



## How Super Absorbent Imbiber Beads Contain Oil and Chemical Spills at Sea

5 Nov, 2007 [Marine Pollution](#)

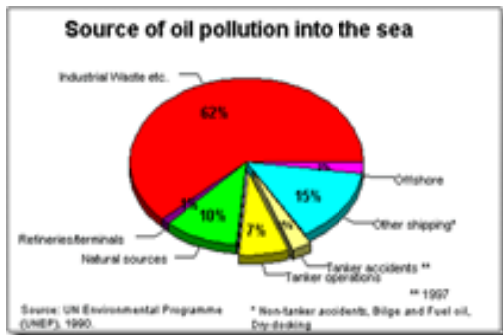


Image source: [evworld](#), [oceana](#)

Oil and Chemical spills at sea is a threat to marine environment. [Sustainableshipping](#) reports that recently Japan tested 'super absorbent' beads called Imbiber Beads designed to effectively contain oil and chemical spills, as well as reducing the emanation of hazardous chemical vapours.

### 1. What are Sorbent, Adsorbent, Absorbent materials ?

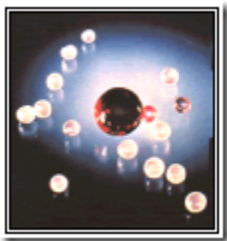
- **Sorbent:** An insoluble material or mixture of materials used to recover liquids through the mechanisms of Absorption or Adsorption or both.
- **Adsorbent:** An insoluble material that is coated by a liquid on its' surface including pores and capillaries without the solid swelling more than 50% in excess liquid. Adsorbent materials are those that are inert to the spilled material and usually have a large surface area. Since adsorption is by definition only a surface coating process, high surface area is advantageous if the fluid has sufficiently low viscosity to cover it. An incomplete list of adsorbent materials includes plastic foams, plastic fibers, straw, peat, sand, porous clay, feathers, foamed glass and silicates, activated alumina, and soil. The surface can be external as in a fiber, or internal as inside a granule of activated carbon.
- **Absorbent:** A material that picks up and retains a liquid distributed throughout its' molecular structure causing the solid to swell (50% or more). The absorbent is at least 70% insoluble in excess fluid. Absorbents – Absorbent materials are those that are inert to the spilled material but physically swell up in it. They often have a low surface area. They are also adsorbent by the nature of their surface area but since this area is small they are not often used as adsorbents. Those absorbents useful in spill control do not dissolve in the spilled fluid but physically contain it in a form with minimum surface area. This reduction in surface area lowers the rate of evaporation and minimizes leaching. For many hazardous spills these

are required properties. Absorbent materials also minimize human and secondary contamination since squeezing and contact may not be with a wetted surface as in the adsorbent.

- **Absorbents vs Adsorbents**

<b>Absorbents</b>	<b>Adsorbents</b>
Volume Pickup - will Absorb/Imbibe up to 27:1	Volume Pickup - can only Adsorb up to one time their own volume of spilled liquid – 1:1
Secondary Contamination – will virtually eliminate secondary contamination.	Secondary Contamination – will more often contribute to secondary contamination.
Vapor Release – is reduced 500 – 600% that of adsorbents. Flash points raised as a result making a dangerous situation less dangerous.	Vapor Release – increased surface area increases the rate of vapor release, lowering flash point and increasing the risk.
OSHA – Contamination of personnel both to free liquid and to hazardous vapors virtually eliminated, thereby “reducing the risk”.	OSHA – Contamination of personnel to free liquid and hazardous vapors enhanced. Risk is increased.
Life Cycle Costs – less product required means less product to dispose of. Elimination of secondary contamination means less labor required and more effective cleanup.	Life Cycle Costs – low volume pickup means increased costs and cost of disposal. Increased incidence of secondary contamination means increased labor costs and questionable efficiency.

## 2.Imiber Beads are Absorbents:



Imbiber Beads are cross-linked alkylstyrene polymers engineered to absorb a broad range of organic chemicals. Imbiber Beads are spherical plastic particles that ‘IMBIBE’, drink - in or absorb a very broad cross section of the organic chemical spectrum. The polymer particles are solid (about the size of a salt or sugar granule). There are no pores or voids to fill (as in a sponge). Once contact has been made with a compatible liquid, the Imbiber Beads drink the liquid into their solid structure and in so doing, swell. This can be up to 27 volumes per original Imbiber Beads volume with some liquids. The Imbiber Beads will not release liquid, not through compression, gravitational pull, not even when cut in half. The liquid is held in the molecular structure - not in droplets

