# Acoustic Wave Treatment

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Japanese garden at company headquarters of
STORZ MEDICAL AG in Tägerwilen/Switzerland

## Acoustic waves for medical and cosmetic procedures

Established in 1987, STORZ MEDICAL AG is an independent partner company of the KARL STORZ Group. Our products have proved their efficacy all over the world in the medical disciplines of urology, orthopaedics, cardiology dermatology and aesthetic medicine.

Close co-operation with leading medical institutes in the United States, Switzerland, Germany and Italy has enabled us to develop a pioneering treatment that sets new standards for medical and cosmetic procedures. This treatment method is referred to as Acoustic Wave Treatment, AWT® for short.

The fields of application of AWT®:

- Body shaping
- Cellulite treatment
- Skin elasticity improvement
- Connective tissue tightening
- Scar and wrinkle smoothing

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## Acoustic Wave Treatment (AWT®) for aesthetic applications

Originally, acoustic waves were used for medical purposes exclusively because of their mechanical effects. While initially applied for the fragmentation of kidney stones, acoustic waves have also been employed in orthopaedic pain therapy for over 20 years. Recent studies have revealed that acoustic waves also produce biological effects that stimulate metabolic processes and improve connective tissue elasticity in aesthetic treatment. The results can be significantly enhanced by combining focused acoustic waves with radial acoustic waves. Moreover, vibration treatment is an ideal complement to AWT®.

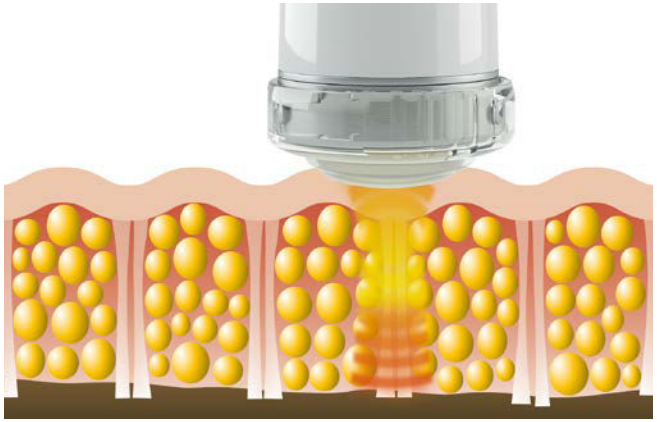
**Biological effects of AWT®**

- Stimulation of microcirculation (blood/lymph)
- Improvement of tissue elasticity
- Stimulation of cellular metabolism (improved cell membrane permeability)
- Improvement of firmness

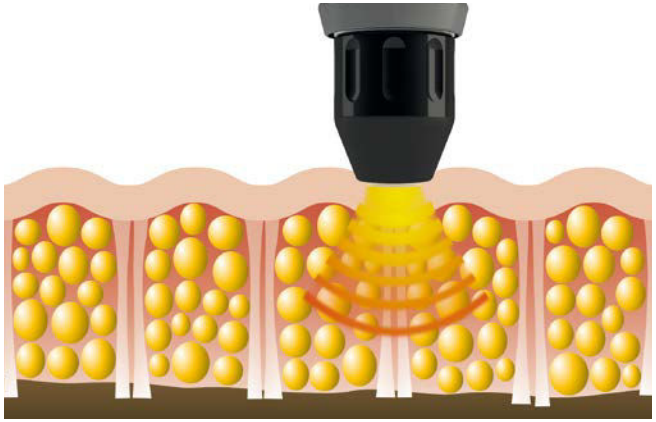
**Benefits of AWT®**

- Non-invasive
- Short treatment time with no downtime
- Suitable for all types of skin
- Initial improvements possible after only one treatment, depending on skin type and application

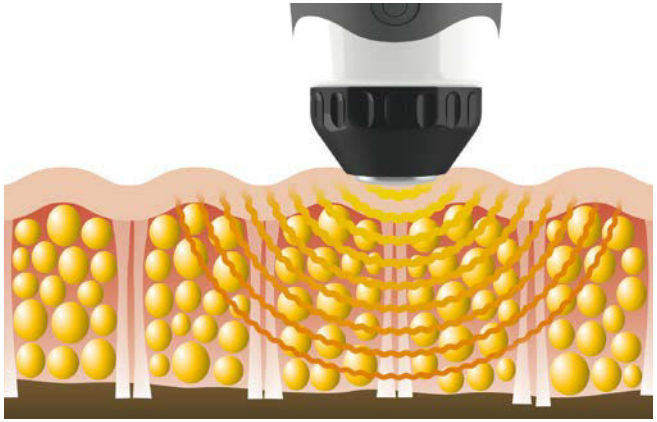
C-ACTOR® handpiece: focused acoustic waves can be used for fat breakdown in the tissue.



D-ACTOR® handpiece: radial acoustic waves can be used to improve elasticity of connective tissue.



V-ACTOR® »HF« handpiece: vibration pulses can be used to stimulate the lymphatic system.



## Improvement of cellulite

The typical orange peel or mattress appearance of cellulite affects 90% of all women. Cellulite is caused by the parallel structure of the collagen fibre bundles, which make it easy for the fat cells to bulge straight upwards towards the skin surface. In addition to this, reduced microcirculation causes fibrosclerosis in the connective tissue, which exacerbates the condition.

AWT® reduces existing metabolic regulation disorders and stimulates fat breakdown in cells. It enhances the elasticity of connective tissue fibres and improves skin tone, thus decreasing the visible signs of cellulite and the appearance of dimples and bumps. Several clinical studies[1,2,3,4] have been conducted using the D-ACTOR® handpiece to assess the effects of radial AWT®. During the studies, skin elasticity increased continually over a period of six months.

## Key facts

- Smoothing of the skin
- Treatment of cellulite and dimpled skin
- Improvement of skin elasticity and microcirculation

[1] Christ, C. et al.: Improvement in skin elasticity in the treatment of cellulite and connective tissue weakness by means of extracorporeal pulse activation therapy. Aesthetic Surgery Journal, 2008, 28(5)
[2] Adatto, M. et al.: Controlled, randomized study evaluating the effects of treating cellulite with AWT/EPAT. Journal of Cosmetic and Laser Therapy, 2010,12(4)
[3] Steinert, M. et al.: Efficacy and safety of AWT in anti-cellulite treatment. PRIME Journal, July/August 2013.
[4] Russe-Wilflingseder, K. et al.: Placebo controlled, prospectively randomized, double-blinded study for the investigation of the effectiveness and safety of the acoustic wave therapy (AWT®) for cellulite treatment, Journal of Cosmetic and Laser Therapy, 2013, 15(3)

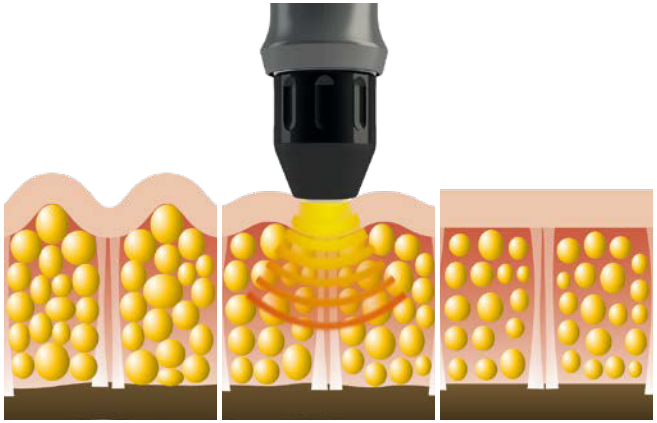
Before AWT® After AWT®

Source: Professor Knobloch, Hanover, Germany

Before AWT® After AWT®

Source: Dr Ledermann, Zurich, Switzerland

Schematic of anti-cellulite treatment using the radial D-ACTOR® handpiece



Before AWT® During AWT® After AWT®

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## Body shaping

The human body contains a high percentage of fat, which, by nature, is stored as energy reserve for periods of food scarcity. This function is primarily performed by the subcutaneous adipose tissue. Depending on gender and nutritional status, fat deposits of 10% to 50% of the body weight are primarily located on the abdomen, buttocks and thighs. These small to medium-size fat deposits can be treated successfully with acoustic waves.

AWT® reduces the thickness of adipose tissue. Acoustic waves also improve the removal of these metabolic waste products via the lymphatic and blood systems. The studies[5,6] conducted with the CELLACTOR® SC1 clearly demonstrate the effectiveness of the body shaping therapy.

This effect can be further enhanced by an appropriate diet, physical exercise and sufficient fluid intake during and after AWT® treatment.

## Key facts

- Treatment of fat deposits
- Thickness reduction of adipose tissue
- Circumference reduction

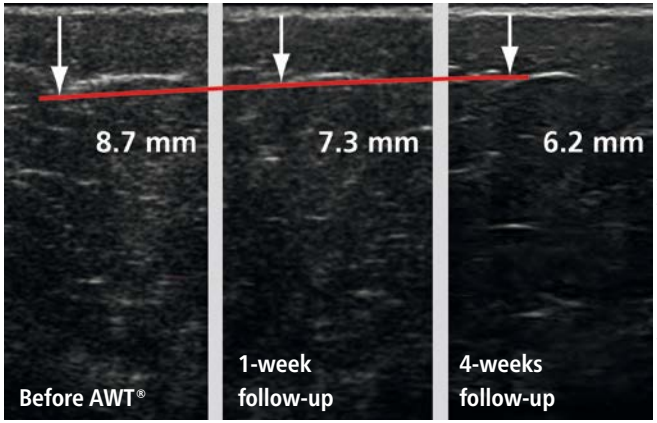
[5] Adatto, M. et al.: Body shaping with acoustic wave therapy AWT/EPAT: Randomized, controlled study on 14 subjects. Journal of Cosmetic and Laser Therapy, 2011, 13/6
[6] Siems, W. et al.: Anti-fibrosclerotic effects of shock wave therapy in lipedema and cellulite. BioFactors 2005; 24(1-4)

Before AWT® After AWT®

Source: RWZ Medical Systems GmbH, Graz, Austria

Body shaping with radial D-ACTOR® handpiece

Ultrasound images of adipose tissue before and after AWT®
(8 treatment sessions in 4 weeks)




Source: Dr Adatto, Geneva, Switzerland

## Treatment of facial wrinkles and skin tightening

The skin begins to age in our mid-20s. The connective tissue stores less moisture and cell production slows down. Wrinkles are the result of the reduced elasticity of the dermal fibres. Tissue tone, for which collagen fibres are responsible, decreases. The effects of this process are most obvious in our face. The notorious deep nose and cheek wrinkles, drooping jowls, sagging skin below the chin, and forehead wrinkles and fine lines around the mouth, cheeks and eyes appear.

AWT® stimulates fibroblasts deep within the skin to resume collagen and elastin production. They promote mechanical stimulation to improve skin firmness and elasticity, making the skin look firmer and smoother. Therefore AWT® is suited to treat the face and chin area.[7]

## Key facts

- Increase of skin elasticity
- Improvement of firmness and skin texture
- Reduction of pore size and wrinkle depth

[7] Adatto, M. et al.: Facial treatment with acoustic wave therapy (AWT) to improve facial skin texture, pores and wrinkles. P0478, 25th EADV Congress, Vienna, 2016

Before AWT® After AWT®

Source: SHOCKWAVE FRANCE/TEPOC, Paris, France

Before AWT® After AWT®

Source: SHOCKWAVE FRANCE/TEPOC, Paris, France

Treatment of facial wrinkles with D-ACTOR® handpiece

## D-ACTOR® mode – radial acoustic waves

The D-ACTOR® handpiece is particularly designed for the treatment of superficial tissue regions. The radial waves are used for applications such as cellulite treatment, facial wrinkle smoothing and connective tissue tightening. Scientific studies could confirm the effectiveness of radial acoustic waves in body shaping when combined with focused acoustic waves.[5,6]

Acoustic waves of the D-ACTOR® handpiece are generated by a projectile which is repeatedly accelerated by compressed air. By impinging on a transmitter, the energy is introduced into the tissue. Various types of transmitters allow the treatment of different structures.

The ergonomic shape of the radial handpiece and a selected range of different transmitters offer the user maximal flexibility in their treatment protocol.

The applied parameters such as frequency, energy and total number of pulses can be selected and viewed on the integrated display and buttons. Additionally, the D-ACTOR® handpiece is equipped with the unique power sensor to display the application pressure intensity.

## Key facts

- All control elements and parameter settings on the handpiece
- Handpiece integrated control of application pressure intensity
- Specific transmitters available to reach different tissue structures

Transmitters for D-ACTOR® handpiece

| | | | |
|---|---|---|---|
| Basic | **DI15 (Ø 15 mm)** Strong treatment on a specific spot | **F15 (Ø 15 mm)** Facial treatment | **D20-S (Ø 20 mm)** Standard cellulite treatment |
| Optional | **C15 (Ø 15 mm)** Sensitive treatment | **D20-T (Ø 20 mm)** Intense cellulite treatment | **D35-S (Ø 35 mm)** Laxity and drainage |

Handpiece buttons and display

Wave propagation of D-ACTOR® handpiece

## C-ACTOR® mode – focused acoustic waves

The C-ACTOR® handpiece has been particularly designed for specific fat break down and smoothing effects. The focused acoustic waves are used for applications requiring precisely controlled energy input and concentration in adipose and skin tissue: body shaping, scar and wrinkle smoothing, post-liposuction treatment and connective tissue tightening. The effectiveness of focused acoustic waves in aesthetic medicine is confirmed in scientific studies.[8,9]

Acoustic waves of the C-ACTOR® handpiece, generated by the proven electromagnetic cylindrical source, allow safe treatment due to a constant energy output.

The dynamic shape of the C-ACTOR® handpiece lies comfortable in the user's hand and reduces hand fatigue. All treatment parameters such as frequency, energy and total number of pulses can be selected and viewed on the integrated display and buttons.

## Key facts

- All control elements and parameter settings on the handpiece
- Energy range: 0.03 – 1.24 mJ/mm²
- Therapeutic effectiveness up to 60 mm penetration depth

[8] Rümmelein, B.: Body composition analysis accompanying the acoustic wave therapy to improve predictability of cellulite therapy results. Presentation given at the 2011 EADV Congress in Lisbon, Portugal

[9] Sattler, G. et al: Pilotstudie Akustische Wellentherapie (AWT) bei Cellulite. [Pilot study: Acoustic Wave Therapy (AWT) for Cellulite.] Ästhetische Dermatologie 2/2008

Different stand-offs to adjust treatment depth

Handpiece buttons and display

Wave propagation of C-ACTOR® handpiece

## V-ACTOR® mode – vibration treatment

The vibration treatment stimulates the metabolism and encourages the elimination of waste products. The pneumatically generated, oscillating impulses cause vibrations in the skin and muscles, which have a positive effect on the circulation. This mode of action promotes natural tightening and smoothing of the skin.

The relaxing wellness effect of vibration massage provides the ideal complement to AWT® and can either be used before or after the treatment.

All parameters such as frequency, energy and total number of pulses can be selected and viewed on the touch display.

## Key facts

- Mechanical stimulation of the skin
- Vibration treatment up to 50 Hz
- Relaxation of muscles
- Increase of blood circulation
- Wellness effect

Vibration heads of V-ACTOR® »HF« handpiece

Tissue smoothing with the V-ACTOR® »HF« handpiece

Vibration pulses of V-ACTOR® »HF« handpiece

## VACU-ACTOR® mode – vacuum treatment

VACU-ACTOR® treatment mechanically manipulates the tissue by applying negative pressure directly to the skin. Since tension is exerted on the tissue both vertically and horizontally, it can loosen adhered tissue layers and increase elasticity. The mechanical effect reaches from skin level into profound subcutaneous layers to fascia and muscle fibres. VACU-ACTOR® treatment is an additional complement to AWT®, especially when vibration treatment (V-ACTOR® mode) is not applicable, e.g. cleavage or face. In static application, treatment using the VACU-Cup is performed locally in specific spots; for dynamic application, it takes place along the course of a muscle or fascia. Besides the vacuum intensity, the user can select between a continuous and an intermittent vacuum mode.

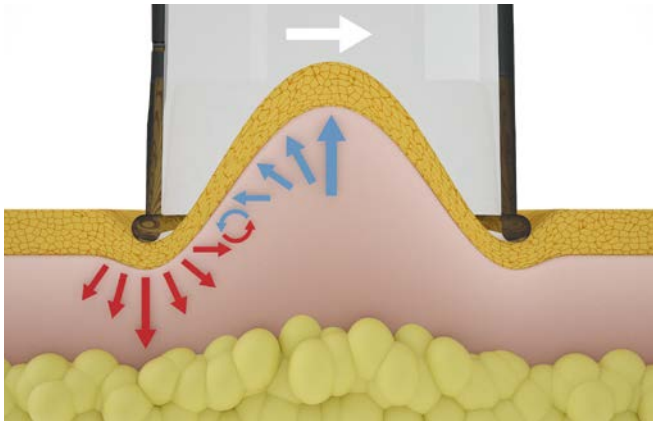
## Key facts

- Tissue mobilisation
- Increase in tissue flexibility and elasticity
- Activation of lymph flow and blood circulation

Tissue mobilisation with VACU-ACTOR®

Overview of VACU-Cups

Mode of action of VACU-ACTOR®



US
D-ACTOR 1
D-ACTOR 2
C-ACTOR
V-ACTOR
VACU-A
0.76
1000
3.0
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Aesthetics
Patients
Body shaping
Cellulite
Skin tightening
Tissue treatment
Settings
Info
Visible Body
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CONTROL

## Touch screen panel – the ideal treatment guide

The touch screen panel adds valuable features: apart from the additional device control, it offers a treatment documentation system as well as treatment parameters recommended by experienced users and supported by images. These parameters can be selected and adopted.

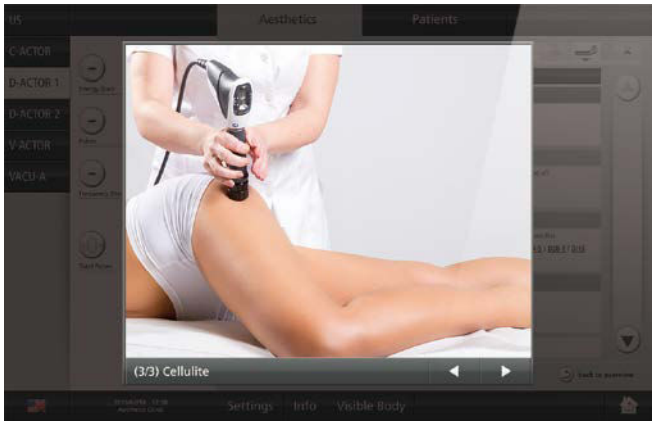
The integrated Visible Body® software allows the user to show detailed definitions and information about the human anatomy. Thus, a novel interaction between practitioner and patient will be enabled.

## Key facts

- Treatment documentation system
- Treatment parameters supported by images
- Visible Body® – Digital Human Anatomy Atlas: macroscopic and microscopic 3D models of the human anatomy

Treatment instructions via touch screen

Treatment images




Digital Human Anatomy Atlas: Visible Body®

# Product overview

## D-ACTOR® 100 »ultra«

**General data**

- Dimensions without touch screen (W x H x D): 426 x 144 x 340 mm
- Weight: 10.5 kg
- 10" touch screen (optional)
- Dimensions trolley (optional, W x H x D): 585 x 840 x 585 mm

**D-ACTOR® mode**

- Handpiece with integrated control buttons and display
- Pressure: max. 5 $bar_{eff}$
- Frequency: 1 – 21 Hz (depending on pressure)

**V-ACTOR® mode**

- Frequency: 1 – 50 Hz

## D-ACTOR® 200 »ultra«

**General data**

- Dimensions without touch screen (W x H x D): 466 x 187 x 454 mm
- Weight: 25 kg
- 10" touch screen
- Two D-ACTOR® handpiece connectors
- Dimensions trolley (optional, W x H x D): 585 x 840 x 625 mm

**D-ACTOR® mode**

- Handpiece with integrated control buttons and display
- Pressure: max. 5 $bar_{eff}$
- Frequency: 1 – 21 Hz

**V-ACTOR® mode**

- Frequency: 1 – 50 Hz

**VACU-ACTOR® mode**

## CELLACTOR® SC1 T-TOP »ultra«

### General data

- Dimensions without touch screen (W x H x D): 466 x 187 x 454 mm
- Weight: 25 kg
- 10" touch screen (optional)
- Two D-ACTOR® handpiece connectors
- Dimensions trolley (optional, W x H x D): 585 x 840 x 625 mm

### C-ACTOR® mode

- Handpiece with integrated control buttons and display
- Energy range: 0.03 – 1.24 mJ/mm$^2$
- Frequency: 1 – 8 Hz

## CELLACTOR® SC1 TOWER »ultra«

### General data

- Dimensions (W x H x D): 590 x 1261 x 660 mm
- Weight: max. 83.3 kg
- 15.6" touch screen
- Integrated ultrasound imaging, Colour Doppler (optional)
- Drawer module »Store Case« (optional)

### D-ACTOR®, V-ACTOR® and VACU-ACTOR® mode

- See D-ACTOR® 200 »ultra«

### C-ACTOR® mode

- See CELLACTOR® SC1 T-TOP »ultra«

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## HUMANE TECHNOLOGY – TECHNOLOGY FOR PEOPLE

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The products listed below and referred to in this brochure are provided by our technology partners to complete our products: Ultrasound, Visible Body®. V-ACTOR® »HF« expected to be available in Q2/2019.