

## Orchestrating Sound of Healing with Spark Wave

### „It all began with a spark“ 25 years of MTS

The mechanism for generating shock waves was discovered in the 1950s. However, it was not until 20 to 30 years later that ultra-short sound pulses at the speed of a supersonic aeroplane conquered the medical world.

The application for kidney stones documented the medical benefits of shock waves for the first time in 1980 in a Munich hospital. Ten years later, the value was recognised by orthopaedic surgeons also.

In 1998, Nikolaus Hopfenzitz and Ralph Reitmajer founded MTS Medical. At Lake Constance, they produced the first device for a young and promising market. At the time, they had no idea that further applications and devices that were unimaginably small were on the horizon.

Despite continuous growth, global crises such as the September 11 attacks and the economic crisis of 2009 challenged the young company.

In 1999, MTS devices received their first patent, closely followed by the first US

clinical trial. Today, the company operates on all continents with a sales network from the USA to China.

The international researchers who have taken MTS technology into new areas of clinical application have been particularly motivating. Today, studies and research with Spark Wave devices include 240 publications from 98 institutions in 20 countries!

The 25-year journey of MTS has been rich in global experiences, fascinating laboratory research and touching patient reports. The collaboration with international partners, customers and dedicated employees is earns our great gratitude.

One thing is certain: Spark Wave's journey will continue to be an exciting one.

#### BBC report on the application of the Spark Wave on the heart

A BBC podcast in September 2023 from „People fixing the World“ reports on a new area of application for the Spark Wave in the field of heart disease. „A historic step“ has been taken, says Dr. Johannes Holfeld, researcher and heart surgeon in Innsbruck, Austria: for the first time in the history of cardiac medicine, regeneration of impaired heart muscle could become a reality. In his study, patients who underwent a heart bypass and were additionally treated with shock waves had a significantly higher healing rate and cardiac output as well as an improved quality of life. MTS wishes Dr. Johannes Holfeld all the best on his way to testing this application in everyday clinical practice.

#### What values drive the MTS team?

In a workshop, MTS employees identified five key values for effective teamwork: communication, respect, flexibility, structure and creativity. These principles are important to us! In an international environment with demanding customers, respectful communication and the balance between flexibility, structure and creativity are the basis for our success and have made MTS a game changer.



## Dear readers,



Winter has set in and with it our anniversary year is drawing to a close. MTS is already 25 years old!

With our anniversary celebration in November 2023, we looked back on an eventful time and celebrated the successes of the past. In this special edition, we present the beginnings of the Spark Wave story. We show the special physical properties of Spark Wave as well as the therapeutic indication areas and give you an overview of the „ancestry“ of our devices.

Who is MTS and what are our values? Here we introduce ourselves. We have

set up a new section on our website under the heading „World of Spark Wave“. With just a few clicks, our products can be presented and understood virtually. MTS wishes you an enjoyable read and we will be happy to open our doors if you would like to meet us in person.

With my best wishes for the New Year  
Yours,

**Nikolaus Hopfenzitz**  
CEO MTS Medical

## Five indications for Spark Wave® Therapy

Shock wave therapy began with the extracorporeal, non-invasive treatment of kidney stones. High acoustic energies are used to turn a stone into sand. MTS uses the so-called „squeezing“ effect for this. A large focus causes the stones in the kidney to be surrounded by a pressure impulse and gently crushed. The smaller fragments can then be flushed out of the body naturally with the urine. The medical profession refers to this as lithotripsy.

Today, shock wave therapy is used to treat four more indications: Spark Wave is used in orthopaedics, dermatology, aesthetics and also in sexual medicine. On one hand, Spark Wave works on a mechanical level and can promote the healing of bone fractures and calcium deposits on tendons and joints. However, Spark Wave is more than just a mechanical impulse: Spark Wave activates intracellular healing processes. Growth factors are released, stem

cells develop and migrate to the affected area, new blood vessels develop and blood circulation is improved. As Spark Wave promotes tissue regeneration, this therapy is also used to treat poorly healing dermatological ulcers, such as diabetic foot ulcers. The same principle is used in the treatment of erectile dysfunction: the blood supply to the penis is improved, an important basis for a functional erection.

Imagining the benefits of Spark Wave therapy is like reaching into a box of miracles: It reveals a wide range of different areas of application. This therapy has been carefully documented and scientifically proven. A therapy for which further areas of treatment are already being tested today and will be developed in the future.



Wound Care



Aesthetics



Orthopaedics



Lithotripsy



Urogenital  
Indications

# Spark Wave® – the latest technology with a sparkling idea

MTS has cutting-edge medical technology at its disposal.  
But what exactly are Spark Waves?

Spark Waves are electro-hydraulically generated, high-energy acoustic shock waves. Unlike normal pressure waves, which always travel at the speed of sound, these shock waves initially travel at supersonic speeds. They are also characterized by a very high positive and a low negative pressure component. We therefore speak of a so-called PureWave: the shorter the rise time and the lower the negative pressure component, the better the quality of the shock wave (a low negative pressure component prevents the formation of hematomas).

## The Spark Wave® mechanism

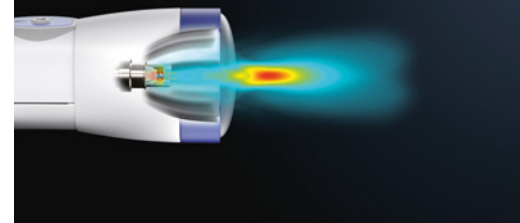
Spark Wave technology uses an electro-hydraulic operating principle in which a voltage is applied between two electrodes in a water bath, resulting in a spark discharge, just like a spark plug. The electrical discharge creates a high-energy hot plasma channel, which leads to a lightning-like heating of the water there. This creates an explosively expanding gas bubble, which forms a nanosecond supersonic shock wave

and transmits a high peak pressure to the tissue to be transformed into a focused shape via a specially designed reflector. With Spark Wave technology, the doctor has a significantly larger therapeutic treatment area available than with other systems, as the shock waves are already formed directly at the electrodes on the therapy head with Spark Wave (a priori, so to speak) and not only by being amplified in the small area of the focus (i.e. „a posteriori“ as with electromagnetic or piezoelectric systems).

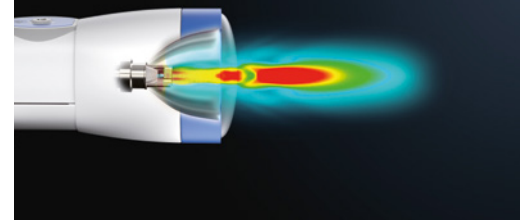
## The medical technology of tomorrow: SmarTrode® & PureWave®

The specially developed SmarTrode technology optimizes the setting of the electrode parameters in such a way that therapeutic treatments can also be carried out with a dynamic range of energy levels. The clever SmarTrode and the plasma-generated, tissue-friendly PureWave therefore complement each other perfectly and allow individually tailored therapies that are gentle on cells and tissue.

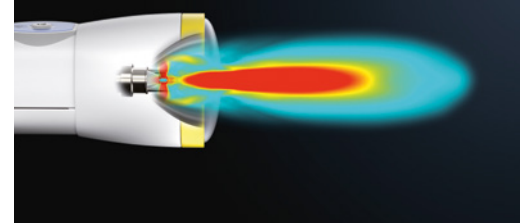
Focused Applicator  
OE050 | OE050S



Soft Focused Applicator  
OE035 | OE035S



SoftWave Unfocused Applicator  
OP155 | OP155S



## World of Spark Wave®

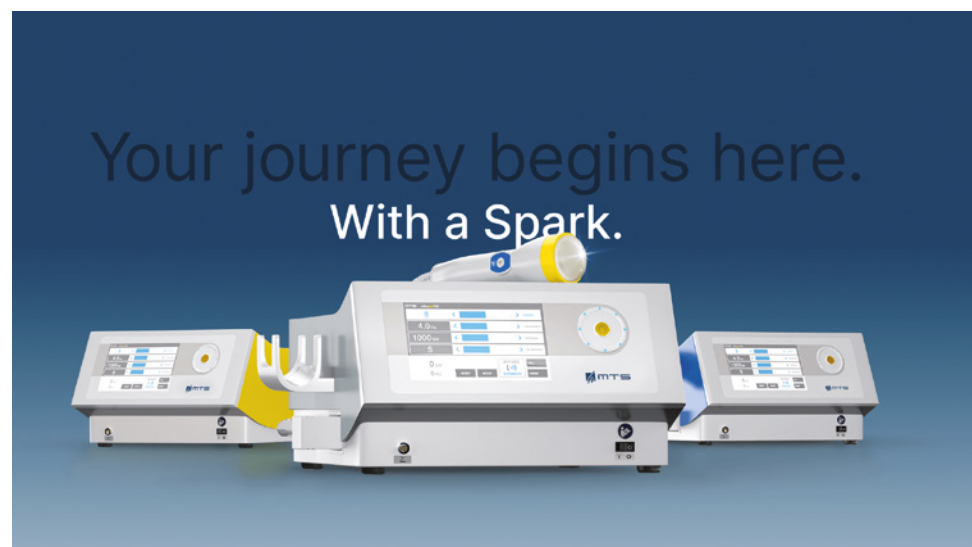
Join us on a virtual journey and experience the MTS Spark Wave interactively and in a new way. Our website has a new landing page that offers a variety of elements to experience Spark Wave even more intensively.

Immerse yourself playfully in the world of MTS Spark Wave devices and their applicators and learn about their physical functions. Realistic simulations illustrate the different pressure propagation in the applicator heads and make their differences comparable. In addition, moving 3D views provide detailed insights into all aspects of the device.

The presentation in World of Spark Wave makes our technology a sensual experience.

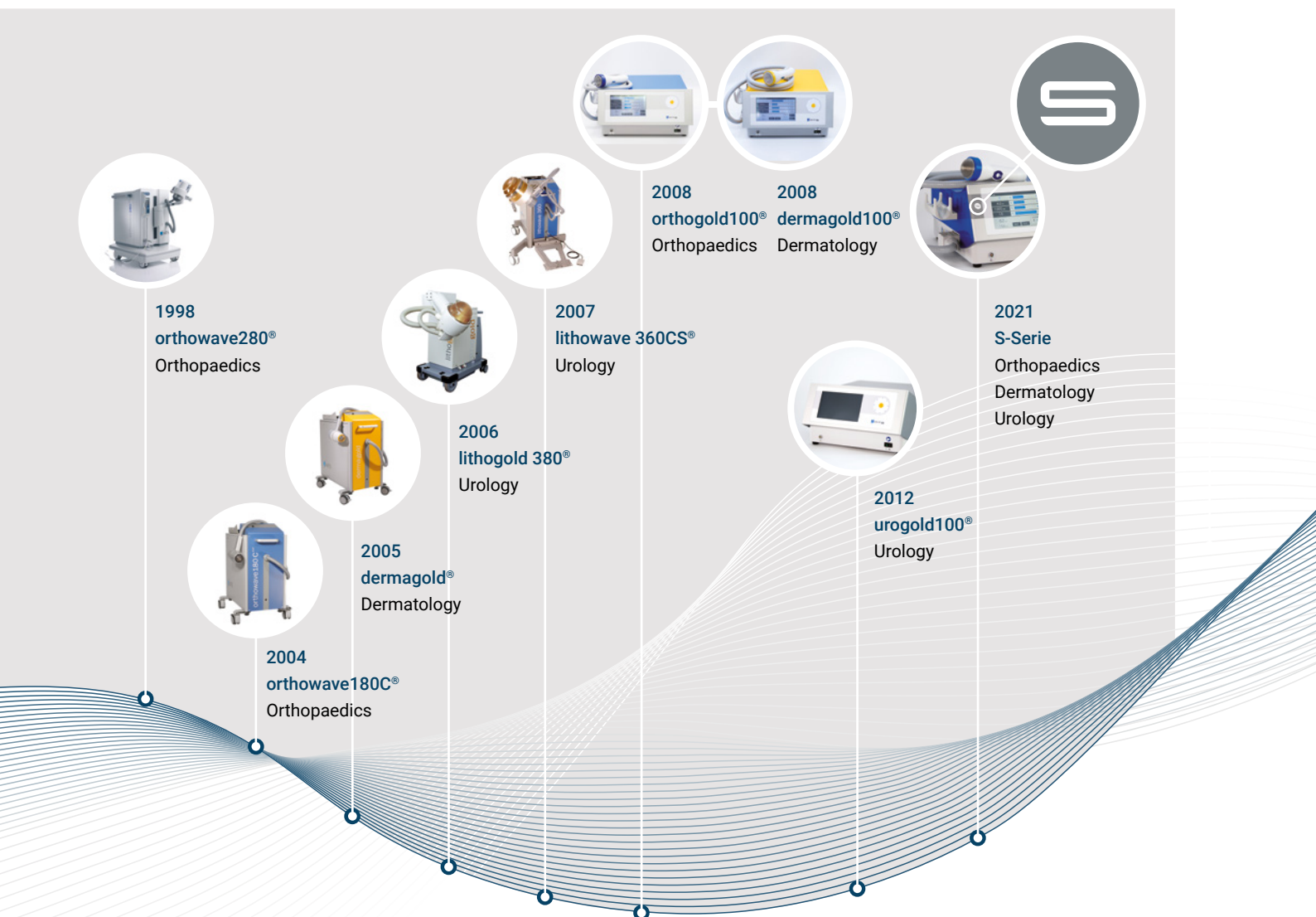
Visit [www.mts-medical.com/worldofsparkwave](http://www.mts-medical.com/worldofsparkwave)

from mid-January and experience MTS Spark Wave in a new way.





## An ancestral journey of MTS devices



## Healing waves



The reflectors of our MTS applicators are amazingly similar in shape to a singing bowl. While traditional singing bowls produce sound waves as very long sounds, our reflectors aim to bundle and focus extremely short shock wave impulses – both with the common goal of achieving healing.

At our company anniversary celebration, employees and guests were able to enjoy a wonderful singing bowl concert. In the spirit of our newsletter slogan „Orchestrating Sound of Healing“.

### Impressum

**MTS Medical (limited liability)**  
Robert-Bosch-Str. 18, 78467 Konstanz – Germany

T +49 (0)7531 36185-0, F +49 (0)7531 36185-070  
E [info@mts-medical.com](mailto:info@mts-medical.com)  
[www.mts-medical.com](http://www.mts-medical.com), [www.mts-science.com](http://www.mts-science.com)

**Authorised Representative:**  
Nikolaus Hopfenzitz, Ralph Reitmajer

**Register Court:** District Court, Freiburg  
**Register Number:** HRB 708104, VAT-IdNr.: DE 282675972

**Collaboration with:** Jana Schnitzer, Christina Hauf  
**Layout:** Anika Zillich

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For regular newsletter subscription, please contact  
[info@mts-medical.com](mailto:info@mts-medical.com).

MTS Medical manufactures Spark Wave Therapy Systems for shockwave applications in fields of orthopaedics, traumatology, wound healing and urology - even in areas that are difficult to treat. MTS Medical is one of the pioneers in the field of non-invasive regenerative medicine.