

IonPhasE IPE
The Static Dissipative Polymer

IonPhasE Company Presentation



Static Electricity is Our Challenge

It is about Cost

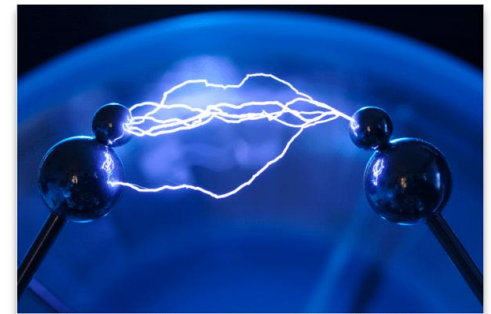
- It damages semiconductor devices and microelectronic systems
- It limits production speed in many applications
- It reduces product reliability and increases product recalls

It is about Safety

- It causes electrostatic shocks to workers and cause accidents
- It ignites flammable gases, dust or liquids causing explosions

It is about usage and convenience

- It attracts dust to product surfaces
- It spoils visual outlook and surface of painted plastics
- It causes difficulty in handling



The Company

IonPhase is an innovative solution provider for dissipative polymers.

IonPhase develops and manufactures high performance dissipative polymers that help to control static electricity in plastic materials. IonPhase products are utilized in wide range of industries like chemical, automotive, telecommunication and consumer electronics.

- Established in 2001
- Head office, Sales, R&D and Manufacturing in Finland; Sales office in Paris area (France), Guangzhou and Hong Kong, P.R. China
- Strong IPRs and continuous product development
- Annual production capacity 1200 tons of IonPhase IPE
- Skilled R&D personnel with Ph.D., Lic.Tech. or M.Sc. degrees in polymer science and chemistry; with annual R&D budget exceeding 1.5M€

IonPhase® IPE® Polymers

IonPhase® IPE® makes plastic products functional

Based on patented technology, IonPhase manufactures polymers called IonPhase® IPE®. IPE stands for *IonomerPolyElectrolyte*. IonPhase® IPE® combines the best features of two polymer groups: ionomers and polymer polyelectrolytes.

Properties of IonPhase® IPE®

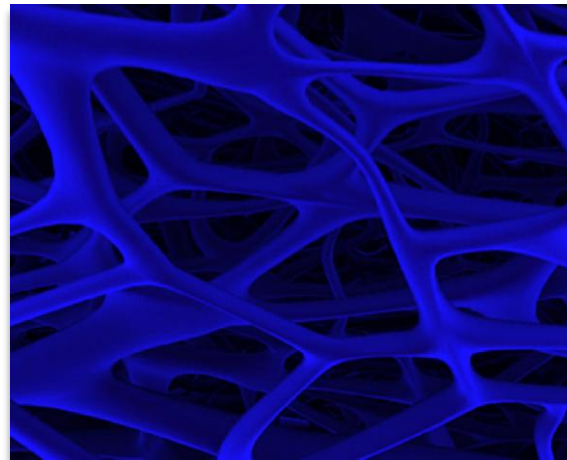
- IonPhase® IPE® based plastic products have immediate, permanent, low humidity functioning dissipative, and low charging properties (antistatic).
- Plastic products made with IonPhase® IPE® have the capability to dissipate charges and neutralize electrostatic fields.
- Easy to process with all plastic conversion technologies.
- Excellent performance with ultra thin layers and low concentrations.



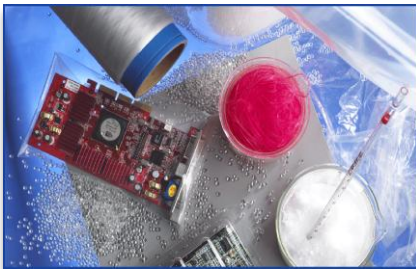
Technology

IonPhaseE has patented technologies in structures of Inherently Dissipative Polymers (IDP) and manufacturing of IDP materials. Technology is based on ions which are able to move along self-organizing ionomer polyelectrolyte, 3D interpenetrated network (IPN) in a host polymer.

Three dimensional polyelectrolyte network acts as ion pathway



IonPhase® IPE® Product Range



IonPhase® IPE® is available in granulate form as a masterbatch, semi-compound or ready-to-use compound (100%).

IonPhase® IPE® prefers:

- PE, PP, PO's
- PS, HIPS, ABS, PC/ABS, PC/ASA, ASA, PMMA, PA
- PET
- TPE, TPE-E, TPU
- SBS, SEBS

IonPhase® IPE® processing grades:

- Blown and cast film extrusion
- Injection molding
- Sheet extrusion
- Tube and wire & cable extrusion
- Blow molding

Converted products can be supplied through the partner networks

IonPhase® IPE® Main Applications



Electronics Industry

Electronics Packaging and Housings

- Sheet, trays
- Carrier Reels and Tapes
- Shielding and ESD Bags, Protection Tapes
- Covers and Housing Parts



Chemical Industry

Industrial Film, Flexible and Rigid Packaging

- RIBCs, Drums
- FIBCs
- Liners, Bags



Automotive Industry

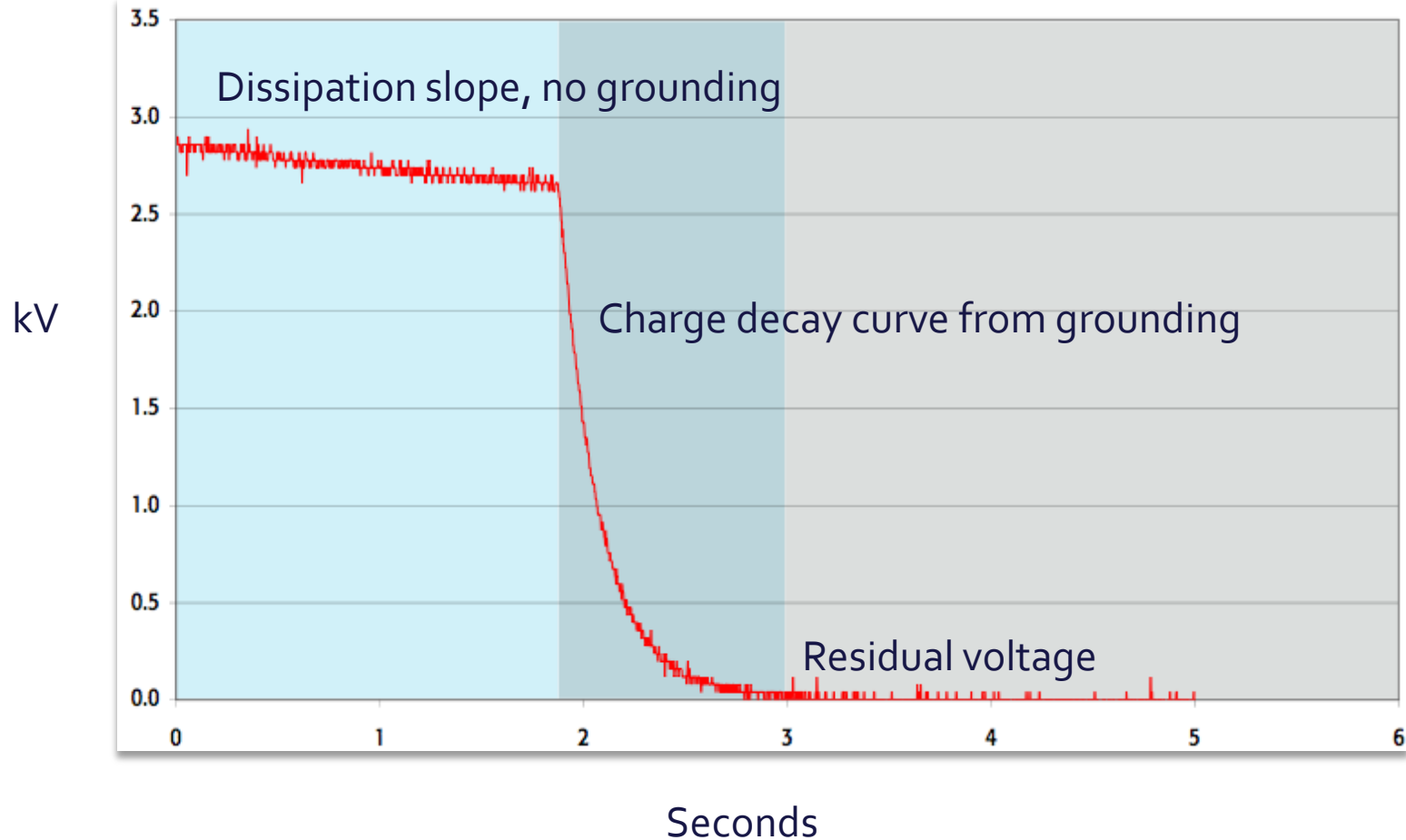
Automotive Parts

- Panels, Frames, Covers
- Other Components



IonPhase® IPE® Static-Dissipative Properties

Charge decay curve; controlled charge decay for optimal ESD safety



IonPhase® IPE® vs. Other Technologies

Typical challenges when utilizing anti-static additive solution:

- Antistatic effect and shelf-life is limited. Non-functional package will damage the contained product or increase explosion risk
- Needs humid environment to function properly
- Needs time to absorb humidity before the anti-static effect comes into force
- Causes sticky surface on the package, unpleasant to handle and can also contaminate the packaged goods.



With IonPhase solution you will enjoy:

Better and permanent static electricity dissipation

- No contamination to packaged goods
- No sticky surface
- Doesn't require high humidity >30 RH%
- Consistent dissipative effect, clearly below the requirements of current standards
- Unlimited shelf-life

Faster processing cycles

- Effect is immediate (vs. antistatic agent product on a roll)

IonPhase® IPE® vs. Other Technologies

Challenges when utilizing conductive filler solution:

- Always need for grounding
- Carbon black particles in the package can become loose and might contaminate and damage the packaged components
- Conductivity is not always uniform
- Can not be used for powered components
- Long maintenance and cleaning time required for conversion lines in packaging manufacturing processes (cost)



With IonPhase solution you will enjoy:

Better and permanent static electricity dissipation

- No contamination to packaged goods
- Uniform conductivity, no percolation problem

Always safe

- No grounding needed, because of adaptation of changing conditions

Faster set-up and product change time

- Fast and easy cleaning of the conversion lines

IonPhase Meets Environment

IonPhase is strongly committed to Sustainable Development and Environmental Protection. IonPhase® IPE® conforms to RoHS and WEEE standards. It is halogen free and recyclable. IonPhase has strong focus and conformity on international Quality Standards.

IonPhase® IPE® meets environmental requirements and makes everybody's life better!



**Are you ready for the next
generation of zero halogen static
control polymers?**

At IonPhase, we are!