# D-Pulse: the Pulse Created for *MonaLisa Touch*[TM]

Thanks to the particular shape of the pulse (**DEKA-Pulse** or **D-Pulse**), small islands of denaturation are created in the vaginal tissue, surrounded by unaltered tissue (fractional or fractionated treatment). Since **the vaginal walls** consist of **mucosa**, which has different morphological characteristics to skin, a particular pulse has to be used that is neither *ultrapulsed* (too "cold" and deep) or *superpulsed* (too "hot" and superficial) nor *Smart-Pulse* (developed to be used on skin).

The outermost **layer of skin** is continuously subject to mechanical stresses, and is rich in keratin and extremely poor in water. The vaginal **mucosa is different**: the epithelium is not keratinized and **is rich in water**.

These differences have important **clinical implications** because of the high affinity of CO_2 laser to the water content. Because of the **different degrees of hydration**, the effects of laser absorption in skin is quite different from those in the mucosa . A laser designed for performing skin photo-rejuvenation may not be as effective on the vaginal mucosa. This is why DEKA developed the **SmartXide^2 V^{2}LR** system for the *MonaLisa Touch*[TM] treatment, capable of supplying energy with a specific pulse, derived from dermatological experience, but taking into account the peculiarities of vaginal mucosa: the **D-Pulse** (or **DEKA-Pulse**).

The operating mode of D-Pulse is an absolute novelty and has been developed by DEKA for **better control** of the relationship between **ablation and denaturation** of the CO_2 laser effect on soft tissue.
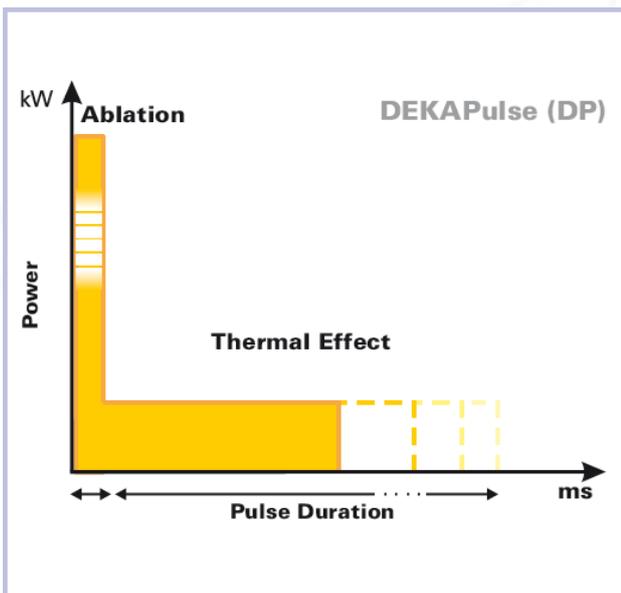
*D-Pulse: the pulse specifically developed by DEKA for V^{2}LR.*

The **D-Pulse** consists of:

- an initial part with constant, **high energy peak power**, for rapid **superficial ablation** of the epithelial component of atrophic mucosa characterized by low water content;

- a second variable part, with **lower peak power** and **longer emission times**, that allows the laser energy heat to **penetrate in depth**, stimulating the synthesis of **new collagen** and of the components of the **ground substance** of the matrix.

The result is amazing, designed to produce the structural improvements needed to restore the **trophism** and full **functionality** of the supporting structures of the vaginal walls.

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The **D-Pulse** is exclusive to DEKA and is the precise pulse required to achieve **effective collagen stimulation** in particularly delicate tissue such as that of the vaginal walls. Only a small superficial part of the mucosa is vaporised with D-Pulse. The heat can then **disperse** into the underlying tissue, thereby generating **controlled denaturation** of the connective tissue. In this way, regeneration of the mucosa is stimulated **with no trauma** and with the right amount of laser energy. This control is absolutely necessary so not to cause fibrosis in such **delicate** tissue with **high regenerative capacity**.
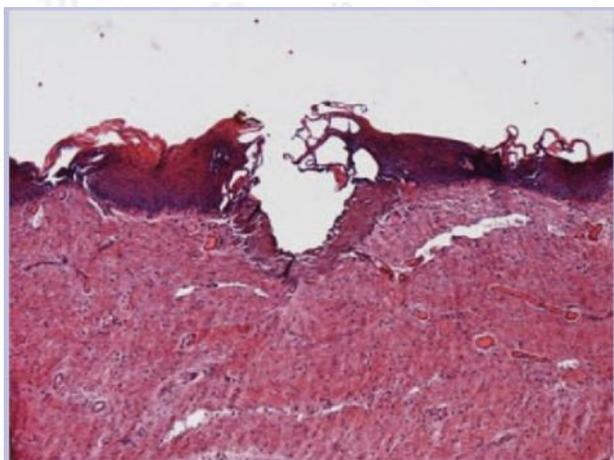
Vaginal mucosal histological preparations stained with haematoxylin and eosin (H&E). Observe the effect produced by a D-Pulse on the mucosa epithelium with vaporization and the formation of a band of collagen denaturing. Below this area, laser stimulation produces a controlled temperature gradient which induces the activation of a specific Heat Shock Protein (HSP47) capable of promoting the synthesis of new collagen fibroblasts.

Excessive heating or vaporisation that is too deep would severely damage the vaginal mucosa, with a consequent risk of scarring. This is proven by the fact that many operators have tried to accomplish this stimulation over the years, or even contraction of the vaginal tissue, with limited success or, in certain cases, with disastrous consequences. Once scars are made, the fibrotic tissue causes the vaginal wall to become even more inelastic, which unfortunately remains so permanently.

D-Pulse is the instrument required for the **right stimulation** to restore the normal conditions of the **vaginal mucosa**.

MonaLisa Touch™