

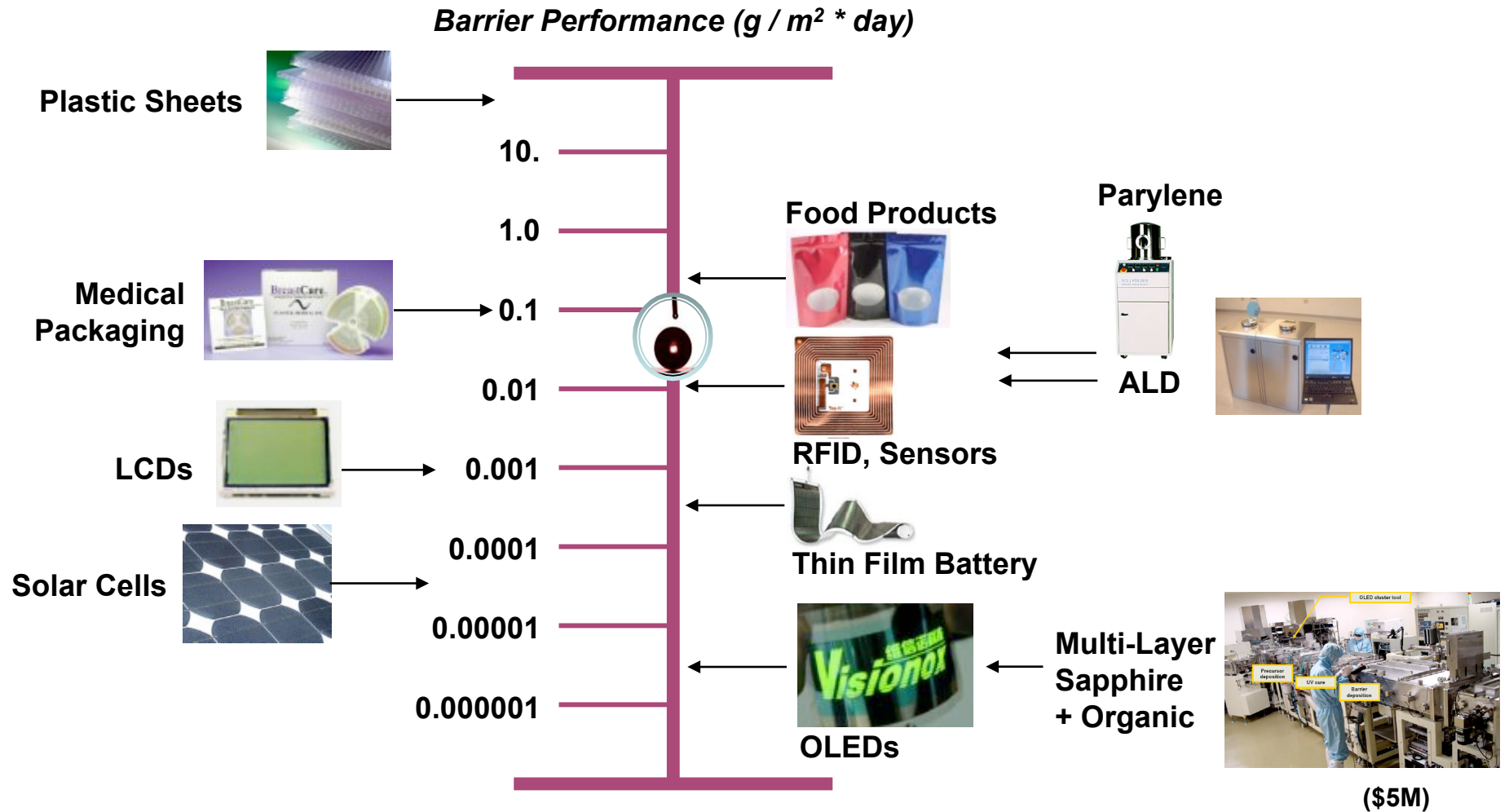
Repellix Protection from Acid

Hydrophobic – Moisture – Corrosion

- Confusion often exists between wetting (hydrophobicity), moisture and corrosion.
 - Hydrophobicity: liquid surface tension (wetting)
 - Moisture: gaseous permeability through media
 - Corrosion: electro-chemical reaction between a material and its environment.
 - Corrosion often a result of moisture
- **Good Hydrophobicity \neq Good Moisture Barrier**

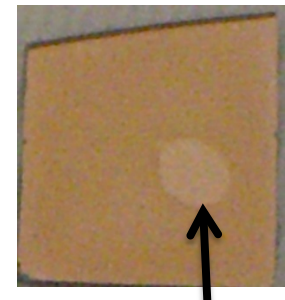


Moisture Permeation Requirements



IST's Unique Position

- Repellix provides superior hydrophobic coating properties with its nano-composite structure.
 - The nano-composite actually has a controlled porosity factor.
- To prevent long term reliability issues with corrosion, a VCI (vapor corrosion inhibitor) is deposited as a base layer of the nano-composite
 - VCI's are well know in the industry.
 - VCI's limitations: they dissolve if they get wet.
- IST integrates a VCI + a non-wetting composite structure
 - The dual layer provides multiplying benefits of corrosion resistance and non-wetting properties.

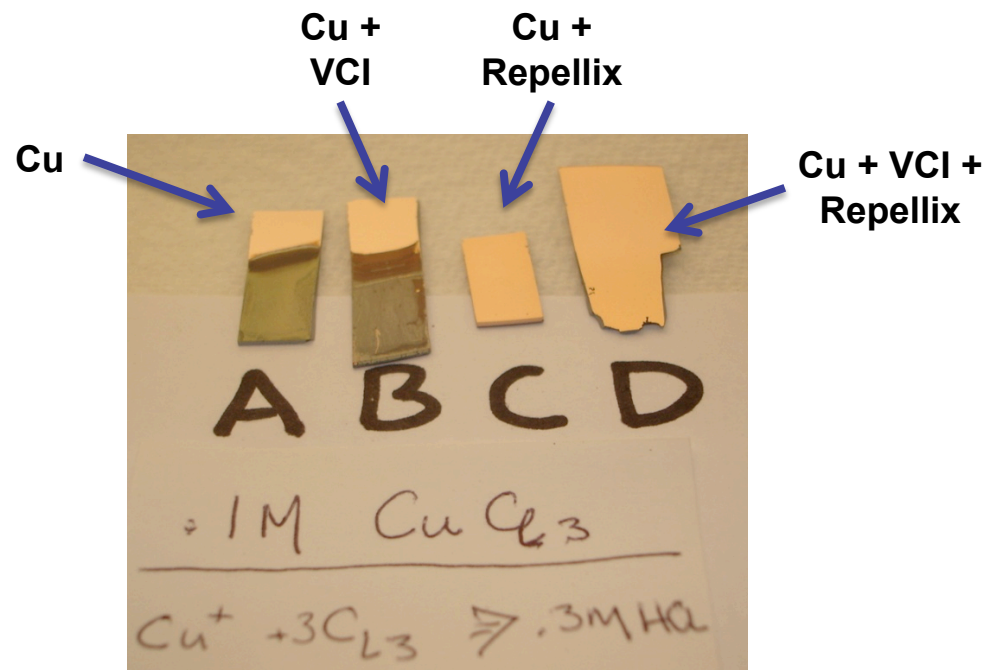


A hole in the VCI film after being exposed to water droplets.



Copper Corrosion from Liquid Sources

- VCI's not effective in wet environments.
- Corrosion testing using copper chloride solution



Test procedure calls for a one-minute dip in copper chloride solution.

- Repellix coated provides barrier to acid attack



Observations

- VCI's are effective in retarding corrosion as shown in the humidity stress test.
- VCI's can be dissociated from surfaces by liquids.
- Nano-composites are have superior non-wetting characteristics but are porous enough to allow moisture transmission which can lead to corrosion.
- VCI + Nano-composite creates a unique combination in which the weaknesses of each coating are protected by the other. The combined film offer superior properties.



Pourbaix Phase Diagram for Cu

