PATIENT INFORMATION LEAFLET: Limonene hydroperoxide

Your patch test shows you have a contact allergy to: Hydroperoxides of Limonene

Synonym(s) (of limonene): (+)-4-Isopropenyl-1-Methylcyclohexene; (+)-R-Limonene; Citrene; D-(+)-Limonene (+)-p-menth-1,8-diene; Carvene; Optical Isomer of Dipentene; (R)-1-Methyl-4-(1-Methylethyenyl); Cyclohexene.

Definition: Hydroperoxides of limonene are formed after the terpene limonene is exposed to oxygen, resulting in auto-oxidation. Limonene is a colorless liquid that has a pleasant citrus smell, and has a slight solvent capacity. It is the major constituent of oil pressed from the peel of citrus fruits, ie oranges, lemons, grapefruits but is also present to a lesser extent in, amongst others, lavender, geranium, celery, etc. Limonene by itself has a mild irritant effect on the skin but has no allergenic potential. Hydroperoxides of limonene, however, are strong allergens.

Use and occurrence:
Limonene is used as a fragrance in a wide variety of products:

- It is frequently found in perfumed cosmetics, (eg. body lotions and creams, aftershave), in bath products, shampoos and conditioners and in deodorant.
- Cleaning products such a liquid soaps, hand cleansers, dishwashing liquids, laundry detergents, furniture polish and stain removers.
- A majority of (prestige) perfumes.
- Air fresheners, aroma therapy.
- Household paints and paint removers

Limonene is also used as a flavoring agent in:

- Toothpastes, mouthwashes and chewing gum. It can also be found in certain foods and beverages.

Due to its solvent properties it is also used in industrial cleaners in high concentrations, for example to degrease metal before painting and cleaning assemblies.
Because of skin penetration enhancing properties it is also found in selected medicinal ointments and creams.

Remarks:
- It is important to note that allergic reactions are caused by the hydroperoxides of limonene, not by limonene itself. As exposure to air causes the formation of hydroperoxides, older products that have not been sealed properly are more likely to cause allergic reactions. It might therefore be possible to tolerate limonene containing products as long as there has been no exposure to air.

- Especially leave-on products such as lotions, creams and ointments should be avoided as there is a significant possibility for air-oxidation.

- Labelling of limonene is compulsory when present in cosmetics and detergents but this depends on its use concentration i.e. when low concentrations are used, it might not be necessarily labelled as such. “Natural” but also ‘fragrance-free’ cosmetics may contain this substance.

Disclaimer: Always check your products as these lists can never be complete and ingredients change.