

OVD Solutions



Four solutions for
today's techniques



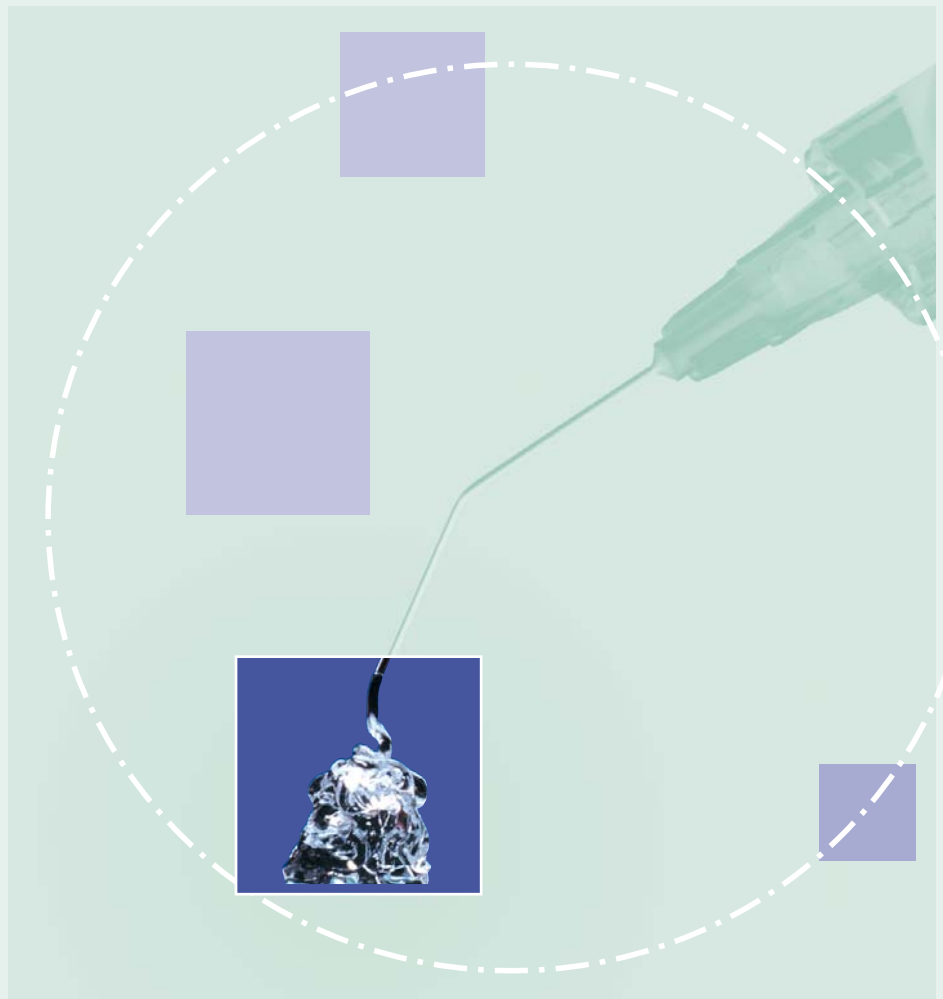
Helping all people
live healthy lives

BD™ 1.0% OVD
Viscoelastic
Solution
1.0%, 1.0 ml

BD™ 1.2% OVD
Viscoelastic
Solution
1.2%, 1.0 ml

BD Visc™
Viscoelastic
Solution
1.4%, 0.85 ml

BD MultiVisc™
Viscoadaptive
Solution
2.5%, 0.60 ml



Viscoadaptive Solution

BD MultiVisc™ Cross-Link in Structure, Cohesive and Pseudodispersive in Behavior

BD MultiVisc™ Viscoadaptive is a unique ophthalmic visco surgical device (OVD) for cataract surgery and IOL implantation. BD MultiVisc™ offers surgeons the benefits of a cohesive and dispersive OVD in one solution. The higher zero-shear viscosity combined with its simultaneous short and long molecular chain enables surgeons to maximize the rheologic properties of both a cohesive and dispersive OVD during cataract surgery and IOL implantation.

What are the advantages of BD MultiVisc™?

Anterior Chamber Stability - BD MultiVisc™ provides the highest zero-shear viscosity³ and sodium hyaluronate concentration (2.5%) available in an OVD, creating a high degree of solid-like behavior. This translates into outstanding space maintenance effectiveness, increased anterior chamber depth, pressurization, safety and stability during capsulorhexis.

Corneal Protection - Combines the highest zero shear viscosity³ of any OVD with high elasticity and pseudoplasticity, thus staying in the eye longer during cataract surgery and IOL implantation for maximum protection of the corneal endothelium.

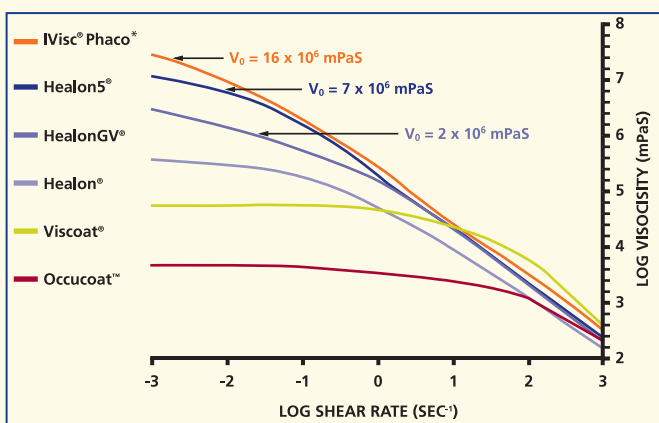
Cohesive and Dispersive Properties - BD MultiVisc™ Viscoadaptive Solution has the unique ability to change its physical characteristics when exposed to different fluidics encountered in phacoemulsification. Low flow rates and directing flow away from the viscoelastic mass helps keep BD MultiVisc™ cohesive and in the anterior chamber during phacoemulsification. High flow rates directed toward the viscoelastic mass makes BD MultiVisc™ fracturable and pseudo-dispersive thus facilitating for easier removal.

Foldable IOL Implantation - Creates a stable environment for the insertion, unfolding, and positioning of foldable IOL's.



FIGURE 1

(Arshinoff) Pseudoplasticity curves of viscoadaptives and common OVDs. IVisc® Phaco and Healon5® have considerably higher shear viscosity³. (left side of graph)

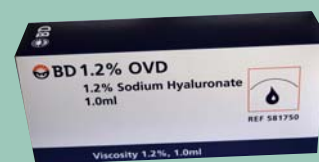
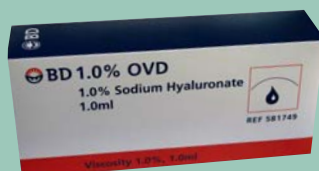


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"In my opinion, BD MultiVisc™ is the highest zero-shear viscosity viscoadaptive available to surgeons today. It provides the best environment for the performance of the USST (Ultimate Soft Shell Technique), considerably reducing the risks of cataract surgery, and making previously difficult cases, routine. It also performs excellently in all types of surgical cases where surgical stability is an advantage."

Steve Arshinoff, MD.
FRCS
Toronto, Canada

* BD MultiVisc™ Viscoadaptive may be marketed and sold under the brand names IVisc® Phaco or MicroVisc® Phaco in Canada and other countries by companies that are unrelated to BD.



Viscoelastic Solutions

BD™ 1.0% OVD

BD™ 1.2% OVD

BD Visc™ 1.4%

A Clear View of the Posterior Capsule During Phacoemulsification and IOL Implantation

BD™ 1.0% OVD, BD™ 1.2% OVD and BD Visc™ 1.4% consist respectively of 1.0%, 1.2% and 1.4% sodium hyaluronate, dissolved in a physiological buffer.

These cohesive OVDs have been designed to allow the creation and maintenance of a deep anterior chamber and space in which to work, thus minimizing the risk of damage to the ocular structures.

Supplied in a disposable glass syringe fitted with the BD Luer-Lok™ safety system, the viscoelastic solutions are proposed by BD in three concentrations - 1.0%, 1.2% and 1.4% - from which surgeons may choose according to their preferences and the technique performed.

BD Viscoelastic solutions applications

- Create and maintain intraocular space
- Displace and stabilize tissue
- Maintain a deep, stable anterior chamber during capsulorhexis and IOL implantation

Surgical operations

- Cataract Surgery and IOL
- Glaucoma Surgery
- Corneal Transplantation
- Anterior Segment Surgery

	Viscoelastic solutions			Viscoadaptive solution
Product reference (1 kit per box)	BD™ 1.0% OVD 581749	BD™ 1.2% OVD 581750	BD Visc™ 1.4% 581744	BD MultiVisc™ 581745
Concentration (sodium hyaluronate)	10mg/ml (1.0%)	12mg/ml (1.2%)	14mg/ml (1.4%)	25mg/ml (2.5%)
Molecular Weight (average)	3 Mio. Daltons	3 Mio. Daltons	7.9 Mio. Daltons	7.9 Mio. Daltons
Zero shear viscosity			4.8 Mio. mPas	18 Mio. mPas
Viscosity at 3.75 per second shear rate	14.5 K mPas	18.5 K mPas		
PH	7.2-7.6	7.2-7.6	7.0-7.5	7.0-7.5
Shelf life	3 years	3 years	3 years	3 years
Storage	2-8° C	2-8° C	2-8° C	2-8° C
Filling size	1.0ml	1.0ml	0.85ml	0.60ml
Cannula size	27G	27G	25G	25G
Composition/ml				
• Sodium Hyaluronate	10mg	12mg	14mg	25mg
• Sodium chloride	8.5mg	8.5mg	8.3mg	8.3mg
• Disodium phosphate dihydrate			1.4mg	1.4mg
• Potassium dihydrogen phosphate			0.26mg	0.26mg
• Disodium hydrogen orthophosphate dihydrate	0.28mg	0.28mg		
• Sodium dihydrogen phosphate dihydrate	0.04mg	0.04mg		
• Sterile water for injection Eur.Ph.	q.s.	q.s.	q.s.	q.s.

K = thousand - Mio. = million - mPas = millipascal-second

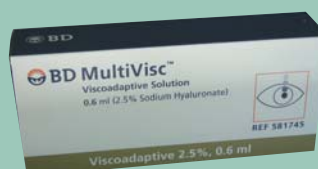
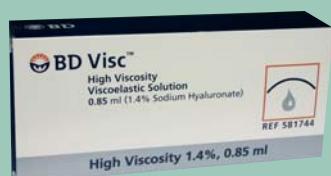


TABLE 1 : OPHTHALMIC VISCOSURGICAL DEVICES-CONTENT, MOLECULAR WEIGHT, AND ZERO-SHEAR VISCOSITY

Class	Ophthalmic Viscosurgical Devices (OVD)	Content (%)	Molecular Weight (Da)	Zero-Shear Viscosity (mPas)	
HIGHER-VISCOSITY Viscoadaptives	COHESIVE OVDs MicroVisc Phaco (IVisc Phaco, Hyvisc Phaco, BD Multivisc) Healon5	NaHa (2.5)	7.9 M	18.0 M	
		NaHa (2.3)	4.0 M	7.0 M	
	Superviscous cohesives	MicroVisc Plus (IVisc Plus, Hyvisc Plus) Healon GV	NaHa (1.4)	7.9 M	4.8 M
			NaHa (1.4)	5.0 M	2.0 M
	Viscous cohesives	MicroVisc (IVisc, Hyvisc) Provisc Healon Biolon Amvisc Amvisc Plus	NaHa (1.0)	2.0 M	280 K
			NaHa (1.0)	4.0 M	230 K
			NaHa (1.0)	3.0 M	215 K
			NaHa (1.2)	1.0 M	100 K
			NaHa (1.6)	1.0 M	100 K
LOWER-VISCOSITY Medium-viscosity dispersives	DISPERSIVE OVDs Viscoat	NaHa (3.0)	500 K	41K	
		Chondroitin sulfate (4.0)	25 K		
	Very-low-viscosity dispersives	Cellugel	Chemically modified HPMC (2.0)	100 K	28 K
			Vitrax	NaHa (3.0)	500 K
		Occucoat	HPMC (2.0)	86 K	4 K
			Hymecal	HPMC (2.0)	86 K
		Adatocel	HPMC (2.0)	86 K	4 K
		Visilon	HPMC (2.0)	86 K	4 K
		Ocuvis	HPMC (2.0)	90 K	4.3 K

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HPMC = Hydroxypropylmethylcellulose, **K** = Thousand, **M** = Million, **Da** = daltons, **NaHa** = Sodium Hyaluronate, **mPaS** = millipascal-seconds.

Note: The molecular weight of BD MultiVisc™ Viscoadaptive is calculated and averaged using a cross-link of both long and short molecular chain lengths of hyaluronic acid. Molecular weight and zero shear viscosity results can vary by testing methods. Bohus BioTech, BD MultiVisc molecular weight (Da) is 7.9M and zero shear viscosity (mPas) is 18.0M⁴

References:

1. Table 1 – Arshinoff S, Opalinski Y, Part 4, “The Lens, Ophthalmic Viscosurgical Devices”; *Ophthalmology Second Addition*; Yanoff M, Duker JS (eds) Mosby 2004: 333-334.
2. Figure 1 – Arshinoff S, *Using BSS with viscoadaptive in “The ultimate soft-shell technique”*, J Cataract Refract Surg Sept. 2002 28(9):1509-14
3. Arshinoff S, Wong E. *Understanding, retaining, and removing dispersive and pseudodispersive ophthalmic viscosurgical devices*. J Cataract Refrac Surg. Dec. 2003; 29(12):2318-23
4. Addendum Letter dated 24 January 2002 to Arshinoff S, *Using BSS with viscoadaptive in “The ultimate soft-shell technique”*, J Cataract Refract Surg Sept. 2002 28(9):1509-14 (Available on File)

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