0.005$





Services to the Science Since 1924

## Cargille Laboratories

**55 Commerce Road • Cedar Grove • New Jersey • 07009-1289 USA**  
**Phone: 973-239-6633 • Fax: 973-239-6096 • WWW.CARGILLE.COM**

# SINK FLOAT STANDARDS PRICE LIST

### INDIVIDUAL STANDARDS

**IMPORTANT:** SPECIFY DENSITY (in gm / cc) AND TOLERANCE FOR EACH SINK FLOAT STANDARD

**NOTE:** A 15% discount from the price of an individual standard will be granted if the last number specified is not "0" or a "5"

CAT.#	DENSITY, gm / cc	LINE INDICATES TOLERANCE		
		±0.01	±0.005	±0.0005
13110	0.70 to 1.00	xxx	\$ 195.50	\$ 321.00
13120	1.01 to 2.00	xxx	\$ 196.75	\$ 301.00
13130	2.01 to 3.00	xxx	\$ 301.00	\$ 500.25
13140	3.01 to 4.00	xxx	\$ 280.50	\$ 447.75
13150	4.01 to 5.00	\$ 448.50	xxx	xxx
13160	5.01 to 6.00	\$ 532.00	xxx	xxx
13170	6.01 to 7.00	\$ 583.25	xxx	xxx
13180	7.01 to 7.50	\$ 671.00	xxx	xxx

Please Inquire for quantity discount of more than 3 Sink Floats with the same density and temperature.

**SINK-FLOAT SETS** THE PRECISE DENSITY OF A SINK FLOAT STANDARD WITHIN A SET MAY NOT END IN A "0" OR A "5". HOWEVER, ITS PRECISE DENSITY WILL BE CLEARLY MARKED AND CALIBRATED WITHIN THE CHOSEN TOLERANCE (i.e. A nominal 1.00 gm/cc Standard for Set #13550 will be marked with its density within its tolerance so its density will be a number between .995 and 1.005 and marked as to its actual density).

WIDE-RANGE	- 7 STANDARDS; 1.00 to 4.00 gm/cc; Interval 0.5	CAT # 13550 ± 0.005	\$ 1,372.25
		CAT # 13551 ± 0.0005	\$ 2,092.00
LIMITED RANGE	- 9 STANDARDS; 1.00 to 3.00 gm/cc; Interval 0.25:	CAT # 13600 ± 0.005	\$ 1,698.75
		CAT # 13601 ± 0.0005	\$ 2,753.50
COMMON RANGE	- 11 STANDARDS; 1.00 to 2.00 gm/cc; Interval 0.1:	CAT # 13650 ± 0.005	\$ 1,631.25
		CAT # 13651 ± 0.0005	\$ 2,646.00

**STANDARD TEMPERATURE:** CALIBRATION WILL BE AT 23 °C UNLESS ANOTHER TEMPERATURE IS SPECIFIED. SEE BELOW

**TEMPERATURE ADJUSTMENT CHARGE:** For a temperature other than 23°C (18°C to 30°C): CAT# 13200 \$ 120.25  
 (For each combination density-temperature specification in a single order)

**FOB & SHIPPING POINT: CEDAR GROVE, NJ 07009 – USA**  
**MINIMUM ORDER – USA, CANADA, MEXICO: \$ 50.00 ♦ INTERNATIONAL: \$ 70.00**  
**SEE SALES POLICY FOR FULL TERMS / PRICES SUBJECT TO CHANGE WITHOUT NOTICE**

# CARGILLE LABORATORIES

## IMMERSION OILS



FOR THE SHARPEST IMAGE POSSIBLE



# CARGILLE IMMERSION OILS

## Research Quality Is Our Standard

### Check Cargille's Record

Since 1924, Cargille Laboratories has been providing specialized services to a broad range of laboratory sciences. Advances for the microscopy field continually develop from Cargille Laboratories' extensive research, among them many significant achievements:

- First NON-DRYING immersion oil 1940
- First HIGH-VISCOSITY immersion oil 1950
- First PCB-FREE immersion oils 1971
- First ULTRA LOW-FLUORESCENCE immersion oil 1984
- First Ultra Low-Fluorescence HALOGEN-FREE immersion oil 1992
- First 37DF immersion oil 2008
- First LIVE CELL FLUORESCENCE immersion oil at 37°C 2009

Key optical characteristics make immersion oil function as a high quality component of the optics of the microscope. Cargille Laboratories was the first manufacturer to print key optical and physical values on every bottle of immersion oil. This makes referencing the data, and the selection process, easy and accurate.

This selection process is further simplified in the lab by color coding all bottle and package labels.

Today, Cargille Immersion Oils are accepted by all microscope manufacturers. Cargille provides the largest line of immersion oils for traditional and specialty uses, and continues to set performance standards in product development, refinement and support services.

### Cargille Immersion Oils Meet or Exceed the ISO 8036-1 Standard

The required specifications for immersion oil are in the International Standards Organization (ISO) 8036-1 which incorporates and supersedes the DIN 58 884. All but three of Cargille Immersion Oils meet the ISO standards. The other three Cargille oils are for more highly specialized applications and used in non-standard conditions not yet addressed by ISO requirements.

Cargille Laboratories served as a member of the U. S. delegation to the International Standards Organization and helped write the ISO specifications for immersion oils in conjunction with microscope manufacturers worldwide.

### Biosciences, Clinical, Hematology and Pathology Labs

Specifications for Cargille Immersion Oils also meet the U.S. FDA criteria for *In Vitro* Diagnostics, General Purpose Reagents, and have been adopted for use by the U. S. Department of Defense.

The physical and optical properties of immersion oil are critical to the proper operation of Automated Hematology Systems. **Type 300** is designed and manufactured to meet the stringent requirements of this equipment, which include specialized viscosity and exacting controls for its consistency.

**Types A and B** are sufficiently low fluorescing for most fluorescence microscopy applications. ~~Extremely low fluorescence is achieved by Type DF.~~ **Type FF** is virtually fluorescence-free, though not covered by ISO. Viscosity for **Type A** is 150 cSt, **Type B** is 1250 cSt, ~~Type DF is 330 cSt~~ and **Type FF** is 170 cSt.

**Type 37DF** was developed specially for research projects that require Fluorescence Microscopy at internal human body temperature. **Type 37DF**, with a refractive index of 1.515 and viscosity of 250 cSt at 37°C, solves the problem of image deterioration at temperatures above the standard calibration temperature of 23 °C.



# CARGILLE IMMERSION OILS

## What Application – What Type – Which One to Choose?

<b>Normal Light Microscopy:</b>	<b>Use Type A or Type B</b>	<p><u>Types A and B</u> are virtually interchangeable and are miscible with each other for intermediate viscosities. Produced in larger quantities than other types, <u>Types A and B</u> are the most economical. The deciding factor in choosing between them is the optimum viscosity for your particular application. (Please refer to the chart of Relative Viscosities on page 3.)</p> <p><u>Type A</u>, at 150 centistokes, reduces any tendency to trap air, especially helpful to beginning students. Air bubbles cause image degradation.</p> <p><u>Type B</u>, at 1250 cSt, is thick enough for viewing multiple slides with one application. This saves time during batch processing.</p>
<b>Automated Hematology Systems:</b>	<b>Use Type 300</b>	<p>AUTOMATED HEMATOLOGY SYSTEMS depend on accurate, precisely controlled physical and optical properties of immersion oil for successful imaging and mechanical processing. <u>Type 300</u> is designed and manufactured to meet the stringent requirements of this equipment, which include specialized viscosity and exacting controls for its consistency.</p>
<b>Inverted, Inclined, Projection, and Long Focus Instruments:</b>	<b>Use Type NVH or Type OVH</b>	<p>The greater the gap between the cover glass and objective, or between the slide and condenser, the more desirable high viscosity becomes. The very high viscosities of <u>Type NVH</u> at 21,000 cSt and <u>Type OVH</u> at 46,000 cSt give excellent results for these applications.</p>
<b>Blending Oils from the Miscible Group of immersion oils to obtain intermediate viscosities:</b>	<b>The Miscible Group of immersion oils is A, B, 300, NVH &amp; OVH.</b>	<p>Users can easily blend any two immersion oils from the Miscible Group to obtain an immersion oil with an intermediate viscosity while maintaining the optical properties common to both oils.</p>
<b>Fluorescence Microscopy:</b>	<b>Use Ultra-Low Fluorescing <del>Type DF</del>, Type HF, Type FF or <del>Type 37DF</del></b>	<p>Extremely low fluorescence is achieved by <u>Type HF</u>. <u>Type FF</u> is virtually fluorescence-free, though not ISO compliant. <u>Type HF</u> is halogen-free. For most non-critical fluorescence microscopy applications, <u>Types A and B</u> are sufficiently low fluorescing. Viscosities for <u>Types HF and FF</u> are 700 cSt and 170 cSt, respectively. <u>Types A and B</u> are 150 cSt and 1250 cSt.</p>
<b>Elevated Temperatures (&gt;23 °C to 37 °C)</b>	<b>Use Type 37*</b>	<p>Elevated temperatures can be due to substage illuminators, "hot stage", or other causes – ideal situations for Cargille Immersion Oil <u>Type 37</u>. Developed specifically for working at human body* temperatures, <u>Type 37</u> has a refractive index of 1.515 and a viscosity of 1250 cSt at 37 °C, solving the problem of image degradation above the standard calibration temperature of 23 °C.</p>



### Blending for Intermediate Working Temperatures From 23 °C to 37 °C

Users can blend for their own working temperature; blending Type B, with a viscosity of 1250 cSt at 23 °C with Type 37, 1250 cSt at 37 °C maintains a constant 1250 cSt viscosity and optical values and places the temperature of calibration proportionally between 23 °C to 37 °C.

(\*For *In Vitro* use only: immersion oil has no *In Vivo* applications.)



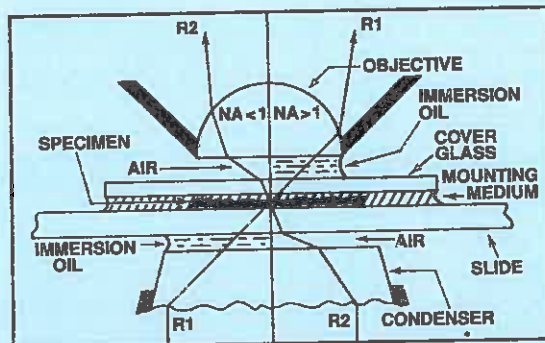


# CARGILLE IMMERSION OILS

## How Immersion Oils Work

Sharper resolution and increased brightness are achieved with oil immersion microscopy:

1. An objective must be used "dry" or "oiled" depending on design, and is marked specifically for use with oil. A condenser will work oiled or dry.
2. The glass of the objective and condenser lenses and the slide and cover glass each have a refractive index of 1.515. Air has a refractive index of 1.000 and is a distorting factor.
3. By replacing the air gap between the condenser and slide and between the slide and objective with immersion oil with a refractive index of 1.515, the best resolution of the image is realized.
4. Cargille Immersion Oil has the specific refractive dispersion necessary to reduce chromatic aberration and maintain the proper color of the image.



For a more detailed explanation of the physics, optical contribution, and use of immersion oil, including angular and numerical apertures, request a free copy of the booklet *Immersion Oil and the Microscope* by John J. Cargille, reprinted by permission of the New York Microscopical Society.



## Relative Viscosities

Viscosity In Centistokes	Cargille Immersion Oil Type	Common Liquids	Viscosity In Centistokes
—	—	water	1 cSt
—	—	salad oil	50 cSt
150 cSt	TYPE A	maple syrup	165 cSt
170 cSt	TYPE FF	dish detergent	225 cSt
250 cSt	TYPE 37DF*	motor oil 10W	225 cSt
300 cSt	TYPE 300	motor oil 30W	285 cSt
330 cSt	TYPE DF	glycerin	550 cSt
1,250 cSt	TYPE B	corn syrup	1,760 cSt
1,250 cSt	TYPE 37*	molasses	2,500 cSt
21,000 cSt	TYPE NVH	honey	15,000 cSt
46,000 cSt	TYPE OVH	(3.07 x honey)	—

\*@ 37 °C.

## Special Applications of Cargille Immersion Oils

Worldwide distribution and rigidly maintained manufacturing specifications allow Cargille Immersion Oils to be used at coordinated work sites around the globe with thoroughly consistent quality results for applications such as:

- *temporary mounting media*
- *fluid mount* (permitting specimen rotation)
- *calibration liquids*
- *optical coupling*
- *transparency medium* for translucent materials and as a filter clearing agent.  
(recommended by Millipore Corp.)



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# CARGILLE IMMERSION OILS

## Optical and Physical Properties

Property values most often requested

Category:	Standard Viscosities				Extra Thick		Fluorescence Microscopy			Halogen-Free
Type of Oil:	Type A	Type 300	Type B	Type 37**	Type NVH	Type OVH	Type 37DF**	Type DF	Type FF	Type HF
Miscible Group:	yes	yes	yes	n/a	yes	yes	n/a	n/a	n/a	n/a
ISO Compliance:	yes	yes	yes	***	yes	yes	***	yes	****	yes
Catalog No.:	16482	16252	16484	16237	16485	16487	16239	16242	16212	16245
Viscosity: cSt $\pm$ 10% @ 23 °C (centistokes)	150 low	300 medium	1250 high	(@ 37 °C) 1250** high	21,000 very high	46,000 very, very high	(@ 37 °C) 250 medium	330 medium	170 low	approx 700 medium
Refractive Index @ 23 °C:										
F Line (4861 Å)	1.5239	1.5238	1.5236	1.5238**	1.5230	1.5230	1.5233**	1.5232	1.4850	1.5234
E Line (5461 Å)	1.5180	1.5180	1.5180	1.5180**	1.5178	1.5178	1.5179**	1.5179	1.4811	1.5180
D Line (5893 Å)	1.5150	1.5150	1.5150	1.5150**	1.5150	1.5150	1.5150**	1.5150	1.4790	1.5150
C Line (6563 Å)	1.5114	1.5115	1.5116	1.5115**	1.5118	1.5118	1.5117**	1.5116	1.4766	1.5117
Dispersion:										
$n_F - n_C$	0.0125	0.0123	0.0119	0.0123**	0.0113	0.0111	0.0116**	0.0117	0.0084	0.0118
Abbe $v_D$	41.3	41.8	43.2	42.0**	45.7	46.3	44.3**	44.2	57.0	43.8
Abbe $v_e$	41.0	41.5	42.8	41.7**	45.4	46.0	44.0**	44.0	56.5	43.6
Temperature Coefficient: (15-40 °C) $\frac{dn_D}{dt}$	-0.00033	-0.00033	-0.00031	-0.00035**	-0.00034	-0.00034	-0.00040**	-0.00039	-0.00037	-0.00038
Stability: change in $n_D$ 25 °C after 24 hrs. @ temp.										
60 °C:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	+0.0001
100 °C:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	+0.0002	+0.0002	0.0000	+0.0006
Fluorescence* (UV):										
Short Wave:	low	low	low	low	low	low	very, very low	very, very low	none	very, very low
Long Wave:	low	low	low	low	low	low	very low	very, very low	none	very low
Color: (Gardner)	1	1	1	1	1	<3	<1	<1	<1	<1
Density: @ 23 °C										
g/cc:	0.923	0.923	0.923	0.917	0.919	0.918	1.2494	1.225	0.877	0.9306
(US) lb/gal:	7.70	7.70	7.70	7.73	7.67	7.66	10.43	10.22	7.32	7.77
Cloud Point:	<-13 °C	<-13 °C	<-13 °C	<-13 °C	<-13 °C	<-13 °C	<-13 °C	<-6 °C	<-6 °C	2 °C
Flash Point: COC *****	325 °F	325 °F	325 °F	325 °F	325 °F	340 °F	199 °C / 390 °F	390 °F	420 °F	>340 °F
Neutralization No. (mg KOH/g)	0.01 max	0.01 max	0.01 max	0.01 max	0.01 max	0.04 max	0.86 max	0.15 max	0.01 max	0.03 max

\* Relative to Cedarwood Oil.

\*\* Values for Type 37 and 37DF standardized at 37 °C.

\*\*\* Meets ISO except for temperature.

\*\*\*\* Not ISO rated.

\*\*\*\*\* Cleveland Open Cup

**See Back Page For Additional Information And Technical Literature.**



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## CARGILLE IMMERSION OILS PRICE LIST

DESCRIPTION	CATALOG NO.	PRICE PER BOTTLE					
		1/4 oz. ††		1 oz. †		4 oz. †	16 oz. †
Type A	16482	ea:	\$ 9.50	ea:	\$11.00	\$ 23.75	\$ 48.25
Type B	16484	36:	\$ 6.00	doz:	\$ 9.50	\$ 21.00	\$ 43.25
		432:	\$ 5.75				
Type 300	16252	ea:	\$ 12.00	ea:	\$13.25	\$ 24.50	\$ 56.25
		36:	\$ 7.75	doz:	\$11.75	\$ 22.25	\$ 51.00
		432:	\$ 7.25				
Type NVH	16485	ea:	\$ 7.25	ea:	\$ 13.25	\$ 29.25	\$ 69.50
		36:	\$ 6.50	doz:	\$ 11.75	\$ 26.00	\$ 59.75
		432:	\$ 6.00				
Type FF	16212	ea:	\$ 10.25	ea:	\$ 13.50	\$ 30.00	\$ 71.25
		36:	\$ 6.25	doz:	\$ 12.75	\$ 27.25	\$ 64.25
		432:	\$ 5.75				
Type 37LDF	16240	ea:	\$ 11.00	ea:	\$ 16.00	\$ 33.25	\$ 77.50
Has distinct odor - request (M)SDS		36:	\$ 6.75	doz:	\$ 14.00	\$ 30.00	\$ 70.50
		432:	\$ 6.25				
Type LDF	16241	ea:	\$ 12.50	ea:	\$ 14.75	\$ 33.25	\$ 73.75
Has distinct odor - request (M)SDS		36:	\$ 7.75	doz:	\$ 13.00	\$ 30.00	\$ 66.75
		432:	\$ 7.25				
<i>These products are not available in 1/4 oz. bottles</i>							
Type HF	16245			ea:	\$ 14.75	\$ 31.25	\$ 73.75
				doz:	\$ 13.00	\$ 28.50	\$ 66.75
Type 37	16237			ea:	\$ 13.75	\$ 29.25	\$ 79.50
				doz:	\$ 12.25	\$ 26.00	\$ 68.50
Type OVH	16487			ea:	\$ 14.25	\$ 30.50	\$ 82.50
				doz:	\$ 12.75	\$ 27.25	\$ 71.00

† Amber glass bottles

†† Polyethylene bottles

Immersion Oil and the Microscope, by John J. Cargille, original reprinted from the 1964 New York Microscopical Society Yearbook.

In an update 1985 Second Edition©, Cargille Labs has a simple but comprehensive discussion of why Immersion Oils are necessary, their function, and their wide use in schools and laboratories for teaching students and technicians.

Free reprint are available at [www.Cargille.com](http://www.Cargille.com)

<b>SAMPLER: Poly-Pak</b>	<b>16490</b>	ea:	\$ 24.00
5 x 1/4 fl. oz. polyethylene btls:		doz:	\$ 20.75
( 2 ea: Type A			
1 ea: Types: 300, B, NVH )			
<b>Dispensing Bottles:</b>			
with glass applicator rods			
1/4 oz.	18507	doz:	\$ 33.00
1 oz.	18506	doz:	\$ 33.25

### FOB & SHIPPING POINT:

Cedar Grove, NJ 07009 USA

### Minimum Order:

USA, Canada, Mexico: \$ 50.00

International: \$ 70.00

See Sales Policy for full terms.

Prices Subject to Change Without Notice.

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# REFRACTIVE INDEX LIQUIDS



RI-0987

## C A R G I L L E R E F R A C T I V E I N D E X L I Q U I D S

Cargille Refractive Index (R.I.) Liquids / Optical Liquids have become standard tools in many laboratories as their applications have expanded from mineralogical identification. Broader as well as more specialized uses in many more fields such as chemicals, engineering, biology, forensic, optics and instrumentation are continuously developing. Special requirements for new applications have created a need for more technical data, new formulations, extended ranges, smaller increments and higher degrees of accuracy.

The largest and most comprehensive assemblage of refractive index liquids – over 250 stocked items – is available for Geo Sciences, Industry, Biology, Optics, Forensics and Education. Many more are custom formulated. Materials research is ongoing in anticipation of new requirements. Since 1942, Cargille Laboratories has developed new materials to meet these challenges.

Chlorofluorocarbon (CFCs) components if used in Cargille Refractive Index / Optical Liquids (Series AAA and Laser Liquid Code 3421) have physical properties that are harmless to the ozone layer, unlike those found in refrigerant gases, propellants and solvents, which are destructive. The components used by Cargille Laboratories have vapor densities ten times that of air, are relatively nonvolatile, and have boiling points at least 100 °C higher than the highest boiling CFC listed for removal from commercial use by the Montreal Protocol.

### CLASSIFICATIONS

1. *STANDARD REFRACTIVE INDEX LIQUIDS	Pg.2	2. CUSTOM LIQUIDS	Pg.3
A. REFRACTIVE INDEX STANDARDS	Pg.2	A. STANDARD IMMERSION LIQUIDS	Pg.3
B. HIGH DISPERSION GROUP	Pg.3	B. IMMERSION LIQUID SPECIALS	Pg.3
		C. LASER LIQUIDS™	Pg.4
3. FUSED SILICA & BK-7 GLASS MATCHING LIQUID	Pg.4		
4. MASTER CALIBRATION LIQUIDS	Pg.4		
5. MELTMOUNTS™ Mounting Media & Quick-Sticks	Pg.4		
6. OPTICAL GELS	Pg.4		
7. SOLID REFRACTIVE INDEX STANDARDS	Pg.4		

\* Complete groups, partial sets, or individual refractive index liquids may be purchased. Request Price List if not included.

### APPLICATIONS

#### PARTICLE IDENTIFICATION and OPTICAL ANALYSIS

Specimen fragments, minerals, ores, chemicals, plastics, gems, identify translucent or transparent solids by microscopic immersion techniques, such as Becke Line, dispersion/optical staining, focal masking and double variation refractometry techniques.

#### FIBER OPTICS

Liquids and Gels used for fiber optic connections and mode stripping.

#### MOUNTING MEDIA

Temporarily mount specimens in various index media for Matching or Contrasting index combinations. Mount specimens in stable, non-drying index of refraction liquid to permit sample rotation by shifting cover glass for more comprehensive examination. See Cargille MELTMOUNTS™ pg. 4

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REFRACTOMETRY	Calibrate refractometers and other optical instruments. See MASTER CALIBRATION LIQUIDS pg.4
EDUCATION	Instruct and demonstrate principles and applications of refraction & optics
STRAIN ANALYSIS	Examine stress and strain effects on transparent or translucent items, molded, formed, curved or intrinsically shaped parts by polariscopic immersion technique. See Cargille IMMERSION LIQUIDS pg.3
OPTICAL COUPLING	Couple optical elements with liquids and gels formulated to reduce or eliminate reflection losses.
OPTICAL LENSES	Fill hollow lens / prisms with index of refraction liquids and obtain unique optical / dispersion properties at lower cost than solid lens / prisms.
ELECTRO-OPTICS	Examine and preserve cathode coatings without stripping or re-immersion by utilizing liquids calibrated to match the index of crystals and glasses.
POLLUTION	Identify particles and particulates from air, water and soil.
FLUID FLOW	Photograph flow patterns by filling test system with refractive index liquids containing suspended "beads".

1. **Standard Refractive Index Liquids Series AAA thru M & High Dispersion Series E are read at 3 wavelengths in order to calculate dispersion, and the liquids are blended so that the dispersion always falls into a consistent range. These liquids are quality-controlled for dispersion and index.**

**Refractive indices are stated for Refractive Index liquids at 25 °C, illuminated by 589.3 nms / 5893 angstroms Sodium light.**

**REFRACTIVE INDEX LIQUID STANDARDS: Range: 1.300 to 2.11**

Consists of 222 liquids divided into seven different Series. The three Certified Series cover the range of most minerals, chemicals, glasses and practically all biological materials.

<b>SERIES AAA</b>	<b>Range</b>	<b>1.300</b>	<b>to</b>	<b>1.395</b>	<b>Int.</b>	<b>0.005</b>	<b>Adjusted to ±0.0002</b>
Slightly volatile, colorless chlorofluorocarbon formulation. Keep tightly capped.							
<b>SERIES AA (Certified)</b>	<b>Range</b>	<b>1.400</b>	<b>to</b>	<b>1.458</b>	<b>Int.</b>	<b>0.002</b>	<b>Adjusted to ±0.0002</b>
Very stable, colorless							
<b>SERIES A (Certified)</b>	<b>Range</b>	<b>1.460</b>	<b>to</b>	<b>1.640</b>	<b>Int.</b>	<b>0.002</b>	<b>Adjusted to ±0.0002</b>
Stable, colorless at the low end, increasing to faint yellow* at the high end.							
<b>SERIES B (Certified)</b>	<b>Range</b>	<b>1.642</b>	<b>to</b>	<b>1.700</b>	<b>Int.</b>	<b>0.002</b>	<b>Adjusted to ±0.0002</b>
Stability inversely related to increasing index. Color increases with index to yellow or yellow brown*.							
<b>SERIES M</b>	<b>Range</b>	<b>1.705</b>	<b>to</b>	<b>1.800</b>	<b>Int.</b>	<b>0.005</b>	<b>Adjusted to ±0.0005</b>
Methylene iodide formulation, keep tightly capped. 1.740 to 1.780 liquids contain sulfur imparting yellow color*. 1.785 to 1.800 liquids have tin iodide added, dark red color*. As methylene iodide evaporates, 1.705 to 1.735 liquids decrease in index. 1.740 liquids and up increase in index and may form crystals.							

\* Color refers to appearance in bulk. All optical liquids are virtually colorless in thin layer.

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These Liquids have been discontinued and we have limited stock available. Please call to check availability.

**SERIES H**      Range    1.81      to    2.00      Int. 0.01      Adjusted to  $\pm 0.0015$

Quite stable. Color varies from yellow to brown\*. Toxic and corrosive. A super-saturated solution. May crystallize with time and low temperature. Formulation: arsenic tribromide, arsenic disulfide and sulfur.

**SERIES EH**      Range    2.01      to    2.11      Int. 0.01      Adjusted to  $\pm 0.0015$

Quite stable. Similar to Series H but contains selenium. Toxic and corrosive. Darker color\*, more viscous. Viscosity increases with Index.

**HIGH DISPERSION GROUP Range: 1.500 to 1.800:**

Consists of 64 liquids ( three combined Series ). Use for dispersion/optical staining, focal masking and double variation refractometry. Series E is specially formulated for high dispersion. Series B-1/2 and M are from the Standard group and have suitable dispersion characteristics.

**SERIES E**      Range    1.500      to    1.640      Int. 0.05      Adjusted to  $\pm 0.0005$

Slightly volatile, keep tightly capped. Supplied with optical constants for F, D and C lines. Recommended by prominent microscopists who have developed and published these techniques.

**SERIES B-1/2**      Range    1.644      to    1.700      Int. 0.004      Adjusted to  $\pm 0.0002$

Represents one-half of the B Series in the Standard group. Has high dispersion characteristics.

**SERIES M**      Range    1.705      to    1.800      Int. 0.005      Adjusted to  $\pm 0.0005$

The same Series M as in the Standard group. Has high dispersion characteristics.

2. **Standard Immersion Liquids, Immersion Liquid Specials & Laser Liquids™** are calibrated according to the customers' requirements, usually reading the index at 1 wavelength. These liquids are quality-controlled only for the customer-specified properties. If requested, typical dispersion data can be provided.

**A. STANDARD IMMERSION LIQUIDS**

Formulations similar to Standard Refractive Index Liquids, but less expensive; custom blended to a desired index between 1.400 and 1.700 at desired temperature and wavelength.  
Consult Technical Department

**B. IMMERSION LIQUID SPECIALS**

Custom blended formulations with properties that differ from Standard Immersion Liquids, making them preferable for certain specific applications  
Consult Technical Department

**C. LASER LIQUIDS™**

Originally formulated for use with lasers, the use of these liquids has expanded to many optical applications for indices between 1.293 and 1.630 where maximum stability, inertness, transparency, and low toxicity are required. Consult Technical Department

**3. FUSED SILICA and BK-7 GLASS MATCHING LIQUID**

Liquids match the refractive index of fused silica or BK-7 Glass at 632.8 nms and closely match it at other wavelengths.

Request Fused Silica Matching Liquid Code 50350 Typical Characteristics  
Request BK-7 Matching Liquid Code 81520 Typical Characteristics

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#### **4. MASTER CALIBRATION LIQUIDS**

Cargille Master Calibration Liquids are very stable, non-toxic liquids with refractive index measured to an accuracy of  $\pm 0.00005$  (five-in-the-fifth-place) at various temperatures and wavelengths. **NOTE:** To make use of the unusually high accuracy of these refractive index measurements, the user will require knowledge of the working temperature to an accuracy of  $\pm 0.02$  °C or better. This is because liquids typically have a temperature co-efficient of  $-0.0004$  refractive index units per 1 °C, so they will be affected by approximately  $0.000008$  (eight-in-the-sixth-place) refractive index units for each  $0.02$  °C difference in temperature. All measurements are NIST (formerly the National Bureau of Standards) traceable.

Consult Technical Department

#### **5. MELTMOUNTS™ MOUNTING MEDIA**

Low melting (65 °C) thermo-plastic, indices 1.539, 1.582, 1.605, 1.662 (PCB-FREE replacement for Aroclor 5442), 1.680, and 1.704. Useful as a thermally reversible cement for making microscope slides and in other optical coupling applications.

Request Data Sheet for MELTMOUNTS™

#### **6. OPTICAL GELS**

Refractive indices of 1.46 and 1.52 for lens and fiber coupling and mode stripping.

**7. SOLID REFRACTIVE INDEX STANDARDS** supplied in a solid wood case. Sets of 58+ vials of powdered minerals and glasses -100 +200 mesh. Range: 1.34 to 2.40, most intervals near 0.01.

**M-1 - REFRACTIVE INDEX STANDARDS:**  $\frac{1}{2}$  cc each of 60 optical glasses & minerals, refractive indices 1.34 to 2.40, 0.01 increments, R.I. value  $\pm 0.01 @ n_D$

**M-7 - PRECISION SOLID REFRACTIVE INDEX STANDARDS:**  $\frac{1}{2}$  cc each of 58 Precision Optical Glasses, R.I. 1.34 to 2.40, 0.01 increments: set is accompanied by extensive technical data. R.I. values:  $\pm 0.00005$  in most instances @ 7 wavelengths.

Consult Technical Department.

<u>Catalog #</u>	<u>ACCESSORIES</u>
18505	REPRINT: "PRACTICAL REFRACTOMETRY BY MEANS OF THE MICROSCOPE", by Dr. Roy M. Allen. 48-page booklet describes basic methods; with 13 photomicrographs.
18501	RACK Model RF-1. Solid wood with transparent rigid plastic cover. Contains four stepped rows for easily identifying R.I. numbers on labels. Each rack holds 51 x 7.4 cc bottles.

#### **ORDERING INFORMATION FOR STANDARD REFRACTIVE INDEX LIQUIDS**

All Refractive Index Liquid Standards Sets are sold in 7.4 cc (  $\frac{1}{4}$  fl.oz. ) in amber bottles with applicator caps.

Temperature co-efficients and dispersion values are printed on each label.

Liquids are standardized for the sodium ( $n_D$ ) line 589.3 nms / 5893 angstroms at 25 °C.

If any  $\frac{1}{2}$  sets have been ordered, the alternate half can be ordered to obtain a complete set.

Individual Refractive Index Liquid Standards come in 7.4 cc ( $\frac{1}{4}$  oz.) and 30 cc (1 oz.) amber bottles with applicator caps.

**SEE PRICE LIST AND SALES POLICY FOR COMPLETE ORDERING INFORMATION**

## **CARGILLE REFRACTIVE INDEX LIQUIDS PRICE LIST**

Refractive Index values stated are standardized at 589.3 nm and 25 °C

### **COMBINED SETS - CERTIFIED SERIES AA, A & B RANGE 1.400 - 1.700**

Cat. No.	18001	RF-1	Full Set	Intl	0.002	151 liq	\$ 3,204.75
	18002	RF-1/2	Half Set	Intl	0.004	76 liq	\$ 1,759.25
	18002/Alt	RF-1/2	1.402 - 1.698	Intl	0.004	75 liq	\$ 1,759.25
	18005	RF-1/5	Fifth Set	Intl	0.01	31 liq	\$ 711.50

### **CARGILLE STANDARD GROUP: 1.300 – 2.11**

#### **Cat. No. SERIES AAA Range 1.300 - 1.395 Adjustment ±0.0002**

18031	AAA-1	Full Set	Intl	0.005	20 liq	\$ 566.75
18032 (1.300)	AAA-1/2	Half Set	Intl	0.01	10 liq	\$ 307.25
1803X	AAA-x	(std) 1/4 fl. oz (7 cc)	Any liq selected			\$ 45.50
1803Y	AAA-xx	1 fl. oz (30 cc)	Any liq selected			\$ 134.25

#### **Cat. No. SERIES AA Range 1.400 - 1.458 Adjustment ±0.0002**

18061	AA-1	Full Set	Intl	0.002	30 liq	\$ 540.75
18062 (1.400)	AA-1/2	Half Set	Intl	0.004	15 liq	\$ 294.75
18065 (1.400)	AA-1/5	Fifth Set	Intl	0.01	6 liq	\$ 122.50
1806X	AA-x	(std) 1/4 fl. oz (7 cc)	Any liq selected			\$ 29.25
1806Y	AA-xx	1 fl. oz (30 cc)	Any liq selected			\$ 85.50

#### **Cat. No. SERIES A Range 1.460 - 1.640 Adjustment ±0.0002**

18091	A-1	Full Set	Intl	0.002	91 liq	\$ 1,628.00
18092 (1.460)	A-1/2	Half Set	Intl	0.004	46 liq	\$ 890.00
18095 (1.460)	A-1/5	Fifth Set	Intl	0.01	19 liq	\$ 360.50
1809X	A-x	(std) 1/4 fl. oz (7 cc)	Any liq selected			\$ 30.75
1809Y	A-xx	1 fl. oz (30 cc)	Any liq selected			\$ 88.00

#### **Cat. No. SERIES B Range 1.642 - 1.700 Adjustment ±0.0002**

18121	B-1	Full Set	Intl	0.002	30 liq	\$ 1,115.00
18122 (1.644)	B-1/2	Half Set	Intl	0.004	15 liq	\$ 629.50
18125 (1.650)	B-1/5	Fifth Set	Intl	0.01	6 liq	\$ 249.75
1812X	B-x	(std) 1/4 fl. oz (7 cc)	Any liq selected			\$ 63.75
1812Y	B-xx	1 fl. oz (30 cc)	Any liq selected			\$ 189.25

#### **Cat. No. SERIES M Range 1.705 - 1.800 Adjustment ±0.0005**

18151	M-1	Full Set	Intl	0.005	20 liq	\$ 749.00
18152 (1.710)	M-1/2	Half Set	Intl	0.01	10 liq	\$ 417.00
1815X	M-x	(std) 1/4 fl. oz (7 cc)	Any liq selected			\$ 65.25
1815Y	M-xx	1 fl. oz (30 cc)	Any liq selected			\$ 184.00

FOB & SHIPPING POINT: CEDAR GROVE, NJ 07009 – USA

MINIMUM ORDER – USA, CANADA, MEXICO : \$ 50.00    ♦    INTERNATIONAL: \$ 70.00

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## **CARGILLE REFRACTIVE INDEX LIQUIDS PRICE LIST**

### **CARGILLE HIGH DISPERSION GROUP**

The Cargille High Dispersion Series are used when doing dispersion staining for identification of asbestos. Please note that Series A will not produce the colors needed in dispersion staining work for identifying asbestos. The Series E liquids were developed especially for this work and will produce the right colors.

#### **Cat. No. SERIES E Range 1.500 - 1.640 Adjustment $\pm 0.0005$**

18431 .....	E-1 .....	Full Set .....	Intl .....	0.005 .....	29 liq ...	\$ 1,047.75
18432 (1.500) .....	E-1/2 .....	Half Set .....	Intl .....	0.01 .....	15 liq ...	\$ 584.25
1843X .....	E-x .....	(std) 1/4 fl. oz (7 cc) .....	Any liq selected .....			\$ 61.00
1843Y .....	E-xx .....	1 fl. oz (30 cc) .....	Any liq selected .....			\$ 175.00

#### **Cat. No. SERIES B Range 1.642 - 1.700 Adjustment $\pm 0.0002$**

18122 .....	B-1/2 .....	Half Set .....	Intl .....	0.004 .....	15 liq ...	\$ 629.50
18125 .....	B-1/5 .....	Fifth Set .....	Intl .....	0.01 .....	6 liq ...	\$ 249.75

#### **Cat. No. SERIES M Range 1.705 - 1.800 Adjustment $\pm 0.0005$**

18151 .....	M-1 .....	Full Set .....	Intl .....	0.005 .....	20 liq ...	\$ 749.00
18152 .....	M-1/2 .....	Half Set .....	Intl .....	0.01 .....	10 liq ...	\$ 417.00

### **COMBINED SETS - HIGH DISPERSION SERIES E, B, & M RANGE 1.500 - 1.800**

Cat. No. 18461 .....	HD-1 .....	Full Set ...	Consists of E-1, B-1/2, & M-1 .....	64 liq ...	\$ 2,061.75
18462 .....	HD-1/2 .....	Half Set ...	Consists of E-1/2, B-1/5, & M-1/2 ...	31 liq ...	\$ 1,134.25

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## **CARGILLE REFRACTIVE INDEX LIQUIDS PRICE LIST**

### **CARGILLE MASTER CALIBRATION LIQUIDS**

See MASTER CALIBRATION LIQUIDS PRICE SHEET: RI-MCL-PL

### **CARGILLE OPTICAL COUPLING LIQUIDS**

Cat. No. 16xxx	See IMMERSION OIL DATA SHEET: IO-DS
Cat. No. 241xx	MELTMOUNT™ Mounting Media - available in 1 oz. (30 cc) jars and convenient QUICK-STICKS™ Refer to DATA SHEET: RI-MOM-MM

### **CARGILLE REFRACTIVE INDEX SOLIDS**

Cat. No. 34100	SET M-1: Solid Refractive Index Standards, ½ cc each of 60 optical glasses & minerals -100 +200 mesh, refractive indices 1.34 to 2.40: 0.01 increments; includes wood case. <b>(LONG TERM OUT OF STOCK)</b> See REFERENCE SETS DATA SHEET
Cat. No. 34200	SET M-7: Precision Optical Glasses, with extensive technical data. <b>(LONG TERM OUT OF STOCK)</b> See DATA SHEET: RS-M7
Cat. No. 34224 <i>NEW - Replacing M-25 Contact us for details!</i>	SET M-24: <u>NVLAP</u> Recognized Means of Verification of Refractive Index Liquids. (Sub-set of M-7) See DATA SHEET: RI-NVLAP

### **CARGILLE REFRACTIVE INDEX ACCESSORIES**

Cat. No. 18501	Rack: Model RF-1 Holds 52, ¼ oz. Stds. (3 racks hold one RF-1 set)	\$ 121.75 /ea
Cat. No. 18505	Booklet " PRACTICAL REFRACTOMETRY BY MEANS OF THE MICROSCOPE " by Dr. Roy M. Allen	\$ 6.25 /ea

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## **CARGILLE MASTER CALIBRATION LIQUIDS**

Cargille Master Calibration Liquids are very stable, non-toxic liquids with refractive index measured to an accuracy of  $\pm 0.00005$  at various temperatures and wavelengths. The unusually high accuracy of these refractive index measurements will often require that the user knows his or her working temperature with an accuracy of  $\pm 0.02$  °C or better; this is because liquids typically have a temperature coefficient of  $-0.0004$  refractive index units per  $1$  °C so they will be affected by approximately  $0.000008$  refractive index units for each  $0.02$  °C difference in temperature.

When the Master Calibration Liquid has refractive index measurements at two temperatures,  $20$  °C or less apart, the user can compute a temperature coefficient and calculate (interpolate) refractive index at any in between temperature with an accuracy of at least  $\pm 0.00006$  ( the relationship of refractive index to temperature is nearly linear ). Typical temperature coefficients (accurate to  $\pm 10\%$ ) are available from Cargille Laboratories and can in practice be used to correct for up to a known temperature change of  $0.20$  °C from temperature of calibration. All measurements are NIST (NBS) traceable. All measurements available are listed here.

Cat. No.	Master Calibration Liquids	Nominal	Temperature
19252	Code S50	nD=1.402	@25°C
19253	Code S50	nD=1.404	@20°C
19255	Code 06	nD=1.457	@25°C
19257	Code 06	nD=1.459	@20°C
19259	Code 1160	nD=1.490	@20°C
19261	Code 1160	nD=1.514	@25°C
19264	Code 1057	nD=1.572	@25°C
19268	Code 63	nD=1.630	@25°C
19300	Code S1050	nD=1.436	@30°C
*19340	Code 1160	nD=1.516	@20°C (Multi-Temp)

\*  $\pm 0.0001$

1 x ¼ fl. oz.	12 x ¼ fl. oz.	1 x 1 fl. oz.	12 x 1 fl. oz.
\$89.75	\$81.00	\$ 230.00	\$ 208.75 ea.

**Note: Prices of multiples (12x) must be for the same Cargille Master Calibration Liquid.**

**See over for Technical Data**

## CARGILLE MASTER CALIBRATION LIQUIDS

Cat. No.	Code	Nominal	Actual Reading	Lot#
19252	S50	nD = 1.402	( 1.40235 at 25 °C at 589.3 nm )	072681
19253	S50	nD = 1.404	( 1.40427 at 20 °C at 589.3 nm )	082581
19255	06	nD = 1.457	( 1.45746 at 25 °C at 589.3 nm )	121681
19257	06	nD = 1.459	( 1.45932 at 20 °C at 589.3 nm )	120981
19259	1160	nD = 1.490	( 1.48989 at 20 °C at 589.3 nm )	072176
19261	1160	nD = 1.514	( 1.51432 at 25 °C at 589.3 nm )	100977
19264	1057	nD = 1.572	( 1.57230 at 25 °C at 589.3 nm )	030374
19268	63	nD = 1.630	( 1.63026 at 25 °C at 589.3 nm )	070395
19300	S1050	nD = 1.436	( 1.43604 at 30 °C at 589.3 nm )	022772
19340	1160	nD = 1.516	*( 1.5163 at 20 °C at 589.3 nm )	051582

\* ±0.0001

FOB & SHIPPING POINT: CEDAR GROVE, NJ 07009 – USA

MINIMUM ORDER – USA, CANADA, MEXICO : \$ 50.00    ♦    INTERNATIONAL: \$ 70.00

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Precaution Sheet  
RI-SS-PS-1186

### **REFRACTIVE INDEX LIQUIDS STANDARD SERIES**

#### **SAFETY AND HANDLING**

SERIES AAA, AA, A, B, M – These series have low toxicity; however, good laboratory procedures should be observed. Series AAA and M are slightly volatile and should be kept well stoppered. Series B and M should be protected from light as they darken slowly from exposure to light.

SERIES H, EH FH\* GH\* Note\* FH and GH are not currently for sale.

1. Cargille High Series and Extra High Series Refraction Index Liquids and FH and GH Series Melts contain arsenic tribromide which is **toxic** and **corrosive**.
2. Personnel handling these materials should avoid contact and breathing of vapors. Any material on the body should be immediately removed by thorough scrubbing. Persons with any allergenic history should be extremely careful to avoid contact.

NOTE: Arsenic can be absorbed through intact skin.

3. The greatest danger of arsenic poisoning is from ingestion. The possibility of accidental ingestion is greatly reduced by preventing eating and smoking in areas where these liquids are used.
4. Since these materials are corrosive, it is recommended that slides be prepared away from the microscope and mounted specimens left on the microscope no longer than necessary. Direct contact with instruments will attack metal parts and leaded optical glasses.
5. These materials also react with moisture in the air. Therefore, mountings should be made quickly so the liquid is protected from the atmosphere by the cover glass, and caps should be tightened on bottles to prevent escape of vapors and avoid moisture-vapor reactions.

FOR ADDITIONAL SAFETY DATA, PLEASE REQUEST MATERIAL SAFETY DATA SHEET BY  
SERIES NAME



Services to the Science Since 1924

## Cargille Laboratories

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**Phone: 973-239-6633 • Fax: 973-239-6096 • WWW.CARGILLE.COM**

### **CARGILLE MELTMOUNTS™ for MICROSCOPY** **Including MELTMOUNTS™ for Asbestos**

The Cargille Meltmount™ series of mounting media are specially formulated optical-quality thermoplastics for use in microscope slide mounting and in other optical coupling applications.

Meltmounts™ are:

1. **Instant** - they are thermal mountants and require "no oven time"
2. **100 % useable** - contain no solvents
3. **Less Expensive** per slide
4. **Reversible** - thermally, for particle retrieval or re-orientation
5. **Soluble** - in toluene if needed for special techniques or clean-up
6. **Fluid** at 65 °C - a temperature chosen because it makes a permanent mount and protects the majority of specimens from thermal changes
7. **PCB-FREE**
8. **Direct replacements** for 'older style' media

<u>Old Media</u>	<u>Meltmounts™ Equivalent</u>
• Canada Balsam	• Meltmount™ 1.539
• Aroclor 5442	• Meltmount™ 1.662
• Naphrax	• Meltmount™ 1.704

**MELTMOUNT™ 1.539 Code 53**      Cat.#24140      Patent Pending      \$ 70.75 /fl.oz

Meltmount™ 1.539 has a refractive index (nD @ 25 °C) of 1.539 and an Abbe V dispersion of 45 making it optically similar to Canada Balsam and, therefore, ideal for mounting many biological specimens but without the long drying time of Canada Balsam.

#### **MELTMOUNT™ FOR CHRYSOTILE ASBESTOS Code 25761**

Cat.#24145      Patent Pending      \$ 77.75 /fl.oz

Meltmount™ Code 25761 has dispersion characteristics making it appropriate for mounting chrysotile asbestos - **CALL TO CHECK AVAILABILITY**

**MELTMOUNT™ 1.582 Code 5870**      Cat.#24150      Patented      \$ 70.75 /fl.oz

Meltmount™ 1.582 has a refractive index (nD @ 25 °C) of 1.582 and an Abbe V dispersion of 33. Its optical clarity makes it the preferred choice for minimum visible absorption.

**MELTMOUNT™ 1.605 Code 5870**      Cat.#24152      Patented      \$ 70.75 /fl.oz

Meltmount™ 1.605 has a refractive index (nD @ 25 °C) of 1.605 and an Abbe V dispersion of 30, making it appropriate for mounting asbestiform Tremolite, Anthophyllite and Actinolite.

**MELTMOUNT™ 1.662 Code 5870**      Cat.#24160      Patented      \$ 70.75 /fl.oz

Meltmount™ 1.662 has a refractive index (nD @ 25 °C) of 1.662 and an Abbe V dispersion of 26, optically similar to Aroclor 5442, but is PCB-free.

**MELTMOUNT™ 1.680 Code 5870**

Cat.#24165

Patented

\$ 70.75 /fl.oz

Meltmount™ 1.680 has a refractive index ( $n_D$  @ 25 °C) of 1.680 and an Abbe V dispersion of 25, making it appropriate for mounting Amosite and Crocidolite asbestos.

**MELTMOUNT™ 1.704 Code 5870**

Cat.#24170

Patented

\$ 70.75 /fl.oz

Meltmount™ 1.704 has a refractive index ( $n_D$  @ 25 °C) of 1.704, similar to naphrax, and an Abbe V dispersion of 24.

**QUICK-STICK™**

Cargille Meltmount™ is now available in a convenient stick form called Quick-Stick™. It can be used to make permanent microscope slide mounts quickly.

Quick-Stick™ can be applied to a slide on a hotplate. As soon as the specimen and cover glass are positioned and the slide is cooled, you have a permanent prepared slide that can be reversed by reheating, if you should wish to retrieve a particular particle.

<u>DESCRIPTION</u>	<u>nD</u>		<u>CAT. NO.</u>	<u>2/3 oz.</u>
Quick-Stick™	1.539	Code 53	#24040	\$ 66.75 /ea
Quick-Stick™	1.582	Code 5870	#24050	\$ 66.75 /ea
Quick-Stick™	1.605	Code 5870	#24052	\$ 66.75 /ea
Quick-Stick™	1.662	Code 5870	#24060	\$ 66.75 /ea
Quick-Stick™	1.680	Code 5870	#24065	\$ 66.75 /ea
Quick-Stick™	1.704	Code 5870	#24070	\$ 66.75 /ea

**Meltmount™ / Quick Stick™ and the proper care of your slides**

Meltmount™ is a THERMAL PLASTIC MATERIAL. This means its viscosity is dependent on temperature, (inversely dependent). As the temperature increases the viscosity decreases. There is no sharp melting point. Being thermal plastic, it is capable of "cold flow". This means the Meltmount™, the specimen, the slide, and the cover slip can all move independently of each other given a mix of time, temperature, and lateral pressure or gravity.

**Storage of prepared slides:** treat them as the *valuable* items they are. Store:

- Flat, cover slip on top
- In the dark
- Away from dust and fumes
- Meltmount™ is meant to be thermally reversible. Don't allow this to happen inadvertently by storing or transporting prepared slides above 88 °F, ( 31.1 °C ).

For complete technical information on Meltmounts™  
contact the Cargille Technical Staff at 973-239-6633

**™ Meltmount and Quick-Stick are Trade Names of Cargille Laboratories**

FOB & SHIPPING POINT: CEDAR GROVE, NJ 07009 – USA  
MINIMUM ORDER – USA, CANADA, MEXICO : \$ 50.00 ◀ INTERNATIONAL: \$ 70.00  
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**CARGILLE LABORATORIES**

55 Commerce Road • Cedar Grove NJ 07009-1289 • USA

Ph: (973) 239-6633 8:15 AM - 4:45PM M-Th 8:00 AM - 12:00 PM Fri. ET

FAX: (973) 239-6096 • WWW.CARGILLE.COM



## Cargille Laboratories

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## BRIX DATA

Our customers working with % Brix have been divided into 3 groups.

**Please Note:** Many refractometers have a temperature compensation mode that works for water based materials, but is not suitable for oils including our Brix Calibration Standards. The compensation mode should be turned *off* during calibration and the actual sample temperature monitored and recorded.

### The First Group works *without* a constant temperature circulating water bath to control

**Refractometer Temperature.** Many times they are using a hand held refractometer. This group can purchase from our Standard Series price list and use a "Cargille Standard Series Brix Chart". The refractive index shown in the left column of this Brix chart has been calibrated at 25°C, but using temperature coefficients, we show what the refractometer should read in Brix when a Standard Series liquid is put on the refractometer; the (% sucrose at 20°C), value is shown in the far right column. Cat. #88105 "Cargille Temperature Compensation Chart" is available for each Cargille Refractive Index Standard Series Liquid ordered, at a cost of \$5.00 each. This chart is very helpful when calibrating your refractometer.

### The Second Group works *with* a constant temperature circulating water bath to control

**Refractometer Temperature** and needs better precision than Group 1 for Brix values. For this group we recommend:

<u>CATALOG #</u>	<u>LL CODE</u>	<u>BRIX UNITS</u>	<u>MIN. QTY</u>	<u>COST</u>
20106 - RCF	3421	1 - 40 Brix	4 X 1 fl. oz.	\$ 502.00
20112 - RCF	S1056	41 - 68 Brix	4 X 1 fl. oz.	\$ 420.00
20127 - RCF	5610	69 - 85 Brix	4 X 1 fl. oz.	\$ 450.75

All custom Brix liquids are *blended* to a Refractive Index tolerance of  $\pm 0.0002$  and *read* to a R.I. tolerance of  $\pm 0.0001$  at 20°C. Brix tolerances vary *nominally* from  $\pm 0.070$  to  $\pm 0.038$  depending on the Brix number chosen;  $\pm 0.070$  at 0.0% Brix, tightening to  $\pm 0.037$  at 85.0% Brix. Please contact our Technical Department if you have any questions. All custom Brix liquids are provided with Letters of Certification and are bottled as 4 x 1 fl. oz.

**The Third Group is for those requiring the greatest precision** for Brix values. This group needs to order the highest precision for refractive index in order to get the best precision for Brix. We have 3 Master Calibration Liquids in stock that can be used for this purpose, *nominally* one at 42%, 67% and 80%. Refer to the enclosed Technical Bulletin RI-MCL-BRX-TB-XXX which describes these liquids.

**Please specify Brix labels when ordering.**

Please contact the Technical Department with any questions



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### **0.000% BRIX STANDARD**

#### **REFRACTIVE INDEX CERTIFIED WATER \***

#### **0.000% Brix at any temperature ( 15 - 35 °C )**

NIST/ASME uses as the authority for the properties of water, the publication issued by IAPWS, (The International Association for the Properties of Water and Steam). The IAPWS has published the "absolute" refractive index of water, that is relative to a vacuum. We have calculated its refractive index, relative to air, by dividing the absolute refractive index of water by the absolute refractive index of air. (References available).

ACS Reagent Grade Water was measured for refractive index at 589.3 nm on an Abbe type refractometer standardized with NIST traceable standards.

Temperature Degrees Celsius ± 0.01	Absolute Refractive Index of Water ± 0.00005 at 589.3 nm, ASME Steam v2.2:	Refractive Index of Water relative to air at 589.3 nm, calculated values:	Refractive Index of Water (RGW) read by Cargille ± 0.00005 RI Units at 589.3 nm 23°C, relative to air, calculated values:	Brix Equivalent as per ICUMSA 2000:
20	1.33334	1.33297	1.33297	0.000
25	1.33285	1.33249	1.33249	0.000
30	1.33228	1.33193	1.33193	0.000

\*Note: Refractive Index of water at 589.3 nm ± 0.00005 is equivalent to ± 0.000% Brix ± 0.035

#### **Catalog # 19400**

1 x 1/4 fl. oz.	12 x 1/4 fl. oz	1 x 1 fl. oz.	12 x 1 fl. oz
\$ 89.75	\$ 81.00	\$ 230.00	\$ 208.75

#### **LETTER OF CERTIFICATION ACCOMPANIES EACH BOTTLE**

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MINIMUM ORDER – USA, CANADA, MEXICO : \$ 50.00 ◆ INTERNATIONAL: \$ 70.00  
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### **CARGILLE MASTER CALIBRATION LIQUIDS WITH EQUIVALENT % BRIX (SUCROSE) - ICUMSA 2000**

Cargille Master Calibration Liquids are very stable, non-toxic liquids with refractive index measured to an accuracy of  $\pm 0.00005$  at various temperatures and wavelengths. The unusually high accuracy of these refractive index measurements will often require that the user knows his or her working temperature with an accuracy of  $\pm 0.02^{\circ}\text{C}$  or better; this is because liquids typically have a temperature coefficient of  $-0.0004$  refractive index units per  $1^{\circ}\text{C}$  so they will be affected by approximately  $0.000008$  refractive index units for each  $0.02^{\circ}\text{C}$  difference in temperature

When the Master Calibration Liquid has a refractive index measurement at two temperatures,  $20^{\circ}\text{C}$  or less apart, the user can compute a temperature coefficient and calculate (interpolate) refractive index at any temperature in between with an accuracy of at least  $\pm 0.00006$  (the relationship of refractive index to temperature is linear). Typical temperature coefficients (accurate to  $\pm 10\%$ ) are available from Cargille Laboratories and can in practice be used to correct for up to a known temperature change of  $0.20^{\circ}\text{C}$  from the temperature of calibration.

All measurements are NIST (NBS) traceable. All measurements available are listed here.

$n$  = refractive index

Cat. No. 19251-BXS	Code 3421	Nominal $n_D = 1.362$
( $n = 1.36176$ at $20^{\circ}\text{C}$ at $589.3\text{ nm}$ )		( 18.742 % BRIX $\pm 0.030$ at $20^{\circ}\text{C}$ )
Cat. No. 19253-BXS	Code S50	Nominal $n_D = 1.404$
( $n = 1.40427$ at $20^{\circ}\text{C}$ at $589.3\text{ nm}$ )		( 42.247 % BRIX $\pm 0.025$ at $20^{\circ}\text{C}$ )
Cat. No. 19257-BXS	Code 06	Nominal $n_D = 1.459$
( $n = 1.45932$ at $20^{\circ}\text{C}$ at $589.3\text{ nm}$ )		( 67.461 % BRIX $\pm 0.021$ at $20^{\circ}\text{C}$ )
Cat. No. 19259-BXS	Code 1160	Nominal $n_D = 1.490$
( $n = 1.48989$ at $20^{\circ}\text{C}$ at $589.3\text{ nm}$ )		( 79.687 % BRIX $\pm 0.019$ at $20^{\circ}\text{C}$ )

Price per Bottle			
1 x 1/4 fl. oz.	12 x 1/4 fl. oz.	1 x 1 fl. oz.	12 x 1 fl. oz.
\$ 89.75	\$ 81.00	\$ 230.00	\$ 208.75

NOTE: Prices of multiples (12x) must be for the same Cargille Master Calibration Liquid


**Cargille**

# PLASTIC BOXES

**...See What's in Store!  
1001 USES!**

Cargille Plastic Boxes are in demand! Whatever your storage needs, there's a Cargille Plastic Storage box that's perfect for you. Molded from polystyrene for optimum clarity and rigidity, they come in an *unbelievable* variety of shapes, styles and sizes.

- Square Boxes
- Rectangular Boxes
- Round Boxes
- Partitioned Boxes
- Friction-fitting Lids
- Hinged lids with Snap locks
- Shallow Boxes
- Deep Boxes
- Small Boxes
- Big Boxes

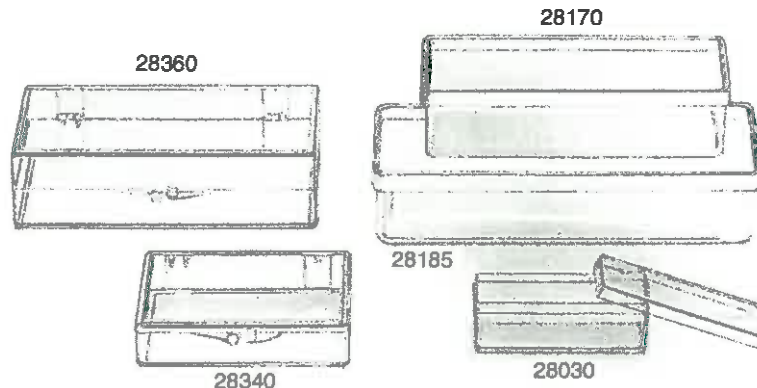
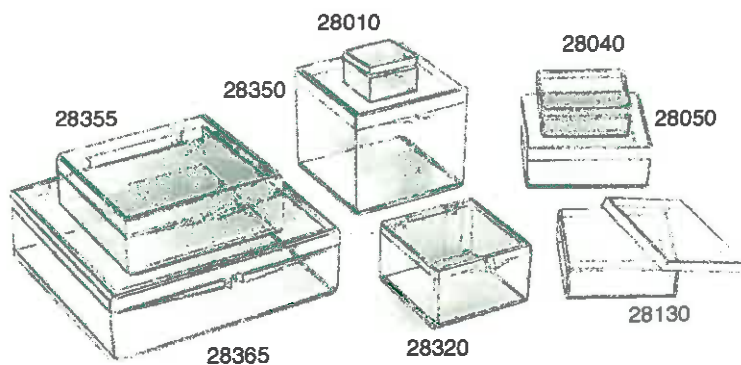
## Economical

Low cost allows you to organize your storage system today! Open stock permits prompt delivery and system expansion at any time. Inquiries on special orders invited.

F.O.B. 55 Commerce Road, Cedar Grove, NJ 07009  
Tel: (973) 239-6633 Fax: (973) 239-6096

See Sales Policy for Full Terms  
Prices Subject to Change Without Notice





## Square Boxes

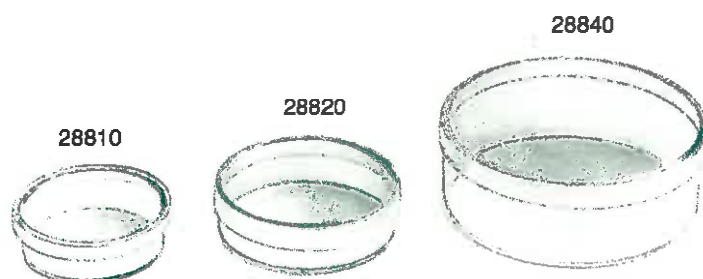
Cargille Square Plastic Boxes have two equal dimensions for length and width. The "Squares" are available in a variety of sizes in both friction-fitting lids and hinged-lids with snap locks.

## Rectangular Boxes

Finally—the right shape for all those long and narrow items. Friction-fitting lids or hinged-lids with snap locks available on a wide selection of box depths and sizes.

## Round Boxes

Super for storing many items that just don't seem to fit in standard square or rectangular boxes. Supplied with friction-fitting lids.

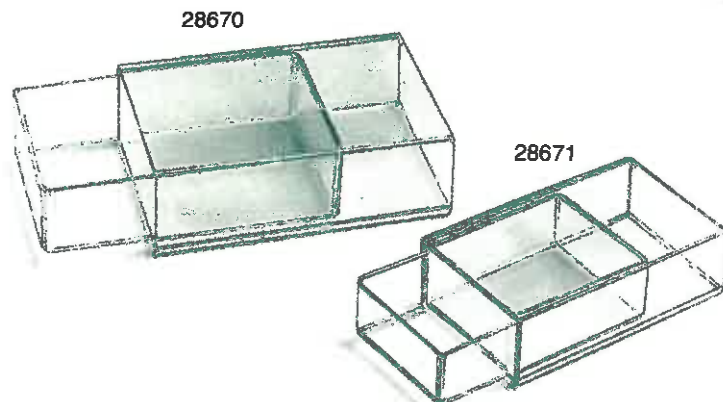


## Plastic Match-Boxes

Especially for those little pieces that were constantly being misplaced. Easy-to-use, contents always visible.

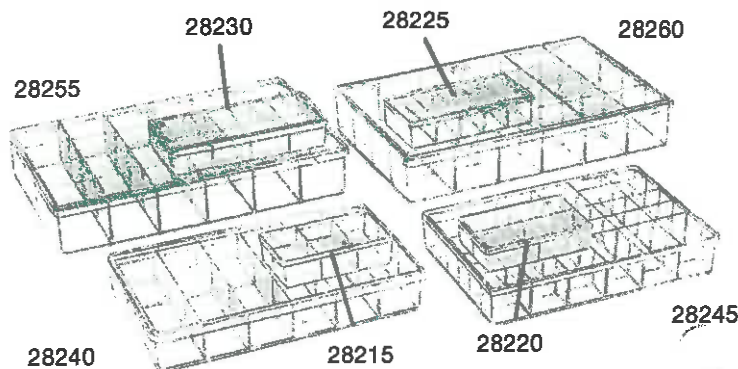
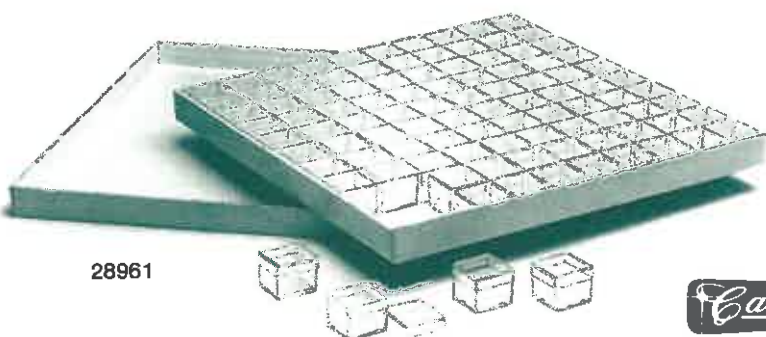
## Partitioned Boxes

Complete organization for storing singular or groups of items in individual compartments. Stored items stay separated and are readily visible from the exterior. Extra-heavy-gauge wall construction permits containment of heavy objects—protects delicate items.



## Tray Box and Tray Sets

The compact, solid fiberboard Tray Box makes instituting a plastic box/sample storage system easy and efficient. To form a Tray Set, use plastic boxes for specimen storage, then organize boxes within the fiberboard Tray Box. Eliminates misplacement or inadvertent sample loss, allows rapid retrieval of specimens. Tray Boxes are available with or without accompanying plastic boxes.



R. P. CARGILLE LABORATORIES, INC.

55 COMMERCE ROAD, CEDAR GROVE, NEW JERSEY 07009-1289, U.S.A./FAX: (201) 239-6096 • (201) 239-6633





## Cargille Laboratories

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**PLASTIC BOXES PRICE LIST**

CATALOG NO. SQUARE:	INSIDE DIMENSIONS ( INCHES )						PRICE PER BOX --			
	LENGTH	WIDTH	HEIGHT	LID H	BASE H		1	50	100	500
	FRICTION - FITTING									
28010	25/32	25/32	5/8	-----	-----	-----	\$ 1.40	\$ 1.30	\$ 1.25	\$ 1.10
28040	1-11/16	1-11/16	9/16	-----	-----	-----	\$ 1.60	\$ 1.55	\$ 1.45	\$ 1.30
28050	2-1/2	2-1/2	7/8	-----	-----	-----	\$ 1.95	\$ 1.90	\$ 1.80	\$ 1.60
28130	2	2	3/4	-----	-----	-----	\$ 1.90	\$ 1.80	\$ 1.70	\$ 1.50

**HINGED - SNAP-LOCK**

28310	1	1	5/8	1/8	1/2	-----	\$ 1.20	\$ 1.15	\$ 1.10	\$ 0.90
28320	2	2	1-1/8	1/8	1	-----	\$ 1.75	\$ 1.65	\$ 1.55	\$ 1.45
28350	2-9/16	2-9/16	2-3/16	1/4	1-15/16	-----	\$ 2.95	\$ 2.70	\$ 2.60	\$ 2.45
28355	3-1/16	3-1/16	1	1/4	3/4	-----	\$ 2.80	\$ 2.55	\$ 2.50	\$ 2.15
28365	4-9/16	4-9/16	1-1/4	1/4	1	-----	\$ 4.55	\$ 4.40	\$ 4.25	\$ 3.90

**RECTANGULAR:** **FRICTION FITTING LIDS**

28020	1-11/16	3/4	5/8	-----	-----	-----	\$ 1.50	\$ 1.45	\$ 1.40	\$ 1.25
28030	2-5/16	3/4	3/4	-----	-----	-----	\$ 1.50	\$ 1.45	\$ 1.35	\$ 1.25
28060	3-3/16	2-9/16	1-1/4	-----	-----	-----	\$ 2.00	\$ 1.95	\$ 1.85	\$ 1.70
28155	3-3/16	6-13/16	1-5/8	-----	-----	-----	\$ 6.75	\$ 6.30	\$ 5.70	\$ 5.15
28170	4-1/4	1-1/2	1	-----	-----	-----	\$ 2.95	\$ 2.80	\$ 2.75	\$ 2.40
28180	5	5-1/4	1-5/16	-----	-----	-----	\$ 6.50	\$ 6.00	\$ 5.85	\$ 4.95
28185	5-1/2	2	1	-----	-----	-----	\$ 3.00	\$ 2.80	\$ 2.60	\$ 2.30

**HINGED - SNAP-LOCK**

28325	2-1/8	1-5/8	5/8	1/8	1/2	-----	\$ 1.40	\$ 1.30	\$ 1.20	\$ 1.10
28340	2-7/8	2	9/16	1/16	1/2	-----	\$ 1.60	\$ 1.55	\$ 1.45	\$ 1.30
28352	3-1/2	2-9/16	1	1/2	1/2	-----	\$ 2.45	\$ 2.10	\$ 2.00	\$ 1.80
28360	4-3/8	2-1/16	1-1/8	9/16	9/16	-----	\$ 2.40	\$ 2.35	\$ 2.20	\$ 2.00
28385	6	4	1-1/4	1/4	1	-----	\$ 4.20	\$ 3.90	\$ 3.65	\$ 3.30
28388	7-3/8	4-29/32	1-1/2	1/4	1-1/4	-----	\$ 9.25	\$ 8.55	\$ 8.05	\$ 7.55
28390	8-1/8	6-1/4	1-3/16	1/4	15/16	-----	\$ 15.10	\$ 12.90	\$ 12.05	\$ 11.60

**ROUND:** **(DIA.)**

28810	-----	1-3/8	3/8	-----	-----	-----	\$ 1.60	\$ 1.40	\$ 1.30	\$ 1.20
28820	-----	1-5/8	1/2	-----	-----	-----	\$ 1.50	\$ 1.45	\$ 1.35	\$ 1.25
28840	-----	2-1/2	7/8	-----	-----	-----	\$ 1.55	\$ 1.40	\$ 1.30	\$ 1.20

-- continued --

Effective: January 15, 2021

# CARGILLE PLASTIC BOXES

Page 2 of 2

## RECTANGULAR:

## PARTITIONED - SNAP - LOCK

Cat. No.	Outside Dimensions (Inches)			Compartment Size - (Inches)				Price Per Box --- :			
	L	W	H	No.	L	W	H	1	50	100	500
28210	4-5/8	3	1-1/8	8	1-1/16	1-1/4	1	\$ 7.05	\$ 6.85	\$ 6.50	\$ 5.60
28215	4-5/8	3	1-1/8	6	1-5/16	1-3/8	1	\$ 7.25	\$ 6.85	\$ 6.50	\$ 5.60
28220	4-5/8	3	1-1/8	4	1-5/16	2-1/8	1	\$ 7.25	\$ 6.85	\$ 6.50	\$ 5.60
28225	5-7/8	3-1/2	1-5/16	5	1-1/16	3	1-1/8	\$ 8.95	\$ 8.00	\$ 7.65	\$ 6.75
28230	7	3-3/4	1-1/4	12	1-11/16	1-1/16	1-1/8	\$ 10.20	\$ 9.55	\$ 9.15	\$ 7.95
28235	8 1/4	4-1/2	1-3/8	18	1-1/4	1-1/4	1-3/16	\$ 13.35	\$ 12.30	\$ 11.75	\$ 10.00
28240	11	6-3/4	1-3/4	18	1-5/8	1-15/16	1-9/16	\$ 24.80	\$ 22.95	\$ 21.80	\$ 19.25
28245	10	7	1-13/16	36	1-1/2	1-1/16	1-9/16	\$ 28.25	\$ 25.50	\$ 24.10	\$ 21.35
28255	13-1/8	9	2-5/16	12	2	4-3/16	2-1/16	\$ 39.75	\$ 35.55	\$ 33.25	\$ 30.00
28260	13-1/8	9	2-5/16	24	2	2	2-1/16	\$ 39.75	\$ 35.55	\$ 33.25	\$ 30.30

## SLIDE -- COVER

28250	10-3/4	8-7/8	1-13/16	24	1-11/16	2	1-9/16	\$ 36.35	\$ 32.65	\$ 30.40	\$ 27.35
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## PLASTIC MATCH-BOXES

Cat. No.	Inside Dimensions -- (Inches)			Price Per Box -- :			
	L	W	H	1	50	100	500
28670	2	1-1/4	1/2	\$ 2.85	\$ 2.50	\$ 2.40	\$ 2.10

## TRAY BOX

Cat. No.	Inside Dimensions -- (Inches)			Price Per Box -- Lots Of :			
	L	W	H	1	5	10	30
28960	9-1/2	9-1/2	3/4	\$ 13.00	\$ 12.65	\$ 12.40	\$ 12.25

## TRAY SETS

CATALOG NO.	INCLUDES PLASTIC BOXES NO.	BOXES PER SET	ARRANGEMENT	PRICE PER TRAY SETS -- LOTS OF :			
				1	5	10	30
28961	28010	100	10 X 10	\$ 105.40	\$ 91.65	\$ 87.25	\$ 82.55
28962	28020	50	5 X 10	\$ 64.55	\$ 60.50	\$ 57.50	\$ 53.75
28963	28030	30	3 X 10	\$ 42.55	\$ 41.25	\$ 40.15	\$ 37.40
28964	28040	25	5 X 5	\$ 43.00	\$ 39.70	\$ 38.25	\$ 35.55
28965	28130	16	4 X 4	\$ 36.60	\$ 34.05	\$ 32.85	\$ 30.65
28966	28310	56	8 X 7	\$ 55.30	\$ 52.40	\$ 51.20	\$ 47.10
28967	28325	20	4 X 5	\$ 32.00	\$ 30.25	\$ 29.90	\$ 27.15
28968	28340	12	3 X 4	\$ 28.20	\$ 26.40	\$ 25.15	\$ 23.55
28969	28670	24	4 X 6	\$ 55.00	\$ 52.50	\$ 51.40	\$ 47.10

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# CARGILLE-ALLEN MICROSCOPY REFERENCE SETS

## REFRACTIVE INDEX STANDARDS COMMUNUTED MINERALS • MICROSCOPY SLIDES

**FOR  
RESEARCH  
EDUCATION  
QUALITY CONTROL  
INDUSTRY**



The identification of sample materials for research or quality control is frequently performed by referral to standards. The credibility of a determination is reflected by the accuracy of the reference standards used. Many individuals arbitrarily "acquire" various sample materials destined to be used as reference standards. Although this technique may temporarily serve its purpose, problems may develop particularly if an entire program is based on reference materials which were initially and unknowingly unreliable. Furthermore, accidental loss or damage to an irreplaceable reference material can virtually destroy a long-term research project or detrimentally disrupt a quality control program. It is for these and many other reasons that Cargille-Allen Reference Sets have been so widely relied upon and acclaimed by scientific, industrial and educational institutions throughout the world.

Cargille-Allen Reference Sets constitute a unique assemblage of comminuted optical glasses and minerals contained in glass vials, and comminuted minerals and various materials mounted on slides "ready-to-use" for microscopic examinations. All materials used are carefully selected and obtained as pure as possible and further concentrated in the case of minerals.

Material organization was initially based on serving existing scientific needs as proposed by Dr. Roy M. Allen, an industrial consultant, research microscopist and author in the field of microscopy and photomicrography. As scientific interests expanded and technology advanced, a need for more comprehensive reference materials correspondingly increased. And today, Cargille-Allen Reference Sets have a broad range of applications encompassing many fields.



## Comminuted Reference Standards

### REFRACTIVE INDEX STANDARDS, SET M-1

A unique collection of selective, comminuted optical glasses supplemented by purified minerals provide a reasonable range of refractive indices from 1.34 to 2.40 in increments of 0.01. This set supplements Cargille Refractive Index Liquids (see Data Sheet RI) by explaining the types of standards available for microscopic identification by refractive index determinations.

The specimens were selected for their placement on the refractive index scale and for their accuracy and purity. As many optical glasses as possible were used, and new specimens are constantly being explored for possible inclusion as they contribute to the accuracy or completeness of the collection.

Approximately 1/2 cc of 60 different materials comminuted to -100 mesh are assembled as a set in a handsome mahogany wood case with tiered shelves for accessibility. Each specimen is contained in a labeled glass screw-thread vial with a plastic screw-cap closure.



**REFRACTIVE INDEX STANDARDS, SET M-1, CAT. NO. 34100**  
1/2 cc each of 60 optical glasses and minerals; refractive index range: 1.34 to 2.40; 0.01 increments; includes tiered mahogany wood case.

### COMMUNUTED MINERALS, SET M-4

Microscopical examination of pure minerals in comminuted form provides insight to many individual characteristics of materials difficult to determine as solids. Some of the many properties which may be ascertained from comminuted materials are: exact determination of refractive indices by the immersion method, separation studies into isotropic and anisotropic groups, extent of birefringence, conoscopic observation of interference figures in particles oriented at random, crystallographic and cleavage studies, pleochroism (when present) in all shades of color, extinction angle with reference to cleavage (traces); color observations of finely divided material, microscopic inclusions. Also, comminuted materials have broad applications in spectroscopy; specific gravity determinations and in many microchemical procedures.

Complete Comminuted Minerals, Set M-4, consists of approximately 1/2 cc of the following 60 materials comminuted to -100 mesh in labeled screw-thread glass vials with plastic screw-cap closures and an attractive mahogany wood case.

- |                |                   |                 |                 |
|----------------|-------------------|-----------------|-----------------|
| 1. Quartz      | 17. Garnet        | 30. Biotite     | 45. Taic        |
| 2. Calcite     | (Almandine)       | 31. Thaumassite | 46. Bauxite     |
| 3. Orthoclase  | 18. Siderite      | 32. Prehnite    | 47. Azurite     |
| 4. Microcline  | 19. Beryl         | 33. Pectolite   | 48. Malachite   |
| 5. Albite      | 20. Corundum      | 34. Serpentine  | 49. Sphalerite  |
| 6. Labradorite | 21. Corundum,     | 35. Anhydrite   | 50. Scheelite   |
| 7. Hornblende  | var. Emery        | 36. Gypsum      | 51. Cassiterite |
| 8. Tremolite   | 22. Aragonite     | 37. Cryolite    | 52. Wolframite  |
| 9. Anorthite   | 23. Monazite      | 38. Kyatite     | 53. Zircon      |
| 10. Apatite    | 24. Topaz         | 39. Spinel      | 54. Serpentine  |
| 11. Tourmaline | 25. Rutile        | 40. Antimony    | 55. Staurolite  |
| 12. Thapsite   | 26. Fluorite      | 41. Epidote     | 56. Calcite     |
| 13. Olivine    | 27. Zircon        | 42. Monochroite | 57. Glauconite  |
| 14. Nepheline  | 28. Vesuvianite   | 43. Asbestos    | 58. Opal        |
| 15. Sodalite   | 29. Rhodochrosite | (Shars) (Long)  | 59. Obsidian    |
| 16. Lepidolite | (Fowlerite)       | 44. Kaolin      | 60. Pumice      |

**COMMUNUTED MINERALS, SET M-4, CAT. NO. 34400**  
1/2 cc each of 60 minerals; -100 mesh; includes mahogany wood case.

# Mineralogical Slides

(All Slides are prepared using Cargille Meltmount™ 1.662 - Cat. # 24160.)

The preparation of slides for microscopy is often laborious, time consuming and detracting from ensuing investigations. Also, it is frequently difficult to secure the materials of interest in the necessary purity to generate meaningful results. The following assemblage of both common and unusual comminuted materials mounted on 3" x 1" slides avoid sample preparations by the microscopist and permit projects to immediately start.

The Mineralogical Slides, MS-Series, consist of 6 sets of comminuted materials (-100 mesh) mounted in Meltmount™. Each set is comprised of 25 slides in a protective plastic microscope slide box. The minerals vary from each other in at least one or several ways. Collectively, they reveal practically all mineralogical characteristics. Examinations in both plain and polarized (crossed prisms) light disclose different features.

In plain polarized light, the following features may be determined: color; degree of opacity or transparency; pleochroism; inclusions within grains; grain configuration; evidence of cleavage direction and angles; relative refractive index as compared to Meltmount™ since minerals with an index near 1.662 are almost invisible and very high and very low index minerals stand out.

Under polarized light (crossed prisms), other features may be revealed: the ability of a mineral to polarize; extent of birefringence since low birefringence produces faint polarization with no colors; very high birefringence (e.g., calcite) show brilliant white with no colors, and moderate birefringence show brilliant colors depending in part on the thickness of the mineral grain; extinction angles with respect to any cleavage traces evident; the presence or detection of impurities in either plain or polarized light since the majority of comminuted minerals include trace quantities of some associated mineral which occurs within or attached to it that can not be eliminated without altering the natural characteristics of the mineral; examining interference figure of the material by conoscopic observation with biaxial mineral grains.

**SET M-2a. ELEMENTARY MATERIALS**— This set is subdivided in four categories consisting of: Naturally Attritioned Materials to display the effects of weathering on grains and geological depositions of micro fossils; Abrasive and Polishing Materials for microscopically comparing various ingredients used in formulating polishing and cleaning compounds; Commercially Ground Materials which are used in ceramics, fillers, lubricants, powders, etc.; and Test Materials for aligning polarizing prism directions and refractive index comparisons. **MATERIAL LISTINGS:**

- |                        |                            |                                 |
|------------------------|----------------------------|---------------------------------|
| 1. Water-worn sand     | 9. Eucory, ground          | 18. Vermiculite clay            |
| 2. Wind-worn sand      | 10. Carborundum, 220 mesh  | 19. Asbestos, long fiber        |
| 3. Zircon sand         | 11. Carborundum, 600 floor | 20. Asbestos, short fiber       |
| 4. Foraminiferous sand | 12. Pumice powder          | 21. Graphite, powdered          |
| 5. Oilite sand         | 13. Tripoli powder         | 22. Preheated Calcium Carbonate |
| 6. Diatomaceous earth  | 14. Quartz, ground         | 23. Biotite                     |
| 7. Radiolarian earth   | 15. Feldspar, ground       | 24. Crown glass                 |
| 8. Garnet, ground      | 16. Kaolin, ground         | 25. Flint glass                 |
|                        | 17. Talc, powdered         |                                 |

**Set M-2b. COMMON ROCK MINERALS**— Comminuted to -100 mesh with refractive indices indicated by Becke line as low, medium (near 1.662), high. **MATERIAL LISTING:**

- |                |                |               |                |
|----------------|----------------|---------------|----------------|
| 1. Quartz      | 8. Biotite     | 16. Sodalite  | 24. Rutile     |
| 2. Calcite     | 9. Triclinite  | 17. Beryl     | 25. Serpentine |
| 3. Microcline  | 10. Apatite    | 18. Corundum  | 26. Olivine    |
| 4. Albite      | 11. Tourmaline | 19. Zircon    | 27. Opal       |
| 5. Labradorite | 12. Thapsite   | 20. Garnet    | 28. Obsidian   |
| 6. Hornblende  | 13. Olivine    | 21. Almandine |                |
| 7. Augite      | 14. Nephelite  | 22. Topaz     |                |

**SET M-2c. MINERALS OF COMMERCIAL IMPORTANCE**— 25 minerals of special interest because of their commercial importance. **MATERIAL LISTING:**

- |              |                 |                |                 |                 |
|--------------|-----------------|----------------|-----------------|-----------------|
| 1. Barite    | 8. Cryolite     | 16. Malachite  | 24. Cassiterite | 32. Rhodonite   |
| 2. Anhydrite | 9. Crocidolite  | 17. Periclase  | 25. Willemite   | 33. Stibnite    |
| 3. Gypsum    | 10. Steatite    | 18. Monazite   | 26. Zincite     | 34. Thiomantite |
| 4. Spodumene | 11. Amblygonite | 19. Sphalerite | 27. Vanadinite  | 35. Prehnite    |
| 5. Kyanite   | 12. Azurite     | 20. Scheelite  | 28. Lepidolite  | 36. Pectolite   |

**SET M-2d. SUPPLEMENTARY MINERALS**— This set represents an extension of the Comminuted Minerals Set, M-4. **MATERIAL LISTING:**

- |                  |                           |                          |                |                   |
|------------------|---------------------------|--------------------------|----------------|-------------------|
| 1. Chalcedony    | 7. Leucite                | 15. Garnet (Spessartite) | 23. Talc       | 31. Nephrite Jade |
| 2. Cristoballite | 8. Aegirine               | 16. Garnet               | 24. Enery      | 32. Lapis lazuli  |
| 3. Orthoclase    | 9. Chrysocolla            | 17. Garnet (Andradite)   | 25. Glauconite | 33. Colophane     |
| 4. Hornblende    | 10. Rhodochrosite         | 18. Garnet               | 26. Bauxite    | 34. Nephrite Jade |
| 5. Pargasite     | 11. Garnet (Grossularite) | 19. Siderite             | 27. Pumice     |                   |
| 6. Epidote       |                           | 20. Pyrophyllite         | 28. Wavellite  |                   |

**SET M-2e. METALLIC MINERALS**— 25 minerals that have a metallic appearance and are quite opaque even on their edges. Distinct colored streaks different from the color of the mineral may also be used as a property for grouping. **MATERIAL LISTING:**

- |                 |                   |                |                  |               |
|-----------------|-------------------|----------------|------------------|---------------|
| 1. Magnetite    | 8. Millerite      | 16. Chalcocite | 24. Polymorphous | 32. Columbite |
| 2. Hematite     | 9. Niocite        | 17. Stannite   | 25. Fluorite     | 33. Rosiger   |
| 3. Pyrite       | 10. Cobaltite     | 18. Galena     | 26. Wollastonite | 34. Stibnite  |
| 4. Arsenopyrite | 11. Chalcocyanite | 19. Frankite   | 27. Forsterite   | 35. Leadglite |
| 5. Pyrrhotite   | 12. Bornite       | 20. Chromite   | 28. Ilmenite     | 36. Uraninite |

**SET M-2f. LIGHT TRANSMITTING MINERALS**— This set consists of 25 minerals with the ability to transmit light on their thin edges and supplements the Metallic Minerals. **MATERIAL LISTING:**

- |               |                 |                   |                 |
|---------------|-----------------|-------------------|-----------------|
| 1. Willemite  | 8. Cuprite      | 16. Magnesian     | 24. Muscovite   |
| 2. Zirconia   | 9. Cerussite    | 17. Rhodochrosite | 25. Rosiger     |
| 3. Sphalerite | 10. Wulfenite   | 18. Foyaitite     | 26. Monazite    |
| 4. Malachite  | 11. Cassiterite | 19. Barite        | 27. Amblygonite |
| 5. Azurite    | 12. Beryl       | 20. Chalcite      | 28. Vanadinite  |
|               |                 | 21. Scheelite     | 29. Polioctite  |

# Microscopy Slides of Furs, Fibers and Foods

The FFF Series are comprised of five sets of selective and authentic Fur, Fiber and Food specimens "ready-to-use" for microscopical examination and study. Each specimen is mounted on a 3" x 1" slide; each set consists of 25 slides packaged in a protective plastic microscope slide box. This collection has broad applications as reference or comparison standards and is of particular value to industrial, commercial and quality control laboratories; criminologists and educators.

## COMMERCIAL FUR HAIRS SLIDE SET, F-5

The specimens contained in this set are from all classes of animal pelts directed for the commercial fur markets. This set in conjunction with Set H-5 display a comprehensive range of different hair structures.

- |            |                |                |                      |
|------------|----------------|----------------|----------------------|
| 1. Mink    | 7. Alaska Seal | 13. Opoum      | 19. Leopard          |
| 2. Beaver  | 8. Chinchilla  | 14. Silver Fox | 20. Russian Coy      |
| 3. Raccoon | 9. Squirrel    | 15. Marten     | 21. Ocelot           |
| 4. Nutria  | 10. Rabbit     | 16. Otter      | 22. Baby Caracul     |
| 5. Skunk   | 11. Skunk      | 17. Kolinsky   | 23. Chinese Grey Kid |
| 6. Ermine  | 12. Minkral    | 18. Civet Cat  | 24. Persian Lamb     |
|            |                |                | 25. Mouton Lamb      |

## COMMON HAIRS SLIDE SET, H-6

This set supplements Set F-5 by including additional fur hairs, human hairs and specimens from domesticated and farm animals and other representative specimens.

- |                |                |                |                               |
|----------------|----------------|----------------|-------------------------------|
| 1. Human, dark | 7. Dog         | 13. Ground Hog | 19. Japanese Pony, belly hair |
| 2. Human, grey | 8. Timber Wolf | 14. Mole       | 20. Llama                     |
| 3. Horse       | 9. House Cat   | 15. Bat        | 21. Guinea                    |
| 4. Cow         | 10. Rat        | 16. Monkey     | 22. Beaver                    |
| 5. Common Goat | 11. Mouse      | 17. Chipmunk   | 23. Angora goat               |
| 6. Antelope    | 12. Guinea pig | 18. Deer       | 24. Rabbit                    |
|                |                |                | 25. Cashmere                  |

## COMMERCIAL FIBERS SLIDE SET, CF-7

Represented in this set are commercial fibers most of which are vegetable or mineral origin with some manufactured fibers.

- |                |                       |                                 |                          |
|----------------|-----------------------|---------------------------------|--------------------------|
| 1. Cotton      | 7. Wool               | 13. Paper, Mulberry             | 19. Short fiber asbestos |
| 2. Flax        | 8. Wild Silk          | 14. Kapok                       | 20. Glass wool           |
| 3. Ramie       | 9. Spun Silk          | 15. Coconut fibers              | 21. Linen rag pulp       |
| 4. Hemp        | 10. Mercerized Cotton | 16. Mercerized fibers           | 22. Chemical wood pulp   |
| 5. Jute        | 11. Wool              | 17. Typha (cattail) fibers      | 23. Mechanical wood pulp |
| 6. Manila Hemp | 12. Pineapple Fibers  | 18. Crocidolite (blue asbestos) | 24. Rayon fiber pulp     |
|                |                       |                                 | 25. Asparto fibers       |

## SYNTHETIC AND MANUFACTURED FIBERS SLIDE SET, T-8

This collection is representative of virtually all classes of manufactured and synthetic fibers. From slide labelling, distinction between bright, semi-dull and dull finishes as well as denier size comparisons may be made.

- |   |  |
|---|--|
| 1. Rayon, bright                                | 13. Orion, (acrylic fiber)             |
| 2. Rayon, semi-dull                             | 14. Buxton, (polyester fiber)          |
| 3. Rayon, dull                                  | 15. Saron, (polyethylene chloride)     |
| 4. Acetate, bright                              | 16. Spectra 1000, (polyethylene fiber) |
| 5. Acetate, dull, 30 den.                       | 17. Graphite yarn, (Therman D.C.C.)    |
| 6. Lyocell, bright                              | 18. Nomex, (Aramid)                    |
| 7. Cuprammonium Rayon, Type A                   | 19. Arlon, semi-dull (acrylic fiber)   |
| 8. Cuprammonium Rayon, Type B                   | 20. Kevlar, (Aramid)                   |
| 9. Synovex, (polypropylene fiber)               | 21. Teflon, (TFE-fluorocarbon fiber)   |
| 10. Nylon, (polyamide fiber), bright            | 22. Perlon, dull                       |
| 11. Nylon, (polyamide fiber), semi-dull         | 23. Egg albumin, (protein fiber)       |
| 12. Spinel, (polyvinyl chloride), dull, 24 den. | 24. Fastflow Karate fiber              |
|   | 25. Fiber glass                        |

## STARCHES AND FOOD CONDIMENTS SLIDE SET, F-9

For microscopical comparison studies, common starches and food condiments in general use are represented by this set.

- |                     |                      |                      |
|---------------------|----------------------|----------------------|
| 1. Wheat Starch     | 9. Sago Starch       | 17. Nutmeg, ground   |
| 2. Cornstarch       | 10. Lima Bean Starch | 18. Cloves, ground   |
| 3. Potato Starch    | 11. Sesame Starch    | 19. Allspice, ground |
| 4. Barley Starch    | 12. Soybean Meal     | 20. Ginger, ground   |
| 5. Rice Starch      | 13. Table Salt       | 21. Mustard, ground  |
| 6. Pot Starch       | 14. Black Pepper     | 22. Cayenne Pepper   |
| 7. Tapioca Starch   | 15. Paprika          | 23. Curry Powder     |
| 8. Arrowroot Starch | 16. Cloves, ground   | 24. Cinnamon, ground |
|                     |                      | 25. Cocoa            |

## MICROSCOPE SLIDE SETS

25 slides per set; includes plastic protective microscope slide box.

### MINERALOGICAL SLIDES, MS-SERIES

- Set M-2a, Cat. No. 34411, Elementary Materials
- Set M-2b, Cat. No. 34421, Common Rock Minerals
- Set M-2c, Cat. No. 34431, Commercially Important Minerals
- Set M-2d, Cat. No. 34441, Supplementary Minerals
- Set M-2e, Cat. No. 34451, Metallic Minerals
- Set M-2f, Cat. No. 34461, Light Transmitting Minerals
- Set M-2, Cat. No. 34401, Includes all six sets above

### FURS, FIBERS, FOODS SLIDES, FFF-SERIES

- Set F-5, Cat. No. 34511, Commercial Fur Hairs
- Set H-6, Cat. No. 34521, Common Animal Hairs
- Set CF-7, Cat. No. 34531, Commercial Fibers
- Set T-8, Cat. No. 34541, Synthetic and Manufactured Fibers
- Set F-9, Cat. No. 34551, Starches and Condiments
- Set FFF, Cat. No. 34501, Includes all five sets above

Cargille Laboratories, Inc. reserves the right to make material substitutions in accordance with material availability; replaced items will be properly identified on labels.



**Cargille Laboratories**  
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**Phone: 973-239-6633 • Fax: 973-239-6096 • WWW.CARGILLE.COM**

**M I C R O S C O P Y   R E F E R E N C E   S E T S**

**CARGILLE LABORATORIES PRICE LIST**

SOLID REFRACTIVE INDEX STANDARDS			Price
Cat. No.	Set	Description	Per Set
34100	M-1	<u>REFRACTIVE INDEX STANDARDS:</u> 1/2 cc each of 60 optical glasses & minerals, refractive indices 1.34 to 2.40, 0.01 increments; RI value $\pm$ 0.01 @ nD. Includes mahogany stained wood case.	<b>LONG TERM OUT OF STOCK</b>
34400	M-4	<u>COMMUNUTED MINERALS:</u> 1/2 cc each of 60 minerals; -100 mesh	\$ 513.75
34200	M-7	<u>PRECISION SOLID REFRACTIVE INDEX STANDARDS:</u> 1/2 cc each of 58 Precision Optical Glasses, R.I. 1.34 to 2.40, 0.01 increments; RI values 0.00005 @ 7 Wavelengths. Set is accompanied by extensive technical data.	<b>LONG TERM OUT OF STOCK</b>
34218	M-18	<u>PRECISION SOLID REFRACTIVE INDEX STANDARDS:</u> 1/2 cc each of 18 Precision Optical Glasses, R.I. 1.54 to 1.71, int. 0.01, with optical data for each glass. Precise Optical Value Sheet included.	\$ 321.75
34224	M-24	<u>PRECISION SOLID REFRACTIVE INDEX STANDARDS:</u> 1/2 cc each of 24 Precision Optical Glasses, R.I. 1.49 to 1.72, int. 0.01, with optical data for each glass. Precision Optical Data for each glass and Technical Bulletin on Becke Line Refractive Index Method included.	\$ 435.75

**NEW - Replacing M-25 - Contact us for details!**

<u>MINERALOGICAL SLIDES: M-2 SERIES - 25 Slides Each</u>			
34411	M-2a	Elementary Materials	\$ 229.50
34421	M-2b	Common Rock Minerals	\$ 229.50
34431	M-2c	Commercially Important Minerals	\$ 229.50
34441	M-2d	Supplementary Minerals	\$ 229.50
34451	M-2e	Metallic Minerals	\$ 229.50
34461	M-2f	Light Transmitting Minerals	\$ 229.50
34401	M-2	ALL SIX SETS ABOVE	\$1,226.00

<u>FURS, FIBERS, FOOD SLIDES: FFF SERIES - 25 Slides Each</u>			
34511	F-5	Commercial Fur Hairs	\$ 216.50
34521	H-6	Common Animal Hairs	\$ 216.50
34531	CF-7	Commercial Fibers	\$ 216.50
34541	T-8	Synthetic & Manufactured Fibers	\$ 216.50
34551	F-9	Starches & Condiments	\$ 216.50
34501	FFF	ALL FIVE SETS ABOVE	\$ 956.25

**REPLACEMENTS FOR REFERENCE SETS**

34208	* M-7, 18, 25	Replacement Vials, filled	\$ 26.75 /ea.	34603	FFF	Replacement Slides	\$ 14.25 /ea.
34601	M-1	Replacement Vials, filled	\$ 12.75 /ea.	34604	M-2	Replacement Slides	\$ 15.00 /ea.
34602	M-4	Replacement Vials, filled	\$ 16.00 /ea.	34607		Microscope Slide Box, Holds 25 slides	\$ 17.00 /ea.
34605	ALL SETS	Replacement Vials & Caps, empty	\$ 83.00 /gr.				

\* Call for availability

CARGILLE LABORATORIES, reserves the right to make material substitutions in accordance with material availability. Replaced items will be properly identified on labels.

FOB & SHIPPING POINT: CEDAR GROVE, NJ 07009 - USA

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# CARGILLE LABORATORIES

## HI-DENSITY STORAGE SYSTEMS

Maximum  
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Minimum  
Space



Cataloging  
Storage  
Sample  
Retrieval

MicroSlide Files • Tissue Files • Complete Sample Storage Sets

*Including:*

The New *Tissue Files-200* • Storage for Existing Vial Systems

Storage Boxes for *Vacutainer*® brand tubes

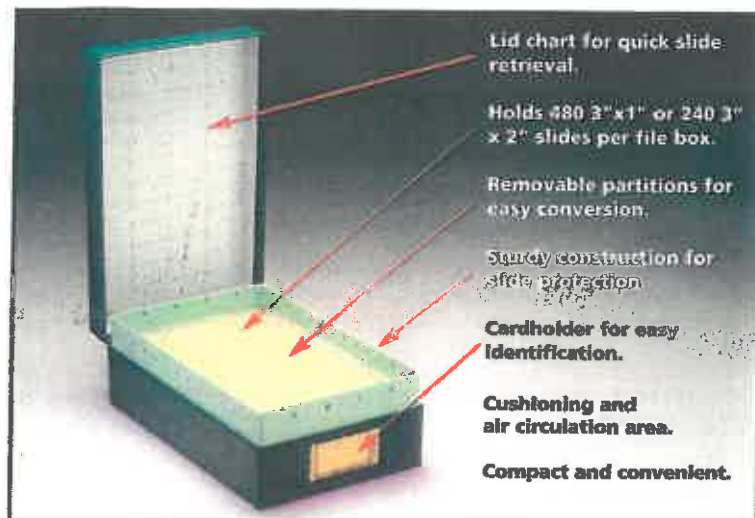
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## CARGILLE MICROSLIDE FILES – for prepared *Microscope Slides*

### Cataloging And Storage System



Cargille MicroSlide Files combine all of the features for prepared microscope slide storage, protection, simplified cataloging, reduction of filing errors and easy retrieval. Each compartment is numerically indexed to a permanent chart on the lid. A replaceable card and brass holder on the front provide instant identification of the contents. Cargille MicroSlide Files are "space efficient" providing maximum slide storage in the least amount of space and at a minimum cost.

**Order Cargille MicroSlide Files:** Catalog No. 73010

### SPECIFICATIONS

#### Microscope Slide Capacity:

480 slides 25 x 76 mm (1 x 3") OR  
240 slides 76 x 51 mm (3 x 2")  
per MicroSlide File.

#### Compartments:

48 2.9 x 16 x 7.6 cm (1 1/8 x 5/8 x 3")

#### Compartment Arrangement:

4 across x 12 deep  
Partitions are removable to enlarge cells.

#### Dimensions:

Outside: 24.1 x 15.2 x 8.3 cm (9 1/2 x 6 x 3 1/4")  
Inside: 23.0 x 14.1 x 7.8 cm (9 1/16 x 5 9/16 x 3 1/16")

#### Cataloging Features:

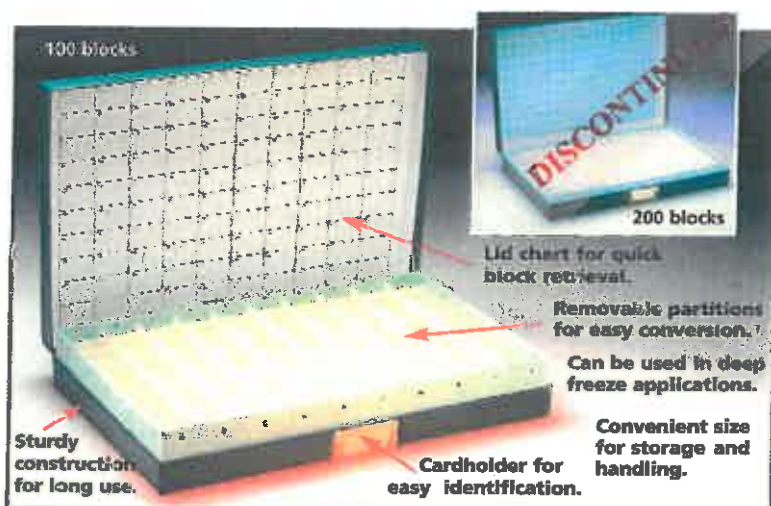
Inside: Lid Chart inside alpha-numerically indexed to cells with I.D. space.  
Outside: Card holder with replaceable card for contents I.D.

#### Approximate Shipping Weight:

0.45 Kg (1lb.) per unit.

## CARGILLE TISSUE FILES – for *Histopathology*

### Embedment Blocks Cataloging and Storage System



The Cargille Tissue File System incorporates the necessary features for embedment block protection, simplified cataloging, reduction of filing errors and facilitation of retrieval – all in minimal space and at an attractive cost. Each compartment is numerically indexed to a chart on the lid. A heavy duty card and holder on the front provides instant identification of the contents.

**Order Cargille Tissue Files:** Catalog No. 72010-100 or 72010-200

### SPECIFICATIONS

#### Embedment Block capacity:

100 or 200 per Tissue File.

#### Compartments:

100 – 3.8 x 2.5 x 5.7 cm (1 1/2 x 1 x 2 1/4) in.  
10 across x 10 deep

200 – 2.3 x 1.8 x 4.4 cm (15/16 x 3/4 x 1 11/16) in.  
20 across x 10 deep

Partitions are removable to enlarge cells.

#### Dimensions:

Outside: 38.7 x 26.7 x 6.0 cm (15 1/4 x 10 1/2 x 2 3/8) in.  
Inside: 37.8 x 25.1 x 5.7 cm (14 7/8 x 9 7/8 x 2 1/4) in.

#### Cataloging Features:

Inside: Lid Chart inside alpha-numerically indexed to cells with I.D. space.  
Outside: Card holder with replaceable card for contents I.D.

#### Approximate Shipping Weight:

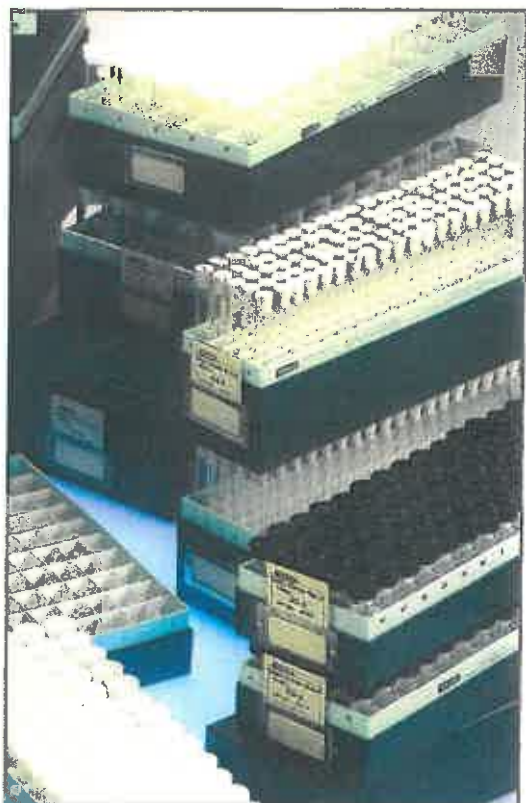
0.9 Kg (2lbs.) per unit.



Tel: 973-239-6633 • Fax: 973-239-6096 • Cedar Grove NJ 07009-1289 USA

[www.cargille.com](http://www.cargille.com)

## CARGILLE SAMPLE STORAGE OPEN STOCK SERIES

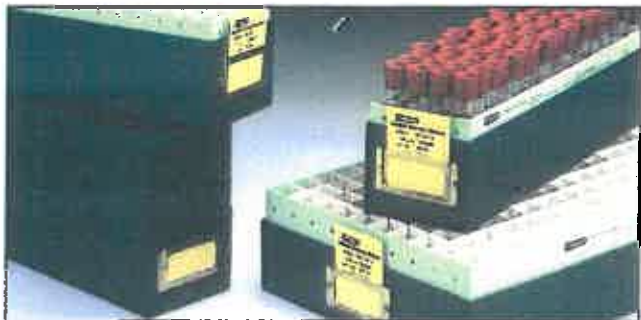


**STANDARD SETS:  
VOLUMES and CLOSURES CHART**

Drams US Fld.	Ounces US Fld.	mL	SAMPLE STORAGE SERIES				
			Cork	Poly- Plug	Screw Cap	Poly- Seal	Oz. Sq.
1	0.13	3.7			✓		
2	0.25	7.4		✓	✓		✓
3	0.38	11.1	✓	✓			
4	0.50	14.8		✓	✓	✓	
7	0.88	25.9		✓			
8	1.0	29.6			✓	✓	✓
10	1.25	37.0		✓			
12	1.5	44.4		✓			
16	2.0	59.1					✓
32	4.0	118.3					✓

## CARGILLE HI-DENSITY STORAGE for Vacutainer® brand tubes

\*Vacutainer® is a registered trademark of Becton Dickinson & Co.



Boxes only - Cargille does not supply Vacutainer® collection vials.

Compact, moisture/condensation - resistant fibreboard boxes for 100 or 200 tubes are available configured especially for accommodating the unique sizes of the Vacutainer® brand collection tubes. An open inventory item, these boxes are always available to expand your storage capacity.

## CARGILLE SPECIAL MODELS STORAGE BOXES for existing Vial Systems

**SPECIAL MODELS**  
Boxes only  
(No caps or vials): Ideally suited to organize and store vials currently in use.

Model Number - Use this number to determine the following information:

100 - 15 - 78

100 - 13 - 92

50 - 27 - 60

Maximum height (millimeters) of vial and closure

Maximum diameter (millimeters) of vial and closure

Number of compartments per box



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# CARGILLE SAMPLE STORAGE OPEN STOCK SERIES

## Standard Sets: Specifications

	Model	Cat No.	Vial		Compartments		Box	
			Vol.	Size, mm	No.	Arrangement	L x W x H	Wt. per set
CORK	CK-3	36130	3 dr	12 x 114	100	5 x 20	11 1/2" x 3" x 5" (292.1mm x 76.2mm x 127mm)	2.2 lbs. 1.04 kg.
POLY-PLUG	PP-2	36210	2 dr	12 x 51	75	5 x 15	12 1/4" x 4 1/4" x 2 1/2" (311.15mm x 107.95mm x 63.5mm)	1.9 lbs. .86 kg.
	PP-3	36220	3 dr	12 x 114	100	5 x 20	11 1/2" x 3" x 5" (292.11mm x 76.2mm x 127mm)	2.5 lbs. 1.12 kg.
	PP-4	36230	4 dr	23.85 x 62	50	5 x 10	10 1/4" x 5 1/2" x 3" (260.35mm x 139.7mm x 76.2mm)	2.3 lbs. 1.02 kg.
	PP-7	36260	7 dr	29.35 x 65	50	5 x 10	12 1/2" x 6 1/2" x 3 1/4" (317.5mm x 165.1mm x 82.55mm)	3.2 lbs. 1.48 kg.
	PP-10	36280	10 dr	29.35 x 80	50	5 x 10	12 1/2" x 6 1/2" x 3 1/2" (317.5mm x 165.1mm x 88.9mm)	3.8 lbs. 1.68 kg.
	PP-12	36290	12 dr	29 x 94	50	5 x 10	12 1/2" x 6 1/2" x 4" (317.5mm x 165.1mm x 101.6mm)	4.1 lbs. 1.89 kg.
SCREW CAP	SC-1	36310	1 dr	15 x 45	100	5 x 20	13 1/2" x 3 1/2" x 2" (342.9mm x 88.9mm x 50.8mm)	1.8 lbs. .71 kg.
	SC-1-200	36320	1 dr	15 x 45	200	10 x 20	13 1/4" x 6 3/4" x 2" (336.55mm x 171.45mm x 50.8mm)	3.5 lbs. 1.53 kg.
	SC-2	36330	2 dr	17 x 60	75	5 x 15	11 1/2" x 4" x 2 1/2" (292.1mm x 101.6mm x 63.5mm)	2.0 lbs. .94 kg.
	SC-4	36360	4 dr	21 x 70	50	5 x 10	9" x 4 1/2" x 3 1/2" (228.6mm x 114.3mm x 88.9mm)	2.1 lbs. .93 kg.
	SC-8	36380	8 dr	25 x 95	50	5 x 10	10 3/4" x 5 1/2" x 4" (273.05mm x 139.7mm x 101.6mm)	3.4 lbs. 1.49 kg.
POLY-SEAL	PS-4	36460	4 dr	21 x 70	50	5 x 10	9" x 4 1/2" x 3 1/2" (228.6mm x 114.3mm x 88.9mm)	2.2 lbs. 1.00 kg.
	PS-8	36480	8 dr	25 x 95	50	5 x 10	10 3/4" x 5 1/2" x 4" (273.05mm x 139.7mm x 101.6mm)	3.5 lbs. 1.59 kg.
OUNCE SQUARE	OZ-0.25*	36810	1/4 oz	23 x 23 x 55	50	5 x 10	9 1/2" x 5" x 2 1/2" (241.3mm x 127mm x 63.5mm)	3.8 lbs. 1.73 kg.
	OZ-1	36830	1 oz	30 x 30 x 72	50	5 x 10	12 3/4" x 6 1/2" x 3 1/2" (323.85mm x 165.1mm x 88.9mm)	5.7 lbs. 2.64 kg.
	OZ-2	36840	2 oz	38 x 38 x 87	32	4 x 8	12 1/2" x 6 1/2" x 4" (317.5mm x 165.1mm x 101.6mm)	6.8 lbs. 3.04 kg.
	OZ-4	36860	4 oz	45 x 45 x 115	21	3 x 7	13" x 5 1/2" x 4 3/4" (330.2mm x 139.7mm x 120.65mm)	7.0 lbs. 3.09 kg.

\*Available only with 1/4 oz amber bottles.



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# CARGILLE SAMPLE STORAGE OPEN STOCK SERIES

## Collect, Catalog, Store, Retrieve

Cargille Sample Storage Sets are available in a variety of box sizes, containers and closures to serve many high-density storage applications requiring cataloged storage in minimum space.

- **Complete Sets:** Each set includes a partitioned box, vials, closures, dry gummed labels, reference chart and an exterior card holder and card.
- **Boxes Only:** Empty Standard Set boxes, and additional Special Models boxes (not components of any set), are available to suit your present storage system. These partitioned boxes also include the exterior identification card holder and card.
- **Alpha-numerical** indexing for rapid identification.
- **Open stock** inventory assures expansion at any time Prompt Delivery.

### Benefits

- **Variety** - 18 different sets! All boxes, vials and closures are available separately, providing maximum efficiency.
  - **Versatility** - Store liquids, powders, small specimens and parts in labeled vials or bottles.
  - **Accuracy** - Alpha-numerically indexed compartments for accurate and rapid retrieval and filing of samples.
  - **Compact** - Requires little space for storing hundreds of thousands of items.
  - **Durable** - Boxes are constructed with a moisture and abrasive-resistant exterior covering.
- Suitable for incubator, refrigerator, deep-freeze and controlled atmosphere applications.**

### The Precise Set to Meet Your Needs

Select the proper Sample Storage Set for your needs by using the *Volumes & Closures Chart* on page 3.

**First**, establish the required volume of the vial, in drams, ounces or mL.

**Then**, read across the chart for available Standard Sets and closure types.



## CK

### Cork Closure

Most economical, straight-sided, flat-bottom, glass shell vials with high quality cork closures. Ideally suited for storing small parts, geological specimens, soil and many other types of samples. For calibrated tubes, ask for Cargille Eight-Ten Tubes or Viscosity Tubes.



## PP

### Poly-Plug Closures

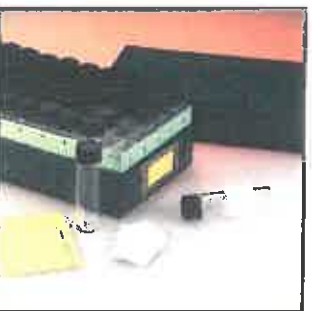
Knurled closures are friction fitting, washable, and reusable. Seamless, one-piece polyethylene construction resists chemical attack, moisture and material entrapment.



## SC

### Screw Caps

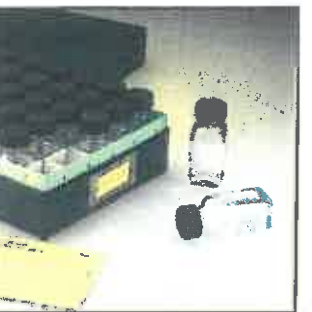
Threaded glass vials supplied with black polypropylene screw-caps. Caps lined with slick-faced polyethylene reduce sample adhesion and create effective seals.



## PS

### Poly-Seal Closures

Screw-cap design with polyethylene cone lining resists chemical attack. Ideal for volatile and corrosive liquids, and chemical or biological specimens.



## OZ

### Ounce/Square Bottles

Largest volume containers of all the sets, the OZ Series contains clear square glass bottles of ounce capacity ratings. Black polypropylene screw-caps have slick-faced polyethylene lining. Caps with glass applicator rods available for 1/4 oz. bottles.

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PAGE 4 OF 5

Effective: Jan. 15, 20201

# HIGH-DENSITY STORAGE SYSTEMS PRICE LIST



## SAMPLE STORAGE COMPLETE SETS INCLUDING VIALS AND CAPS

CATALOG NO.	MODEL NO.	PRICE PER SET			
		EACH SET	6 SETS	12 SETS	36 SETS
36130	CK - 3	\$ 81.75	\$ 74.75	\$ 71.50	\$ 68.25
36220	PP - 3	\$ 78.00	\$ 71.50	\$ 68.25	\$ 65.50
36230	PP - 4	\$ 80.00	\$ 70.75	\$ 67.25	\$ 65.50
36260	PP - 7	\$ 93.00	\$ 83.50	\$ 79.25	\$ 76.50
36290	PP - 12	\$ 128.00	\$ 117.50	\$ 110.50	\$ 107.25
36310	SC - 1	\$ 91.00	\$ 81.75	\$ 77.75	\$ 75.25
36320	SC - 1 - 200	\$ 138.00	\$ 125.25	\$ 120.75	\$ 116.25
36330	SC - 2	\$ 86.00	\$ 78.25	\$ 75.00	\$ 71.75
36360	SC - 4	\$ 87.00	\$ 79.75	\$ 75.00	\$ 73.00
36380	SC - 8	\$ 105.50	\$ 97.25	\$ 92.75	\$ 89.25
36460	PS - 4	\$ 93.00	\$ 84.00	\$ 81.00	\$ 77.00
36480	PS - 8	\$ 110.00	\$ 100.00	\$ 95.50	\$ 92.75
36810*	OZ - 0.25	\$ 92.00	\$ 82.25	\$ 77.75	\$ 74.75
36830	OZ - 1	\$ 102.50	\$ 94.00	\$ 89.25	\$ 86.00
36840	OZ - 2	\$ 85.00	\$ 77.75	\$ 76.50	\$ 71.50
36860	OZ - 4	\$ 82.50	\$ 74.75	\$ 70.00	\$ 67.25

\*Available only with 1/4 oz. amber bottles.

## SAMPLE STORAGE BOX ONLY

CATALOG NO.	MODEL NO.	PRICE PER DOZEN				
		EACH	1 DOZ	3 DOZ	6 DOZ	12 DOZ
36132	CK - 3	\$ 41.75	\$ 397.75	\$ 373.50	\$ 351.00	\$ 341.00
36222	PP - 3	\$ 42.00	\$ 399.00	\$ 373.00	\$ 351.00	\$ 341.00
36232	PP - 4	\$ 47.00	\$ 449.00	\$ 414.75	\$ 391.75	\$ 382.00
36262	PP - 7	\$ 47.00	\$ 449.00	\$ 414.75	\$ 391.75	\$ 382.00
36292	PP - 12	\$ 48.00	\$ 442.00	\$ 407.25	\$ 385.25	\$ 373.50
36312	SC - 1	\$ 42.75	\$ 411.00	\$ 383.50	\$ 362.75	\$ 352.25
36322	SC - 1 - 200	\$ 48.00	\$ 454.00	\$ 426.00	\$ 401.25	\$ 388.75
36332	SC - 2	\$ 44.00	\$ 418.00	\$ 390.50	\$ 369.00	\$ 358.25
36362	SC - 4	\$ 50.50	\$ 483.00	\$ 449.00	\$ 422.75	\$ 410.50
36382	SC - 8	\$ 44.00	\$ 407.50	\$ 381.00	\$ 361.00	\$ 351.00
36462	PS - 4	\$ 50.50	\$ 483.00	\$ 449.00	\$ 422.75	\$ 411.00
36482	PS - 8	\$ 44.25	\$ 408.00	\$ 380.75	\$ 368.00	\$ 349.50
36812	OZ - 0.25	\$ 50.50	\$ 483.00	\$ 449.00	\$ 422.75	\$ 410.50
36832	OZ - 1	\$ 51.00	\$ 492.50	\$ 458.50	\$ 434.00	\$ 417.75
36842	OZ - 2	\$ 51.00	\$ 492.50	\$ 458.50	\$ 434.00	\$ 417.75
36862	OZ - 4	\$ 50.50	\$ 484.25	\$ 449.00	\$ 422.75	\$ 410.50

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## CARGILLE LABORATORIES

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See other side for Special Storage Boxes

Effective: Jan. 15, 2021

# HIGH-DENSITY STORAGE SYSTEMS PRICE LIST



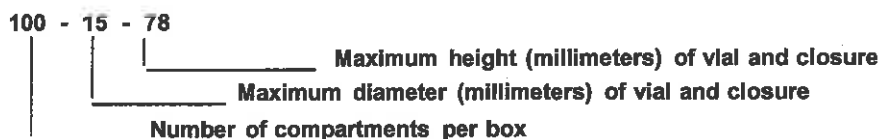
## SAMPLE STORAGE BOX FOR VACUTAINERS®

ITEM	CATALOG NO.	MODEL	EACH	1 DOZ	3 DOZ	6 DOZ	12 DOZ
VACUTAINER® STORAGE BOXES	36562 holds 68 tubes	68-16-112	\$ 41.00	\$ 392.25	\$ 370.00	\$ 346.00	\$ 336.00
	36572 holds 200 tubes	200-19-117	\$ 97.00	\$ 925.75	\$ 866.50	\$ 814.50	\$ 789.00

Boxes only. Caps and vials not included. Other special storage boxes available upon request.  
VACUTAINER® is a registered trademark of Becton Dickinson & Co.

## SPECIAL STORAGE BOXES

SPECIAL MODELS / Boxes Only (No caps or vials) : Ideally suited to organize and store vials currently in use.  
Model number - use this number to determine the following information:



		SPECIFICATIONS				PRICE PER DOZEN			
Catalog Number	Model	Weight Per Box	L x W x H (inches)	PARTITIONS	EACH	1 DOZ	3 DOZ	6 DOZ	12 DOZ
36532	100 - 13 - 92	9 oz	11-1/4 x 2-13/16 x 3-5/8	5 x 20	\$ 40.75	\$ 392.25	\$ 365.50	\$ 345.50	\$ 335.50
36542	100 - 15 - 78	10 oz	12-1/2 x 3 1/8 x 3-1/8	5 x 20	\$ 52.00	\$ 501.75	\$ 468.00	\$ 441.50	\$ 426.00
36552	50 - 27 - 60	10 oz	11-1/4 x 5-5/8 x 2-3/8	5 x 10	\$ 47.25	\$ 441.50	\$ 407.25	\$ 385.25	\$ 373.50
36562	68 - 16 - 112	11.5 oz	11-1/2 x 3 x 5-1/8	4 x 17	\$ 41.00	\$ 392.25	\$ 370.00	\$ 346.00	\$ 336.00
36572	200 - 19 - 117	24 oz	15-3/4 x 8 x 4-1/2	10 x 20	\$ 97.00	\$ 925.75	\$ 866.50	\$ 814.50	\$ 789.00

## MICROSLIDE FILES For Microscope Slide or Parts Storage

Cat. # 73010: PRICE EACH IN QUANTITIES OF:

Quantity	1	6	12	72	144
Price Each	\$44.50	\$35.75	\$ 34.50	\$ 33.75	\$ 32.25
Ship Wt. (lbs)	1	6	13	60	120

## TISSUE FILES For Embedment Block or Parts Storage

Cat. # 72010: 100 Compartments PRICE EACH IN QUANTITIES OF:

Quantity	1	6	12	72	144
Price Each	\$50.50	\$40.75	\$ 39.50	\$ 39.00	\$ 38.75
Ship Wt. (lbs)	2	10	18	104	216

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See other side for Special Storage Boxes



# CULT-UR™ TABLETS

## STABILIZE URINE SPECIMENS FOR DELAYED LABORATORY CULTURE AND IDENTIFICATION OF URINARY TRACT BACTERIA

### Maintains Bacterial Viability at room Temperature Up to 72 Hrs.

- Eliminates refrigeration of urine culture specimens during storage or transit.\*
- Prevents *over-growth* of U.T.I. Bacteria in specimen.

### Maintains Normal Growth and Chemical I.D. Characters of U.T.I. Bacteria

- Culture and subculture growth characteristics are *not* altered.\*

### Minimizes Growth of Patient Introduced Contaminants

- Accident introduced contaminants won't confuse results because levels are maintained for at least 24 hrs.
- False positives are virtually eliminated- reducing the need for a second sample, and preventing needless patient anxiety.

### Convenient To Use

- No messy or strong smelling liquids to dispense into tubes.

### Economical Cult-Ur™ Tablets

Effective: 1/15/2020

Tablet Size	Cat. No.	Urine Qty.	Tablets per btl.	Price per bottle in Quantities of:			
				1	6	12	
75 mg	39075	5cc	1,000	\$ 103.50	\$ 83.25	\$ 77.75	
			10,000	\$ 681.25	\$ 635.75	\$ 619.50	
150 mg	39150	10cc	1,000	\$ 111.25	\$ 88.50	\$ 84.50	
			10,000	\$ 720.00	\$ 673.00	\$ 650.25	
420 mg	39420	29cc	1,000	\$ 132.75	\$ 107.50	\$ 100.50	
			10,000	\$ 926.50	\$ 865.00	\$ 842.25	
840 mg	39840	56cc	1,000	\$ 208.00	\$ 166.25	\$ 156.75	
			4,000	\$ 583.50	\$ 543.00	\$ 512.25	\$ 499.00

(M)SDS AVAILABLE

The Cult-Ur™ Tablets are formulated for effective bacteriostatic action without altering the viability of typical urinary tract bacteria for culture and identification (no fluorides).

\* Microbiological analyses performed by Analytab Products Inc. (API), under the supervision of Dr. Geophery McKinley, 1986

**See STABILUR® TABLETS for microscopic sediment analysis**

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**CULT-UR™ TABLETS FOR GENERAL STABILIZING OF URINE**

**Cargille Labs has two products for stabilizing urine for delayed testing:**

**Stabilur® and Cult-Ur™**

**Stabilur® has been used for 70 years to stabilize urine for up to 3 days at room temperature ( un-refrigerated ) for urine chemistries and morphological study.**

**Stabilur® increases specific gravity of 0.002 and lowers pH by 0 to 1 pH units; other wise it has little interference with urine chemistries.**

**Stabilur® kills micro-organisms, but maintains their microscopic appearance and Chemistries.**

**Cult-Ur™ was developed 45 years later to stabilize urine for up to three days at room temperature ( un-refrigerated ), to prevent micro-organism overgrowth, without killing the micro-organisms, so that cultures can be grown.**

**Cult-Ur™ also has little effect on chemistries and will stabilize urine for chemical analysis for 2-4 days.**

**Cult-Ur™ has not been widely used for chemistries and morphological study, as long as there is Stabilur® and its 70 years of proven minimal non-interference for these uses.**

**Now that there is increasing concern about smaller and smaller quantities of residual chemicals, Stabilur®'s 0.36% Mercuric Oxide is a concern at some centers conducting urinalysis.**

**Cargille has made Stabilur® without mercuric oxide and has been found it to be much less effective.**

**Cult-Ur™ does not contain mercuric compounds. For those who want to avoid mercury, it is suggested that you consider:**

**Cult-Ur™ for both purposes: stabilizing viable micro-organism and also stabilizing that urine for chemical and microscopic evaluations.**

**It is recommended if you are considering using Cult-Ur™ instead of Stabilur®, that you qualify Cult-Ur™ with the tests you are running.**





# STABILUR® TABLETS

## STABILIZE URINE SPECIMENS FOR DELAYED LABORATORY MICROSCOPIC EXAMINATION OF URINE SEDIMENT

### Maintains\* Red and White Blood Cells in Original Conditions

- Prevents the usual rapid lysis of leukocytes to assure accurate confirmation of this key indicator of urinary tract infection<sup>1</sup>
- Permits accurate counting and estimation of erythrocytes.

### Maintains\* the Morphology of Typical Formed Elements in Urine Sediments Such as Casts, Crystals and Mucous Threads

- Morphology and staining characteristics of casts and cells are retained in original condition.
- Tablet dissolves completely, and does not contribute any crystals to the sediments.<sup>2</sup>

### Maintains\* Most Urine Dipstick Chemistries

- Maintains most chemical constituents in urine for retesting by dipstick chemistry by preventing bacterial decomposition.
- Does not interfere with enzyme based dipstick chemistry tests, i.e. leukocyte esterase.<sup>3</sup>

*At recommended levels urine pH is buffered to just under neutral, and specific gravity is raised 0.002.*

### Maintains\* Other Chemistry Assay Components

- Does not interfere with certain TLC and RIA methods for assay of physiological marker compounds and drugs and their metabolites.

### Economical Stabilur® Tablets

Effective: 1/15/2021

Tablet Size	Cat. No.	Urine Qty.	Tablets per btl.	Price		
				1	6	1
25 mg	40025	3 - 5cc	1,000	\$ 130.00	\$ 105.50	\$ 97.00
			10,000	\$ 859.00	\$ 812.50	\$ 789.25
50 mg	40050	5-10cc	1,000	\$ 134.25	\$ 108.00	\$ 102.50
			10,000	\$ 874.25	\$ 827.50	\$ 805.75
95 mg	40095	10-20cc	1,000	\$ 141.00	\$ 114.75	\$ 106.75
			10,000	\$ 913.50	\$ 859.00	\$ 827.50
276 mg	40276	30-60cc	1,000	\$ 168.50	\$ 135.50	\$ 128.75
			10,000	\$ 1,179.00	\$ 1,109.25	\$ 1,071.00

(M)SDS AVAILABLE

The Stabilur® tablets contain a proprietary mixture of buffering and osmolality adjustment ingredients, plus agents which produce a minute quantity of several bacteriostatic chemicals sufficient to prevent bacterial degradation of urine constituents, without interfering with most analyses. Shelf life is 5 years from date of purchase.

1. Depending on osmolality and pH of the urine, up to 90% of unsaturated leukocytes are lysed in as little as 2.5 hours at elevated room temperature. Even at 4 degrees C, 50% may be lost in that time.
2. Wait until the tablet has completely dissolved before centrifuging the sample ( approx. 30 min. + ).
3. Validated on Ames (Division of Miles Laboratories) and Boehringer Mannheim chemistry dipsticks: November, 1986.

**See CULT-UR™ TABLETS for microbiological culture and identification**

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**SUBSTITUTION OF CULT-UR TABLETS FOR STABILUR TABLETS**  
**FOR GENERAL STABILIZING OF URINE**

Cargille Labs has for a long time sold two products for stabilizing urine for delayed testing: Stabilur for 70 years and Cult-Ur for 20 years.

Stabilur has been used for 70 years to stabilize urine for up to 3 days at room temperature ( un-refrigerated ) with little interference with urine chemistries. Stabilur increases specific gravity of 0.002 and lowers pH by 0 to 1 pH units. Stabilur kills micro-organisms, but maintains their microscopic appearance.

Cult-Ur was developed to stabilize urine, and prevent micro-organism overgrowth without killing the micro-organisms, so that cultures can be grown for up to 3 days without refrigeration. Cult-Ur also has little effect on chemistries and will stabilize urine for chemical analysis for 2-4 days. It has not been used that way, as long as there is Stabilur and its 70 years of proven non-interference to use for this purpose.

0.36% Mercuric Oxide is an important component in Stabilur. Cargille has made Stabilur without mercuric oxide and have found it to be much less effective.

Cult-Ur does not contain mercuric compounds. For those who want to avoid mercury, it is suggested that you consider Cult-Ur for both purposes: stabilizing viable micro-organisms and also stabilizing the urine for chemical and microscopic evaluations. It is recommended if you are considering substituting Cult-Ur for Stabilur, you qualify Cult-Ur with the tests you are running.

## **Cargille Laboratories**

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# **BORIC ACID NF TABLETS**

Tablets of Boric Acid are available from stock in convenient sizes and weights. Used in the biology field as a preservative and bactericide. Boric Acid Tablets also serve as a grinding aid in Spectroscopy.

The many applications of Boric Acid open up the possibilities for cost reduction in numerous other fields where the advantages of tablets have not been explored.

The costs of tableting have been saved many times over by eliminating weighing and dispensing cost, eliminating dust, simplifying solution preparation and permitting automatic feeding and metering.

### **Potential applications include:**

- |                                  |                |                   |
|----------------------------------|----------------|-------------------|
| • Weather-proofing wood          | • Nickel baths | • Carpets         |
| • Wick impregnating              | • Glass        | • Printing        |
| • Preservation                   | • Dyeing       | • Leather         |
| • Electrical condensers          | • Porcelain    | • Photography     |
| • Fire-proofing fabrics          | • Painting     | • Hardening steel |
| • Manufacture of cement crockery | • Borates      | • Enamels         |

<b>Boric Acid NF – Quantity: Bottles of 1000</b>
--

Current in-stock tablet sizes are listed below

<u>Catalog #</u>	<u>Weight</u>	<u>1M</u>	<u>5M</u>	<u>10M</u>	<u>25M</u>
41120	0.4 gm	\$ 83.50	\$ 74.25	\$ 65.00	\$ 55.75
41121	0.5 gm	\$ 91.25	\$ 79.75	\$ 69.50	\$ 59.50
41123	1.0 gm	\$ 99.50	\$ 88.75	\$ 76.75	\$ 65.00
41125	2.0 gm	\$ 128.50	\$ 115.25	\$ 99.50	\$ 85.00
41127	2.5 gm	\$ 143.25	\$ 127.00	\$ 109.50	\$ 95.00

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Cargille Time Test Viscosity Tubes Meet ASTM D1545

*Cargille*

# VISCOSITY TUBES

## for Measuring Viscosity by the Air Bubble Rise Method

### INTRODUCTION

Rheology is a branch of science dealing with the deformation and flow of materials which includes the subject of viscosity. Viscosity is a measurement of internal friction, or resistance, to flow by external forces. Viscosity is the ratio of shear force to shear rate (the slope of the curves in Figure 1a) expressed by:

$$\eta = \frac{f/A}{dv/dx} = \frac{\text{shear force}}{\text{shear rate}}$$

$f$ =Force  
 $A$ =Area  
 $v$ =Velocity  
 $x$ =Distance

The viscosity of many materials depends on shear rate and is classified accordingly, Figure 1b. Viscosity is expressed as Absolute  $\eta$ , and Kinematic,  $\nu$ . Absolute viscosity is determined by measuring the shear force required to produce a given shear rate and is independent of the density of the liquid. Kinematic viscosity is measured by the time required for a given volume of liquid to flow through a capillary or restriction. It is related to flow caused by the hydrostatic head of the liquid and therefore strongly dependent on density.

The relationship between Absolute and Kinematic viscosity is given by the following, where  $\rho$  is density:  $\nu = \eta / \rho$

One of the simplest methods for determining Kinematic viscosity is by the rising bubble technique employing matched viscosity tubes. The method is visual, convenient, rapid and easily learned by technical and non-technical personnel.

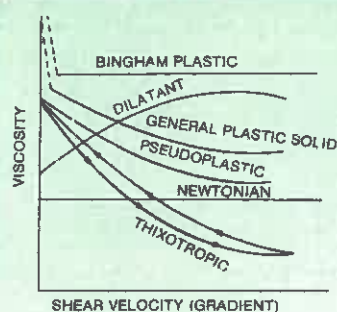


Fig 1a

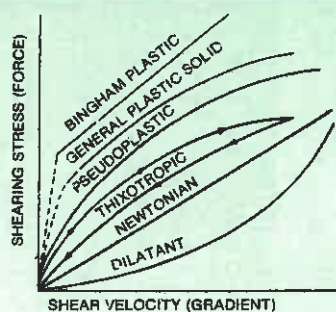


Fig 1b



## Rising Bubble Technique, Principle

The time required for an air bubble in a liquid to rise is directly proportional to its viscosity. Bubble rise rates vary with the inside diameters of viscosity tubes; therefore, the tubes must be precision matched to a tolerance that will keep bubble rise rate variations below the level of visual detection. Variations in viscosity readings or comparisons are visually imperceptible from viscosity tubes with inside diameter tolerances closer than  $\pm 0.025\text{mm}$ . Any variations in readings are attributed to differences in viscosities.

Viscosity is determined by either measuring the time an air bubble takes to pass between two specifically spaced marks on viscosity tubes, or by comparison to the bubble rate rise of calibrated viscosity standards. The accuracy of the method is therefore a function of precision matching of tube bores and identical score heights, which are measured from the center outside bottom.

Other factors, such as uniformity of temperature and verticality of tubes, influence timed bubble travel and controlled laboratory techniques are essential for precise results. For example, a variation in temperature of  $0.1^\circ\text{C}$  will cause a 1% variation in the timed bubble travel, and a one radius departure from tube verticality may introduce a 10% error in timed bubble travel.

## Procedure for Using Cargille Viscosity Tubes

A viscosity tube is filled to the 100mm level score with the material to be tested. A cork is inserted to the 108mm score which provides and fixes a uniform air bubble. The sample, and standard if used, is placed in a suitable rack and immersed in a water bath until a uniform temperature of  $25^\circ\text{C}$  ( $77^\circ\text{F}$ ) is attained. If viscosity determinations are performed by referral to comparison samples of known viscosities or precisely calibrated standards, then they too should be at the same temperature as the samples. Viscosity is determined by one of two methods:

### COMPARISON METHODS

The bubble rate rise of the samples is compared to samples of known viscosities or calibrated standards contained in tubes of the same dimensions. The rack containing the samples and standards is removed from the water bath, held vertically to stabilize the air bubbles and quickly inverted maintaining verticality. A comparison of air bubble speed of the samples to the standards permits estimation of viscosity; the faster the rate of bubble rise, the lower the viscosity. The user may prepare viscosity standards or employ Gardner Viscosity Standards.

### TIME-METHOD (ASTM D-1545)

Time-Test Tubes are required to determine viscosity by the Timed-Method. The length of time, in seconds, required for an air bubble to pass from the 27mm to 100mm score mark, a distance of 73mm, is approximately equal to the viscosity of the liquid in "Stoke" units; alternatively, viscosity may be expressed in "Bubble Seconds." It is important to note that the position of the air bubble in relation to the 27mm score should be similar at the end of the test on the 100mm score.

### VISCOSITY TUBE SELECTION GUIDE

Cargille Viscosity Tubes are divided into four Classes as determined by precision sorting in accordance with bore size, number of score marks and contemplated method of use for bubble rise testing, Figure 2. The numbers assigned refer to bore size, which is expressed in mm.

#### TIME-TEST VISCOSITY TUBES, 10.65mm

Time-Test Viscosity Tubes are frequently referred to as ASTM D-1545 Tubes, which originated from the adopted standard method of test for viscosity as described in ASTM D-1545\* issued by the American Society for Testing and Materials. Time-Test Tubes are scored in three places, Figure 3b: 27mm, 100mm and 108mm. The score mark at 27mm is used for a 73mm timed bubble travel. Time-Test Viscosity Tubes are also subjected to additional testing procedures to ascertain the 10.65mm bore which is very critical for precision measuring.

#### CLASS "G-10.65" AND CLASS "V-10.75" TUBES

Class "G-10.65" and "V-10.75" Viscosity Tubes are used principally for direct comparisons to Gardner Viscosity Standards. Both Classes of tubes are inscribed at the 100mm and 108mm lengths, Figure 3a.

For bubble rate rise comparisons to Gardner Viscosity Standards, the following equivalency chart is provided:

Cargille Class "G-10.65" = Gardner Grade A Tubes

Cargille Class "V-10.75" = Gardner Grade B Tubes

#### CLASS "V" VISCOSITY TUBES

Class "V" Tubes are the least expensive of the viscosity tubes. Their principal utility is for comparison to other samples or standards of known viscosities as prepared by the user.

Class "V" Tubes are the Cargille specific assigned sizes between 10.50 and 11.00mm, with the exception of the 10.65mm and Class "V-10.75"mm sizes.

Within this range, a specific tube size will be assigned, recorded in the Cargille Master File for future reference on re-orders to insure furnishing the identical tube size. The Class "V" Tubes are also inscribed at the 100mm and 108mm lengths, Figure 3a.

\*Copies of ASTM-D-1545 are available free of charge upon request.  
Fig 2

### CLASSIFICATION OF CARGILLE VISCOSITY TUBES

CLASS	SCORE MARKS	ID $\pm 0.025\text{mm}$	METHOD OF TESTING
Time-Test, 10.65mm (ASTM D-1545)	108mm 100mm 27mm	10.65	Bubble time rise or bubble comparisons
Class "G-10.65"	108mm 100mm	10.65 (equivalent to Gardner A tubes)	Bubble comparisons to Gardner Standards or to calibrated standards with identical tube dimensions
Class "V-10.75"	108mm 100mm	10.75 (equivalent to Gardner B tubes)	
Class "V"	108mm, 100mm	10.50 to 11.00**	Bubble comparisons to standards prepared by the user

NOTE: All score marks are measured from the center of the outside bottom.  
\*\*Excluding 10.65 and 10.75mm sizes.



ACTUAL SIZE



# Viscosity Tube Specifications

## DIMENSIONS

Cargille Viscosity Tubes are manufactured to the closest possible tolerances and then precisely measured for final selection.

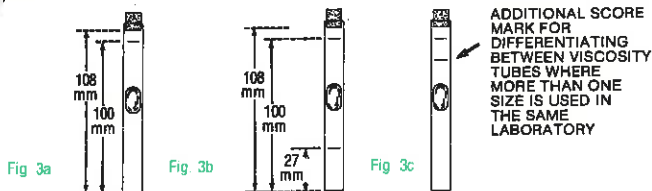
Length..... 114mm  $\pm$ 2mm  
 Wall Thickness..... 0.65mm  
 Tolerance, I.D.....  $\pm$ 0.025mm  
 Composition..... Soda-lime glass, flat-bottom  
 Score Height Tolerance.....  $\pm$ 0.5mm

NOTE: Inside diameter tolerance closer than  $\pm$ 0.025mm is unnecessary since variations in viscosity readings or comparisons would be imperceptible.

## SCORE MARKS

All Cargille Viscosity Tubes are permanently marked with two score marks, at 100mm and 108mm heights (Figure 3a) with the exception of Time-Test Viscosity Tubes, which have an additional score at 27mm (Figure 3b). In compliance with ASTM D-1545, all score marks are measured from the center outside bottom of the tubes.

The score mark at 100mm represents the filling level and the 108mm score is used to fix the size of the air bubble in the tube by inserting a cork to this mark. The 27mm and 100mm scores on Time-Test Viscosity Tubes are used to time bubble rise. In instances where more than one viscosity tube size is used, in the same laboratory, an additional score is inscribed, on request, to differentiate between sizes, Figure 3c.



# Cargille Quality Assurance Service

Cargille Laboratories, Inc. maintains a master record for every Viscosity Tube customer. All production specifications related to the specific viscosity tubes supplied are maintained indefinitely. Each subsequent request for similar viscosity tubes is individually processed by referral to the firm's specifications record. This record keeping avoids any possibility of potential typographic error in requisitioning viscosity tubes. Cargille's unique Quality Assurance Service is automatically effected and is applicable to singular or multiple viscosity tube purchases.

## CARGILLE VISCOSITY TUBES & ACCESSORIES

CAT. NO.	DESCRIPTION	CAT. NO.	DESCRIPTION
44154	TIME-TEST	44250	ROUGH SORT TUBES: HIGH
44106	CLASS G: 10.65	44280	SHELL VIALS
44107	CLASS V: 10.75	44004	CORKS/BAG OF 150
44100	CLASS V:	44004	CORKS/BULK
44350	COLOR TUBES	44010	RACK, 10 TUBE
44200	ROUGH SORT TUBES: LOW	44023	THERMOMETER

# Viscosity Tube Accessories



## CARGILLE "10" VISCOSITY TUBE HOLDER

All stainless steel construction; holds up to 10 viscosity tubes by convenient spring-loading design. Samples and standards may be concurrently immersed in water bath, removed and held vertically for bubble rate rise comparisons.

## VISCOSITY TUBE SAMPLE STORAGE BOX



A durable, compact, solid, fibreboard Sample Storage Box with attractive dark green, moisture and abrasive resistant exterior covering holds up to 100 viscosity tubes in partitioned compartments. The compartments are arranged

5 x 20 and are alpha-numerically indexed for rapidly locating stored viscosity samples. Boxes are supplied with separate, correspondingly-numbered index chart for recording pertinent sample information, and an exterior card in a polished brass card holder for easily identifying the general contents of the Sample Storage Box Model CK-3.

## ROUGH SORT TUBES

Tubes unsuitable for viscosity applications are separated, sorted, matched and grouped in two ranges according to tube bore size. Although these tubes are not precision matched or scored, they are adequately matched in bore size for diversified use in general industrial and laboratory procedures.

Rough Sort Tubes, Low ... Range: 10.50 - 10.75mm;

Rough Sort Tubes, High ... Range: 10.75 - 11.00mm

**COLOR TUBES** Critical color or turbidity comparisons are frequently affected by variations in the light path of the liquid sample. To minimize this "visual diluting" effect, tubes are available with matched bore sizes to  $\pm$ 0.05mm to insure replicate volume comparisons under similar light path conditions.

Dimensions: 114mm long, 10.80mm I.D., 0.65mm wall thickness.

**SHELL VIALS** Tubes exhibiting bore sizes exceeding Viscosity, Color and Rough Sort Tube specifications are available for innumerable laboratory applications where inside dimensional tolerance is not critical. Dimensions: 114mm long, approximate 12mm O.D., 0.65mm wall thickness.



## CORKS

High quality, short length corks properly fit viscosity tubes so that the small end is in firm contact with inside of tubes to prevent small extraneous bubbles from interfering with timed bubble movement.

## THERMOMETER



20° to 30° C; graduated in 0.1° C increments; immersible type; 4½" long for conveniently inserting in viscosity tubes.



### Cargille Laboratories

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## VISCOSITY TUBES PRICE LIST

CATALOG NO.	DESCRIPTION	PRICE		
		1 DOZEN *	1/2 GROSS *	1 GROSS
44154	Time - Test ( ASTM-D-1545 )	\$ 66.25	\$ 153.75	\$ 262.25
44106	Class " G-10.65 "	\$ 60.00	\$ 133.50	\$ 227.25
44107	Class " V-10.75 "	\$ 54.25	\$ 116.00	\$ 199.00
44100	Class " V "	\$ 48.25	\$ 98.25	\$ 168.75

\* Corks Included

44350	Color Tubes, 10.80 - 10.85 MM I.D	\$ 39.00	\$ 61.00	\$ 92.50
44370	Colormetric Tubes, 10.85 MM I.D.	\$ 25.00	NA	\$ 116.25
44200	Rough Sort Tubes, Low	\$ 35.50	\$ 54.25	\$ 81.50
44250	Rough Sort Tubes, High	\$ 35.50	\$ 55.00	\$ 82.00

36134	PRICE PER GROSS				
CK-3 (SHELL VIALS )	1 GROSS	3 GROSS	6 GROSS	12 GROSS	24 GROSS
	\$ 67.25	\$ 64.75	\$ 58.75	\$ 49.50	\$ 45.25

### ACCESSORIES

44004	Corks ( for Viscosity Tubes ) 150 corks per pkg	\$ 17.25 / per pkg.
36132	Sample Storage Box CK-3, holds 100 tubes	\$ 41.75 / each

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