



**indena**<sup>®</sup>

INDUSTRIA

DERIVATI

NATURALI

PERSONAL CARE

---

# LEGSWELLNESS

The ingredients described herein are offered for consideration for use in personal care products. The information provided describes historical use, ingredient activity and other information that may be relevant to their use in such products. How each ingredient would contribute to a particular product would be formulation specific. Furthermore please note that this documentation is available for various countries all over the world and hence it may contain statements not applicable to your country.

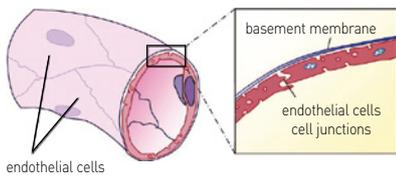
# WHAT ABOUT LEGS WELLNESS

Under the general definition of “legs wellness” fall most skin care applications targeting the discomfort of legs. In legs, due to the facts that are the longer limbs, the venous return is always challenged by the force of gravity and the maintenance of a healthy vascular system is crucial for a physiological circulation.

The approach proposed here refers to three different targets as the vascular system and its protection and efficiency of its venous walls, the reduction of the resting blood flow by performing a vasokinetic promotion and finally the fluid retention by modulating the fluid leakage and the onset of swollen limbs .

**Aim of this brochure is to provide a comprehensive overview of the botanical active ingredients suitable for an overall legs’ wellness application. It contains several options addressed to multiple biological targets to offer a multifunctional approach in the project of finished dosage forms containing natural active ingredients from plants .**

## VASCULAR PROTECTANTS, REINFORCEMENT OF THE VENOUS WALL



**CENTELLA ASIATICA SELECTED TRITERPENES (CAST):** the triterpenes obtained from *Centella asiatica* exert their activity by stimulating collagen biosynthesis and increasing the incorporation of hydroxyproline into this protein, thus modulating the metabolism of connective tissue, promoting the physiological cicatrization. Centella asiatica selected triterpenes also exert a protective effect on microcirculation, as well as promoting a physiological cicatrization. Centella asiatica selected triterpenes has also been formulated in the most bioavailable Phytosome® form.

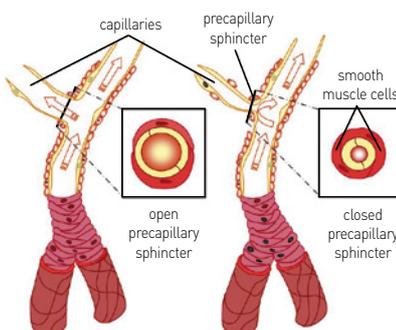
Level of use 0.1-1%



**ESCULOSIDE:** acts to provide capillary protection by addressing capillary permeability and fragility. It is reported to inhibit catabolic enzymes such as hyaluronidase and collagenase, thus preserving the integrity of the perivascular connective tissue. Esculoside is a glycosilated coumarin obtained from the bark of Horse Chestnut branches. Traditionally it has been used to address venous peripheral diseases. Recently in the research of new vasoactive substances, Esculoside has been reported to have an interesting activity on skin microcirculation, thus becoming a candidate ingredient for topical applications addressing cellulite.

Level of use up to 3%

## VASOKINETICS



**XIMILENE® and XIMENOIL®:** are obtained from *Santalum album*, a plant traditionally used in form of poultices as “traditional masks” to treat the skin and make it smoother, tauter and more velvety. Ximeninyc acid, contained in Ximenoil®, and ethyl xymeninate, contained in Ximilene®, as well as polyunsaturated fatty acids, in general are important factors related to the nourishment of tissues and biochemical balance of the skin, as they make up an integral part of cell wall lipids, building up cell membranes. They have been clinical reported to promote blood flow.

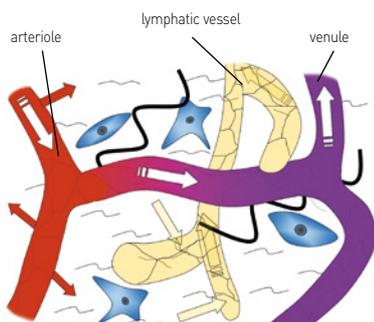
Level of use 0.1-1%

**VISNADINE:** is a natural product extracted from the seeds and aerial parts of *Ammi visnaga* (Umbelliferae), a plant widely used in traditional Egyptian medicine since the Pharaohs times. Visnadine has a strong vascular activity, not associated with vasodilating properties. Its efficacy, in fact, is due to the enhancement of the inotropic activity of the wall myocytes in microcirculatory vessels. Visnadine also has strong antiphosphodiesterase activity, maintaining high levels of cAMP, which activates lipases, thus improving lipolysis in fat cells. Visnadine has also been formulated in the most bioavailable Phytosome® form (Visnadex®).

Level of use 0.1-1%



## SWELLING MODULATORS



**ESCIN:** the topical benefits of escin, or aescin, are demonstrated by scientific studies assessing its anti-oedema and vasoactive properties. It acts principally in capillaries, being its mechanism of action related to the modification of vascular permeability. In fact, it has been shown to reduce the number and the size of the small pores of the capillary walls through which water exchanges normally occur. Escin has also been formulated in the most bioavailable, yet most tolerable, Phytosome® form.

Level of use 0.5-2%



**HORSE CHESTNUT:** the topical benefits of horse chestnut fruit extract, containing escin or aescin, are demonstrated by scientific studies assessing its anti-oedema and vasoactive properties. It acts principally in capillaries. Escin mechanism of action is related to the modification of vascular permeability. Aescin has been shown to reduce the number and the size of the small pores of the capillary walls through which water exchanges normally occur.

Level of use up to 2%

# THE BOTANICALS' OPTIONS

Several botanical active ingredients have been reported effective in addressing, by various mechanisms of action, the physiological functions our organism uses to maintain a healthy status of the lower limbs.

In particular, it is worth mentioning ingredients protecting the venous walls by improving the perivascular architecture and sustaining the walls endothelium. Vasokynetics promote the regular blood flow at a superficial level and ensure the delivery of the appropriate quantity of nutrients to dermis cells. Vasoactive and vascular protectant active ingredients address the superficial vessels by promoting circulation and maintaining the vessels' integrity.

Fluid retention is another topic, again more typical in women than in men, involving an excessive fluid leakage especially at the limbs' edge due to an excessive vascular permeability. Several botanicals protect blood and lymphatic vessels to modulate fluid leakage.

**LEUCOSELECT®:** (Grape Seed extract) exerts its activity through multiple mechanisms: as a free radical scavenger, through chelation of transition metals, and by inhibition of proteolytic enzymes, etc. The oligomeric procyanidins contained in the extract are the active small molecular size polyphenols responsible for the biological activity. Leucoselect® has also been formulated in the most bioavailable Phytosome® form.

Level of use up to 1%



**MIRTOSELECT®:** is a standardized extract obtained from *Vaccinium myrtillus*, bilberry, also known as the wild blueberry. It contains biologically active molecules, the deep purple anthocyanosides, which strengthen the capillary walls by linking to the endothelial cells membrane and increasing capillary resistance. They also contribute to reduce capillary permeability by stimulating the synthesis of perivascular tissue constituents, thus qualifying as capillary protectants.

Level of use 0.1-1%

**PA2:** PA2 (Proanthocyanidin A2) is a molecule present in the bark of the Horse Chestnut tree. It has potent antienzymatic activity (mainly anti-elastase and anti-collagenase), is a free radical scavenger, and also normalizes impaired capillary permeability and fragility. The Phytosome® form has also been developed. This delivery system clinically has been reported to promote skin firmness and to reduce fine wrinkles.

Level of use 0.1-1%



**RUSCOGENINS:** Ruscogenins (mainly ruscogenin and neoruscogenin) are steroid saponins typical of *Ruscus aculeatus* L. Their pharmacological activity is vasoconstricting and anti-inflammatory, having been found to enhance venous circulation by promoting muscle contractions with a mechanism involving post junctional -adrenergic receptors. Moreover, they inhibit the enzyme elastase maintaining the integrity of the constituents of the connective tissue, thereby exerting anti-ageing effect.

Level of use 0.1-1%

**BUTCHER'S BROOM:** Butcher's broom, also known as *Ruscus aculeatus*, is the dry extract standardized to contain the active saponins ruscogenin and neoruscogenin, which have been demonstrated to exert a vasoconstricting and anti-inflammatory activity by promoting muscle contractions with a mechanism involving post-junctional receptors.

Level of use up to 2%

**GINKGO BILOBA DIMERIC FLAVONOIDS:** are a specific diflavonoid fraction obtained from the Ginkgo biloba leaves. They have been reported to have a lipolytic action mediated by the inhibition of cAMP-phosphodiesterase, thus improving lipolysis in fat cells and capillary blood flow. Ginkgo Biloba Dimeric flavonoids has also been formulated in the most bioavailable Phytosome® form.

Level of use 0.1-1%



**LYMPHASELECT®:** this *Melilotus officinalis* extract has been reported to exert a marked activity on the lymphatic system thanks to its myotropic stimulation of the rhythm and tonus of the lymphatic vessels. At the venous system level, Lymphaselect® has been shown to increase blood flow and to improve the venous return.

Level of use up to 2%

**CENTEROX®:** this highly purified blend of madecassoside and asiaticoside *Centella asiatica*, freely water soluble, is recommended to modulate the ECM architecture, thus qualifying for body care products. In vitro, it was demonstrated to promote membrane proteins expression thus reinforcing the dermal-epidermal junction.

**PHYTOSOME**  
MORE  
BIOAVAILABLE





**SERICOSIDE:** is a pure molecule obtained from *Terminalia sericea*. Many trials have been performed and Sericoside has been shown to have skin restructuring activity, capillary protection activity, skin regeneration and anti-oedema properties. This is due to a remarkable reduction of capillary permeability exerted by the active ingredient. Significant anti-inflammatory qualities have also been demonstrated by Sericoside.

Level of use 0.5%

**GINKGOSELECT®:** *Ginkgo biloba* extract contains two families of molecules, of which the flavonoid components are responsible for the anti-oxidant and free radical scavenger properties of the plant. When topically applied, Ginkgoselect® has been shown to reduce skin sensitivity to UVB irradiation, and to promote blood flow and provide capillary protection. Ginkgoselect® has also been formulated in the most bioavailable Phytosome® form.

Level of use up to 1%



## Also in more bioavailable PHYTOSOME® form.

The Phytosome® technology is used to improve the bioavailability of active ingredients through biological membranes. Phytosome® demonstrated a higher biological activity compared to an equal amount of the active ingredient or extract. The delivery system forms a structure in which the active ingredient is anchored to the polar head of the phospholipid and becomes an integral part of the micellar membrane. It allows a high load of active (1:2 or 1:3).

The ingredients described herein are offered for consideration for use in personal care products. The information provided describes historical use, ingredient activity and other information that may be relevant to their use in such products. How each ingredient would contribute to a particular product would be formulation specific. Furthermore please note that this documentation is available for various countries all over the world and hence it may contain statements not applicable to your country.

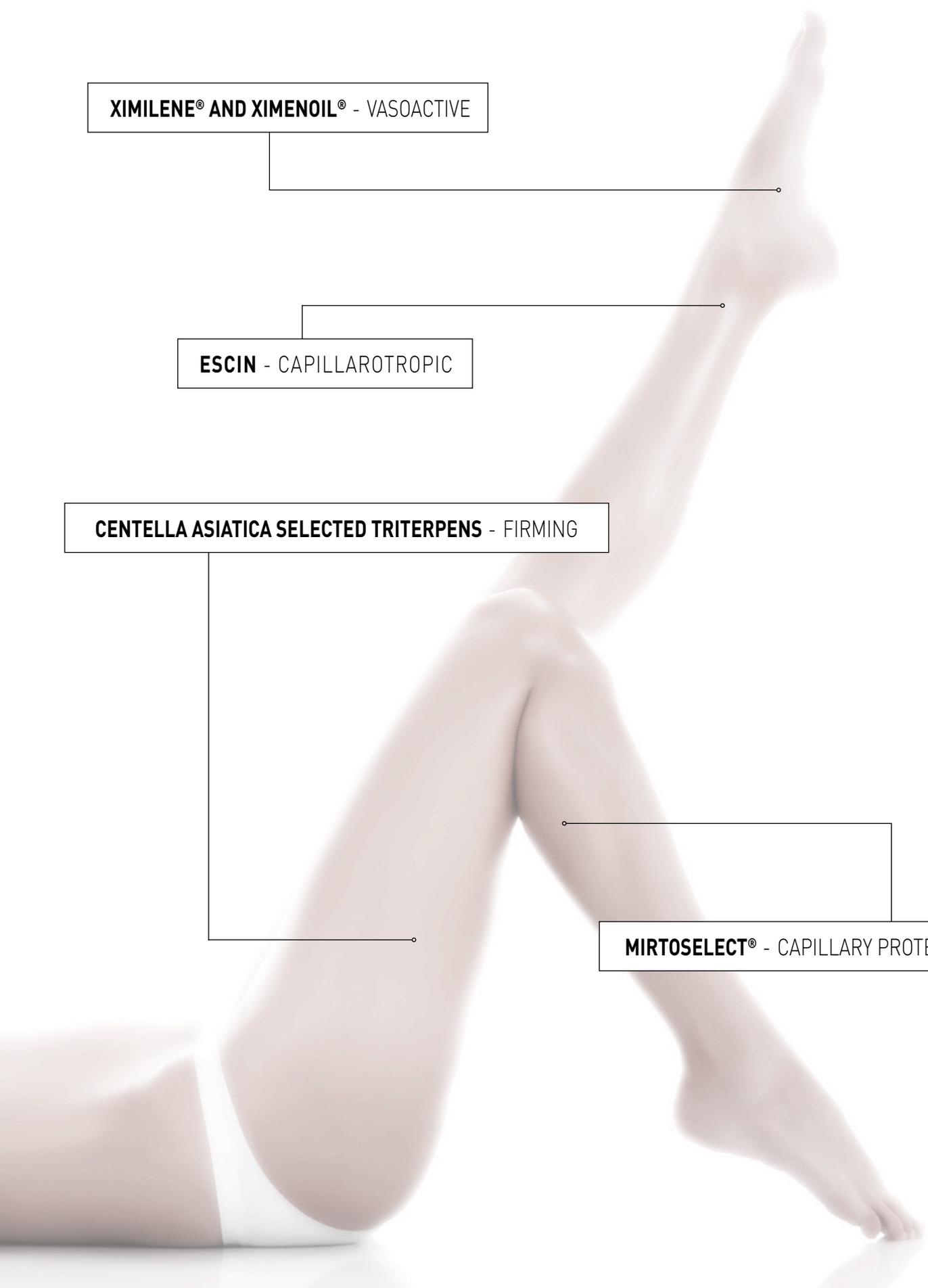
APPLICATIONS

**XIMILENE® AND XIMENOIL®** - VASOACTIVE

**ESGIN** - CAPILLAROTROPIC

**CENTELLA ASIATICA SELECTED TRITERPENS** - FIRMING

**MIRTOSELECT®** - CAPILLARY PROTECTANT





**HEADQUARTERS - INDENA S.p.A.**

Viale Ortles, 12  
20139 Milan - Italy  
tel. +39 02.574961

**INDENA BIOTECHNOLOGY (Shanghai) Co., Ltd.**

Unit 03, 16/F, Cross Tower, 318 Fu Zhou Road  
Shanghai 200001 - China  
tel. +86.21.22815900

**INDENA BRASIL Ltda**

Rua Bandeira Paulista, 600  
CEP 04532-001  
São Paulo - Brazil  
tel. +55.1.127.690.624

**INDENA JAPAN Co., Ltd.**

KDDI Bld. 21F. 1-8-1 Otemachi  
Chyoda-Ku Tokyo 100-0004 - Japan  
tel. +81.3.3243 9924

**INDENA USA Inc.**

Two Union Square  
601 Union Street, Suite 330  
Seattle, WA 98101 - USA  
tel. +1.206.340.6140

**INDENA S.A.S.**

23, Rue de Madrid  
75008 Paris - France  
tel. +33.1.45229128

i n d e n a . c o m

