

USE

To naturally cool and sooth burns and moisturize skin.

Rheological data may be obtained using several methods. For example, three very different, yet suitable tests, were done to the Sunburn Treatment Gel. All the data were valid and significant.

METHOD I

TEST EQUIPMENT

- **Spring Torque Range:** RV
- **Spindle:** T-A T-Bar Spindle
- **Accessory:** Helipath Stand
- **Speed:** 5 rpm
- **Temperature:** Temperature (70-72°F)

TEST METHOD

The Helipath Stand may be used with various Brookfield viscometers or rheometers. It is useful for testing creamy, pasty, or gel-like materials. In our example, we used a Brookfield RVDV-II+Pro, with Rheocalc software for automated instrument control and data acquisition. We ran the test in the gel's original bottle.

We recommend testing at least three different samples, to account for sample variability and repeatability of the test. If the sample's container is wide enough then at least three locations in the container may be tested. However, if the container happens to be narrow, then it is recommended that material from at least three different containers be tested. Customers often test in at least three different containers, regardless of width. This method is a good idea since it is possible for a single container to be improperly filled due to a production-line problem. Representative data from the analyses are shown in Figure 1.

The readings increase from zero as the spindle goes into the material, and then increase steadily until plateauing at approximately 1,500,000 cP. That reading is maintained until the spindle begins to rise out of the substance; it then falls back to zero due to the lack of torque. The data demonstrate repeatability of this test.

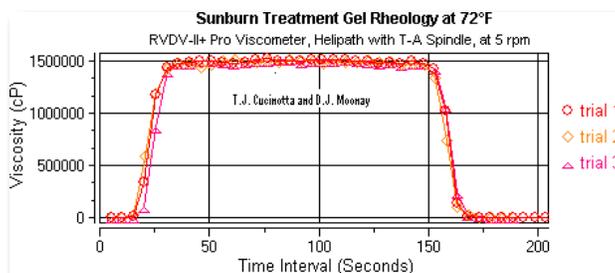


Figure 1
Sunburn Treatment Gel at Room Temperature
(70-72°F).

METHOD II

TEST EQUIPMENT

- **Spring Torque Range:** RV
- **Spindle:** RV-7
- **Speed:** 50, 70, 90, 110, 130, 150, 170, 190, 210, 230 and 250 rpm
- **Temperature:** Room Temperature (70-72°F)

TEST METHOD

In our example, we used a Brookfield RVDV-III Ultra, with Rheocalc software for automated instrument control and data acquisition. Our test temperature of 70-72°F was due to testing our material at room temperature. The sample was squeezed out of its bottle into a 250-mL beaker, where it was tested. The spindle was immersed to its immersion mark and then into fresh portions of the sample in different areas of the beaker for each trial. Representative data from the analyses are shown in Figure 2.

Figure 1 demonstrates that the viscosity of the Sunburn Treatment Gel decreased as the speed increased. This behavior is known as "shear-thinning". The three trials gave similar results. The viscosities were repeatable to within plus or minus 1%.

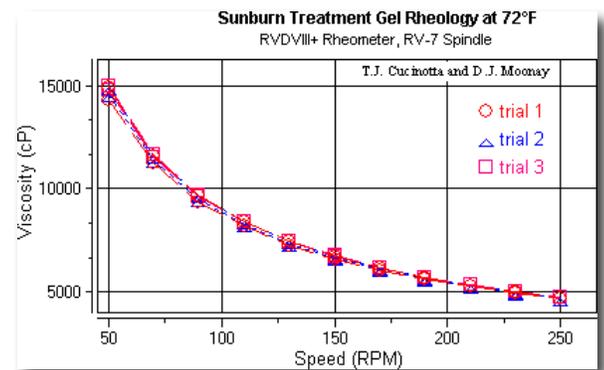


Figure II
Sunburn Treatment Gel, at Room Temperature
(70-72°F).

METHOD III

TEST EQUIPMENT

- **Instrument:** YR-1 Yield Rheometer
- **Spring Torque Range:** RV
- **Spindle:** Vane Spindle V-73; Immerse to the Primary Immersion Mark
- **Speed:** 1 rpm
- **Temperature:** Room Temperature (70-72°F).



VISCOSITY APPLICATION NOTE: SUN BURN TREATMENT GEL

TEST METHOD

We used the Brookfield RVYR-1 Rheometer, with EZ-Yield™ software for automated instrument control and data acquisition. The YR-1 performs yield stress tests, which determine the stress that must be applied to make a material flow. The corresponding apparent yield strain is the deformation at which the sample structure breaks down - and at which the sample flows. The sample was squeezed out of its bottle into a 50-mL beaker, where it was tested. The vane spindle was immersed to its primary immersion mark. The vane spindle was immersed into a new portion of the sample for each trial. Representative data from the analyses are shown in Figure 3.

Figure 3 demonstrates Stress (Pa) vs. Apparent Strain (rad) of the Sunburn Treatment Gel at 1 rpm. On-scale results were obtained while testing with the RVYR-1 and the V-73 vane spindle, at 1 rpm. The stiffness or firmness of the material is reflected in the slope or steepness of the stress-strain curve. The yield stress is the maximum stress, in each run. The results were repeatable.

We recommend appropriate procedures, such as testing samples in 600-mL, low form, Griffin beakers. However, we understand that customers may have to use other containers for various reasons.

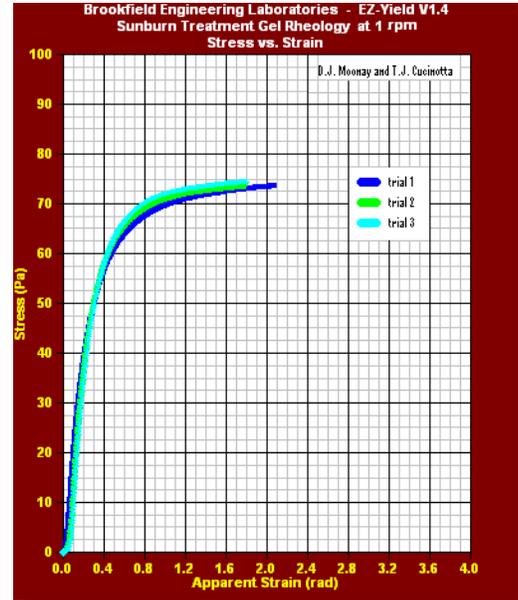


Figure III
Sunburn Treatment Gel at Room Temperature.

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