An introduction to

Fluoropolymer coating for the reliable protection of electronic circuits and assemblies

Why should assemblies be protected?

Water and condensate lead to:

- direct functional failures
- long-term corrosion

Other trouble makers are:

- dirt
- oil
- fuel
- solvents and cleaning agents
- dust
- air pollution

➔ **These problems can be avoided by coating your assemblies**

Common available varnishes:

- resins
- paints
- acrylics
- urethanes
- epoxides
- silicones
- Paraxylene

Conventional painting process:

- covering contacts, plugs, switches, etc.
  → usually a manual process
- application of the paint by spraying, dipping, brushing or partial dispensing
- drying for up to 1 hour in air or in a drying oven
- removing the covers → usually a manual operation
- curing by heat, storage, UV light, etc.

Compared to the conventional painting processes, the protective coating with fluoropolymers offers many interesting advantages!

Puretecs GmbH | Fabrikstraße 18 | 73277 Owen
Tel.: +49 7021-8608838 | Email: info@puretecs.de | www.puretecs.de

Advantages of the fluoropolymer coating:

- masking is only necessary in exceptional cases, what reduces the process time significantly
- due to very short coating times and no curing times, a process time of 3-6 minutes is achieved
- the handling is straightforward as no safety precautions are required and the storage and disposal of the material is very easy
- no separate premises or extraction units are needed

Properties of the fluoropolymer coating:

- reduces the surface energy to 11 - 12 dynes /cm (less than PTFE)
- rejects liquids efficiently
- has very good adhesion on all surfaces
- gives a very thin layer, typically 500nm, absolutely transparent and UV resistant
- provides many years of durability, both on the assemblies, as well as when it's stored

The coating process

- manual or fully automatic loading of the baskets
- diving in the immersion bath
- immersion time 10-30 seconds (at room temperature)
- drying time approx. 3-5 minutes in the plant (at approx. +4°C)
- no post-curing is needed

➔ Including the loading and unloading of the basket, this average process time is approx. 6-7 minutes.

This is a very fast, clean and cost effective process!

Plus there is the appropriate plant technology from Puretecs for high performance and process reliability.

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Safety/ Health/ Environment

Fluorochemical carrier fluid (HFE) and fluoropolymers:

- have no ozone-depleting effect
- are non-flammable (UL registered)
- are not harmful to health
- have no labelling requirements
- are PFOS-free
- are REACH registered and RoHS compliant
- are almost odorless
- are easy to store in closed containers, but should not be exposed to extreme heat

Properties of the coating:

- repair friendly (solderable)
- the coating process can be repeated
- contactability of plugs, switches, potentiometers,... is given
- low refraction index → optical components such as LCDs can be covered
- insoluble in conventional solvents and fuels

Limitations of the coating:

- no voltage insulation
- can't protect the components against mechanical forces
- can't make assemblies submersible in water

Reliability:

- complies with the 1000h HAST 85/85 test
- meets the 14 days air humidity test with 95% RH at 40° C
- meets the temperature cycle test IEC-68-2-14
- passes the common corrosive gas tests
- resists 10% acids and alkalis
- complies with the approval of several international telecommunications network providers

Summary

Our fluoropolymer coatings give you an

- **easy**
- **fast and therefore cost effective**
- **solid**
- **clean**
- **environmentally friendly**

process, which protects your assemblies and PCBs reliably against condensation, dripping water, high air humidity, tropical climate, oil films etc.

You increase the reliability and quality of your products, even if no conformal coating is mandatory!

Contact us. We deliver from stock.

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