

RHEOLOGY SOLUTIONS

EVALUATING DIFFERENCES BETWEEN CAULK PRODUCTS

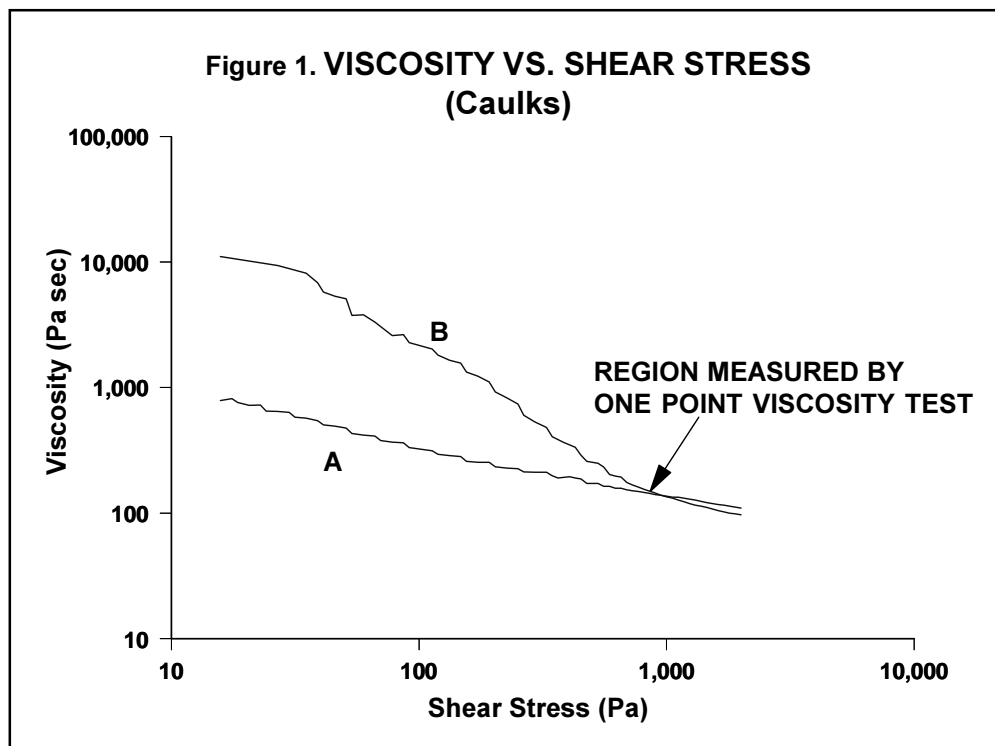
PROBLEM

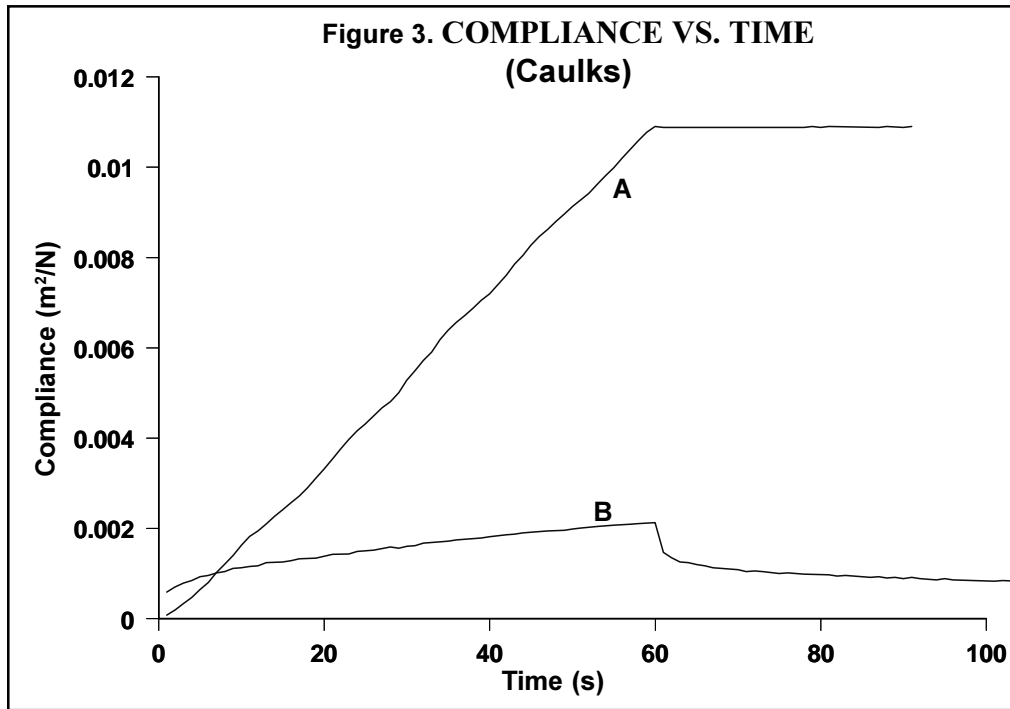
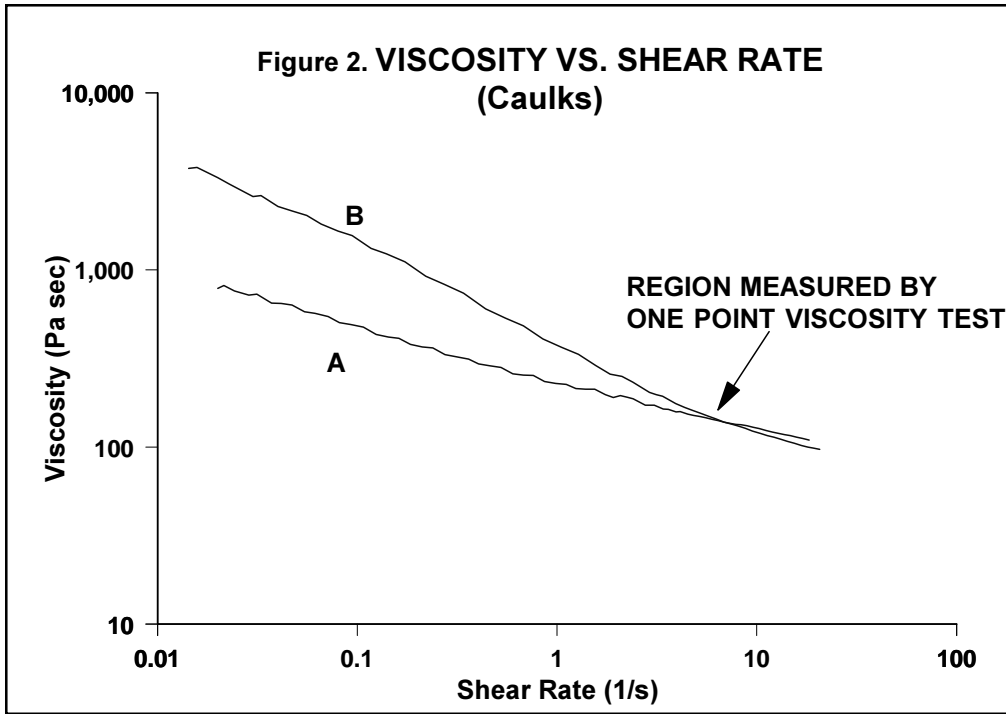
A manufacturer of caulk compounds found that one of his products (Caulk A) did not perform as well as a competitor's (Caulk B) in an application requiring sealing of vertical joints. The manufacturer's product tended to sag or run out of the joint; whereas, the competitive product remained in place. The manufacturer evaluated the two products using a one-point viscosity test. However, that test showed no difference between the two products.

SOLUTION

A Controlled Stress Rheometer was used to characterize the two caulks over a broader range of conditions. Initially, the flow properties of the materials were measured as a func-

tion of applied force (or stress) at levels that might be experienced as the product is applied out of a tube. The results obtained are illustrated in Figures 1 and 2 where product viscosity is plotted as a function of shear stress and shear rate respectively. Those results indicated that Caulk A had a lower viscosity at low stress and shear levels, and hence should be easier to squeeze from the tube. However, to obtain information about the compliance or sag of the caulk once applied, a different rheology test was more useful. In that test (Figure 3), the caulks were subjected to a constant stress for a period of time and the amount of creep (compliance) was measured. The stress was then removed and the recovery (elasticity) was measured. The results clearly showed that Caulk A had a higher compliance and poorer recovery than Caulk B. Formulation changes were subsequently made to reduce compliance and improve the elasticity of Caulk A.





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