

PROBLEM

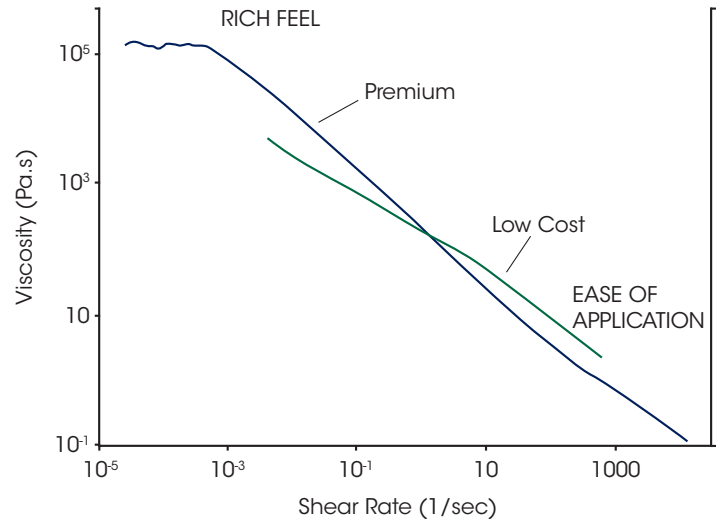
A manufacturer of hand creams was interested in a quick and easy test for comparing the properties of different products within its product line, as well as comparing its products with those offered by competitors.

SOLUTION

There are two key physical properties related to the application of hand creams. Those properties are initial feel to the fingers before application and ease of application and absorption into the skin. The ideal hand creme should be rich and thick to the touch when initially removed from the container. When applied, however, the creme should spread easily to obtain a thin layer which is quickly absorbed. Rheology, which measures the deformation and flow of materials under different end-use conditions, provides a convenient method for evaluating those hand creme properties.

Figure 1 shows the comparative results from a controlled stress rheometer for a low cost moisturizer and a premium hand creme. The curves represent the viscosity (resistance to flow) as a function of shear rate. At low shear rates which approximate dipping fingers into the container to obtain a quantity for application, a higher viscosity was desirable. There was, however, an upper limit to the viscosity that gave the desired rich "feel". Petroleum jelly, for example, had a higher low shear viscosity than either of the hand creams evaluated, but it was so thick, it felt tacky instead of rich. The actual range of acceptable viscosity was ultimately determined by

Figure 1: Hand Creme Comparison



correlating the rheology results with customer test panels. Under higher shear rates simulating application to the skin, shear thinning occurred and both cremes exhibited a low final steady state viscosity. The premium creme had a lower viscosity indicating that a thinner layer could be applied, resulting in more rapid absorption into the skin.

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