

Angela McNamee provides an updated list of the latest dry eye preparations with a useful ingredients glossary



# Dry eye preparations: an update

**T**he original version of the table overleaf appeared in the July 2009 issue of *Dispensing Optics*, as part of the article: 'A drop of the wet stuff – part two'. The table proved particularly popular, as no such comprehensive resource existed, and many readers reported pulling it out to keep as a practice reference guide.

Here, in response to requests, the author has updated the table to encompass many new products – in a special 'pull out and keep' format. This time, all of the preparations included may be sold 'over the counter' and thus are available for all dispensing opticians and contact lens opticians to supply. The few products

which carry a Pharmacy 'P' classification have been omitted.

Also included this time is the ingredients glossary below, which covers not only preservatives and lubricants, but also most of the other ingredients/terms commonly found in dry eye preparations.

## Dry eye preparations glossary of ingredients and terms

- Aminomethylpropanol** *Buffer*.
- Benzalkonium chloride** Preservative.
- Bicarbonate** *Electrolyte*.
- Boric Acid** (Sodium borate) *Buffer*.
- Buffer** Maintains pH of solution.
- Calcium** *Electrolyte*.
- Carbomer** (Polyacrylic acid). *Viscoelastic* lubricant. Binds moisture to eye surface.
- Carboxymethylcellulose** (Sodium carboxymethylcellulose/Carmellose sodium) Low *viscosity* polymer lubricant.
- Chelating agent** Binds metals. Enhances activity of preservative.
- Cetrimide** Preservative
- Citrate** *Buffer*
- Dexpanthenol** Derivative of vitamin B5. Aids healing
- Dimyristoylphosphatidylglycerol** Polar *phospholipid* surfactant. Mimics polar lipids in the tear film. Decreases tear evaporation.
- EDTA** (Disodium edetate) *Chelating agent*.
- Electrolytes** Salts found naturally in tears, and added to dry eye preparations. Electrolytes contribute to osmolarity and act as *buffers*.
- Glycerin** Draws/binds water to cells. Also may act as an "osmoprotective", protecting the ocular surface from the effects of increased *osmolarity*.
- Hydroxypropyl guar** (HP-Guar) *Viscoelastic* lubricant, becoming more viscous when in contact with the eye, to form a gel-like network, which binds to the ocular surface.
- Hypotonic** Having a lower concentration than normal tears. Hypotonic solutions aim to reduce tear *osmolarity*. Increased osmolarity of tears is common in dry eye, and leads to drying of ocular surfaces, inflammation, and damage to goblet cells, meibomian glands and lacrimal gland.
- Hypromellose** (HPMC) Low *viscosity* polymer lubricant.
- Isotonic** Having the same concentration as normal tears.
- Liquid paraffin** High *viscosity* polymer lubricant.
- Magnesium** *Electrolyte*.
- Mineral oil** Lipid.
- Ocupure** *Vanishing preservative*. Breaks down into water and sodium chloride when exposed to light.
- Osmolarity** The measure of solute concentration per unit volume of solvent. In the context of tears, this could be described as a measure of how concentrated or "salty" they are.
- Oxyd** *Vanishing preservative*. Turns to water, oxygen and sodium chloride on contact with the eye.
- Phenoxyethanol** Used in spray preparations. A *vanishing preservative* which evaporates from the aerosol state.
- Phosphate** *Electrolyte*.
- Phospholipid** Stabilises the lipid layer of the tears.
- Polyethylene glycol** (PEG) Lubricant.
- Polyhexanide** (Polyhexamethylene biguanide/PHMB) Preservative.
- Polyquad** (Polidronium chloride/Polyquaternium 1) Preservative.
- Polyvinyl alcohol** (PVA) Low *viscosity* polymer lubricant.
- Potassium** *Electrolyte*.
- Povidone** (Polyvinylpyrrolidone/PVP) Low *viscosity* polymer lubricant.
- Propylene glycol** Lubricant.
- Purite** *Vanishing preservative*. Breaks down into water and sodium chloride when exposed to light.
- Sodium** *Electrolyte*.
- Sodium Hyaluronate** (Hyaluronic acid) *Viscoelastic* lubricant.
- Sorbitol** A sugar alcohol. Optimises *viscosity* to reduce blur on instillation.
- Soy bean oil** A source of *phospholipids*.
- Soy lecithin** Contains a *phospholipid*, to stabilise the lipid layer.
- Tonicity** The osmotic pressure gradient of two solutions (tears and cell contents) separated by a semi-permeable membrane (the cell membrane).
- Trehalose** A disaccharide, shown to protect corneal cells from desiccation and subsequent death.
- Triglycerides** Lipids
- Trometamol** *Buffer*
- Vanishing preservative** Preserves the product in the bottle but is not present in the eye.
- Viscoelastic** Lubricant becoming more viscous when the eye is open.
- Viscosity** In general, the higher the viscosity, the longer the product will remain in the eye, and the more likely it is to blur vision.
- Vitamin A** An antioxidant. May promote corneal healing.
- Vitamin B12** May protect from oxidative stress.
- Vitamin E** An antioxidant. May also help stabilise the lipid layer.
- White soft paraffin** High *viscosity* polymer lubricant.
- Xanthan gum** Polymer. Prolongs contact time of drop.
- Zinc-hyaluronate** Zinc bound to hyaluronic acid, forming a mechanical barrier. Zinc also acts as an antimicrobial, avoiding need for preservative.

PRODUCT	SUPPLIER	LUBRICANT	PRESERVATIVE	CL USE	DISCARD AFTER	NOTES
Artelac Rebalance	Bausch + Lomb	Sodium hyaluronate 0.15%, polyethylene glycol 8000 0.5%, (+vitamin B12)	Oxyd <sup>1</sup>	Yes	2 months	Aqueous/ general deficiency. Hypotonic
<b>Artelac Nighttime Gel</b>	<b>Bausch + Lomb</b>	<b>Carbomer 0.2%, triglycerides</b>	<b>Cetrimide</b>	<b>No</b>	<b>28 days</b>	<b>More severe dry eye/lipid deficiency. Day or night use.</b>
Blink Contacts Unit Dose	AMO	Sodium hyaluronate 0.15%	None	Yes	N/a	Aqueous/general deficiency
<b>Blink Contacts Multi-Dose</b>	<b>AMO</b>	<b>Sodium hyaluronate 0.15%</b>	<b>Ocupure 0.005%<sup>1</sup></b>	<b>Yes</b>	<b>45 days</b>	<b>Aqueous/general deficiency</b>
Blink Intensive Tears Unit Dose	AMO	Sodium hyaluronate 0.2%, polyethylene glycol 400 0.25%	None	Yes	N/a	Aqueous/ mucous deficiency
<b>Blink Intensive Tears Multi-Dose</b>	<b>AMO</b>	<b>Sodium hyaluronate 0.2%, polyethylene glycol 400</b>	<b>Ocupure 0.005%<sup>1</sup></b>	<b>Yes</b>	<b>45 days</b>	<b>Aqueous/ mucous deficiency</b>
Blink Intensive Tears Plus	AMO	Sodium hyaluronate 0.38%, polyethylene glycol 400 0.25%	Ocupure 0.005% <sup>1</sup>	See note <sup>3</sup>	45 days	Aqueous/mucous deficiency. More severe dry eye. Hypotonic
<b>Blink Refreshing Unit Dose</b>	<b>AMO</b>	<b>Polyvinyl alcohol 1.4%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Aqueous/mucous deficiency</b>
Blink Refreshing Multi-Dose	AMO	Polyvinyl alcohol 1.4%	Ocupure 0.005% <sup>1</sup>	Yes	45 days	For mild dry eye symptoms
<b>Clinitas Hydrate</b>	<b>Altacor</b>	<b>Carbomer 980 0.2%</b>	<b>Cetrimide</b>	<b>No</b>	<b>4 weeks</b>	<b>More severe dry eye or night use</b>
Clinitas Soothe Unit Dose	Altacor	Sodium hyaluronate 0.4%	None	Yes	N/a	Aqueous/general deficiency
<b>Emustil Unit Dose</b>	<b>Moorfields Pharmaceutical</b>	<b>Soybean oil 7%, natural phospholipids 3%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Lipid deficiency (MGD)</b>
Eye Logic Dry Eye Drops	Savant	Sodium hyaluronate 0.1%	None <sup>2</sup>	Yes	12 weeks	Aqueous/ general deficiency
<b>Eye Logic Spray Relief</b>	<b>Savant</b>	<b>Soy lecithin 1.0%, (+vitamins A &amp; E)</b>	<b>Phenoxyethanol 0.5%<sup>1</sup></b>	<b>Yes</b>	<b>6 months</b>	<b>Lipid deficiency (MGD)</b>
Eyezin	Moorfields Pharmaceutical	Zinc-hyaluronate 0.15%	None	See note <sup>4</sup>	4 weeks	Aqueous/ general deficiency
<b>Hyabak</b>	<b>Spectrum Thea</b>	<b>Sodium hyaluronate 0.15%</b>	<b>None<sup>2</sup></b>	<b>Yes</b>	<b>3 months</b>	<b>Aqueous/ general deficiency. Hypotonic</b>
Hyabak Unit Dose	Spectrum Thea	Sodium hyaluronate 0.15%	None	Yes	N/a	Aqueous/ general deficiency. Hypotonic
<b>Hycosan</b>	<b>Scope Ophthalmic</b>	<b>Sodium hyaluronate 0.1%</b>	<b>None<sup>2</sup></b>	<b>Yes</b>	<b>6 months</b>	<b>Mild aqueous/ general deficiency</b>
Hycosan Extra	Scope Ophthalmic	Sodium hyaluronate 0.2%	None <sup>2</sup>	Yes	6 months	Moderate aqueous/ General deficiency
<b>Hycosan Plus</b>	<b>Scope Ophthalmic</b>	<b>Sodium hyaluronate 0.1% (+dexpanthenol 2%)</b>	<b>None<sup>2</sup></b>	<b>Yes</b>	<b>6 months</b>	<b>Severe aqueous/ general deficiency or damage/injury</b>
Hydromoor Unit Dose	Moorfields Pharmaceutical	Hypromellose 0.3%	None	Yes	N/a	Aqueous/ general deficiency
<b>LacriFresh Comfort Drops</b>	<b>Avizor</b>	<b>Povidone 1%</b>	<b>Polyhexanide 0.0002%</b>	<b>Yes</b>	<b>60 days</b>	<b>CL rewetting drop</b>
LacriFresh Moisture Drops	Avizor	Sodium hyaluronate 0.1%	Polyhexanide 0.0001%	Yes	60 days	Aqueous/ general deficiency
<b>LacriFresh Moisture Drops Unit Dose</b>	<b>Avizor</b>	<b>Sodium hyaluronate 0.1%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Aqueous/ general deficiency.</b>
Lubristil Unit Dose	Moorfields Pharmaceutical	Sodium hyaluronate 0.15%	None	Yes	N/a	Aqueous/ general deficiency
<b>Lubristil Gel Unit Dose</b>	<b>Moorfields Pharmaceutical</b>	<b>Sodium hyaluronate 0.15%, xanthan gum 1%</b>	<b>None</b>	<b>No</b>	<b>N/a</b>	<b>Moderate- severe dry eye or night use</b>
Lubristil Gel Unit Dose	Moorfields Pharmaceutical	Sodium hyaluronate 0.15%, xanthan gum 1%	None	No	N/a	Moderate- severe dry eye or night use
<b>Lumecare Fast Acting Drops</b>	<b>Lumecare</b>	<b>Hypromellose 0.3%</b>	<b>Benzalkonium chloride</b>	<b>See note<sup>5</sup></b>	<b>28 days</b>	<b>Aqueous/ general deficiency</b>
Lumecare Long Lasting Gel	Lumecare	Carbomer 0.2%	Cetrimide	No	28 days	More severe dry eye or night use
<b>Lumecare Unit Dose</b>	<b>Lumecare</b>	<b>Hypromellose 0.3%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Aqueous/ general deficiency</b>
Ocusan Unit Dose	Agepha Pharma	Sodium hyaluronate 0.2%	None	Yes	N/a	Aqueous/ general deficiency
<b>Optive</b>	<b>Allergan</b>	<b>Carboxymethylcellulose 0.5%, glycerin 0.9%</b>	<b>Purite<sup>1</sup></b>	<b>Yes</b>	<b>6 months</b>	<b>Mucous/aqueous deficiency. Mild</b>
Optive Fusion	Allergan	Sodium hyaluronate 0.1%, carboxymethylcellulose 0.5%, glycerin 0.9%	Purite <sup>1</sup>	Yes	6 months	Mucous/aqueous deficiency. Moderate to severe
<b>Optive Plus</b>	<b>Allergan</b>	<b>Carboxymethylcellulose 0.5%, glycerin 1.0%, castor oil 0.25%</b>	<b>Purite<sup>1</sup></b>	<b>Yes</b>	<b>6 months</b>	<b>Moderate to severe dry eye. Supports all tear layers</b>

PRODUCT	SUPPLIER	LUBRICANT	PRESERVATIVE	CL USE	DISCARD AFTER	NOTES
Optrex Actimist 2-in-1 Spray Dry & Irritated	Optrex	Soy lecithin 1.0%, (+vitamins A & E)	Phenoxyethanol <sup>1</sup>	Yes	6 months	Lipid deficiency (MGD)
<b>Optrex Actimist 2-in-1 Spray Itchy &amp; Watery</b>	<b>Optrex</b>	<b>Soy lecithin 1.0%, (+vitamins A &amp; E)</b>	<b>Phenoxyethanol<sup>1</sup></b>	<b>Yes</b>	<b>6 months</b>	<b>Lipid deficiency (MGD)</b>
Optrex Actimist 2-in-1 Spray Tired & Uncomfortable	Optrex	Soy lecithin 1.0%, (+vitamins A & E)	Phenoxyethanol <sup>1</sup>	Yes	6 months	Lipid deficiency (MGD)
<b>Optrex Dry Eye Drops</b>	<b>Optrex</b>	<b>Sodium hyaluronate 0.15%</b>	<b>Oxyd<sup>1</sup></b>	<b>Yes</b>	<b>4 weeks</b>	<b>Aqueous/general deficiency</b>
Oxyl	Kestrel Ophthalmics	Sodium hyaluronate 0.1%, Protector ("filmogenous polymer")	Oxyd <sup>1</sup>	Yes	60 days	Aqueous/general deficiency. Hypotonic
<b>Refresh Contacts</b>	<b>Allergan</b>	<b>Sodiumcarboxymethylcellulose 0.5%</b>	<b>Purite<sup>1</sup></b>	<b>Yes</b>	<b>60 days</b>	<b>CL rewetting drop</b>
Refresh Contacts Unit Dose	Allergan	Sodiumcarboxymethylcellulose 0.5%	None	Yes	N/a	CL rewetting drop
<b>Refresh Soothe And Protect Unit Dose</b>	<b>Allergan</b>	<b>Sodiumcarboxymethylcellulose 1%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Mucous/aqueous deficiency</b>
Systane	Alcon	Hydroxypropyl guar, polyethylene glycol 400 0.4%, propylene glycol 0.3%	Polyquaternium-1 0.001%	See note <sup>6</sup>	6 months	Mucous/aqueous deficiency
<b>Systane Balance</b>	<b>Alcon</b>	<b>Propylene glycol 0.6%, hydroxypropyl guar, sorbitol, 'LipiTech' (dimyristoylphosphatidylglycerol + mineral oil)</b>	<b>Polyquaternium-1 0.001%</b>	<b>See note<sup>6</sup></b>	<b>6 months</b>	<b>Lipid deficiency (MGD)</b>
Systane Gel Drops	Alcon	Hydroxypropyl guar, polyethylene glycol 400 0.4%, propylene glycol 0.3%, sorbitol	Polyquaternium-1 0.001%	See note <sup>6</sup>	6 months	Mucous/aqueous deficiency. Moderate to severe. Day or night use
<b>Systane Ultra</b>	<b>Alcon</b>	<b>Hydroxypropyl guar, polyethylene glycol 400 0.4%, propylene glycol 0.3%, sorbitol</b>	<b>Polyquaternium-1 0.001%</b>	<b>Yes</b>	<b>6 months</b>	<b>Mucous/aqueous deficiency</b>
Systane Ultra Unit Dose	Alcon	Hydroxypropyl guar, polyethylene glycol 400 0.4%, propylene glycol 0.3%, sorbitol	None	Yes	N/a	Mucous/aqueous deficiency
<b>Systane Unit Dose</b>	<b>Alcon</b>	<b>Hydroxypropyl guar, polyethylene glycol 400 0.4%, propylene glycol 0.3%</b>	<b>None</b>	<b>See note<sup>6</sup></b>	<b>N/a</b>	<b>Mucous/aqueous deficiency</b>
Thealoz	Spectrum Thea	Trehalose 3%	None	Yes	8 weeks	Aqueous/general deficiency. Moderate to severe dry eye
<b>Theratears Lubricant Eye Drops Unit Dose</b>	<b>Matheson Optometrists</b>	<b>Sodiumcarboxymethylcellulose 0.25%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Mucous/aqueous deficiency. Hypotonic. Electrolyte balanced.</b>
Theratears Liquid Gel Unit Dose	Matheson Optometrists	Sodiumcarboxymethylcellulose 1%	None	Yes	N/a	Mucous/aqueous deficiency. Hypotonic. Electrolyte balanced. Day or night use
<b>Vismed Light</b>	<b>TRB Chemedica</b>	<b>Sodium hyaluronate 0.1%</b>	<b>Polyhexanide</b>	<b>Yes</b>	<b>3 months</b>	<b>Aqueous/general deficiency</b>
Vismed Multi	TRB Chemedica	Sodium hyaluronate 0.18%	None <sup>2</sup>	Yes	3 months	Aqueous/general deficiency. Hypotonic.
<b>Vismed Unit Dose</b>	<b>TRB Chemedica</b>	<b>Sodium hyaluronate 0.18%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Aqueous/general deficiency Hypotonic</b>
Vismed Gel Multi	TRB Chemedica	Sodium hyaluronate 0.3%	None <sup>2</sup>	Yes	3 months	Moderate to severe aqueous/general deficiency. Hypotonic
<b>Vismed Gel Unit Dose</b>	<b>TRB Chemedica</b>	<b>Sodium hyaluronate 0.3%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Moderate to severe aqueous/general deficiency. Hypotonic</b>
VitA-POS	Scope Ophthalmics	White soft paraffin, light liquid paraffin, liquid paraffin, wool fat (+vitamin A)	None	No	6 months	More severe dry eye. Night time use.
<b>Xailin Fresh Unit Dose</b>	<b>Nicox Pharma</b>	<b>Sodiumcarboxymethylcellulose 0.5%</b>	<b>None</b>	<b>Yes</b>	<b>N/a</b>	<b>Moderate aqueous/general deficiency</b>
Xailin Night	Nicox Pharma	White soft paraffin, white mineral oil, lanolin alcohol	None	No	28 days	More severe dry eye. Night time use.

1) Vanishing preservative; 2) Dispensing system prevents contamination of contents; 3) Remove CLs before use, reapply CLs when any blurring has cleared; 4) Not for use with ionic CL materials; 5) Wait 30 minutes before applying CLs; 6) Use before applying and after removing CLs