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chemmuniqué®

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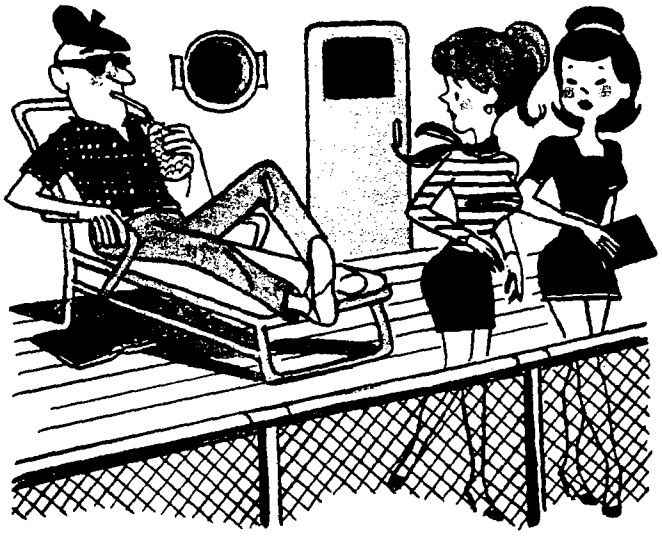
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chemmuniqué

(a communiqué to chemical processing industries)

This publication is sent to friends of Atlas Chemicals Division to bring them examples of the many applications of our products. A return card is enclosed for your convenience in correcting your address and in asking for samples or other information.

Editor, Chemmuniqué
Atlas Chemical Industries, Inc.
Wilmington, DE 19899
Phone (302) 658-9311



Bartender's guide

. . . an epistle from our retired ex-editor

Dear Papa Atlas:

It occurred to me that you might get a bang out of hearing about some of my beverage-sipping down in the West Indies. This led me to discover a few rather exotic uses of your TWEEN polysorbate surfactants, of all things.

After I departed your halls, I took off on a cruise of the balmy Caribbean. I soon found that the way to establish status on shipboard was to loaf around in a deck chair sipping a *piña colada*, a rather heavenly collation of rum, pineapple juice and coconut milk, served in a scooped-out pineapple with a straw. Ar-

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riving in Antigua, I discovered the delights of an icy-slushy *banana daiquiri*, served in an oversize beer glass, and consumed while bending my ear to the rhythms (also intoxicating) of a steel band.

Naturally, I wished to impress my friends back in Wilmington with these pleasant libations. So, on arrival home, I hied me to my friendly liquor store for a fast thumb-through of their free recipe books. Maybe you'll be as surprised as I was when I found that I could produce these luxurious goodies at home much faster than you can open a can of pineapple juice or skin a banana.

It seems that they have this *piña colada* thing—and also the *banana daiquiri*—neatly packaged in a little envelope, in the form of powder. All you have to do is buy some rum to go with it. I have also become acquainted with such elegant delicacies as strawberry daiquiris, (to say nothing of blackberry, apricot, cherry and peach) which are likewise made from delightfully handy powders.

Where Atlas comes in is that some of the best-known brands of these powders are made with polysorbate 80, and I presume that you supply your lovely TWEEN 80 brand of polysorbate 80 to the makers of these cocktail mixes.

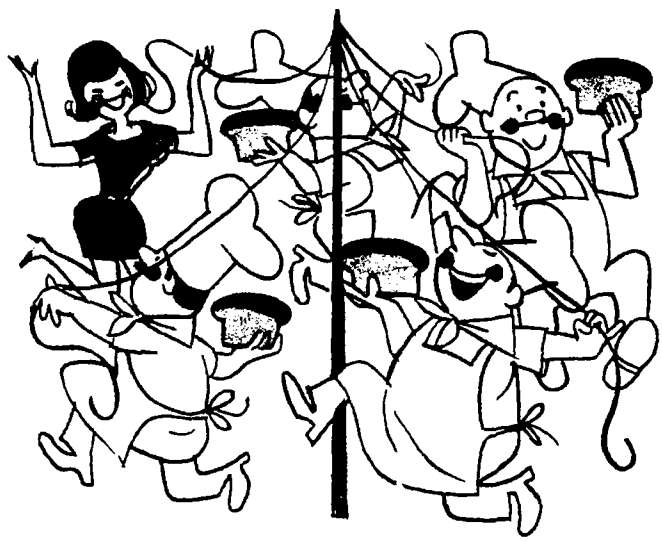
If all this is not already old hat to you, examine the whole gamut of these ready-mix deals next time you replenish your liquor supply. Note that there are liquid mixes as well as powders, and that these are often made with polysorbate 60—I like to think it is your TWEEN 60 brand. You'll see all sorts of fruit daiquiris and sours, lemon-lime flavoring mix, and some terrific liquid bar aids to help you put a beautiful professional-looking "head" on your fruit drinks.

It seems that polysorbate 60 is recognized as a "frothing agent" and "flavor dispersant" and polysorbate 80 as a "flavor dispersant" for these fruity delights. I'm sorry to tell you I can't find any polysorbate products in the powder or liquid mixes for such non-fruit drinks as martinis and manhattans. Obviously, a "head" on these drinks would be out of character and there is no fruit flavor to be dispersed.

Your ardent supporter of TWEEN emulsifiers for instant relaxation, Ex-editor

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We're boosters for bread

Way back in 1953, a group of West German bakers persuaded their government to designate a "Day of Bread" as part of the Harvest Festival. Each year this has been continued, and other countries have joined in. For many, this annual celebration has become a symbol of world understanding.

This year, for the first time, the United States joined the celebration. The last week in October has been designated as Harvest Festival, and October 28 as the Day of Bread.

Here at Atlas, we're so interested in bread that we've already had our own day to celebrate it. That happening was in June when we introduced our TANDEM 8 conditioner-softener for bread to our salesmen and to our distributor, R. T. Vanderbilt Co., Inc. This twin-purpose product is causing a real stir in the baking world because it's so easy to use and economical, too. Until TANDEM 8 came along, bakers had to use separate products to obtain good conditioning and softening.

The dough conditioning action of TANDEM 8 eliminates wet and sticky dough which adheres to bread processing equipment like freshly discarded bubble gum clings to a shiny Florsheim. This is good news for any baker, but especially for those who form a lot of small items like hamburger, hot dog, and dinner

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rolls in addition to loaves of bread. TANDEM 8 also gives well-shaped loaves that have uniform grain and texture, a happiness factor which pleases bakers and homemakers, too.

Coupled with these dough conditioning characteristics, the softening action of TANDEM 8 helps to keep the bread soft and delectably palatable, even after it's several days old.

If you're a baker and want to know more about TANDEM 8, just ask us for booklet LG-112 "New TANDEM 8 Conditioner / Softener" on the enclosed card. You can also ask us for a TANDEM 8 sample so that you can try it in your bread. If you go TANDEM 8, we think you'll have an additional reason to celebrate next year's Day of Bread.



The "wood" that isn't wood

An apartment full of new furnishings can cost a pretty penny. So newlyweds are likely to be stuck with time-worn Early Attic or Late Aunt Sarah furniture rather that the elegant solid pecan Mediterranean pieces that they've dreamed of. But furniture and home accessory manufacturing is undergoing an exciting change which will probably make such wistful dreaming a thing of the past. Less expensive furnishings with the exquisite styling of hand-crafted

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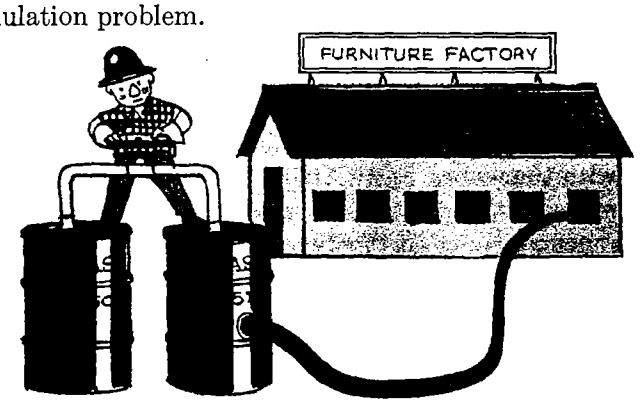
wood pieces can now be made by molding high density polyurethane foams. As you might expect, Atlas has a piece of the action. In fact, we've just introduced two new polyethers, G-2450 and G-2451, which will simplify the manufacture of attractive and sturdy simulated wood objects.

In making molded polyurethane furniture, you mix the polyether and an isocyanate, some modifiers and maybe a dye, plus a blowing agent. Then you make haste to pump or pour this goop into a mold before a hair-trigger reaction makes it expand to as much as thirty times its original volume. As the copious foam forms in the mold, it fills it completely, even if it's intricate. Then it sets to a rigid foam. The outer surface of the molded piece is smooth and continuous—you might even say it's tough-skinned.

The resulting molded object can be finished like wood. By changing the mold, you can make pieces with rich grain, elaborate detail, tool marks, and even worm holes. By changing the formula, the weight of the piece can be changed from extremely light to heavier than a comparable wood piece.

G-2450 and G-2451 polyethers fit neatly into the formulation slot for this space-age furniture. They speed up production because they make a liquid molding mixture that pumps or pours quickly, instead of flowing like molasses-on-ice, typical of some old style foam systems. Not only that, but they give the added benefit of consistent foam quality.

Should you want to hear more about these new polyethers, write us on your company stationery, baring your soul to us about your specific foam formulation problem.



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Atlas wins award

The June 1969 issue of *Food Processing* brought a ray of joy into our life. It announced the winners of the 1969 Putman Food Awards, given for major contributions toward more efficient and effective operation of the food processing industries and for outstanding food product developments. Our happiness cup is brimming because Atlas received Top Honors in the ingredient category for work on our SPAN 60 and TWEEN 60 surfactants in chocolate.

If you've ever eagerly opened a box of chocolates only to find the pieces covered by a drab gray, unappetizing film, you know how a good, glossy surface adds to the appetite appeal of chocolate items. SPAN 60 and TWEEN 60 surfactants hold that gloss and prevent that gray fatty haze from forming during the shelf life of the candy by impeding the movement of cocoa butter to the chocolate surface.

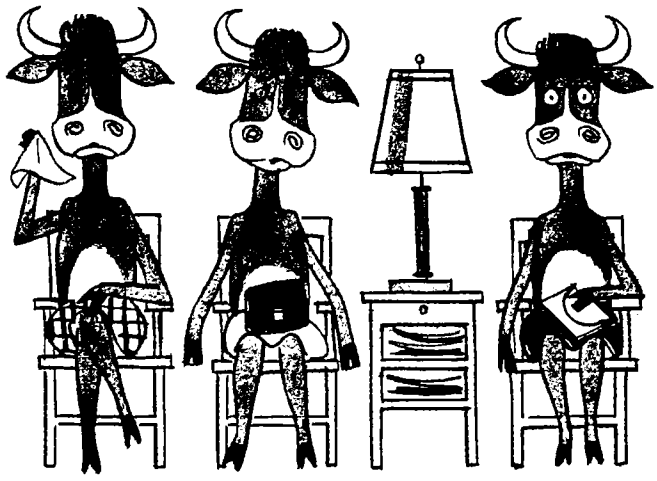
Candy manufacturers are happier with these surfactants in a batch of chocolate because the coating needs fewer modifications during use, speeding the coating operation and saving money.

If you want to know all the whys-and-wherefores of this award winning development, just ask us for brochure LG-102 "How SPAN 60 and TWEEN 60 Surfactants Preserve Gloss and Prevent Bloom" on the enclosed reply card.

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CARBON FILTERED COWS



Several months ago, the unfortunate owners of a herd of healthy Holsteins in Kentucky found that the milk produced by their animals was contaminated by a harmful pesticide residue. State and federal officials ordered immediate quarantine of the animals, and their milk was withdrawn from the market. The owners began dumping about $200 worth of milk a day—and that's a lot of moola. Our DARCO activated carbon solved their problem!

It happened like this. The harried owners traced the origin of the pesticide residue to the oats they were feeding the animals. So they stopped supplying that diet, but the amount of pesticide that each cow had consumed wouldn't be eliminated naturally for over a year. They urgently appealed to the University of Kentucky dairy specialist, Dr. Darwin Braund, for help—and he recommended a DARCO activated carbon treatment. He learned about it when he was a graduate student working under Dr. Robert M. Cook of Michigan State University, who pioneered the activated carbon dosage of dairy cattle accidentally contaminated with pesticide.

Dr. Braund planned a field test of the activated carbon treatment. Half the herd was fed corn silage. For the other half, the owners whipped up a black snack of corn silage, phenobarbital, and our DARCO

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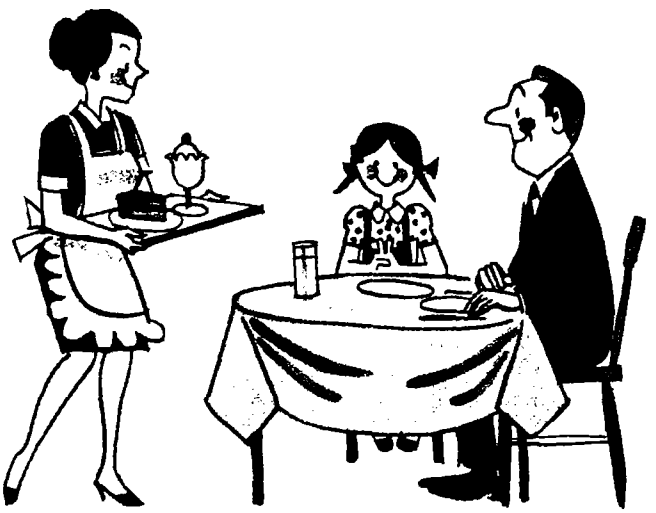
activated carbon. According to the July 20, 1969 *Des Moines Sunday Register*, the recipe for this goody is two pounds of DARCO and five grams of phenobarbital mixed with each cow's daily silage ration. Cows go for the flavor of phenobarbital, which not only stimulates liver action but also transforms them to a happy relaxed state. DARCO is tasteless and odorless, so they find the novel cuisine just as tempting and tasty as their regular diet.

In less than a month from the start of treatment the treated cows were decontaminated. Milk from the untreated cows still contained pesticide residue. Naturally, the herd owners were delighted with the DARCO treatment, and they switched the untreated cows to a carbon diet. They were back in the milk business in record time.

It's not likely that you'll have to clean up cows with our DARCO activated carbon. But it's good for cleaning up lots of other things, too—like chemicals, wastewater, potable water, dry cleaning fluids, wines, beer, and sugar solutions. If you have a purification problem where you want to remove large organic molecules, poorly soluble materials, colloids, or surface active substances, we'd like to try to use our fifty odd years of experience in activated carbon technology to help you. Just drop us a note.

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When is a dispersion a delectable dish?

Believe it or not—a lot of dispersions are delightfully palatable. This is not to say that you'll find Dispersion à la Grecque or Dispersion Bearnaise on the menu at your favorite French restaurant. But, although you may not think about it when you eat them, the fact is that many well-known food products are dispersions. Milk is a liquid-in-liquid dispersion or *emulsion* of liquefied fats in water. If you add chocolate syrup to the milk, suspending chocolate particles in it, you're making a solid-in-liquid dispersion or *suspension*. If you separate cream from the milk, and beat lots of air into it, you get a gas-in-liquid dispersion or *foam*, better known as whipped cream.

If you jazzed up your first-thing-this-morning Java with a liquid coffee whitener you used a dispersion of a low melting fat in water, formulated to look like milk or cream. These products use a lipophilic surfactant like our own ATMOS 150 (mono-and diglycerides of edible fats or oils) as the emulsifier for the fatty ingredients.

Not all emulsions have the white appearance of milk. You may find it hard to believe that the sparkling clear liquid in a jar of dill pickles is also an emulsion. There *are* dispersed flavor oil particles in the liquid that most dills are dunking in, but they're so small that they simply don't show up when you look

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at the jar on your supermarket shelf. If you're interested more than somewhat in making a flavor or vitamin oil "water soluble", try about three to eight parts of our TWEEN 60 (polysorbate 60) or TWEEN 80 (polysorbate 80) surfactants for each part of oil you want to solubilize.

Even butter and margarine are dispersions, but they have an unusual twist. In most food emulsions, liquefied fats and oils are dispersed in water. In these spreads, the emulsion is flip-flopped, and the water is dispersed in the fats or oils. As you might suspect, we have a hand in making water-in-oil emulsions, too. Our ATMUL 84 (mono- and diglycerides of edible fats or oils) surfactant is used to help keep the water dispersed in margarine. Our ATMUL 80 and ATMOS 300 surfactants, which are also mono- and diglycerides, are good choices for making other water-in-oil food emulsions. Sometimes they'll work even better if you add a dash of TWEEN 60 (polysorbate 60) or TWEEN 80 (polysorbate 80) surfactants.

Cake and ice cream and the whipped topping that sometimes goes with them are dispersions, too. They are foams, but the surfactants used in them can be emulsifiers, demulsifiers, and oil encapsulating agents as well as foaming agents.

We have some pretty unusual evidence that cakes are foams. During one long cake mix study, our lovely blonde laboratory technician began to use a waterproofing silicone hand cream. It healed her hands, but it blew the whole experiment when the silicone fluid, which is also an anti-foam, picked up on the mixing equipment and made the cakes aerate erratically. Be that as it may, we've since found that SPAN 60 (sorbitan monostearate) surfactant and TWEEN 60 (polysorbate 60) surfactant blended with mono- and diglycerides like ATMUL 80 surfactant, or ATMUL 80-ATMUL 84 surfactant blends will make cakes higher and give them better texture.

In ice cream, ATMOS 150 (mono- and diglycerides of edible fats and oils) surfactant is a good foaming agent and emulsifier. It's often blended with TWEEN 80 surfactant to give a well-aerated product that will dip well, taste good, and won't drip when you eat it in a cone, sandwich, or chocolate covered popsicle.

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This helps the ice cream manufacturer, too, because he gets the no-drip feature while he's making and packing novelties.

If you're intent on having a whipped topping to go with the cake and ice cream, SPAN 60 (sorbitan monostearate), TWEEN 60 (polysorbate 60) and TWEEN 65 (polysorbate 65) surfactants alone or in combination are good emulsifiers for vegetable fats, and they're good whipping aids.

A lot of food formulators who are developing convenience foods are finding our storehouse of know-how on dispersions a real time-saver in their work. Should you want to make time with a knotty emulsifying, suspending or foaming problem, drop us a note describing your puzzler, and we'll send you a recommendation posthaste. Or you can ask us for one or more of the following informative guides to formulating by checking the space provided on the enclosed reply card:

LG-88—"Atlas Emulsifiers for Coffee Whiteners"
LG-103—"Guidelines to the Formulation of Whipped Toppings"
LG-106—"A Multi-component Emulsifier System for Cake Mixes"

Variations on a theme

When you were thumbing through the pages of the August 1969 issue of CHEMMUNIQUÉ, you probably came across our offer to send you bulletin D-110 "Activated Carbon for Wastewater Treatment?" You might say that this publication is the first part of a trilogy that our DARCO activated carbon folks are writing on the theme "Wastewater Treatment". They tell us that it may even become a tetralogy!

At any rate, the second bulletin in the series, D-111, "Evaluation of Granular Carbon for Wastewater Treatment" has just rolled off the press. It's a real gold mine of info on ways to test a bunch of granular carbon samples to find out which is best suited for hauling stubborn organic pollutants out of the wastewater you're rejuvenating. It goes all the way from laboratory screening tests to testing granular

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carbons in laboratory and pilot plant test columns.

It leads off with how you can screen granular carbon candidates in contact tests using pulverized portions of those carbons. You can get ideas on how to sample and treat the test liquid and how to run a control. It gives you trial carbon dosages, and conditions for treatment, including temperature, pH, and contact time. It's a quick way of finding out which carbons aren't worth a further look-see.

After you've selected some candidate carbons in the powdered carbon test, you can turn to this bulletin to learn how to run laboratory column tests. You can learn how to construct, load and operate a test column. Then you can find out how to analyze your laboratory results to select the leading candidate carbon for pilot column tests.

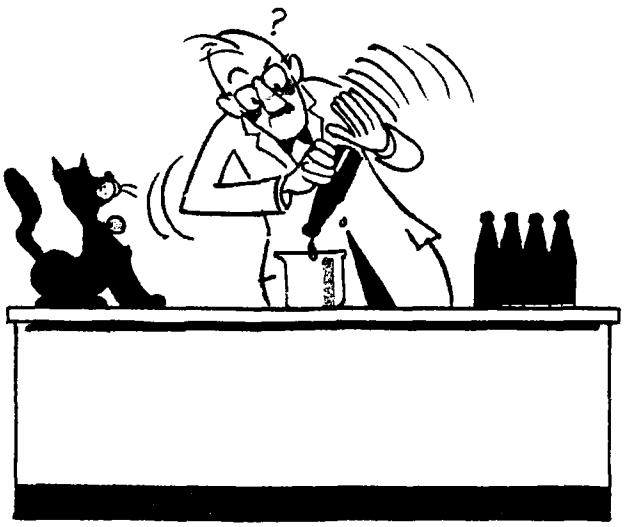
When you're ready to go on to pilot column tests to get more reliable data for plant design, this bulletin will suggest the kind of equipment to use, how to operate it, and how to analyze your results. And there's a short section on carbon regeneration.

If the name of your game is wastewater treatment, and you'd like to know the ins-and-outs of laboratory and pilot scale methods of evaluating granular carbon, check D-111 on the attached reply card. And if you want some of our DARCO activated carbon for trial, just fill in the sample request space on the same handy card.



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Stow flow woe!

Suppose you're developing a new hand lotion and your marketing men think it's great stuff except that it comes out of the bottle like reluctant catsup. Or that you're working on a paste furniture polish emulsion which has only one drawback—it's too firm to rub out easily on a wood surface. Don't slump into immediate grim despair! Here are five rules-of-thumb to help you adjust the apparent viscosity of these *and* other emulsion products.

If you've got an emulsion where the outside phase is more than half the total volume of the emulsion, one good way to alter the apparent viscosity is *to change the viscosity of the external phase.* For example, if you want to thicken an oil-in-water emulsion, thicken the water phase by adding soap gels, sodium carboxymethylcellulose, gums or other aqueous thickening agents.

Since water is water is water, it's a little difficult to thin an oil-in-water emulsion by reducing the viscosity of the water unless, of course, thickeners can be deleted or used at lower levels. You can sometimes add polar solvents which have a thinning effect, but more often than not, they'll break the emulsion, and that gives you an added problem.

Applying the same idea to a water-in-oil emulsion, you can change its consistency by thickening or thin-

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ning the oil phase. Use a lower or higher viscosity oil, or thicken the oil with additives such as waxes and lipophilic surfactants.

The second method of changing the apparent viscosity of an emulsion is *raising or lowering the melting point of the internal phase* of the emulsion. This route is good for oil-in-water emulsions, but not so hot for water-in-oil systems. If you're making an oil-in-water emulsion using mineral oil and beeswax as the inside phase, you would use more beeswax and less mineral oil to thicken it. Or you could use a higher melting point wax such as carnauba for part of the beeswax. To make it thinner, you use less beeswax and more mineral oil, or substitute a lower melting wax for the beeswax.

A third way to alter emulsion consistency is to *change the ratio of the oil and water phases.* If you increase the amount of external phase, you thin the emulsion. If you add internal phase, you'll increase apparent viscosity. So add more water to thin an oil-in-water emulsion and more oil to thin a water-in-oil emulsion. Conversely, if you gradually increase the internal phase of either an oil-in-water or a water-in-oil emulsion above about 50%, the emulsion will become progressively thicker. It will finally become non-pourable as the internal phase particles become more and more crowded and eventually distorted from their usual spherical shape.

Regulating particle size gives you one more means of controlling viscosity. For example, if you homogenize an emulsion, reducing its particle size, you will usually observe a marked increase in viscosity.

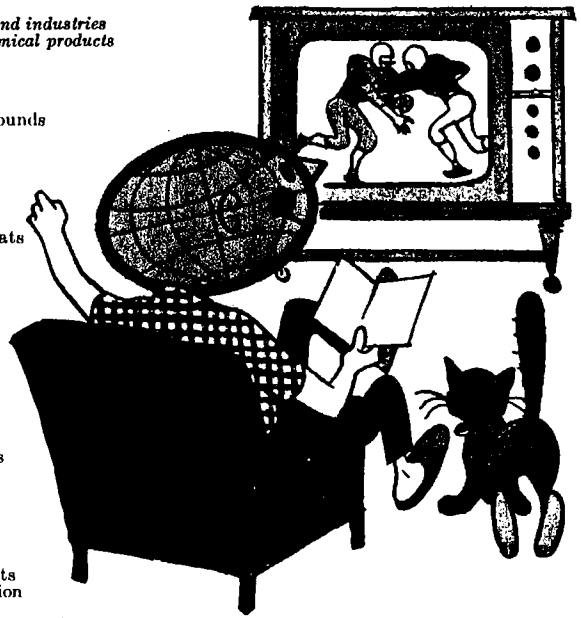
A fifth way of altering viscosity is to *change emulsifier type.* The way in which each surfactant orients itself at the interface, (the point of contact of the two emulsion phases) helps to determine emulsion viscosity. Our experience shows that you can often thin an emulsion by adding a small amount of a hydrophilic emulsifier. Our beloved TWEEN 20 (polysorbate 20), TWEEN 40 (polysorbate 40) and TWEEN 80 (Polysorbate 80, U.S.P.) surfactants will usually do the job. The trick in using these is to add just enough to thin the product, but not enough to alter its stability very much.

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These products and industries use ATLAS chemical products

Adhesives
Brewing
Chemicals
Cleaning Compounds
Confections
Cosmetics
Cutting Oils
Detergents
Drugs
Drycleaning
Edible Oils & Fats
Electroplating
Explosives
Foods
Glue Specialties
Herbicides
Inks
Insecticides
Lubricants
Paints
Paper
Perfumes
Plastics
Pharmaceuticals
Polishes
Resins
Rubber
Sugar
Textiles
Tobacco
Vitamin Products
Water Purification



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