Electrostatic charging of persons walking on Kaindl floor coverings

It is a normal feature of standard Laminate and Real Wood Floor coverings that all who walk upon them become electrostatically charged. Usually the person concerned would remain quite unaware of this because the charge is negligible and below the threshold of perception. Indeed, if the relative humidity is ≥ 50%, it is unlikely that the Laminate and Real Wood Floor covering would give rise to any unpleasant sensations.

How do electrostatic charges come about?

Even the smallest possible single particle of a material – the atom – is itself constructed out of electrically charged elementary particles: the positively charged protons in the nucleus and the negatively charged electrons which circulate around the nucleus at a high speed. When two different types of material are brought together their atomic force fields are superimposed on one another. If one of these two materials has insulating properties, the exchanged charges will be unable flow back quickly enough once these materials are separated again. Consequently the originally neutral charge balance is lost. One of these materials will then show an excess positive charge, the other an equally excess negative charge.
If two materials which both have poor electricity conducting properties rub together or are separated an electrical potential difference will be set up. The so produced charge is also known as frictional electricity. The magnitude of this charge will depend on the material, the intensity of the contact, the size of the contact surfaces, and the speed at which they are separated. The action of walking or sliding on the floor increases the charge.

Electrical potential difference is measured in volts (V) and can be set up or artificially produced in different ways including:

- through friction when different poor conducting materials rub against one another, e.g. as in the case of clouds in the sky, or shoes on a floor covering.
- through induction when a magnet is moved to and fro inside a coil, or when a coil is rotated around a magnetic core as in the case of a bicycle dynamo or an electric power generator.
- through chemical action where one material chemically decomposes another material, e.g. as in the case of a battery.

The so created potential difference endeavours to neutralise itself whenever an electric conductor is available. The electrons then surge towards the plus (+) and an electrical current flows. The strength of an electric current is measured in Amperes (A). All materials present a greater or lesser resistance to this flow of electric current. This resistance is measured in Ohms (Ω).

By virtue of its high moisture content the human body presents itself as an optimal electric conductor which electric charge carriers will readily make use of in the absence of more suitable “alternatives.” Under unfavourable conditions the electric charge carriers will accumulate around the human being so that the latter becomes “charged” in the real meaning of the word. Generally speaking this is more likely to happen if the electrons cannot be discharged into the moisture which is dispersed throughout the air in the room and when, at the same time, discharge into an antistatic/electricity-conducting floor covering is prevented by shoe soles which act as electric insulators. Some time or other under these circumstances it is quite possible that there will be a sudden discharge in the form of a flash via an electric conductor immediately an earthing circuit is established e.g. via a human who happens to touch a current-conducting material (door handle, staircase banister, or even another person, etc.).

Experience to date with the static electrification of floor coverings

- Persons walking on standard types of floor coverings can pick up electrostatic charges.
- Electrostatic charges can build up regardless of the nature of the floor foundation – even if the latter has the capability to be earthed
- Regardless of which type of underlay (corrugated cardboard, PE foam etc.) is used to attenuate footstep sound, discharge phenomena can still occur.
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Depending on the person, electrostatic discharges are experienced subjectively as follows:

- Discharges of up to 2 kV cannot be felt (but in quiet surroundings may be audible)
- Discharges exceeding 2 kV can be felt
- Discharges in excess of 5 kV can be both felt and heard
- Discharges of 10 kV and above can be seen as a flash and feel unpleasant

Avoidance of electrostatic charges in the case of Kaindl standard type floor coverings

- Ensure an **optimal room climate** with a permanent relative room air humidity of at least 50 per cent.
- Through the use of suitable **floor-cleaning additives** such as **Kaindl Cleaner Fluid** it is possible to ensure that, in addition to being cleaned, the Kaindl flooring surface is given a "non-layer-forming film" which favourably influence the transfer of electrical charge carriers between the human body and the Kaindl flooring surface.
- At times when the relative humidity is low, avoid the use of **articles of clothing which have a high synthetic fibre content** because – as non-conducting or poor-conducting materials – these may become electrostatically charged.

The perception of electrostatic charges is **not** restricted exclusively to Kaindl floor coverings. Under unfavourable conditions this same phenomenon can occur in the case of elastic floor coverings, textile floor coverings, as well as in that of synthetic resin coatings.
Discharges not present any direct danger to life or health.