Hyalogran®
Hyalofill®
Hyalosafe®
Hyalomatrix® PA

HYAFF® BIOLOGICAL DERMAL REGENERATION TECHNOLOGIES

AT TECHNOLOGIES GmbH


HYAFF® Technology

One of the major components of the extracellular matrix, Hyaluronic Acid (HA) is a naturally occurring, ubiquitous glycosaminoglycan found in many of the organs and tissues of the human body including skin, joints and eyes. It is also referred to as “hyaluronan” or “hyaluronate”.

HA is known to play a key role in all fundamental phases of the highly complicated wound healing process such as inflammation, granulation, angiogenesis and re-epithelialization.

Despite its utmost significance, the application of hyaluronic acid on damaged dermal tissue in a direct, stable and sustained manner was only made possible with the HYAFF® technology. Thus, a new era of fast, reliable and cost-effective dermal repair has begun.

HYAFF® is the patented esterified version of pure hyaluronic acid and it has a bioactive effect on dermal regeneration. All HYAFF® products listed in this brochure utilize the below mentioned clinical benefits of HA.

Role of HA in Dermal Regeneration

- Thanks to its direct interaction with other extracellular matrix components as well as cells, hyaluronic acid has the capability to effect the wound environment on a macro and micro level. Therefore, it plays a prominent role in regulating the otherwise chaotic wound environment and the complicated healing processes from inflammation on.

- As it is highly hygroscopic, HA maintains the moisture balance on the wound bed which is vital for all stages of dermal regeneration.

- Enhances cell migration and proliferation.

- Stimulates neo-angiogenesis.

- Scavenges free radicals that are detrimental to healing and promotes a healthy granulation.

- Contributes to the structural integrity of the new tissue by supporting and regulating collagen production. Thus minimizing scar formation, it helps restore functional and aesthetic qualities of the skin.

- Abundant also in epidermis, HA promotes a fast and orderly re-epithelialization and thus helps complete the final step of the wound closure process with a high-quality clinical outcome.
Bioactive Material Composed of HYAFF® and Sodium Alginate Granules

Hyalogran® has a double-acting mechanism that serves to stimulate granulation formation by creating a HA-rich environment while simultaneously ridding the wound bed of necrotic tissues. Thanks to this unique characteristic, Hyalogran® combines the clinical benefits of two different product groups and offers a reliable, practical and cost-effective option in the treatment of chronic ulcers.

- The granule form provides easier application in hard-to-treat surfaces such as fistulas and cavities.
- The HA-rich gel form that Hyalogran® takes upon contact with exudate adsorbs the micro debris that stem from tissue and bacterial degradation and thus helps protect cells from damage.
- It is highly absorbent and can be used in highly exuding wounds.
- Provides the ideal moisture balance.
- Regulates inflammation via the HYAFF® effect; thus:
  - enables a healthy and timely transition into the granulation phase.
  - Helps minimize malodor and pain
- Hyalogran® can be easily removed from the wound bed by standard irrigation.

Indications

Hyalogran® is indicated for the treatment of stalled wounds as well as wounds with necrotic tissues. Suitable also for cavities. Can be used on infected/colonized wounds in combination with the appropriate infection treatment as seen fit by the physician.

- Pressure ulcers
- Diabetic ulcers
- Chronic leg ulcers
- Surgical and traumatic wounds

Application

After standard wound cleansing procedures, Hyalogran® is applied directly onto the wound covering the entire surface with an approximately 3mm-thick layer. Coverage with a secondary absorbent dressing is advised. Frequency of application depends entirely on the condition of the wound, though it is advisable to re-apply Hyalogran® every 3-4 days.

Hyalogran® is available in 2g sterile pouches.
Case: 72-year-old diabetic patient

- DFU following minor amputation
- Wound covered in slough, moderately exuding
- Non-viable, callous wound edges

Hyalogran® applied after superficial curettage

- Highly effective autolytic debridement with Hyalogran®
- Significant acceleration in wound healing

Complete healing within 20 days.
Frequency of application: every 3 days.
Bioactive HYAFF® Matrix for Dermal Regeneration

Hyalofill® is used in the treatment of stalling wounds that are free of necrosis and infection to kick-start the healing process and provide a healthy and fast regeneration. Utilizing the benefits of the HYAFF® technology, Hyalofill®:

- regulates the characteristically chaotic chronic wound environment
- stimulates cell migration into the fibrous matrix
- forms a highly conformable gel through biological degradation and maintains moisture balance
- accelerates dermal and epidermal regeneration

Indications

Hyalofill® is indicated for the treatment of partial and full-thickness wounds. Not recommended for use on infected areas.

- Diabetic foot ulcers
- Pressure ulcers
- Chronic leg ulcers
- Partial-thickness burns
- Surgical and traumatic wounds

Application

Hyalofill® is applied directly onto the clean wound bed and is covered with a secondary dressing. Frequency of application should be decided by the physician in accordance with the wound conditions. Hyalofill® can stay on the wound bed up to 7 days depending on the level of exudate. As Hyalofill® is a completely biodegradable matrix, the remnants of the product that have not yet been fully absorbed by the tissue do not have to be thoroughly removed as long as standard wound cleansing procedures are observed.

Hyalofill®-F Sizes:
5cm x 5cm
10cm x 10cm

Hyalofill®-R (rope form for cavities and fistulas)
0.25g
0.50g
Case: Chronic Radiodermatitis

- 75-year-old cancer patient
- Painful, exuding wound on scalp
- Inflammation around wound edges and surrounding tissue
- Wound remains unresponsive to prior treatments

- Start of Hyalofill®-F treatment

- Day 6: Integration of the HYAFF® matrix into the tissue
- Day 20: Complete regeneration without scar formation
- Frequency of Hyalofill®-F application: once a week.
**HYAFF® based Epidermal Substitute**

Hyalosafe® is a transparent biological sheet that is composed entirely of HYAFF®, the esterified version of pure hyaluronic acid which is one of the major components of the human skin. Unlike transparent wound dressings, Hyalosafe® is a bioactive nano-technology product that functions not only as a mechanic barrier but also, and more importantly, as an epidermal substitute with a re-epithelializing function. It acts as a temporary epidermal layer until the epidermis is fully restored.

- Hyalosafe® consolidates the missing HA component in the wound bed which is otherwise abundant in the healthy epidermal tissue.
- Actively regulates the epithelialization process.
- Significantly accelerates regeneration.
- Helps enable a scar-free healing in superficial wounds and burns.
- Acts as an effective barrier against contamination while preserving a moist environment.

**Indications**

Hyalosafe® is indicated for epidermal regeneration in cases of superficial dermal damage. Not recommended for use on infected areas.

- Superficial burns (I&II degree)
- Graft donor sites
- Superficial acute and chronic wounds with minimal exudate
- Subsequent to laser procedures

**Application**

Hyalosafe® is applied directly onto the clean wound bed. As befitting the highly fragile nature of epithelialization process, Hyalosafe® is designed not to stick to the newly forming tissue. If necessary, Hyalosafe® can be covered with a non-adherent contact layer and fixed into place via bandage. As it has a long lasting effect, one application is generally enough to achieve complete epidermal regeneration.

**Hyalosafe® Sizes:** 10x15cm
**Case: Superficial Second Degree Flame Burn**

- 28-year-old female
- Hyalosafe® application subsequent to disinfection of the burn area
- Complete re-epithelialization in 21 days with only one Hyalosafe® application.

**Case: Epidermal Nevus**

- CO2 Laser and Erbium Laser procedures
- Hyalosafe® application
- Optimal healing with one application.
HYAFF® Based Dermal Substitute

Hyalomatrix® PA is a dermal substitute composed of a three-dimensional HYAFF® scaffold and a protective, transparent outer silicon layer. It is designed specifically to restore the unique architecture of the dermis in cases involving full thickness dermal damage.

- Hyalomatrix® stimulates dermal regeneration by its steady and sustained release of hyaluronic acid as soon as it is implanted.
- The 3D scaffold provides an ideal environment for cell invasion.
- Stimulates neo-angiogenesis
- Minimizes scar formation due to its ability to regulate collagen production.
- Helps prevent contractures thanks to the neodermis structure it forms.
- Helps reduce revision procedures by enabling a dermal regeneration that supports functional and esthetic qualities of the skin.
- Hyalomatrix® is highly bio-compatible and is fully integrated into the tissue over time.

Indications

Hyalomatrix® is indicated for the treatment of full-thickness dermal tissue loss. It is also suitable for use on exposed tendons and bones. Not recommended for infected and/or highly exuding wounds.

- Chronic wounds including diabetic foot ulcers, pressure ulcers and leg ulcers
- Full thickness burns (deep 2nd degree & 3rd degree)
- Surgical and traumatic wounds

Application

Immediately after the surgical debridement/excision, when hemostasis is achieved, Hyalomatrix® is applied onto the clean wound bed. (The silicon layer must be on top). It can be fixed into place via staplers. It is advisable to cover Hyalomatrix® with a secondary absorbent dressing. Bandaging is also recommended to provide protection as well as enable a close contact of the matrix with the wound bed. The transparent outer layer of Hyalomatrix® allows for regular inspections without disturbing the matrix. Depending on the physician’s decision, when sufficient dermal regeneration is achieved (usually within 14-21 days), the outer silicon membrane is removed and split thickness skin graft procedure can be performed; or alternatively spontaneous re-epithelialization can be preferred.

Hyalomatrix® PA Sizes: 5cm x 5cm, 10cm x 10cm, 10cm x 20 cm
Case: Achilles Tendon Ulcer in Patient with Type 2 Diabetes

- Ulcer unresponsive to treatment for over a month
- Progressive exposure of the Achilles tendon
- Equinus foot due to lack of use

- Meticulous curettage of the ulcerative lesion and correction of the equinus foot.
- Application of Hyalomatrix® at the end of the procedure

- Post-op day 20: Hyalomatrix® has been integrated into the tissue and tendon is fully covered with good functional results (ankle flexing in extension). The newly-formed dermis allowed for rapid re-epithelialization from the edges, with significant reduction of the area of the lesion.
- Completion of dermal repair with STSG using a very small donor site.
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