



PlasmaDerm®

Plasma Technology for Health



Wound treatment with PlasmaDerm®

**The cold plasma therapy
with added effectiveness**

For you. For your patients. Simply PlasmaDerm®

Chronic wounds, wound-healing disorders, infected wounds. Your patients suffer greatly when a wound heals poorly or not at all.

Targeted and structured treatment of these wounds is important – including frequent dressing changes, regular check-ups and targeted pain management.

With PlasmaDerm® technology, CINOGY has taken a significant step towards the future of wound healing. Because PlasmaDerm® supports wound healing and can therefore considerably improve the lives of many patients with chronic and stagnant wounds.

Innovative cold plasma technology with PlasmaDerm®: The game changer for wound healing

PlasmaDerm® makes a real difference in the treatment of chronic and infected wounds. Our innovative cold plasma therapy with a deep penetration effect activates wound healing and tissue regeneration –

proven, effective and easy to apply. This is not only good news for you, but also for your patients.

Added effectiveness for a better quality of life.

PlasmaDerm®: The cold plasma therapy with added effectiveness

The PlasmaDerm® cold plasma system from CINOGY generates a tissue-compatible, cold, physical plasma that stimulates wound healing in a variety of ways. PlasmaDerm® generates the cold plasma directly on the wound surface. What's more: The body is part of the process. In addition to the cold plasma, a high-fre-

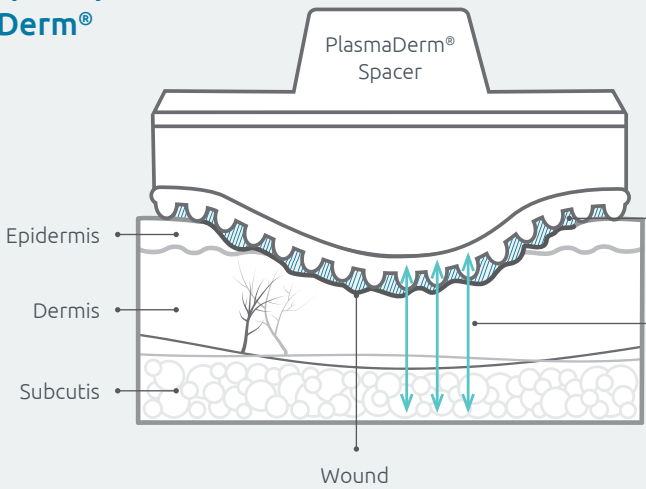
quency electric field thus unfolds its effect deep into the tissue layers. It has been proven to increase microcirculation and oxygen saturation.

A small detail. But one that makes the difference!

Good to know

Acts for several hours, penetrating deep into the tissue layers^{4,5} – PlasmaDerm® with added effectiveness.

The active principle of PlasmaDerm®



Generated cold plasma:
Effective in the upper tissue layers.

Electric field:
Effective down into deep tissue layers.

PlasmaDerm® generates the cold plasma directly on the treatment area. With hardly any diffusion effects, the electric field also develops its effectiveness down into deep tissue layers.



PlasmaDerm® has a multimodal effect – down into deep tissue layers

- › **Activates the healing** of chronic, stagnant and infected wounds^{1,2}
- › **Reduces the germ load** and also **inactivates multi-resistant pathogens**³
- › **Increases microcirculation, tissue oxygen saturation** and nutrient supply down to **deep tissue layers**^{4,5,6}
- › **Aids in overcoming the chronic inflammation phase**
- › Can alleviate **itching** and **wound pain** and **reduce wound odours**
- › **No clinically relevant side effects**
- › **Gentle and painless**

Your benefits at a glance:

- › **Simple, fast and safe** to use
- › Able to be **integrated** into **standard wound treatment** seamlessly
- › **Delegable** to healthcare professionals
- › Universally **applicable** for **small and large wounds**
- › **Light and mobile** – ideal for hospitals, medical practices, wound centres and nursing homes
- › **Can be used at home** by patients and relatives **after instruction**



As good as tailor-made. Simply PlasmaDerm®

In the hectic day-to-day running of a hospital or practice, as well as in nursing care, implementing a therapy concept quickly and without great effort is crucial. We have therefore invested a lot of development work in this area.

The result? One example: Even larger wounds up to 27 cm² can be treated with PlasmaDerm® in 180 seconds. Just press a button!
It couldn't be simpler or more efficient.

PlasmaDerm® Universal: Our innovative medical device in practice

For maximum comfort and safety, our PlasmaDerm® device has been thought through down to the last detail: PlasmaDerm® Universal can be equipped with two different handheld devices ('Flex' and 'Cutan').

Depending on the treatment area, a corresponding spacer is available, which is placed on the head of the handheld device before each treatment.

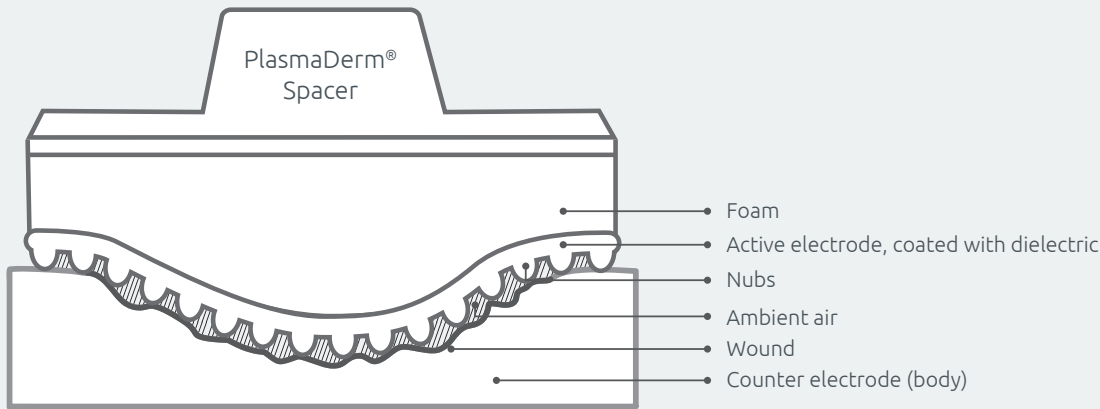


Everything at a glance: clear user interface with Start/Stop button and indicator LEDs

High-level technology, but very easy to use and handle – our Development department designed the innovative PlasmaDerm® medical device with these aspects in mind.

Two spacers: for large and small wounds

Our two spacers with an integrated electrode have two different sizes – which means that large and small wounds can be treated with equal precision. Thanks to their soft, flexible nub construction and soft foam, they also adapt perfectly to the contours of the wound or the patient's body.



The soft and flexible design of the spacer allows it to adapt well to the wound geometry.

i Good to know

Our two spacers 'Flex' and 'Cutan' guarantee the optimum distance to the treatment area, therefore ensuring consistent plasma quality, regardless of the practitioner – unique to PlasmaDerm® and important for the effect.



Spacer ,Flex' – Effective on large wounds:

- › Ideal for large and extensive wounds
- › Covers 27.5 cm²



Spacer ,Cutan' – effective with precision:

- › Ideal for small or hard-to-reach wounds and cavities
- › Covers 2 cm²



Mobile, simple and time-saving: that's PlasmaDerm®

Lightweight and easy to transport: The compact dimensions of the PlasmaDerm® device and the required consumables allow mobile use in hospitals and medical practices, as well as in wound centres and nursing homes – which makes transsectoral care considerably

easier. You can also easily bring the PlasmaDerm® system with you for home visits. Everything you need to carry out the therapy fits into a handy, easy-to-carry case.

Good to know

PlasmaDerm®. So simple that the therapy can be delegated.

PlasmaDerm® is safe to handle and intuitive to use – which means that therapy can be delegated within the team after a short briefing. And it goes one step further: PlasmaDerm® has a homecare authorisation; patients and their relatives can and may therefore also use PlasmaDerm® at home.

Simply part of the standard wound treatment

Therapy with the deep penetration technology of PlasmaDerm® can be easily integrated into standard wound treatment – in all phases of wound healing. The treatment is uncomplicated and is usually carried out two to three times a week as part of the dressing

change. If more frequent dressing changes are required in the initial phase, PlasmaDerm® treatment can also be carried out daily. In addition, the therapy can be combined with all types of wound dressings and wound irrigation solutions if required.

Gentle and painless

Treatment with PlasmaDerm® is not only uncomplicated, but also extremely gentle, well-tolerated and free of clinically relevant side effects. The total duration of PlasmaDerm® therapy depends on the indication and the course of wound healing: Chronic wounds are

usually treated for eight to twelve weeks. In the case of infected wounds, the period is usually shorter; however, treatment at shorter intervals (e.g. daily) is recommended until the signs of infection have subsided.

Fewer steps, noticeable results

PlasmaDerm® is very uncomplicated and can be explained in just a few steps:

1. The entire surface and also the edges of the wound should be treated in two intervals of 90 seconds each.
2. Place the spacer as completely as possible, press the start button and start the treatment.
3. Once the treatment interval of 90 seconds has elapsed, an acoustic signal sounds.
4. Now place the spacer overlapping on the next area and start the next treatment interval.
5. Has the entire wound surface been treated for 90 seconds? A second 90-second treatment interval as described above follows, once again over the entire surface.
6. Are the wound and its surroundings smaller than the spacer area? In this case, you can start the second treatment interval after a 30-second break without moving the spacer.



Place the spacer completely over the surface



Start the therapy session



After 90 seconds, repeat the treatment

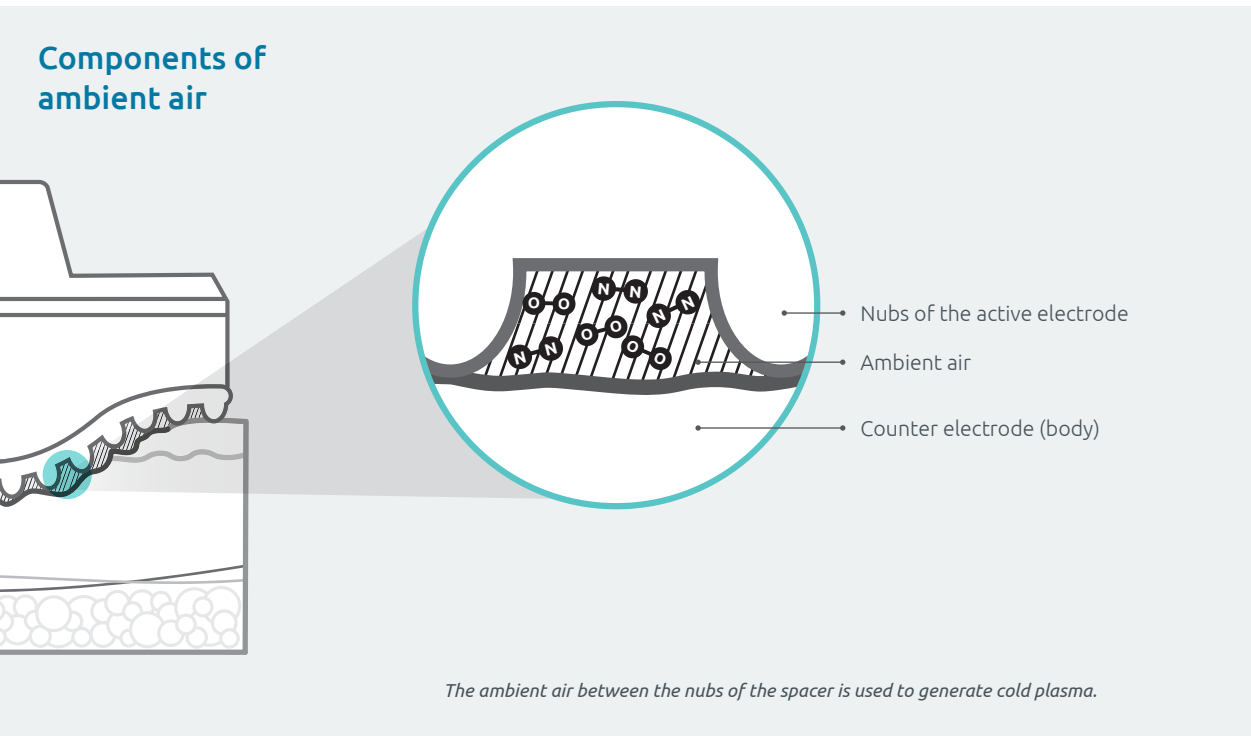
Cold, physical, atmospheric plasma – ionised gas with an amazing effect

Cold, physical, atmospheric plasma (cold atmospheric plasma – CAP) is a high-energy gas that consists of free electrons, ions, neutral atoms and molecules, as well as reactive species. It arises when electrical energy (e.g.

high-frequency alternating voltage) is supplied to a gaseous element (ambient air).

i Good to know

PlasmaDerm® uses ambient air to generate cold plasma. Ambient air consists of 78% nitrogen (N₂), 21% oxygen (O₂) and various other gases and inert gases.



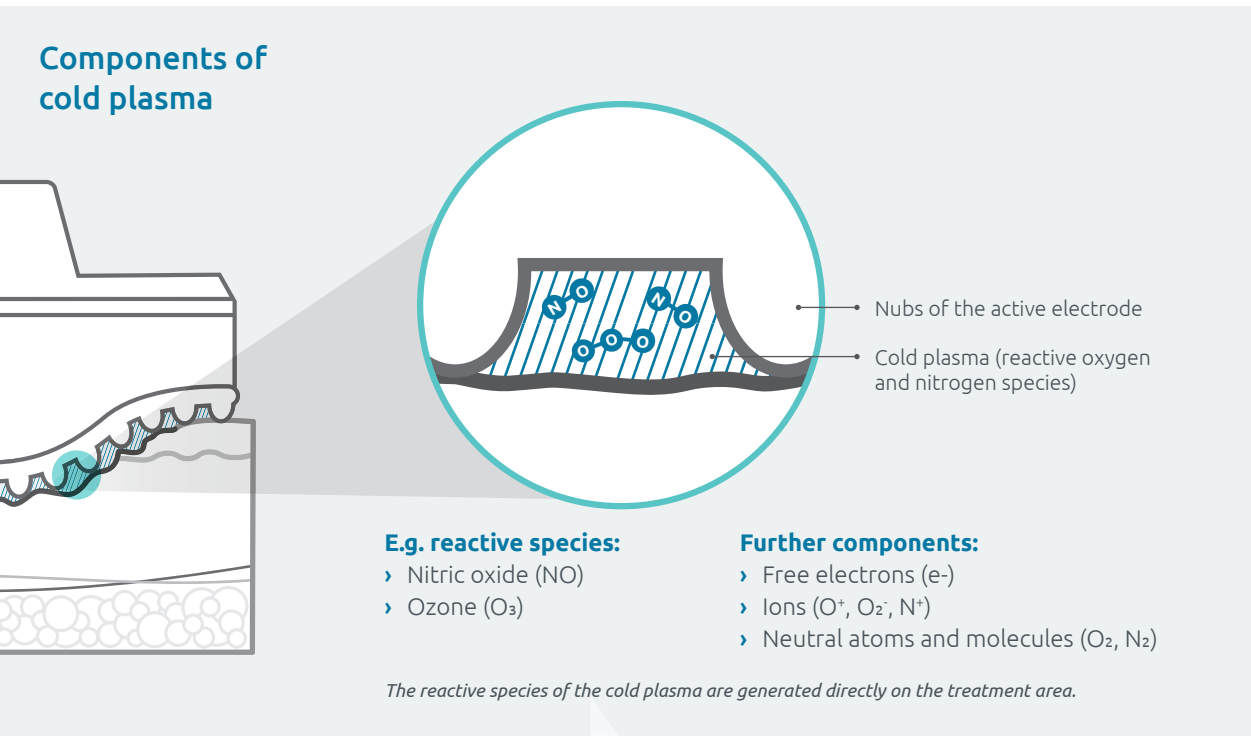
How is cold plasma created?

PlasmaDerm® generates cold plasma using a physical process known as dielectric barrier discharge (DBD).

An active electrode coated with a so-called dielectric plays a central role here. A high-frequency alternating voltage is applied to this electrode. The dielectric prevents a direct and complete discharge – instead, the dielectric charges up and then discharges in a controlled manner towards the neighbouring gas molecules. The dielectric is polarised with each individual voltage pulse and the actual cold plasma generation takes place at the interface between the electrode, dielectric and the ambient air. In this process, electrons are extracted from the oxygen and nitrogen molecules in the ambient air. These free electrons absorb

additional energy from the high-frequency alternating voltage and enter a high-energy state. The high-energy electrons then collide with other molecules, resulting in collisions that lead, among other things, to the formation of ions and the splitting of molecules in ambient air into atoms.

These particles react with each other and form new compounds, creating reactive oxygen and nitrogen species (e.g. ozone and nitrogen monoxide) – characteristic of cold plasma.



Not all cold plasma is the same

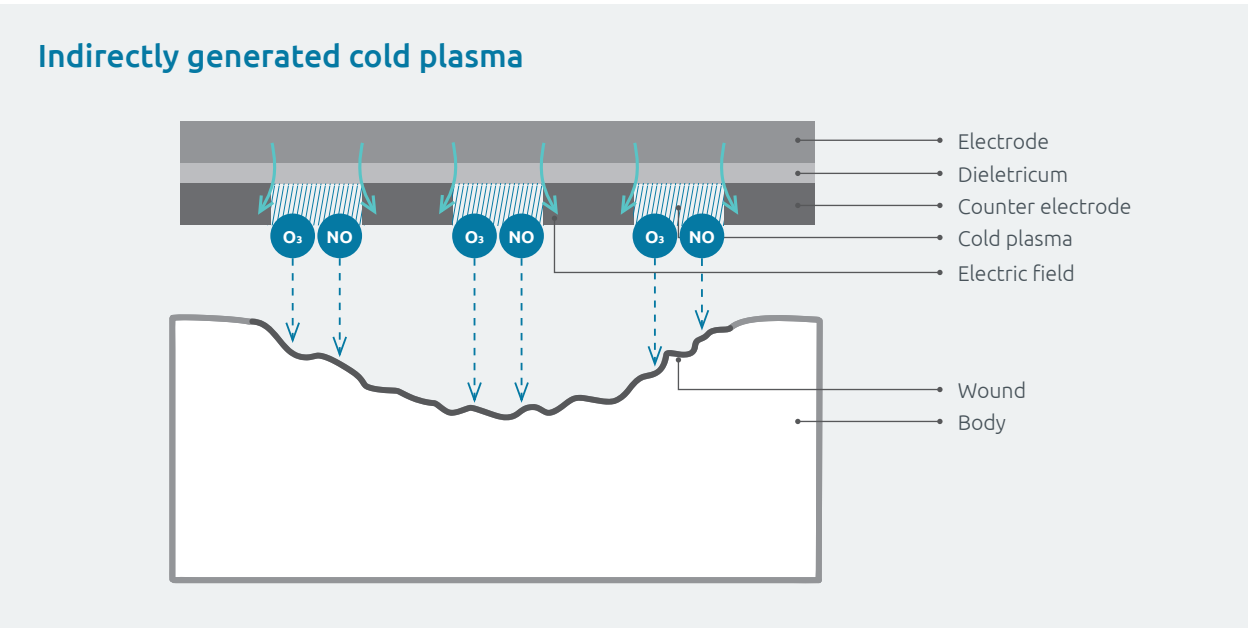
Which criteria are decisive for the quality of the cold plasma? The composition of the gas used and the technical method of cold plasma generation play a key

role. A basic distinction is made between indirectly and directly generated cold plasma.

Indirectly generated cold plasma

In indirect generation, the cold plasma is not generated directly on the treatment area by a dielectrically impeded discharge, but in an isolated discharge area of the device.

The active species are then transferred from the plasma to the treatment area.

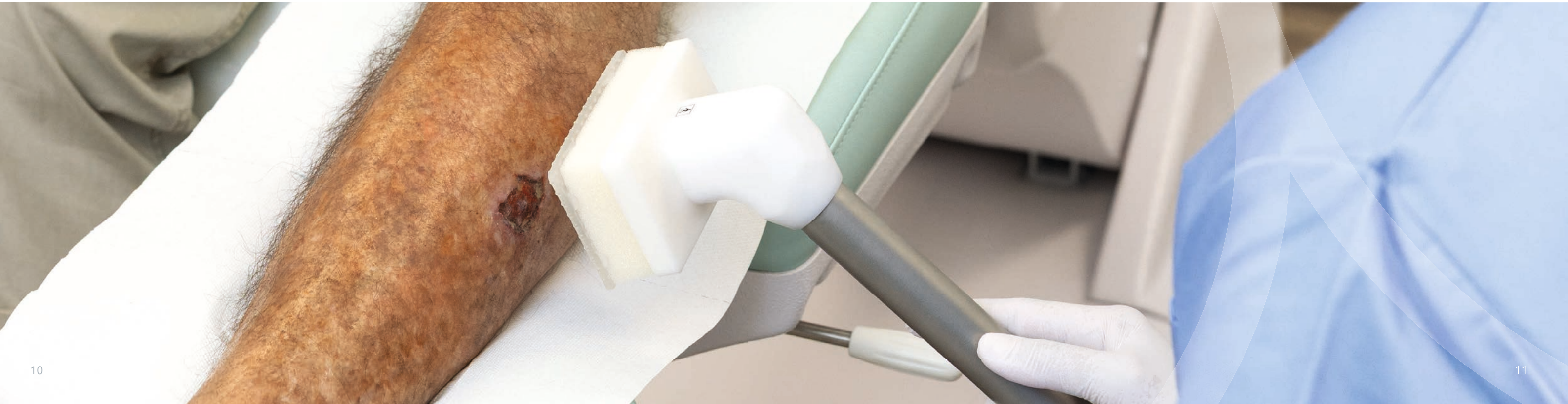
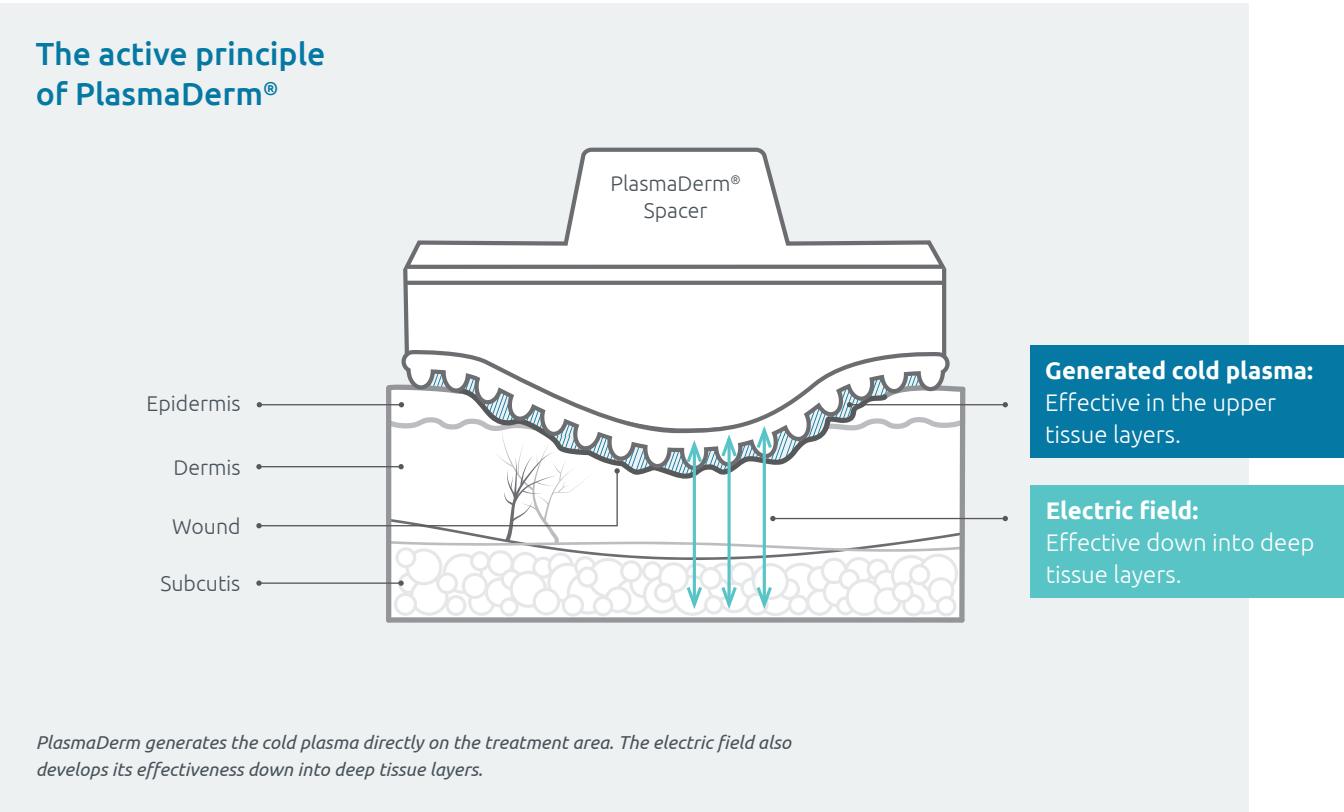


Directly generated cold plasma

PlasmaDerm® is a direct plasma process: With directly generated cold plasma, the treatment area is part of the process: The body itself serves as a counter-electrode, i.e. the high-frequency electrical field builds up between an active electrode on the spacer and the treatment area. The cold plasma is generated precisely over the treatment area and spreads out like a carpet.

The species can interact directly with the treatment surface. In addition to the cold plasma, the electric field has a direct effect on the body.

Decisive advantages in terms of effectiveness!





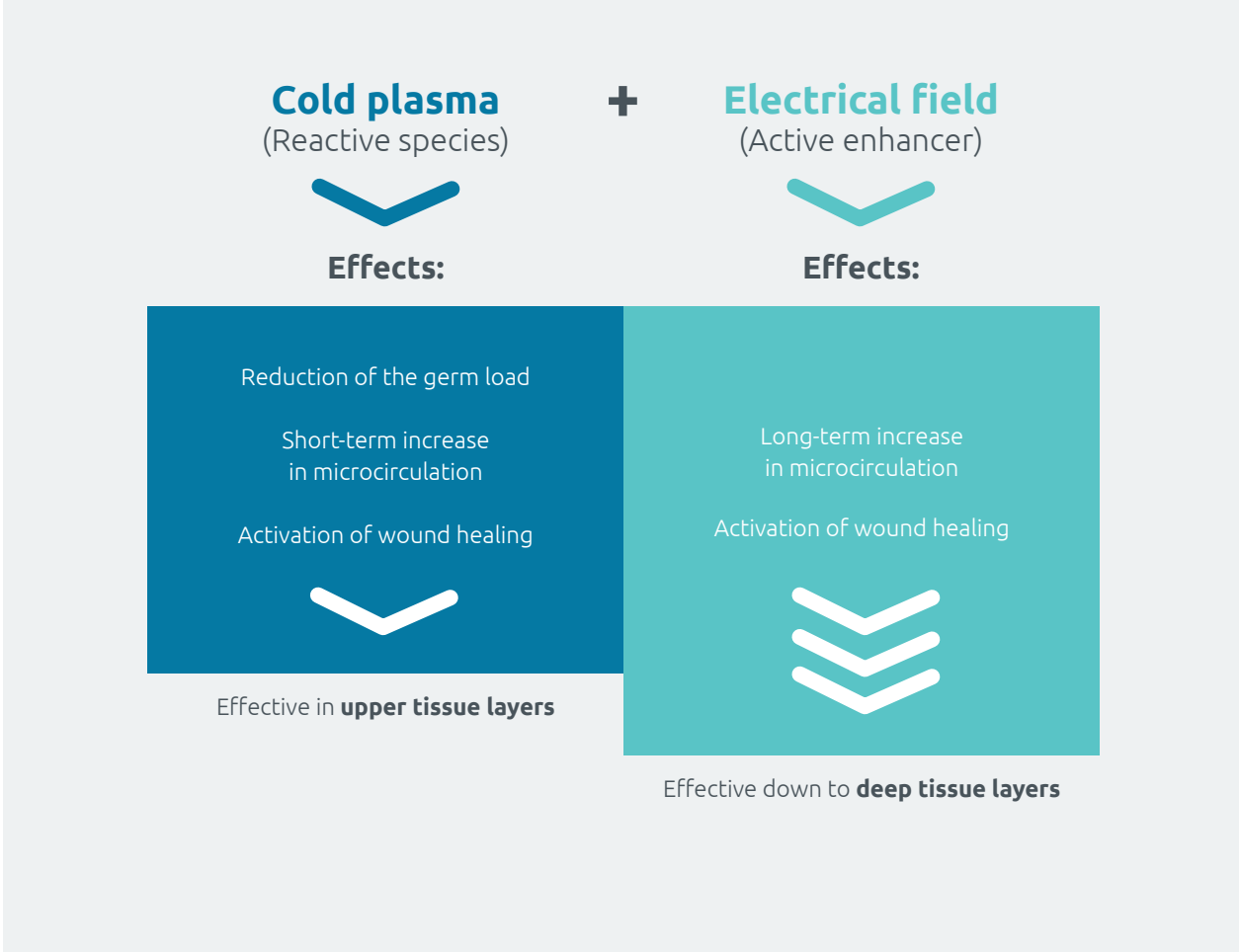
Breaking the vicious circle with PlasmaDerm®

PlasmaDerm® can make a decisive contribution to breaking this vicious circle and restarting wound healing. Because PlasmaDerm® reduces the germ load, increases microcirculation, activates wound healing and

tissue regeneration and helps overcome the chronic inflammatory phase.

Good to know

PlasmaDerm® and the main active components of the process:



When a wound just won't heal

Chronic wounds often get caught in a vicious cycle that continuously delays healing. This cycle arises from various factors that negatively influence each other, leading to stagnation or even further deterioration of the wound:

- › Persistent inflammation increases the demand for oxygen and nutrients.
- › The wound environment is altered, slowing down the healing process.
- › The open wound surface is highly susceptible to infections.
- › Infections, in turn, intensify inflammation and further delay healing.
- › Excessive exudation softens the tissue, making healing even more difficult.

One problem, many causes: PlasmaDerm® acts at various levels:

- › **Activates the healing** of chronic, stagnant and infected wounds^{1,2}
- › **Reduces the germ load** and also **inactivates multi-resistant pathogens**³
- › **Increases microcirculation, tissue oxygen saturation** and nutrient supply down to **deep tissue layers**^{4,5,6}
- › **Aids in overcoming the chronic inflammation phase**
- › Can alleviate **itching** and **wound pain** and **reduce wound odours**

PlasmaDerm® has a multimodal effect

PlasmaDerm® reduces the germ load³ – Bad news for germs and bacteria

PlasmaDerm® leads to an immediate and significant reduction in germs, including multi-resistant pathogens, which are effectively inactivated.

The development of resistance unlikely – not even with topical or local application. The reactive species of the cold plasma interact with the wound surface and with the water in the wound secretion and tissue. As a result, PlasmaDerm® lowers the pH value in the wound environment by one to two log levels within a very short

time. In addition, the reactive species have a direct effect on proteins and enzyme systems of the germs.

These rapid, multimodal changes are responsible for the antimicrobial effect, as bacteria – in contrast to human eukaryotic cells – lack important protective and repair mechanisms.

Good to know

Recolonisation of the wound is to be expected between applications – therefore we recommend combining the regular use of PlasmaDerm® with other wound cleansing measures such as disinfectant wound irrigation solutions.⁷

PlasmaDerm® increases microcirculation^{4,5,6} – Clear the way for oxygen and nutrients

Chronic or poorly healing wounds are often associated with impaired microcirculation, which means that the supply of oxygen and nutrients to the wound bed and surrounding tissue is often impaired, as is the removal

of metabolic products and excess tissue fluid. However, all these factors are essential to promote wound healing and support tissue regeneration.

At this point, PlasmaDerm® provides several positive impulses:

Short-term effect in upper tissue layers:

- › The reactive species of the cold plasma stimulate the formation of the body's own nitric oxide (NO) on contact with the wound. This natural signalling substance relaxes the smooth muscles of the blood vessels. The consequences are far-reaching and varied: The vessels dilate, the blood flow in the capillaries is activated, the supply of oxygen and nutrients, as well as the removal of metabolic products, are supported.

Lasting effect down to deep tissue layers:

- › In addition, the high-frequency electrical field of PlasmaDerm® directly stimulates blood circulation by influencing the nervous regulation of the smooth muscles in the blood vessels, which increases the blood flow, which in turn has a positive effect on the transport of oxygen to the tissue. In addition, cold plasma also stimulates the formation of new capillaries (angiogenesis), which improves tissue supply in the long term.

The result: After the application of PlasmaDerm®, an increased partial oxygen pressure and increased capillary blood flow in the tissue could be detected – not only on the wound surface, but also at a depth of at least 8 mm. This effect lasts for several hours and can be intensified and prolonged by repeated applications.





PlasmaDerm® activates wound healing³ – Tissue regeneration gets a chance

PlasmaDerm® activates wound healing and tissue regeneration through the combination of the mechanisms of action described above. The reactive species and the electric field have a synergistic effect.

But the reactive species can do much more: For example, they stimulate the body's own signalling pathways and thus promote the activity of cells involved in wound healing (e.g. fibroblasts and keratinocytes). They support cell proliferation and migration, as well as the formation of collagen.

The reactive species also stimulate the formation of new blood vessels and contribute to the reduction of inflammatory processes: Excessive inflammation, which impedes healing, can be reduced and the resilience of the cells in the tissue to oxidative stress can be increased.

The high-frequency electric field also plays an important role: It enhances important aspects of wound healing and tissue regeneration by, among other things, increasing microcirculation down to deep tissue layers and increasing the migration and proliferation of connective tissue cells.

i Good to know

PlasmaDerm® has a wide range of indications and is successfully used in the therapy of:

- › Chronic and poorly healing wounds
- › Microbially infected skin and wound surfaces
- › Skin conditions caused by pathogens
- › Wound healing disorders resulting from surgery or trauma

Researched, documented and proven

Our own studies and case series prove the effectiveness of our technology. Many studies also demonstrate the positive effect of cold plasma on wound healing.



PlasmaDerm®: Developed by CINOGY

CINOGY: Innovation and technology leader with a future

Ambitious development work, in-depth expertise and a strong innovative drive are at the centre of the standards we set ourselves.

CINOGY is a pioneer and trailblazer in what is perhaps the most decisive development in wound treatment in decades. CINOGY brings together all the expertise required for the development, manufacture and sale of

medical technology devices under one roof. But we want even more: for example, to be there for our customers. For this reason, comprehensive service and reliable 1:1 contact are extremely important to us. Our sales force is present in hospitals, wound centres and medical practices throughout Germany.

Patented and honoured many times over

With PlasmaDerm®, CINOGY offers an innovative cold plasma system for wound treatment whose unique mode of action is protected by numerous patents. PlasmaDerm® generates cold plasma as a stimulating

element directly on the treatment area. This technology was honoured with the Fraunhofer Award 'Technology for People' in 2015 and the German Innovation Award in 2019.

Innovation meets ambition – since 2011

- 2011** › CINOGY begins development and production of medical devices for wound treatment with cold plasma
- 2013** › CINOGY is the first company with a CE declaration for cold plasma therapy in medical technology
› Our products are ready for the market – the distribution of PlasmaDerm® Flex 9060 is launched
- 2015** › PlasmaDerm® wins the Fraunhofer Award 'Technology for People', one of the most important scientific honours in Germany and Europe
- 2019** › PlasmaDerm® receives the German Innovation Award and launches the second generation of its medical device with PlasmaDerm® Vario
- 2020** › Homecare authorisation for PlasmaDerm® – an important boost in flexibility for practitioners and patients
- 2021** › We launch our PlasmaDerm® 'Universal' device

Quality: Made in Germany

CINOGY is certified according to ISO 13485:2016. A complete and comprehensive quality management system ensures the safety of the devices and therapy for patients and users.



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