

Polyurethane (PU) microspheres & microcapsules

EXECUTIVE SUMMARY

Spherical PU microspheres of uniform shape and size used in getting a film of uniform thickness without any defects or fat edges. Applications in coatings, paints, powder coating/molding. Also, PU microcapsules that can encapsulate any chemical of interest, that could be later released when required.

TECHNOLOGY DESCRIPTION

A novel process for preparation of polyurethane microspheres of uniform shape, a narrow particle size distribution, size ranging from 1 to 100 micron and molecular weight ranging from 200-2000. The yield is as high as ~60-85%.

A process for the preparation of polyurethane microcapsules that can encapsulate any chemical of interest, that could be later released when required. For ex.: biocides, pesticides, anti-microbial agents, disinfectants, etc.

MARKET POTENTIAL

- Indian paint industry has been growing at 13% over the last five years & predicted to grow by 15% annually over the next five years*
- Asia Pacific paint market is expected to grow by 7.9% per year, and top demand over 20 million tons by 2014**
- Powder coatings are increasingly being used to meet the needs of new markets/ applications and the worldwide powder coating market in 2010 was \$ 2.5 billion[^]
- The market for anti-microbial coatings in the US has been projected to touch \$ 1 billion by the year 2015^{##}

* Coatings World, May, 2008, **<http://www.coatingsworld.com/contents/view/24989>
[^]www.malvern.com/ProcessEng/industries/powder_coatings/overview.html#www.p
^{##}rweb.com/releases/anti_microbial_coatings/indoor_air_quality/prweb8121153.htm

VALUE/ADVANTAGES

- Microspheres
 - Produces a film or coating of uniform thickness without defects or fat edges
 - Narrow particle size distribution
 - Superior appearance (smoothness, uniform coating thickness)
- Microcapsules
 - Reduce the environmental/mammalian toxicity otherwise caused
 - Controlled Release by microcapsules extends the activity of the agent – increases effective delivery, and longer life

APPLICATIONS

- Microspheres
 - Coatings, paints an powder molding
 - Adhesives
 - As an encapsulant for pigments, agrochemicals, drugs and reactive chemicals like curing agents
- Microcapsules
 - Controlled release applications in interior/ exterior paints, coatings for medical devices,- for example, biocides, fungicides or algaecides

TECHNOLOGY STATUS

- Demonstrated at the lab scale
- On the lookout for potential partners for licensing
- Patent applications filed/granted: US [5814675](#), US [5859075](#), US [5962003](#), US [6123988](#), US [6239213](#), US [20060251688A1](#)