Kerecis®

Kerecis® Omega3 MariGen™

Intact fish-skin grafts
for tissue regeneration

About MariGen™

Kerecis Omega3 MariGen is intact fish skin used to support tissue regeneration and healing chronic wounds. MariGen products have successfully treated countless number of patients around the world. The fish-skin grafts have prevented many amputations, helping improve the patients' quality of life[7] and potentially increasing their life spans.

Kerecis® Omega3 Technology

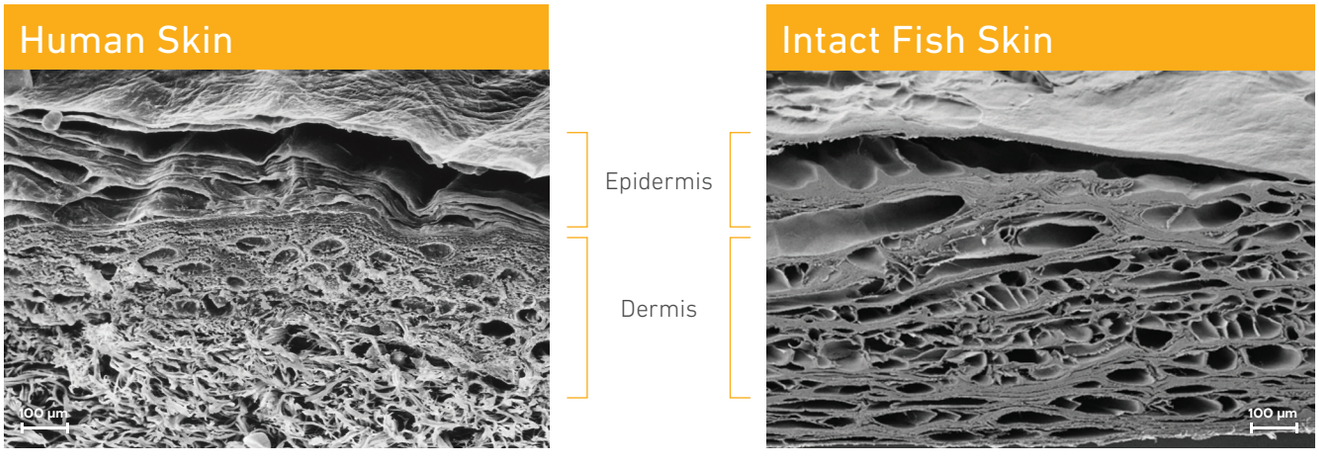
Kerecis Omega3 MariGen is intact fish skin that is homologous to human[1] skin, used for tissue regeneration and grafting.[2] Kerecis® Omega3 MariGen is FDA approved and CE marked for multiple clinical applications.

Because there is no risk of a viral disease transfer from Atlantic cod to humans, the fish skin needs only mild processing for medical use and maintains its natural structure and elements, including Omega3 fatty acids.[3,4]

When grafted onto damaged human tissue, such as a burn or a wound, the fish skin recruits the body's own cells, supporting its ability to regenerate.[2]

The superior clinical and economic performance of Kerecis Omega3 MariGen has been demonstrated in three blinded, randomized, controlled clinical trials[2,5,6] and in numerous other clinical studies.[7,8,12-16]

Kerecis Omega3 MariGen is Homologous to Human Skin



Scanned electron microscopy images of human skin (left) and Kerecis® Omega3 MariGen (right) show the structural similarities between the skin types.

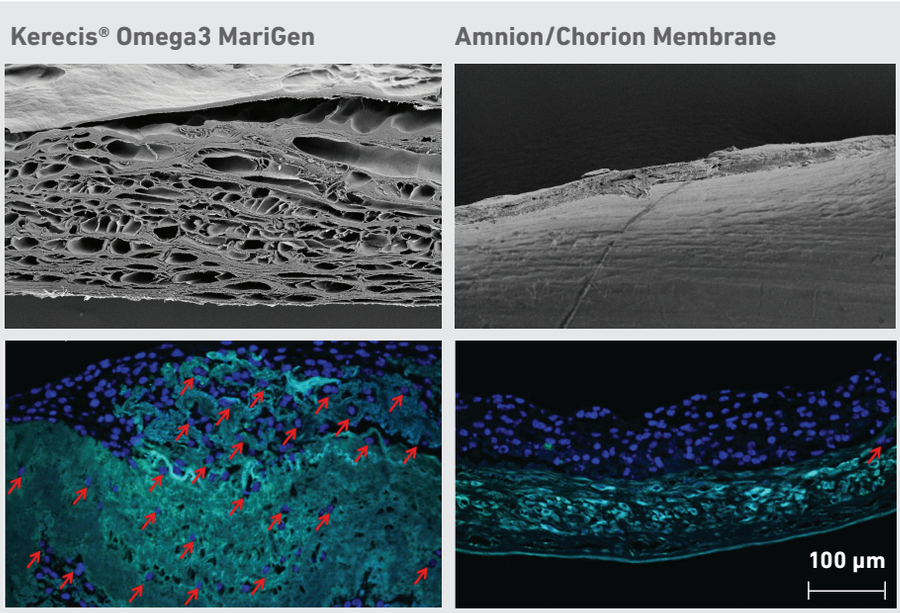
Product Features

- Easy to Apply[9]
- Homologous to Human Skin[1]
- Improved Wound Closure Rates[4,5,6]
- Better Functional Outcome[17]
- No Chemical Cross-linking[1]
- Dermal and Epidermal Layers Intact[1]
- Natural Microbial Barrier and Wound Cover[2,3,4]
- Strong, Robust and Conforms to the Wound Bed[1]
- Three-dimensional Structure and Natural Porosity Preserved[1]

Early Cellular Ingrowth

The **Kerecis® Omega3 MariGen** intact fish skin graft facilitates significantly more three dimensional cellular ingrowth than in amnion/chorion tissue. The fish skin is thicker, and more porous, than mammalian matrixes and human amnion/ chorion membranes.

The unique biomechanical properties of the fish skin and the size of its pores facilitate cell ingrowth, a critical step for tissue regeneration. In-vitro tests of the fish skin shows significantly more ($p<0.0001$) three-dimensional cell ingrowth than human amnion/chorion membranes.



Top row: Scanned electron microscopy images of fish skin show a pore size of ~10-150 µm. This is suitable for human cell infiltration because typical human cells range from ~10-100 µm in diameter.

Amnion/chorion membrane has an average pore size of 1.3 µm which is more than 10 times smaller than typical human cells.

Lower row: Confocal microscopy images following cell seeding and fluorescent labeling, indicated with red arrows, show examples of cell infiltration in fish skin and human amnion/chorion.

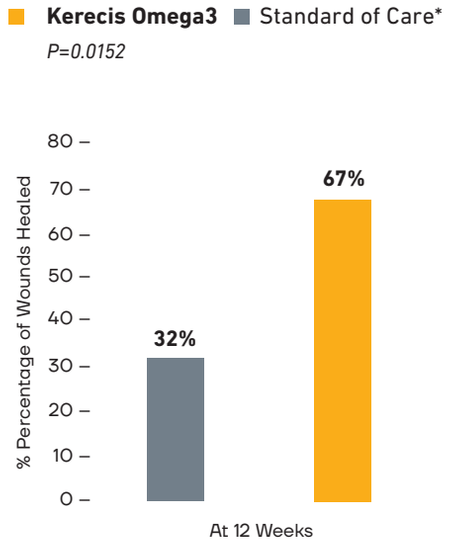
Scale bar on all images 100µm.

Proven Results

Kerecis Omega3 MariGen exhibits superior in two separate randomized controlled trials published in peer-review journal.

Kerecis Omega3 MariGen vs SOC[6]

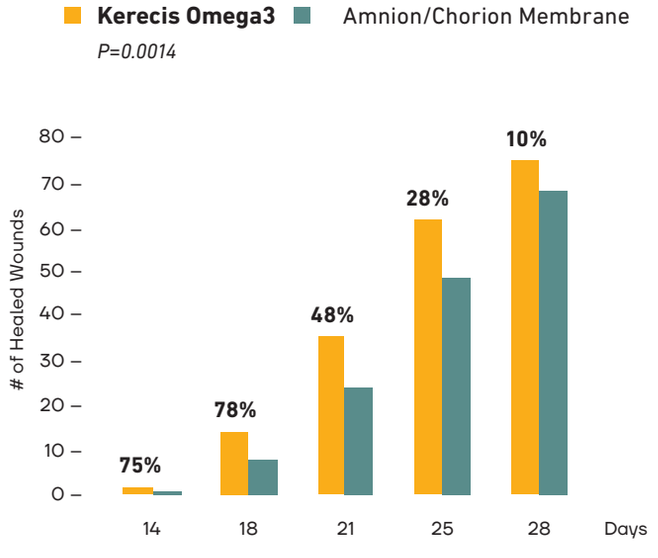
N=49



*SOC - wound care covering of collagen alginate dressing

Kerecis Omega3 MariGen vs Amnion/Chorion Membrane[5]

N=170



Ordering Information
Kerecis® Omega3 MariGen™

Catalog # Box of 10	Catalog # Single Units	Description	Billable Units
50200S16B2D	50200S16B0D	Kerecis Omega3 MariGen, 16 mm, circular	2
50200S00B2D	50200S00B0D	Kerecis Omega3 MariGen, 1.75 x 1.75 cm	4
50200S01B2D	50200S01B0D	Kerecis Omega3 MariGen, 3 x 3.5 cm	11
50200S02B2D	50200S02B0D	Kerecis Omega3 MariGen, 3 x 7 cm	21
50200S05B2D	50200S05B0D	Kerecis Omega3 MariGen, 5 x 7 cm	35
50200S04B2D	50200S04B0D	Kerecis Omega3 MariGen, 7 x 7 cm	49
50200S03B2D	50200S03B0D	Kerecis Omega3 MariGen, 7 x 10 cm	70
50200F01B2D	50200F01B0D	Kerecis Omega3 MariGen, 3 x 3.5 cm, fenestrated	11
50200F02B2D	50200F02B0D	Kerecis Omega3 MariGen, 3 x 7 cm, fenestrated	21
50200F03B2D	50200F03B0D	Kerecis Omega3 MariGen, 7 x 10 cm, fenestrated	70
50200P00B2D	50200P00B0D	Kerecis Omega3 MariGen Micro, 4 cm^2	4
50200P01B2D	50200P01B0D	Kerecis Omega3 MariGen Micro, 8 cm^2	8
50200P02D2D	50200P02DOD	Kerecis Omega3 MariGen Micro, 19 cm^2	19
50200P04D2D	50200P04D0D	Kerecis Omega3 MariGen Micro, 38 cm^2	38

Indications for Use

- Diabetic ulcers
- Chronic vascular ulcers
- Venous ulcers
- Pressure ulcers
- Draining wounds
- Partial and full-thickness wounds
- Trauma wounds: abrasions, lacerations, second-degree burns, skin tears
- Surgical wounds: donor sites/grafts, post-Mohs surgery, post-laser surgery, podiatric, wound dehiscence

References

1) Magnusson, S., Baldursson, B. T., Kjartansson, H., Rolfsson, O. & Sigurjonsson, G. F. Regenerative and Antibacterial Properties of Acellular Fish Skin Grafts and Human Amnion/Chorion Membrane: Implications for Tissue Preservation in Combat Casualty Care. Mil. Med. 182, 383–388 (2017). **2)** Magnusson, S. et al. Decellularized fish skin: characteristics that support tissue repair. Laeknabladid 101, 567–573 (2015). **3)** Rakers, S. et al. 'Fish matters': the relevance of fish skin biology to investigative dermatology. Exp. Dermatol. 19, 313–324 (2010). **4)** Baldursson, B. T. et al. Healing rate and autoimmune safety of full-thickness wounds treated with fish skin acellular dermal matrix versus porcine small-intestine submucosa: a noninferiority study. Int. J. Low. Extrem. Wounds 14, (2015). **5)** Kirsner, R. S. et al. Double-Blind, Prospective, Randomized Clinical Trial on 170 Acute Wounds Shows Significantly Faster Healing Rate with Intact Fish Skin Compared to Human Amniotic Membrane. Natl. Am. Podiatr. Med. Assoc. Annu. Sci. Meet. (2018). **6)** Lullove E. J. et al. A multicenter, blinded, randomized controlled clinical trial evaluating the effect of Omega-3–rich fish skin in the treatment of chronic, nonresponsive diabetic foot ulcers. Wounds. Published online April 15, 2021. **7)** Winters C, Kirsner RS, Margolis DJ, Lantis JC. Cost Effectiveness of Fish Skin Grafts Versus Standard of Care on Wound Healing of Chronic Diabetic Foot Ulcers: A Retrospective Comparative Cohort Study. Wounds. 2020;32(10):283-290. **8)** Stone R 2nd, Saathoff EC, Larson DA, et al. Accelerated Wound Closure of Deep Partial Thickness Burns with Acellular Fish Skin Graft. Int J Mol Sci. 2021;22(4):1590. **9)** Pujji O, Jeffery SLA, Safe burn excision prior to military repatriation: an achievable goal? BMJ Military Health 2018;164:358-359. **10)** Chun K. Yang, John C. Lantis II & Thais O. Polanco. A prospective, single-center, non-blinded, non-comparative, post-market compassionate cli-nical evaluation of a Novel Acellular Fish Skin Graft which contains Omega3 fatty acids, for the closure of hard to heal lower extremity chronic ulcers. Wounds 28, 112–118 (2016). **11)** T. T. Trinh, F. Dünschede, C.-F. Vahl & B. Dorweiler. Marine Omega3 Wound Matrix for the Treatment of Complicated Wounds. Phlebologie 45, 93–98 (2016). **12)** Dorweiler, B. et al. Die marine Omega-3-Wundmatrix zur Behandlung komplizierter Wunden. Gefässchirurgie 22, 558–567 (2017). **13)** Woodrow, T., Chant, T. & Chant, H. Treatment of diabetic foot wounds with acellular fish skin graft rich in omega-3: a prospective evaluation. J. Wound Care 28, 76–80 (2019). **14)** Sitje, T. S., Grøndahl, E. C. & Sørensen, J. A. Clinical innovation: fish-derived wound product for cutaneous wounds. Wounds Int. 2018 9, 44–50 (2018). **15)** Patel, M. & Lantis II, J. C. Fish skin acellular dermal matrix: potential in the treatment of chronic wounds. Chronic Wound Care Manag. Res. 6, 59–70 (2019). **16)** Sibbald R., Goodman L., Woo K. et al (2011) Special considerations in wound bed preparation 2011: An update. Adv Skin Wound Care. 24(9):415-36. **17)** Wallner C. et al. A Comparison of Intact Piscine Skin, Split-thickness Skin Graft, and Lactic Acid Membrane in Treating Superficial and Deep Burn Wounds Following Enzymatic Debridement, J Burn Care Res, 2021; 42 (Suppl 1): 125- 126 **18)** Alam K, Jeffery SLA. Acellular Fish Skin Grafts for Management of Split Thickness Donor Sites and Partial Thickness Burns: A Case Series. Mil Med. 2019;184(Suppl 1):16-20. doi:10.1093/milmed/usy280

kerecis®

OUR VISION
To become the world leader in tissue regeneration by sustainably harnessing nature's own remedies

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FDA approved, U.S. and international patents and trademarks granted and pending.

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