# Hansen Solubility Parameters(HSP) Application Notes

# Hansen Solubility Parameters in Practice

Complete with software, data and examples

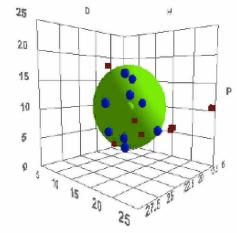
### Steven Abbott & Charles M. Hansen

with

Hiroshi Yamamoto

#### &

Richard S Valpey III (SC Johnson)



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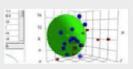
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The HSPiP team

JAVA, HTML5 & Chemistry Site

Pereka

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<u>Hansen</u> Solubility

Parameter (HSP) **Basic HSP** Applications Polymer Bio, Medical, Cosmetic Environment **Properties Estimation Analytical** Chemistry Formulating for **Cosmetics** Other DIY:Do It Yourself

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Dr Hiroshi Yamamoto (right) officially joins the HSPiP development team (in his spare time!) as Dr Charles Hansen (left) handed over a signed copy of the Hansen Handbook. Professor Steven Abbott is holding the celebratory bottle of champagne.

#### HSP User's Forum

#### e-Book Contents

Introduction & Guarantee by Steven Abbott

Chapter 1 The Minimum Possible Theory (Simple Introduction)

Chapter 2 The Sphere (The Preferred Method of Visualizing)

Chapter 3 Your first HSP Sphere (Determining the HSP Sphere)

Chapter 4 The Grid (A different route to the Sphere)

Chapter 5 Coming clean (Finding Good Solvents)

Chapter 6 Safer, Faster, Cheaper (Optimizing Solvent Formulations)

#### Hansen Solubility Parameters in Practice

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Chapter 7 Coming together (Polymer Compatibility)

Chapter 8 Sticking, Flowing and Dissolving (HSP and Adhesion, Viscosity and Dissolving)

Chapter 9 <u>Shades of Black</u> (Designed Partial Compatibility - Bitumen)

Chapter 10 Insoluble solubility parameters (HSP for Pigment Surfaces)

Chapter 11 Cracks in the system (Environmental Stress Cracking)

Chapter 12 Let's make this perfectly clear ... (Formulating clear automotive lacquers)

Chapter 13 That's swell (HSP and Swelling)

Chapter 14 Paint failure - the science of blistering

Chapter 15 Skin deep (HSP and Skin Absorption)

Chapter 16 HSP and Diffusion

Chapter 17 <u>It's your call</u> (Rational Selection of Chemical Protective Gloves)

Chapter 18 <u>Gloves: from minimum data to maximum insight</u> (Exploring Glove Permeation)

Chapter 19 <u>Saving the planet</u> (Finding Improved Environmental Solutions)

Chapter 20  $\underline{\text{HSP for ionic liquids}}$  (How to Assign HSP to New Materials)

Chapter 21 Cleaning by numbers (HSP for Surfactants)

Chapter 22 <u>Chromatography – HSP creator and user</u> (Retention Times and HSP)

Chapter 23 Noses artificial and natural (HSP for Sensors Both Artificial and Live)

Chapter 24 <u>Attacking DNA</u> (HSP for DNA , Drugs, and Biological Membranes Compared)

Chapter 25 HSP for Pharma and Cosmetic applications

Chapter 26 Exploring with HSP – (Generating and testing research hypotheses)

Chapter 27 Liquid extraction – a work in progress

Chapter 28 The HSP of gel formation

Chapter 29 Going nano (HSP Characterizations of Nanoparticles)

Chapter 30 <u>DIY HSP</u> (Methods to Calculate/Estimate Your Own HSP)

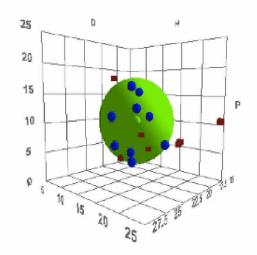
Chapter 31 <u>Predictions</u> (Many Physical Properties are Correlated with HSP)

Chapter 32 Improvements?

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Chapter 33 Into the 4th Dimension. Donor/Acceptor Chapter 35 <u>A Short History of the Hansen Solubility Parameters</u> Chapter 36 <u>The next steps</u> (What Is Planned and Asked For)

# Hansen Solubility Parameters in Practice



#### About the authors

**Professor Steven Abbott** is an independent technical software author and consultant in the areas of coating/printing/formulation and nano-science. He is a Visiting Professor at the School of Mechanical Engineering, University of Leeds. He has a PhD in Chemistry from Oxford University (but did the work for it at Harvard University) and has worked extensively in the coating and printing industries. His current research interests include environmentally safer solvents for the printing industry, biomimetic nanosurfaces and nanoparticle dispersions for highperformance coatings and practical skin permeation science.

**Dr Charles M. Hansen** is in a state of active semi-retirement working from his residence as consultant and author, having recently completed a second edition of *Hansen Solublilty Parameters: A User's Handbook*, CRC Press, Boca Raton, 2007. He holds a B.Ch.E from the University of Louisville, an M.S. from the University of Wisconsin, and lic. techn. and dr. techn. degrees from the Technical University of Denmark. He has worked extensively with numerous organisations in the coatings, plastics, and related industries with employment by PPG Industries in the USA, and the Scandinavian Paint and Printing Ink Institute and FORCE Technology, both in Denmark.

**Dr Hiroshi Yamamoto** is a senior researcher at private company. He has a PhD from Nihon University "Molecular design of CFC alternatives using Chemo-Informatics" and has been a Visiting Associate at CalTech. His expertise includes neural networks and data mining for thermodynamic and chemical properties. Outside work he is "Senior Developer of HSPiP", "ChemNeuro" and his site,

#### Hansen Solubility Parameters in Practice

www.pirika.com is widely used and referenced in the literature for its range of on-line Java-based predictors. His amazing work for HSPiP is all done in his spare time.

**Dr Richard S Valpey III** is Research Associate at SC Johnson Inc. He has a PhD in Organic Chemistry from The University of Rochester and has worked extensively with consumer products. His current research interests include environmentally friendly formulations for consumer products, liquid atomization and sprays, and aerosol science and technology.

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# **HSP User's Forum**



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