

Focused and variable

## PiezoWave<sup>2</sup>

Therapy sources and focal zones  
made for individual indications



ESWT/ESWL Team of  
RICHARD  
**WOLF**  
spirit of excellence

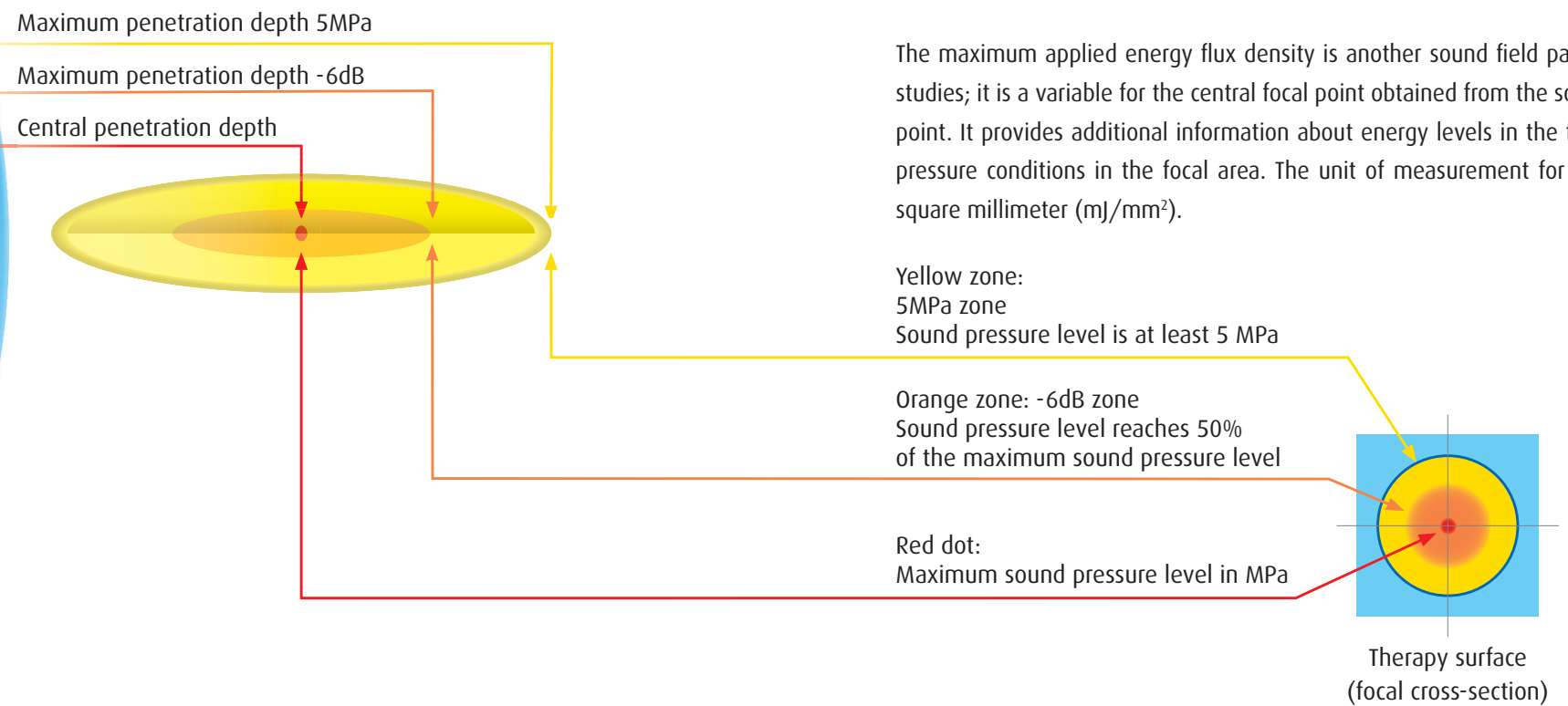
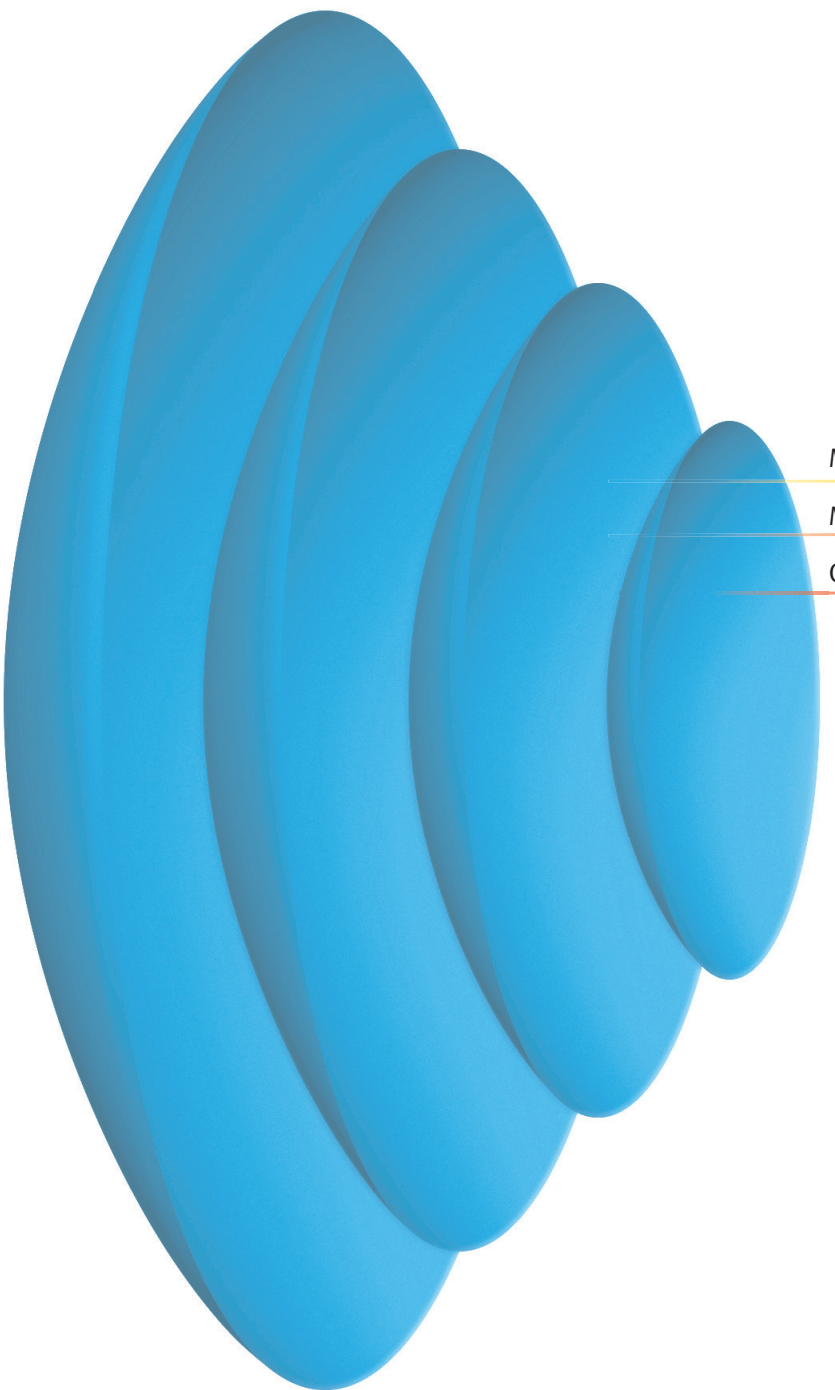
Elvation Medical GmbH  
Ludwig-Wolf-Str. 6  
75249 Kieselbronn-Germany  
+49 72 31 - 56 36 56 tel  
+49 72 31 - 56 36 46 fax  
info@elvation.de  
www.elvation.com

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## Focused and variable - Therapy sources for individual indications

The use of focused shock waves is firmly established as an accepted procedure to treat many different conditions. With the increased numbers of indications for shockwave procedures and the expansion of ESWT options, the requirements for the focal zones of shock waves in terms of their penetration depth, strength, shape and volume have risen significantly. The idea that one type of focal zone fits all is therefore no longer in keeping with current user demands. A modern and innovative shock wave system needs to be variable to allow it to be adjusted to the respective target tissue. To meet the demand for successful treatments optimally adjusted to various indications, Richard Wolf GmbH and ELvation Medical GmbH set about developing the right therapy sources and focal zones for many different indications in addition to all-purpose therapy sources. All therapy sources shown in this brochure are optional and were designed for use with the PiezoWave2 system. This allows the treatment concept to be expanded from all-purpose treatments to new therapies in future.



## Focal size, explained in terms of standard sizes...

Focal size, therapeutic impact zone, -6dB zone, 5 megapascal (MPa) zone, central penetration depth, maximum/distal penetration depth, energy flux density... all of these terms can be confusing and are often randomly used, also in advertising. But focal zones are defined according to specific standard sizes and technical norms, as shown in the simplified description given below:

The -6dB zone, commonly used to compare measurements and studies, refers to the area in the focal zone where the sound pressure amplitude is at least 50% of the maximum sound pressure amplitude in the central focal point. According to current scientific knowledge, this figure provides no data about the therapeutic impact zone of shock wave therapy. But based on the assumption that a sound pressure amplitude of at least 5MPa is needed to achieve a tissue effect/therapeutic effect in standard ESWT treatments, the 5MPa zone is increasingly considered to be a therapeutic impact zone. According to this definition, the 5MPa zone is the focal sound field area where the sound pressure amplitude is  $\geq 5$ MPa.

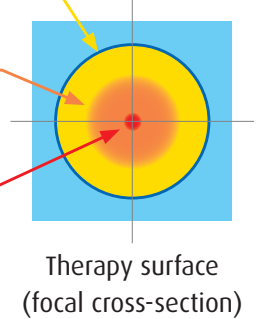
The specified maximum penetration depth refers to the respective sound field. The central maximum penetration depth is the distance between the skin surface and the point of maximum sound pressure when using a gel pad which ensures the greatest penetration depth. The maximum penetration depths of the -6dB and 5MPa zones refer to the distance between the skin surface and the distal "end" of the respective focal zone, again while using a gel pad with the greatest penetration depth. Penetration depths can be precisely varied or reduced, using gel pads as spacers.

The maximum applied energy flux density is another sound field parameter often used in practice and in studies; it is a variable for the central focal point obtained from the sound pressure signal measured at that point. It provides additional information about energy levels in the focal sound field in addition to sound pressure conditions in the focal area. The unit of measurement for energy flux density is millijoule per square millimeter ( $\text{mJ}/\text{mm}^2$ ).

Yellow zone:  
5MPa zone  
Sound pressure level is at least 5 MPa

Orange zone: -6dB zone  
Sound pressure level reaches 50%  
of the maximum sound pressure level

Red dot:  
Maximum sound pressure level in MPa



**F7G3**  
Convenient therapy source with small focal point

Penetration depth  
40 mm  
33 mm  
30 mm

Maximum energy flux density 0,4  $\text{mJ}/\text{mm}^2$

**F10G4**  
The all-rounder

Penetration depth  
66 mm  
44 mm  
40 mm

Maximum energy flux density 0,82  $\text{mJ}/\text{mm}^2$

**FB10G6**  
Powerful source with a large volume and deep penetration depth

Penetration depth  
99 mm  
71 mm  
60 mm

Maximum energy flux density 0,7  $\text{mJ}/\text{mm}^2$

**F10G10**  
Deep penetration depth with elongated focal zone

Penetration depth  
172 mm  
116 mm  
100 mm

Maximum energy flux density 0,3  $\text{mJ}/\text{mm}^2$

**FBL10x5G2**  
The horizontal line with the largest volume and highest pulse energy

Penetration depth  
30 mm  
29 mm  
20 mm

Maximum energy flux density 0,16  $\text{mJ}/\text{mm}^2$   
Line length/y total 50 mm

Figures can vary according to the preselected intensity and may be rounded up or down. All figures for therapy sources F10G10 und F7G3 given here are provisional.