Innovative Biomaterials for Retinal Surgery

Ultrapure fluids and gases made in Germany

Geuder®
Precision made in Germany

FLUORON®
PURITY AND VARIETY

Content

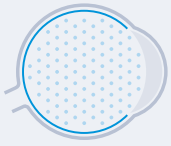
Products for ophthalmic surgery

G-81010 G-81015 G-81002

5 ml: G-803157 ml: G-80317
5 ml: G-803057 ml: G-80307

5 ml: G-801157 ml: G-80117
5 ml: G-801057 ml: G-80107

G-80950 G-80960 G-80970



Long-Term Tamponades

Silicone Oils

Long-Term Tamponades

Heavy Silicone Oils

Cleansing Fluids / WashOut

Optional Accessories

Fluoron

Brilliant Peel®

Heavy dye for selective staining of the ILM

- Precise and intense staining of the ILM due to fast sinking dye
- Safe application under air and BSS
- Quick and easy application (ready to use)
- Physiological osmolarity
- Biocompatible

Composition and properties

1 ml Brilliant Peel® contains:

- 0,25 mg Brilliant Blue G
- Disodium hydrogen phosphate ($Na_2HPO_4 \times 2\ H_2O$)
- Sodium dihydrogen phosphate ($NaH_2PO_4 \times 2\ H_2O$)
- Sodium chloride (NaCl)
- Deuterium oxide (D_2O)
- Water for injection purposes

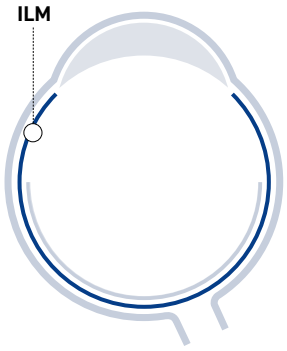
Density [g/cm³] at 25° C: 1.02
pH value in physiological range

Packaging units

G-81010 Brilliant Peel® Syringe
0.5 ml syringe, 5 pcs. per box, sterile

Fields of application

Brilliant Peel® was developed for specific staining of the internal limiting membrane (ILM). Specific staining of the ILM allows it to be clearly differentiated from the underlying retinal tissue and the epiretinal membranes. Due to the density of 1.02 g/cm³ Brilliant Peel® quickly sinks to to the fundus of the eye without diffuse dispersion in the whole bulbus. The surgically demanding removal of the ILM thus becomes easier and safer.



Comparison of Brilliant Blue G (BBG), Indocyanine Green (ICG) and Trypan Blue (TB) for Chromovitrectomy

	BBG	ICG	TB
Dye class (by chemical structure)	Triphenylmethane	Cyanine	Diazo
Color	blue	dark green	dark blue
Ready-to-use	yes	no	yes
Toxicity	no	yes	moderate
Affinity for ILM	high	high	low
Affinity for ERM	low	low	high
Exposure time	short	short	long
Liquid / Gas exchange necessary	no	no	yes

Farah ME, Maia M, Penha FM, Rodrigues EB (2016) The Use of Vit al Dyes during Vitreoretinal Surgery - Chromovitrectomy. Dev Ophthalmol. 55: 365-75

Testimonials Brilliant Peel®

"Our data underline the good biocompatibility of BBG and its applicability and safety for the use in humans. BBG provides a sufficient and selective staining of the ILM. No retinal toxicity related to BBG was observed in our animal study and our shortterm clinical investigation in humans."

Remy, M., S. Thaler, R. G. Schumann et al. 2008. "An in vivo evaluation of Brilliant Blue G in animals and humans" British Journal of Ophthalmology 92(8): 1142-1147.

"Heavy brilliant blue G (BBG-D_2O) provides a significantly improved staining effect of the ILM and by this makes ILM peeling more efficient, easier, faster and less traumatic."

Gerding, H., M. Timmermann and U. Thelen. 2011. "Intravital staining of the internal limiting membrane with a novel heavy solution of brilliant blue G." Klinische Monatsblätter für Augenheilkunde, 228(04): 298-301.

"Brilliant blue G D_2O dye comportment is convenient, as the dye sinks readily onto the retinal surface and dye dispersion to the remaining vitreous is reduced. Indications for dye-related toxicity or complications were not seen."

Henrich, P. B., C. Valmaggia, C. Lang, S. G. Priglinger, C. Haritoglou, R. W. Strauss and P. C. Cattin. 2013. "Contrast recognizability during Brilliant Blue G - and heavier-than-water Brilliant Blue G-assisted chromovitrectomy: a quantitative analysis." Acta Ophthalmologica 91(2): e120-124.

"Although the MH closure rate was the same using BBG or ICG for ILM peeling, visual acuity improvement was better in eyes peeled with BBG compared to eyes peeled with ICG."

Jenisch, T. M., F. Zeman, M. Koller, D. A. Märker, H. Helbig and W. A. Herrmann. 2017. "Macular hole surgery: An analysis of risk factors for the anatomical and functional outcomes with a special emphasis on the experience of the surgeon." Clinical Ophthalmology (Auckland NZ) 11: 1127–1134.

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Li SS, You R, Li M, Guo XX, Zhao L, Wang YL, Chen X. Internal limiting membrane peeling with different dyes in the surgery of idiopathic macular hole: a systematic review of literature and network meta-analysis. Int J Ophthalmol. 2019;12:1917-1928

Mao X, You Z, Cheng Y. Outcomes of 23G vitrectomy and internal limiting membrane peeling with brilliant blue in patients with myopic foveoschisis from a retrospective cohort study. Exp Ther Med. 2019;18:589-595

Martins D, Neves P. Epiretinal membrane negative staining and double peeling in a single block with Brilliant Blue G. Eur J Ophthalmol. 2018;28:112-116

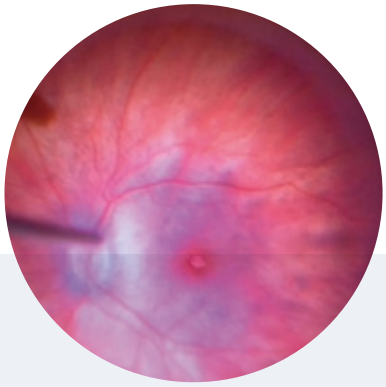
Rizzo S, Tartaro R, Barca F, Caporossi T, Bacherini D, Giansanti F. Internal limiting membrane peeling versus inverted flap technique for treatment of full-thickness macular holes: A comparative study in a large series of patients. Retina. 2018;38 Suppl 1:S73-S78

Totan Y, Güler E, Gürağaç FB, Uzun E, Doğdu E. Brilliant blue G assisted macular surgery: the effect of air infusion on contrast recognisability in internal limiting membrane peeling. Br J Ophthalmol. 2015;99:75-80

Brilliant Peel® Dual Dye

Non-toxic dual dye

Safer peeling due
to distinct staining
of the membrane



- Intense and selective staining of ILM and ERM
- Fast sinking – maximized contact surface with tissue due to higher density
- Safe application under air and BSS
- Quick and easy application (ready to use)
- Physiological osmolarity
- Biocompatible

Composition and properties

1 ml Brilliant Peel® Dual Dye contains:

- 0,25 mg Brilliant Blue G
- 1,3 mg Bromphenol Blue
- Disodium hydrogen phosphate ($Na_2HPO_4 \times 2\ H_2O$)
- Sodium dihydrogen phosphate ($NaH_2PO_4 \times 2\ H_2O$)
- Sodium chloride (NaCl)
- Deuterium oxide (D_2O)
- Water for injection purposes

Density [g/cm³] at 25° C: 1.03
pH value in physiological range

Packaging units

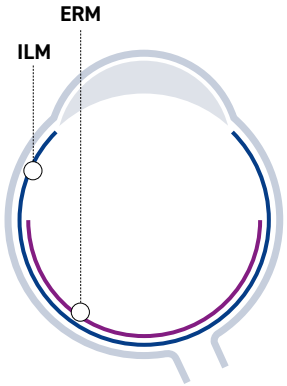
G-81015 Brilliant Peel® Dual Dye Syringe
0.5 ml syringe, 5 pcs. per box, sterile

Video

Scan QR-Code for
further information on
Brilliant Peel Dual Dye

Fields of application

Brilliant Peel® Dual Dye was developed for specific staining of the inner limiting membrane (ILM) and epiretinal membrane (ERM). Specific staining of the ILM and ERM allows them to be clearly distinguished from the underlying retinal tissue, thus making the challenging surgical removal of the ILM and ERM easier and safer. Due to the density of 1.03 g/cm^3 Brilliant Peel® Dual Dye quickly sinks to to the fundus of the eye without diffuse dispersion in the whole bulbus.



Comparision of Brilliant Blue G (BBG), Bromphenol Blue (BPB), Indocyanine Green (ICG), Trypan Blue (TB) and Lutein for Chromovitrectomy

	Brilliant Peel® Dual Dye	Other dyes		
	BBG & BPB	**ICG**	**TB**	**Lutein**
Dye class (by chemical structure)	Triphenylmethane	Cyanine	Diazo	Carotinoid
Color	violet-blue	green	blue	yellow-orange
Dyes	Brilliant Blue G & Bromphenol Blue	Indocyanine Green	Trypan Blue	Lutein
Toxicity	no	yes	moderate	no
Affinity for ILM	high	high	low	low
Affinity for ERM	high	low	high	n.a.
Exposure time	short	short	long	short
Liquid / Gas exchange	no	no	yes	no

Bergamo VC, Caiado RR, Maia A, Magalhães O Jr, Mor aes NSB, Rodrigues EB, Farah ME, Maia M (2020) Role of Vital Dyes in Chromovitrectomy. Asia Pac J Ophthalmol (Phila) 10: 26-38

Testimonials Brilliant Peel® Dual Dye

”Excellent staining of pre-retinal membranes and vitreous remnants.“

Senior Consultant Jürgen Steinhauer, MD University Eye Clinic Witten / Herdecke, County Hospital Hagen, St.-Josefs-Hospital, Germany

”Outstanding staining properties and an impressing sinking behavior makes Brilliant Peel Dual Dye the perfect tool for a save peeling in epiretinal macular procedures. Flawless for a fast and reliable multiple staining of different membrane parts.“

Prof. Dr. Lars-Olof Hattenbach, Director of Eye Clinic Ludwigshafen, Germany

”Even under yellow UV-IOL the shape of the retinal nerve fiber layer (RNFL) on the ILM was perfectly visible. A highly promising new dye with excellent sinking properties.“

A. Viestenz MD, University Clinic of Saarland, Homburg, Germany

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Gerding H. A Short review on the safety of bromphenol blue for dye-assisted vitreoretinal interventions. Klin Monbl Augenheilkd. 2020;237:441-445

Guber J, Pereni I, Scholl HPN, Guber I, Haynes RJ. Outcomes after epiretinal membrane surgery with or without internal limiting membrane peeling. Ophthalmol Ther. 2019;8:297-30

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Haritoglou C, Strauss R, Priglinger SG, Kreutzer T, Kampik A. Delineation of the vitreous and posterior hyaloid using bromophenol blue. Retina. 2008;28:333-339

Vioron®

Versatile trypan blue dye for the anterior segment

- Brilliant visualization of the anterior lens capsule
- Excellent distinction of the capsulorhexis margin
- Quick and easy application (ready to use)
- Approved for DMEK

Composition and properties

1 ml Vioron® contains:

- 0,6 mg trypan blue
- Disodium hydrogen phosphate ($Na_2HPO_4 \times 2\ H_2O$)
- Sodium dihydrogen phosphate ($NaH_2PO_4 \times 2\ H_2O$)
- Sodium chloride (NaCl)
- Water for injection purposes

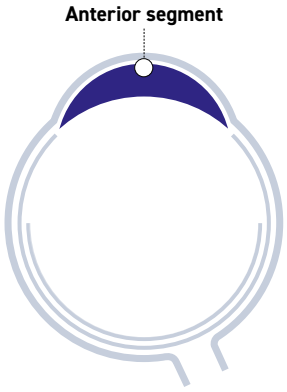
Density [g/cm³] at 25° C: 1.00
pH value in physiological range

Packaging units

G-81002 Vioron® Syringe
0.5 ml syringe, 5 pcs. per box, sterile

Fields of application

Vioron® was developed for ophthalmic surgical procedures in the anterior segment of the eye such as cataract operations or keratoplasties. Staining the anterior lens capsule makes it more visible, thus facilitating capsulorhexis and minimizing the risk of tearing. Furthermore, Vioron® facilitates the preparation and transfer of the donor cornea in the case of lamellar corneal transplantations and the removal of the diseased Descemet's membrane in case of DMEK and DS(A)EK).



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Price MO, Gupta P, Lass J, Price FW Jr. EK (DLEK, DSEK, DMEK): New frontier in cornea surgery. Annu Rev Vis Sci. 2017;3:69-90

Capsulorhexis

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Kayıkçıoğlu ÖR, Mayalı H, Doğruya S, Alp Ş, Yılmazlar AA, Kurt E. Unintentional staining of the anterior vitreous with trypan blue during cataract surgery. Turk J Ophthalmol. 2020;50:308-312

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Nagashima T, Yuda K, Hayashi T. Comparison of trypan blue and brilliant blue G for staining of the anterior lens capsule during cataract surgery: short-term results. Int Ophthalmol. 2019;39:33-39

F-Octane F-Decalin

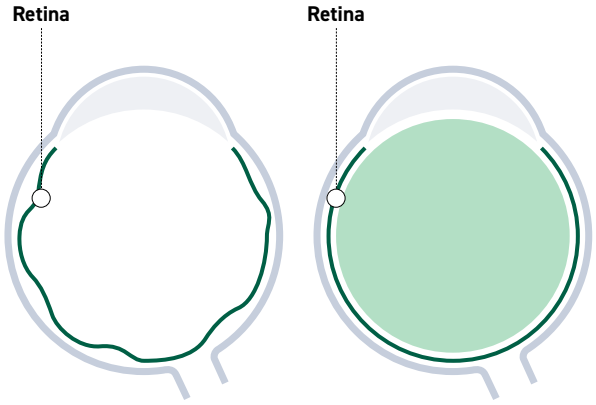
Ultrapure perfluorocarbons for intraoperative tamponades

- Gentle retinal unfolding and stabilization
- Drainage of subretinal fluids
- Refloating luxated lenses
- Short-term tamponade
- Outstanding stability and biocompatibility
- Ready-to-use syringes
- Highly purified

Packaging units		F-Octane	F-Decalin
	Syringe 5 ml	G-80315	G-80115
	Syringe 7 ml	G-80317	G-80117
	Vial 5 ml	G-80305	G-80105
	Vial 7 ml	G-80307	G-80107

Field of application

F-Octane and F-Decalin are used as medical adjuvants for gentle retinal unfoldings, giant tears, traumata, laser coagulation as well as cryotherapy. Furthermore, they are used for refloating luxated lenses and as short-term tamponades.



Composition and properties

F-Octane and F-Decalin are sterile fluorocarbon compounds with high density (1.76 g/cm³ and 1.93 g/cm³). They only consist of C-C and C-F bonds and do not contain any relevant amounts of biologically active components. Due to the exceptional strength of the C-F bonds, F-Octane and F-Decalin are chemically and physiologically inert and absolutely non-toxic.

	F-Octane	F-Decalin
Density [g/cm³] at 25° C	1.76	1.93
Vapor pressure [mbar] at 25° C	18.5	8.0
Refractive index at 20° C	1.2700	1.3110
Surface tension [mN/m] at 25° C	14.0	19.0
Interface tension [mN/m] at 25° C	55.0	57.8
Composition	completely fluorinated perfluorooctan (PFO)	completely fluorinated perfluorodecalin (PFD)
Cytotoxicity according to ISO 10993-5	not cytotoxic	not cytotoxic

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Fukumoto M, Nishida Y, Kida T, Sato T, Kobayashi T, Ikeda T. A case of silicone oil adhered to the retinal surface via perfluorocarbon liquid. BMC Ophthalmol. 2018;18:82.

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EasyGas®

First ready-to-use gas tamponade

- Quick and easy application through sterile, pre-filled system
- Sterile gas
- Safe usage because of precise, non-expanding mixture ratio
- No mix-up of gases due to colour coding
- Three gases for different tamponade durations
- Reduced risk for hypertension or ischemia, because manual mixing is not required
- Contains patient information card and patient wristband

Packaging units

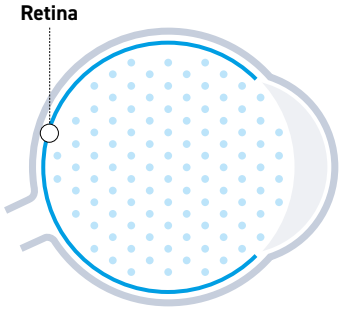
G-80950 EasyGas® SF6
Syringe 40 ml, sterile

G-80960 EasyGas® C2F6
Syringe 40 ml, sterile

G-80970 EasyGas® C3F8
Syringe 40 ml, sterile

Fields of application

EasyGas® SF_6, EasyGas® C_2F_6 and EasyGas® C_3F_8 are the first ready-to-use gas tamponades. The sterile, pre-filled, ready-to-use system offers a quick and easy application of the tamponades. EasyGas® is used as long-term tamponade after operative treatment of severe retinal detachment.



	EasyGas® SF6	EasyGas® C2F6	EasyGas® C3F8
Effective tamponade time [days]	6	15	30
Retention time / longevity [weeks]	1 – 2	4 – 5	6 – 8
Non-expansive gas concentration* [%]	20	16	12

Composition and properties

	EasyGas® SF6	EasyGas® C2F6	EasyGas® C3F8
Composition	20 % SF_6 80 % synthetic air	16 % C_2F_6 84 % synthetic air	12 % C_3F_8 88 % synthetic air
Purity of gas	› 99.99 %	› 99.99 %	› 99.99 %

References

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Hecht I, Mimouni M, Blumenthal EZ, Barak Y. Sulfur hexafluoride (SF6) versus perfluoropropane (C3F8) in the intraoperative management of macular holes: A systematic review and meta-analysis. J Ophthalmol. 2019:1820850

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Siluron®

Next generation of silicone oils with innovative molecular design

- High resistance to emulsification
- Short injection time
- Good long-term tolerability
- Excellent chemical purity

Siluron® 2000

The premium silicone oil with the customized extensional viscosity

Siluron® XTRA

The premium silicone oil with an Xtra portion of elasticity

The next generation of Siluron® silicone oils is characterized by its special property of a significantly higher emulsification resistance. This is based on an intelligent mixture of different chain lengths of molecules and the resulting extensional viscosity. Good injectability in cases of small incisions is a further advantage of these innovative silicone oils.

Packaging units

G-80740 Siluron® 2000 Syringe
10 ml, sterile

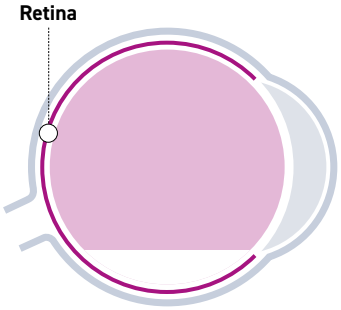
G-80750 Siluron® Xtra Syringe
10 ml, sterile

Fields of application

Siluron® silicone oils are used as long-term tamponades after operative treatment of severe retinal detachment, particularly for:

- Retinal detachments with giant tears
- Retinal detachments with proliferative vitreoretinopathy (PVR)
- Retinal detachments in cases of proliferative diabetic retinopathy (PDR)
- Traumatic retinal detachments

Due to their specific density of 0.97g/cm³ the Siluron® silicone oils float on water.



Standard silicone oils also available in vials

Good long-term tolerability

Excellent chemical purity

Chemically and physiologically inert

Siluron® 1000
Easily injectable

Siluron® 5000
High resistance to emulsification

Packaging units

G-80720 Siluron® 1000 Syringe 10 ml, sterile
G-80820 Siluron® 5000 Syringe 10 ml, sterile

G-80710 Siluron® 1000 Vial 10 ml, sterile
G-80810 Siluron® 5000 Vial 10 ml, sterile

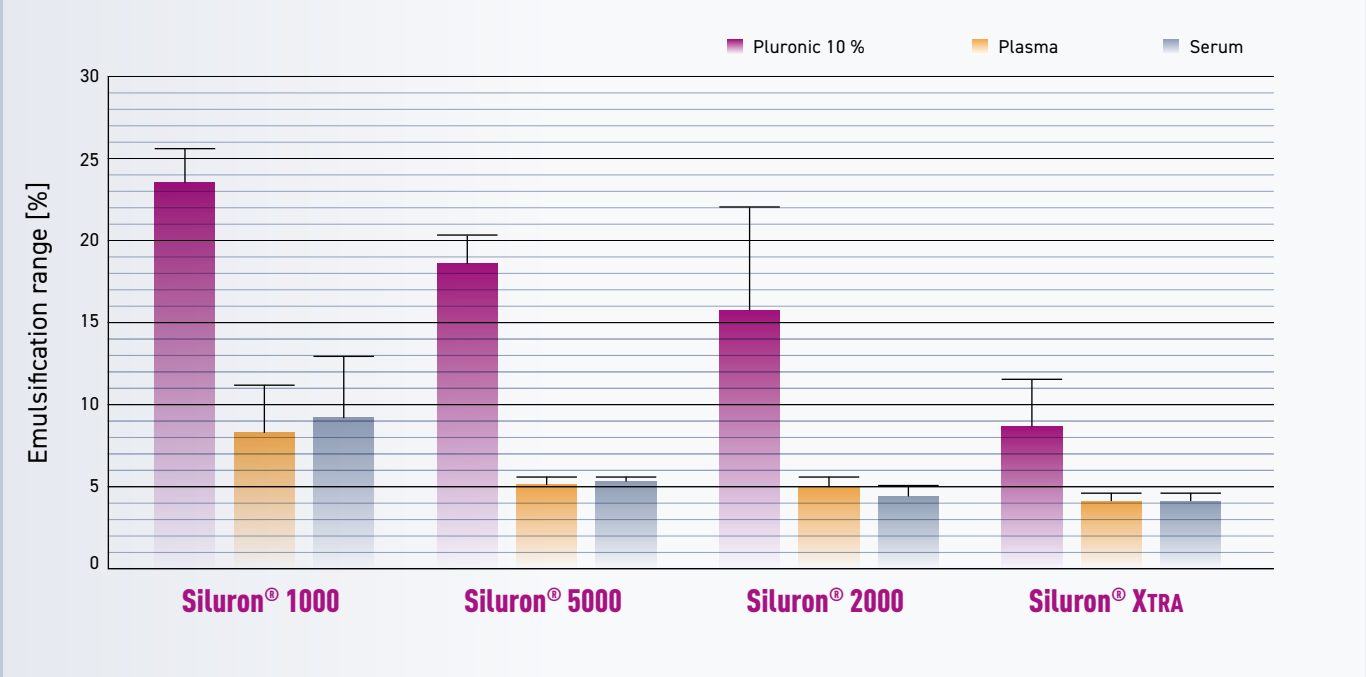
Overview of Siluron® Oils

Physicochemical properties

Property	Siluron® 1000	Siluron® 5000	Siluron® 2000	Siluron® Xtra
Density [g/cm³] at 25° C	0.97	0.97	0.97	0.97
Viscosity [mPas] at 25° C	900 - 1200	4800 - 5500	2000 - 2400	4100 - 4800
Refractive index	1.404	1.404	1.404	1.404
Solubility in water	non miscible	non miscible	non miscible	non miscible
Composition [w%]	100% Polydi-methylsiloxane (PDMS)	100% Polydi-methylsiloxane (PDMS)	95% Siluron® 1000 + 5% PDMS (2.5 M mPas)	90% Siluron® 1000 + 10% PDMS (2.5 M mPas)
Volatile components (200° C, 24 h) [%]	⩽ 0.2%	⩽ 0.2%	⩽ 0.2%	⩽ 0.2%

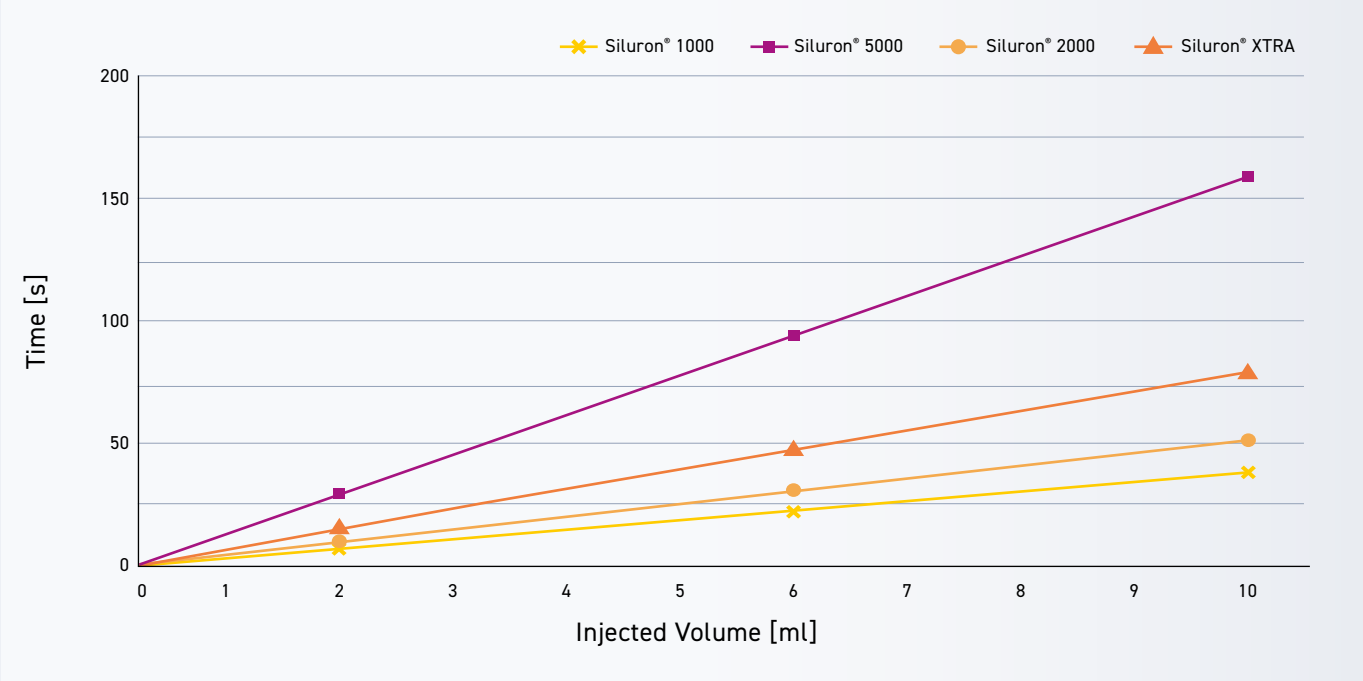
Caramoy A., Hagedorn N., Fauser S., Kugler W., Gross T., Kirchhof B.: Development of emulsification-resistant silicone oils: can we go beyond 2000 mPas silicone oil? Invest Ophthalmol Vis Sci. 2011; 52: 5432-5436

Comparison of emulsification



Caramoy A., Hagedorn N., Fauser S., Kugler W., Gross T., Kirchhof B.: Development of emulsification-resistant silicone oils: can we go beyond 2000 mPas silicone oil? Invest Ophthalmol Vis Sci 2011; 52: 5432-5436

Comparison of injection time



Geuder AG test measurement with 6 bar injection pressure and 20 gauge single-use VFI Cannula (G-34493)

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Densiron® Xtra

Heavy silicone oil with molecular design

- Unique moleculary design
- Heavier than water
- Ideal for inferior pathologies
- Removing proliferative milieu in lower part of retina ("shift up")
- Avoiding unpleasant constraints for patient ("head-down-position")
- Easy to inject
- 25G compatible
- High resistance to emulsification

Composition and properties

Density [g/cm³] at 25° C: 1.06
Viscosity [mPas] at 25° C: 1.000 – 1.400
Composition [w%]:
30.5 % F6H8®
69.5 % Siluron® Xtra
pH value in physiological range

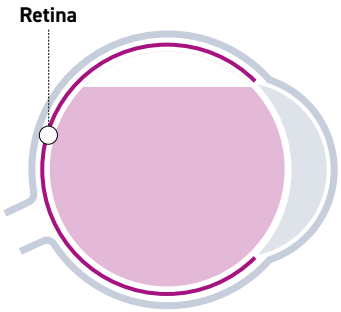
Packaging unit

G-80925 Densiron® Xtra Syringe
10 ml syringe, 1 pc. per box, sterile

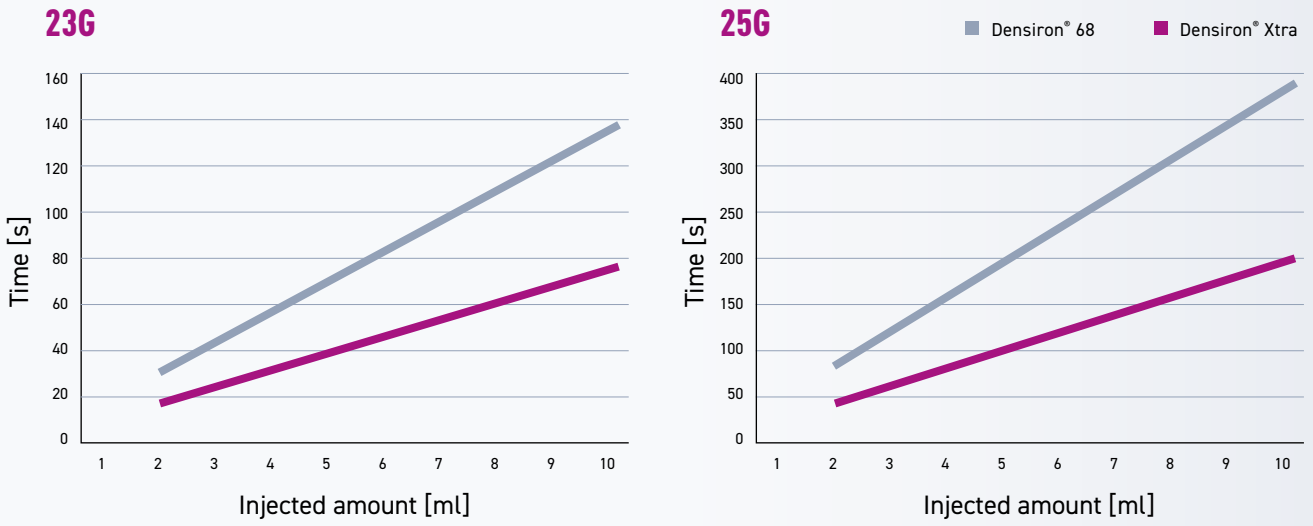
Fields of application

Densiron® Xtra is used as a intraocular tamponade after operative treatment of severe retinal detachment, particularly for:

- Inferior and posterior retinal holes
- Retinal detachments with giant tears
- Retinal detachments with proliferative vitreoretinopathy (PVR)
- Retinal detachments in cases of proliferative diabetic retinopathy (PDR)
- Traumatic retinal detachments

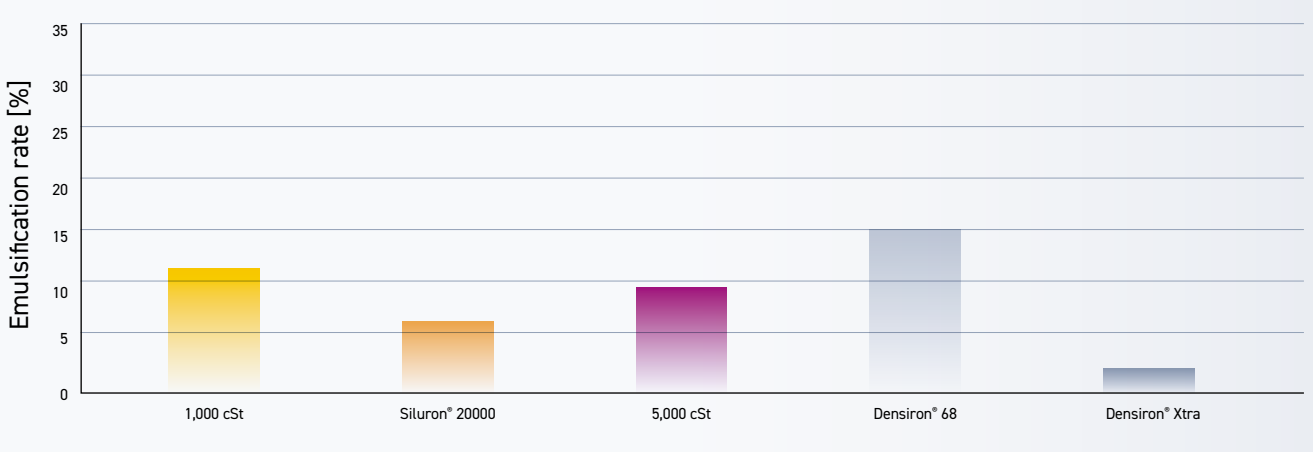


Comparison of injection time Densiron® Xtra vs. Densiron® 68



Geuder AG test measurement with 6 bar injection pressure and single-use VFI Cannula 23 gauge (G-34494) und 25 gauge (G-34495)

In vitro emulsification of various silicone oils when using plasma as emulsifier



Caramoy A, Schröder S, Fauser S, Kirchhof B (2010) In vitro emulsification assessment of new silicone oils. Br J Ophthalmol 94, 509-512

Testimonials Densiron® Xtra

"Temporal inverted ILM flap technique combined with heavy silicone oil (Densiron Xtra) for macular detachment associated with ODP is a highly effective alternative technique. This procedure achieved very rapid resolution of the submacular fluid with successful anatomical and functional results."

Oncel, M: A Novel Approach for the Management of Macular Detachment Associated with Optic Disc Pit: Temporal Inverted Internal Limiting Membrane Flap Technique and a New Heavy Silicone Oil (Densiron Xtra)

Prof. Francesco Boscia
MD, Associate Professor and Chair at the Department of Ophthalmology at the Sassari University, Sassari, Sardegna (IT)

Which are the key pathologies and why?

"As tamponade in recurrent inferior rhegmatogenous retinal detachment, especially if complicated by severe proliferative vitreoretinopathy."

What features do you like most?

"It can effectively tamponade inferior retina with the patient standing upright (...). I routinely use 25G system and I never met any trouble in injecting and aspirating Densiron Xtra."

What is your conclusion about Densiron Xtra?

"It's an essential surgical tool for every vitreoretinal surgeon who needs to face with complex pathologies. It is effective in tamponing and stabilising the inferior retina and safe at the same time."

Dr. Vignesh Raja
Joondalup Eye Clinic
and Perth Eye Hospital
Perth, Australia

Which are the key pathologies and why?

"I prefer to use Densiron Xtra for pathologies such as persistent macular hole, inferior retinal detachment with PVR, inability to posture face down, recurrent and chronic retinal detachment that need long term silicone oil endotamponade."

What features do you like most?

"I like Densiron Xtra because of its heavier than water property, low risk of emulsification and low risk of developing retinal/macular toxicity. Removal of Densiron is straight forward (with the correct technique) with low risk of residual silicone oil bubbles."

What is your conclusion about Densiron Xtra?

"Densiron Xtra adds to my retinal armamentarium and is my preferred agent for endotamponade in challenging and complicated cases. "

Dr. Theodor Stappler
Médecin adjoint, Unité de chirurgie vitréorétinienne, Hôpital ophtalmique Jules-Gonin, Lausanne (CH)

Which are the key pathologies and why?

"The treatment of inferior proliferation in recurrent retinal detachment (...) to exclude the aqueous environment containing cytokines and proliferative agents entirely from the retinal area which had just been treated."

What features do you like most?

"I can use Densrion Xtra irrespective of the gauge. The process of injection and removal has stopped being lengthy and arduous."

What is your conclusion about Densiron Xtra?

"Easy to inject and aspirate, decreased emulsification rate, yet heavy tamponade agent."

Dr. Andreas Kölbl
Ophthalmic Specialist,
Ophthalmic Private Practice, Eggenburg (AT)

Which are the key pathologies and why?

"Mainly for complicated retinal detachements (PVR) with tear formation and tensions in the inferior segment, also for tractions due to diabetic retinopathy and I'm happy with the results."

What features do you like most?

"The comparable low viscosity and hence the excellent injectability even via 25G sytems (...)."

What is your conclusion about Densiron Xtra?

"I use Densiron Xtra because I feel more secure in complicated retinal detachements with pathologies in the inferior segment for elderly patients for whom correct patient positioning cannot be guaranteed."

Dr. Antonio Palomino Muñoz
Oftalmologo, Hospital Quiron San Jose, Madrid (ES)

Which are the key pathologies and why?

"We use it in all retinal surgery in which are predisposing factors for PVR."

What features do you like most?

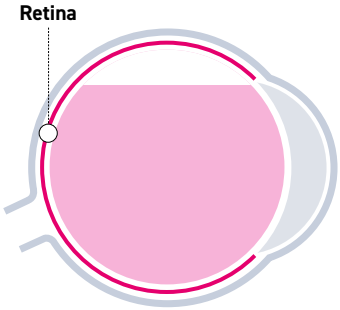
"The quality that I appreciate most is the ease of injection, even with 25G. Also its intraocular tolerance and stability against emulsification is apreciable."

What is your conclusion about Densiron Xtra?

"These referred qualities make Densiron Xtra an important ally in complex vitreoretinal surgery improving its prognosis."

Densiron® 68

"Heavier-than-water" endotamponade with exceptional features



- High density of 1.06 g/cm³ for efficient tamponade of lower retina
- Purely physical mix of two thoroughly researched and CE-certified liquid implants (F6H8® and Siluron® 5000)
- Medium viscosity of 1400 mPas
- Easy application and removal of endotamponade
- High storage stability even at low temperatures (no phase separation down to 2°C)
- Reliable and successful in clinical applications for more than 10 years

Composition and properties

Density [g/cm³] at 25° C: 1.06
Viscosity [mPas] at 25° C: 1.400
Composition [w%]:
30.5 % F6H8®
69.5 % Siluron® 5000
pH value in physiological range

Packaging units

G-80920 Densiron® 68 Syringe
10 ml syringe, 1 pc. per box, sterile

G-80910 Densiron® 68 Vial
10 ml vial, 1 pc. per box, sterile

References

Caporossi T, Franco F, Finocchio L, Barca F, Giansanti F, Tartaro R, Virgili G, Rizzo S. Densiron 68 heavy silicone oil in the management of inferior retinal detachment recurrence: analysis on functional and anatomical outcomes and complications. Int J Ophthalmol. 2019;12:615-620

Cillino S, Cillino G, Ferraro LL, Casuccio A. Treatment of persistently open macular holes with heavy silicone oil (Densiron 68) versus C2F6. A prospective randomized study. Retina. 2016;36:688-694

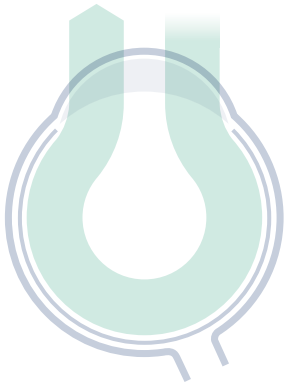
Hostovsky A, Mandelcorn MS, Mandelcorn ED. Transient macular thinning during the use of heavy silicone oil, Densiron 68. Curr Eye Res. 2021;46:350-354

Keilani C, Augstburger E, Robin M, Beaugrand A, Ores R, Sahel JA, Ayello-Scheer S. Comparative biochemical outcomes, effectiveness and tolerance of Densiron 68 and Oxane HD for the management of complicated retinal detachment. Turk J Ophthalmol. 2019;49:334-341

Mishra S, Wadhwani M, Kumar A, Chauhan R. Outcome of pediatric retinal detachment using high-density silicone oil. Int Ophthalmol. 2021;41:575-580

F4H5® WashOut

The simple solution for oil residues in vitreoretinal surgery



- Unique amphiphilic properties
- Solves silicone oil efficiently
- Removes silcone oil residues and "sticky oil"
- Rinses silicone oil-polluted IOL
- Biocompatible

Also available with suitable syringe in a procedure pack

Composition and properties

Density [g/cm³] at 25° C: 1.28
Viscosity [mPas] at 25° C: 1.05
Mix ratio F4H5® : Silicone oil:
Mix in all ratios

Packaging units

G-80615 F4H5® WashOut Vial
5 ml vial, 1 pc. per box, sterile

G-80616 F4H5® WashOut Procedure Pack
consists of:
- G-80615 F4H5 WashOut, 5 ml vial, sterile
- G-62.4717 single-use syringe, 5 ml, Luer-Lock, sterile

Anwendungsgebiete

F4H5® WashOut is a biocompatible solvent for removing silicone oil residues from the retina and for cleaning intraocular lenses after silicone oil tamponades.

Video

Scan QR-Code for further information on F4H5® WashOut

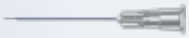
References

Coppola M, Del Turco C, Querques G, Bandello F. Perfluorobutylpentane (F4H5) solvent-assisted silicone oil removal technique. Retina. 2017;37:793-795 | Stalmans P, Pinxten AM, Wong DS. Cohort safety and efficacy study of Siluron 2000 emulsification-resistant silicone oil and F4H5 in the treatment of full-thickness macular hole. Retina. 2015;35:2558-2566 | Stappler T, Williams RL, Wong D. F4H5 - A novel substance for the removal of silicone oil from intraocular lenses. Br J Ophthalmol. 2010;94:364-367 | Wenzel DA, Kunzmann BC, Druchkiv V, Hellwinkel O, Spitzer MS, Schultheiss M. Effects of perfluorobutylpentane (F4H5) on corneal endothelial cells. Curr Eye Res. 2019;44:823-831

Optional Accessories

for PFCL

G-33057
CHANG
PFCL CANNULA
for injection of heavy fluids
dual bore, coaxial
25 gauge / 0.5 mm tip
20 gauge / 0.9 mm shaft



G-34285
SINGLE-USE PFCL CANNULA
for injection of heavy fluids
dual bore, coaxial
23 gauge / 0.64 mm
10 pcs. per box, sterile

SINGLE-USE
BACKFLUSH CANNULA
with silicone brush
5 pcs. per box, sterile
G-34293 20 gauge / 0.9 mm
G-34294 23 gauge / 0.6 mm
G-34297 25 gauge / 0.5 mm

G-37002
BACKFLUSH HANDPIECE
with silicone chamber and
Luer-Lock connector

G-34289
SINGLE-USE
BACKFLUSH HANDPIECE
with silicone chamber, Luer-Lock
10 pcs. per box, sterile

SINGLE-USE
BACKFLUSH CANNULA
blunt tip
5 pcs. per box, sterile
G-34291 20 gauge / 0.9 mm
G-34296 23 gauge / 0.6 mm
G-34299 25 gauge / 0.5 mm

for EasyGas®

G-80975
SINGLE-USE INJECTION CANNULA
for EasyGas®
30 gauge / 0.3 x 12 mm
100 pcs. per box, sterile

G-34492
KIRCHHOF
SINGLE-USE INJECTION CANNULA
for gas / viscous fluids
5.0 mm beveled tip
with 4 infusion side ports
2 metal sleeves, Luer-Lock plastic
adapter and 40 cm silicone tube
20 gauge / 0.9 mm
10 pcs. per box, sterile

for silicone oils

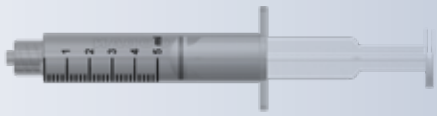
HEIDELBERG MODEL
CANNULA
for injection or aspiration
of viscous fluids
and Densiron® 68, bevel 30°
G-32699 19 gauge / 1.1 mm
G-32698 18 gauge / 1.2 mm

G-33056
ROIDER
ASPIRATION CANNULA
for viscous fluids
0.7 mm side port
19 gauge / 1.0 mm

SINGLE-USE VFI CANNULA
for silicone oil injection/aspiration
polyimide tip 6 mm, thin-walled
10 pcs. per box, sterile
G-34493 20 gauge / 0.9 mm
G-34494 23 gauge / 0.6 mm
G-34495 25 gauge / 0.5 mm
G-34496 27 gauge / 0.4 mm

HAMBURG MODEL
INJECTION CANNULA
for viscous fluids
25 cm silicone tube with metal sleeve
and Luer-Lock adapter
3 spare silicone tubes
G-33470 20 gauge / 0.9 mm,
beveled, 4 mm
G-33471 20 gauge / 0.9 mm,
beveled, 5 mm
G-33472 20 gauge / 0.9 mm,
beveled, 6 mm
G-33473 23 gauge / 0.6 mm,
beveled, 4 mm
G-33474 23 gauge / 0.6 mm,
beveled, 6 mm

SINGLE-USE INJECTION CANNULA
for viscous fluids
with 1 metal sleeve, Luer-Lock
plastic adapter
and 25 cm PVC tube
20 gauge / 0.9 mm
5 pcs. per box, sterile
G-33488 beveled tip, 4.0 mm
G-33489 beveled tip, 6.0 mm



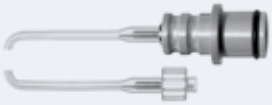
G-62.4717
SINGLE-USE SYRINGE, 5 ML
Luer Lock, scale 0.2
100 pcs., sterile
CE 0543

Optional Accessories

for silicone oils

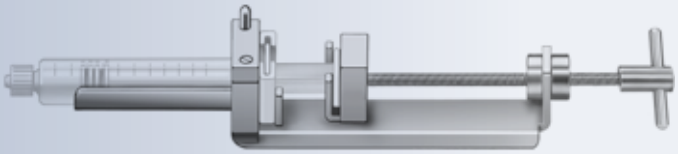
G-32697
PRESSURE TUBE
(reusable)
for injection of viscous fluids
Luer-Lock female / male

G-32696
SINGLE-USE PRESSURE TUBE
for injection of viscous fluid,
Luer-Lock female / male
10 pcs. per box, sterile



STOPPER
for viscous fluid aspiration
with tube connection for single-use syringe
G-33065 10 ml syringe
G-33066 20 ml syringe

G-28766
SINGLE-USE OIL INJECTION SYSTEM
to inject silicone oil pneumatically, with protective cover for glass syringe, pressure tube fits megaTRON® S3 / S4 HPS and Pentasys®**, sterile
(G-28767 for megaTRON® and Accurus®, G-28768 for Millennium®)*



G-28752
SYRINGE HOLDER
for manual injection of
viscous fluids in glass syringes,
with clamp and retraction mechanism

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„Pentasys®“ is a registered trademark of Fritz RUCK Ophthalmologische Systeme GmbH
„ACCURUS®“ is a registered trademark of Alcon Laboratories, Inc.
„Millennium®“ is a registered trademark of MBI Millennium Biomedical, Inc.

Fluoron

Purity and Variety Made in Germany

Fluoron GmbH, based in Ulm, Germany, was founded in 1996 by Prof. Dr. Hasso Meinert and is a sister company of Geuder AG, Heidelberg. With his intellectual property rights, Prof. Meinert laid the foundation for a successful development of the company and accompanied Fluoron GmbH over 10 years on scientific topics. The company is managed by Mr Volker Geuder.

Fluoron GmbH develops and manufactures ultrapure innovative biomaterials for retinal and cataract surgery. In this field, Fluoron GmbH plays a worldwide leading role in providing ophthalmic surgeons with creative and efficient solutions and consolidated its international competitive position by acquiring extensive intellectual property rights. The company's competence focuses on the development, manufacture and regulatory approval of light and heavy tamponades for retinal surgery, perfluorohydrocarbons and semifluorinated alkanes as temporary tamponades, as well as dyes for anterior and posterior segment surgery.

CE 2797

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