



THE DISPEX[®] MANUAL

A Guide to the Use of Acrylic Dispersing Agents

Introduction

Both the imaging and coating industries are large users of fine particle size pigments which provide opacity/hiding power and colour strength in the finished products.

Whilst most users of such fine particle size powders are well equipped to handle them, it is becoming increasingly common for pigment producers to supply their products in slurry form. This provides the end user with a number of advantages relating to easier handling of the pigment, such as simpler mixing equipment and reduced dusting problems.

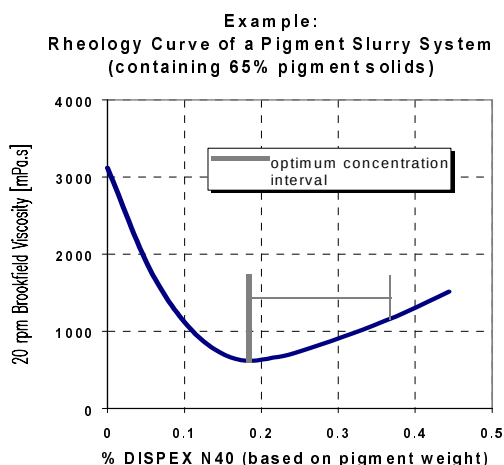
From the pigment manufacturer's point of view it is essential that the slurry produced is high in solids content (for cost effective transportation), low in viscosity, resistant to any sediment formation and stable in viscosity with time.

Products from the DISPEX range have proven to be highly effective general purpose dispersants for a wide variety of mineral types such as china clay, calcium carbonate, titanium dioxide, gypsum, etc. and also for organic pigments. Slurries of 65-70% solids content (or in some cases even higher) can be obtained with addition levels of around 0.1 % - 0.5% active dispersant on pigment solids.

Determination of the optimum Use Level

Two basic methods are commonly used for evaluating products on a sample of pigment.

1. A high solids content (60-70%) paste/slurry of the pigment is prepared in water and the viscosity of the system is monitored (e.g. using a Brookfield Viscometer) as the dispersant dose level is increased incrementally. A plot of slurry viscosity versus dispersant dose level can then be constructed. (A typical result is shown in Graph 1 over page.)



The optimum dispersant dose level can be quickly established using this procedure.

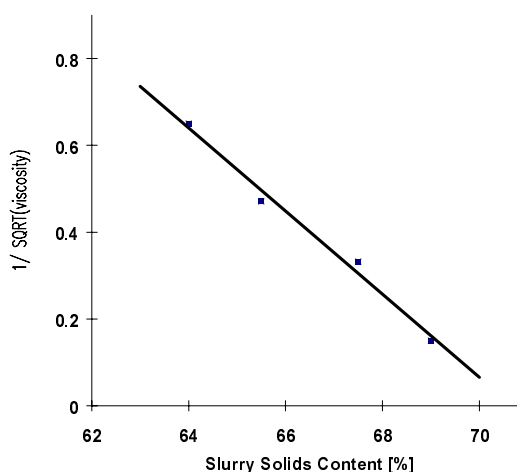
2. If an upper limit exists for the slurry viscosity of a given pigment system, an indication of the maximum solids content which is obtainable can be deduced using the Clark Viscosity Method.

Firstly the optimum dispersant level is established according to the procedure given above. This quantity of dispersant is then used to prepare a slurry at the highest convenient solids concentration. The viscosity is noted and the slurry diluted with water to lower solid contents with the viscosity being re-measured at each concentration.

A plot of root reciprocal of viscosity versus solids content is then made:

$$1 / \sqrt{\eta} = a' \cdot c + b'$$

A typical Plot: Viscosity vs. solids content





It is now possible to determine the weight% the slurry has at a given viscosity.

Production of ultra-fine Particle Size Pigments

Products from the DISPEX range, especially DISPEX N40, also find use in the manufacture of ultra-fine particle size pigments. These materials - often around 90% of particles are below 2 microns in size - are commonly used in inks and paints as high quality extenders for titanium dioxide.

In the case of calcium carbonate, such grades can be produced by a precipitation process and DISPEX N40 is used to aid slurry preparation when the dried solids are re-dispersed in water.

Alternatively, the desired particle size may be achieved by a milling or grinding process in water, using a much coarser grade of the same mineral as the starting material. As the particle size is reduced in such a milling operation, a very large increase in viscosity can occur due to the rapid increase in surface area of the pigment.

The addition of DISPEX N40 to the milling chamber helps minimise this viscosity increase. This increases substantially the efficiency of the process by reducing power consumption, shortening the milling time, as well as giving a final product with much improved viscosity characteristics.

Calcium carbonate slurries having solid contents of 72% or above at a particle size of 90% less than 2 microns can now be obtained. Such slurries have been found to have excellent viscosity stability since the incorporation of DISPEX N40 helps minimise any 'gel build-up' which might occur on standing for several days.

Trade Name

DISPEX is a registered trademark.

Important Notice

IMPORTANT: The following supersedes Buyer's documents. SELLER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are

Ciba Specialty Chemicals

Additives

Imaging and Coating Additives



based on controlled or lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.