

INSTRUCTIONAL GUIDE

Contents

- 1 L Bottle of Rheoscopic Fluid
- Instructional Guide

Recommended for Activities:

- Modelling clay
- Shallow pan
- [Hot Plate \(PX-1043\)](#)
- [Beakers](#)
- [Wire Gauze with Ceramic Center \(66-4013\)](#)



Background

The term rheoscopic is the combination of two Greek words: *rheo* (meaning to flow) and *scope* (meaning to watch or see). Rheoscopic, therefore, means to be able to watch or see something flowing. This unique and dynamic substance has the ability to produce striking visual images of currents taking place within a liquid. This pearly-white, water-based suspension of crystals is excellent for teaching units on ocean currents, aerodynamics, turbulence, convection, and many other concepts which are difficult for students to visualize. Rheoscopic Fluid is non-toxic and reusable. It can be colored with food color at a ratio of 2 to 3 drops per 1-liter bottle. Appropriate for all grade levels.

Introduction

1. Be sure to thoroughly shake the rheoscopic fluid before using it. Over time, the microscopic crystals will settle out of suspension. Settling may also occur if the fluid is made to flow at slow rates over long periods of time. Stirring or shaking up the liquid will resuspend the crystals.
2. Do not boil or heat the rheoscopic fluid to temperatures that are hot to the touch. Very little heat is required to show convection currents with the rheoscopic fluid, so high temperatures are not necessary. Overheating may result in damaging the crystals.
3. Use extreme caution if you choose to use an electrical appliance to create currents. Do not let students use appliances unattended.
4. If some of the rheoscopic fluid evaporates during the course of your experiments, distilled water may be added to bring the fluid back to its original volume.
5. Do not add other substances or chemicals to the rheoscopic fluid. This may damage the crystals.

Experimenting

Ocean Currents

You can use the rheoscopic fluid to explore how ocean currents are created, including the Gulf Stream. Use modeling clay in a shallow, black-bottom pan to create outlines of the eastern shorelines of North and South America on one side of the pan, and those of Europe and Africa on the other. Add the rheoscopic fluid to the center of the pan (about 16 oz. to an 11" x 17" pan) to create the Atlantic Ocean. The trade winds can be simulated by using a hair dryer on a stand directed to blow from western Africa toward the Gulf of Mexico. (Take care when using electrical appliances around water! Do not let students use unattended!) The Gulf Stream and other Atlantic currents will be clearly visible as they flow between the continents.

Coastal Erosion

The sedimentation and erosion patterns associated with jetties can also be investigated with rheoscopic fluid. Using clay or blocks cut out of Styrofoam, create jetties that extend from one side of a shallow, black-bottom pan, perpendicular to the side of the pan. Add some rheoscopic fluid to the pan and use a hair dryer to create currents that flow perpendicular to the jetties. The flow pattern around the jetties should be very clear and the sedimentation patterns will become visible over time as the fluid begins to settle out of suspension.

Aerodynamics

Various shapes (such as children's blocks) can be placed in a shallow, black-bottom pan containing rheoscopic fluid. Using a hair dryer to create currents in various directions, study the effect of the shape on the fluid flow and the turbulence patterns created behind different objects. A fun way to use this demonstration is to have students experiment with car or airplane design by cutting out various shapes from Styrofoam blocks, clay, or floral oasis. These shapes can then be tested in the rheoscopic fluid for their aerodynamic efficiency.

Convection

Convection currents are clearly visible using rheoscopic fluid. Simply place some in a clear beaker and place the beaker on a wire-gauze pad protected hot plate. Heat the beaker very gently to create the convection currents that can easily be seen from any side view (Be careful not to boil or over heat the rheoscopic fluid!).

Another way to display convection currents is to place some rheoscopic fluid in a shallow, black-bottom pan. Fill beakers of different sizes with hot water. Place the beakers in different positions in the pan. Convection currents will start. Try different arrangements of the beakers. Try different temperatures of water in the beakers. Then try it with some beakers containing ice water.

Related Products

Ice Melting Blocks (P6-7060) Cool experiment kit! Touch these two black blocks, and one feels cooler. This discrepant event introduces many concepts, including heat transfer, change of state, and thermal conductivity.

Galileo's Thermometer (P3-5006) Our Galileo's Thermometer is a great attention getter when discussing topics on pressure and fluids or the gas laws.

Stirling Engine (P6-7100) Visually demonstrate the conversion of thermal energy into mechanical work to create electrical energy!