Chemical permeation testing of PPE
Eurofins Product Testing A/S

[Nikolaj Røjkjær Andersen, February 2016]
Principle

• Measuring the permeation of liquid chemicals through personal protective equipment (PPE)
• Performance test of gloves, protective suits, sleeves…
• Performed in a permeation test cell, as shown below
Principle

- Test cell with two compartments separated by the material in test
  - Compartment 1: Challenge chemical
    - Any type of pure chemical or mixture
  - Compartment 2: Collection medium
    - Typically air or water
  - Collection medium is analysed for content of challenge chemical which have permeated through the material
 Principle

• Test duration: 8 hours (Corresponding to a full working day)
• Analytical result
  • Breakthrough time – Number of minutes after initiation of the test until the permeation rate reach a specified limit value
• Permeation curve:
Our forces

• Experience with permeation testing for more than 25 years (Since 1988)
• Cooperation with some of the largest customers in the world:
  • Mölnlycke
  • Kimberly-Clark
  • Ansell
  • Siemens
• Offer accredited permeation testing according to the three major international standards:
  • EN 16523-1 (New standard replacing the old EN 374-3)
  • ASTM F739
  • ISO 6529
(All three standards can be covered in the same test)
Our forces

- Very broad portfolio. We can test almost any chemical / mixture of chemicals
- In house equipment include:
  - GC/FID, GC/MS, GC/ECD
  - HPLC/UV, HPLC/MS
  - Ionchromatography
  - pH
  - Spectroscopy
  - ...
- Almost all other request can be covered through
  - Method development
  - Cooperation with other Eurofins labs
Our forces

• One of the only labs in the world who can offer chemical permeation testing of chemicals that are both water insoluble and non-volatile
  • Epoxy resins
  • Polyurethane (isocyanates)
  • High-boiling mineral oils
  • ...

• Collection medium is a special type of adsorption filter

• Typical customers:
  • Siemens Wind Power (Epoxy-resins in their production of blades)
  • 3M, Huntsman… (Chemical producers)