Hybrid Plastics®
Superior Technology for Superior Products

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POSS® Frequently Asked Questions

This FAQ gives a concise list of POSS® attributes and answers to typical customer questions about pure POSS® and POSS® enhanced products.

General Questions

Q. Is POSS® safe to use?
A. Toxicity testing has shown POSS® to be very safe.

Q. Is POSS® commercially available?
A. POSS® is available in hundreds of tons scale. And trial amounts can be purchased from the POSS® R&D Chemicals catalog.

Q. Can Hybrid Plastics® provide me with a free sample?
A. Company policy is to not provide free samples, instead we sell samples through the POSS® R&D Chemicals catalog.

Q. What is POSS®?
A. POSS® are chemicals that bridge the gap between ceramic and organic materials into a single molecular composition. The unique structure of POSS® means it can provide performance attri butes not attainable using standard chemical additives.

Q. Does POSS® really provide hybrid organic-inorganic properties?
A. Yes the cage modulus is 11.7 GPa and surface area is 3,600 m^2/g are similar to those of inorganic materials. The refractive index range is 1.41-1.61 g/ml and the density range is 0.97-1.65 g/mLwhich are similar to organic materials. The low surface energy of 17.77 mJ/m^2 and dielectric range from 2.4-2.6 are in the range of organics. POSS® melt within the ranges of most polymers and soft metals and are soluble in solvent as are chemicals.

Q. Are POSS® nanoparticles?
A. No, it has been shown using several methods that POSS® are chemicals. See users guide for density, melting point, refractive index and solubility properties.

Q. Which is better POSS® or nanosilica particles?
A. POSS® is a class of chemicals and very different from silica particles. Silica particles are harder, more abrasive, and higher density than POSS®. POSS® combine some attributes of particles such as a high (11.7 GPa) modulus yet they melt, dissolve, and offer the precision of chemistry. POSS® silanols work synergistically with nanosilica particles to stabilize and disperse them.

Q. Is POSS® difficult to disperse like nanoparticles are?
A. No, because POSS® is a family of chemicals, they dissolve spontaneously if you use a solvent / media of the correct polarity/solubility parameter.

Q. Is POSS® abrasive to my processing equipment?
A. No, because POSS® is a chemical there is no abrasion whatsoever.

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Q. Can you provide an MSDS?
A. Yes, a MSDS for each POSS® chemical is available for download at the Hybrid Plastics® website http://www.hybridplastics.com/docs/list.htm.

Q. What is the purity of POSS®?
A. Standard purity is greater than 97%. Each batch is individually checked. Purer grades and elec tronics grades are available upon request.

Q. Can you help me select a POSS® for my application?
A. Yes, the Hybrid Plastics® experts have years of experience to help you get started and develop your application. We can help you formulate and have a state of the art laboratory to support de velopment work. We can also design and synthesize “non-catalog” POSS® chemicals for you.

Q. I don’t see the POSS® I want, can you help?
A. Contact us about custom synthesis of new POSS®. We may even have what you need already in stock.

Q. Is POSS® stable to acidic and basic conditions?
A. POSS® is very stable to both acid and base.

Q. What is the thermal stability of POSS®?
A. Each POSS® has its own unique stability. We determine the stability through TGA. The most stable types survive to over 400ºC.

Q. Is POSS® soluble in my solvent?
A. POSS® solubility guidelines are given in the POSS® Chemicals catalog. If you need testing in another solvent we can give advice or check for you.

Q. What concentration of POSS® is normally used?
A. POSS® can be effective from ppm levels to 100% POSS® depending on the application. In ther moplastics 1-5 wt% loadings are typical, in thermosets loadings of 10-4% are typical, in surface modification 0.4-1.5 wt%.

Q. How much does POSS® cost?
A. Bulk orders see pricing in the $60/kg range for popular POSS® types.

Q. What physical form does POSS® come in?
A. The vast majority of POSS® are white, crystalline solids. A few types are greases or liquids.