Zac Monroe

WotsitsTM

The WotsitTM to which I have been assigned seems to be a red soap production station. Given the inclusion of an apparent Plexiglas cone for mixing the soap with erythrosine, a red dye, as well as a cylindrical steel canister for drying, a steel lever for draining, Plexiglas manipulation tools, and a solid tin and iron framework lubricated by lithium grease, this claim of soap dyeing emerges as credible.

First and most crucial to discuss is the container inside which the soap and dye are combined. I found the maximum volume capacity of this Plexiglas cone, using the given dimensions of 3”x6”x14”, MS Paint, and a simple geometric formula to be ~9.98 in3, which means that a typical bar of soap (taking up ~7.42 in3, on average), when melted, would fit comfortably, not even taking up 75% of the cone’s total volume. This gives for plenty of margin for stirring the soap without worrying about spilling. This conical mixing vessel’s transparency is rather beneficial in that it allows for more of the mixture to be seen than just the top, facilitating more proper blending.

Another highly important component of the machine is the place in which the soap will cool and solidify. In the case of this soap dyer, this comes in the form of a steel canister. It is hanging on one of the shiny poles using what seems to be a clamp that is opened by squeezing on each of its tabs. This indicates that the canister can be moved and removed from the pole rather easily, and that the clamp has much more to do with function than with aesthetics; this aids our argument in that we would be able to take it off the pole and place it under the Plexiglas cone and allow the soap to drain into it. The volume of this cylinder is roughly 10.91 in3; I found this using the same technique used for the cone. This is nearly perfect in that the maximum volume of the cone does not exceed that of the cylinder. There would not be any overflow when transferring the soap to the steel drying container. The soap wouldn’t constantly be dripping out of the funnel shape, however; the steel bar underneath the cone in fact acts as a drain-stopping lever. When rotated about the axis of the altitude of the cone, it uncovers a hole in the bottom of the mechanism that permits the passage of soap; this is done when the soap is fully dyed and ready to be cooled.

Barring the containers of the soap itself, the most important parts of this machine are the tools by which the substances are manipulated. The tools of importance are the Plexiglas tubes in the front of the picture. The cylinder that appears leftmost in the picture functions as a test tube, but not in the typical sense of that name. None of the tubes appear closed on either of the apparently circular sides; for this first cylinder, this is quite convenient. Due to its rectilinearity as well as its transparency and high surface area-to-volume ratio, a small amount of soap can be seen almost entirely when the tube is placed into the cone and a finger is placed over the top, disallowing airflow, which causes the soap to stall inside the tube. The soap can then be released back into the funnel-shaped mixing place by removing the finger. The high visibility is in place so that we can test how well the substance has been mixed. However, this component’s use would be futile without a mixer of some sort; this is where the second (pictured) tube comes in. Thanks to its oblique nature and staggered parallel tubular components, this tool works perfectly as a stirrer. If the part that is depicted facing up is placed into the soap cone from its top, it would appear to fit into the slight cylindrical space at the cone’s bottom, allowing it to spin around in circles in a similar manner (but not a similar axis) as a jack-in-the-box winder. Ideally, we would put our finger over the hole in the part that doesn’t go inside the liquid right before it’s submerged, so that none of the soap comes into the tube which would prevent it from being stirred with the rest of the soap. The third and final tool, the rightmost Plexiglas tube, functions as a transport method as much as an efficient pourer for the dye. Erythrosine/Red #3, the red dye that we’re combining with our soap, is rather potent. Using this tool, we pick up some dye from a container using the same modus that we used in picking up the soap with the first “test tube” tool; however, due to the not-completely-circular top, the tube allows for easier, more controlled pouring of the liquid (erythrosine mixed with water). This allows for the soap to have a more precise quantity of redness. This larger opening, acting almost as a pitcher’s spout, releases the effects of surface tension in the water-dye blend, so that the liquid flows out at its normal rate with much less surprises (such as when a surface tension force gives out, causing a quick, annoying influx of fluid flow).

The frame of this machine seems to have its sturdiness based on its sheer metallic strength. The base of the whole object as well as the bubble-wand reminiscent holder for the funnel appear to be made from cast iron, which is known for its high weight and hardness. This is important in that we need the WotsitTM to be able to stay standing to not spill out the product. The tri-leg design of the bottom is key because it permits the soap containers to be rotated with a degree of freedom without worrying as much about stability. The loop holding the Plexiglas cone should be hard because we do not want it to bend down due to the weight of the soap. Between the cast iron loop and the steel lever that opens the drip hole, there is some lithium grease. This is certainly the most ideal place for it on this whole machine because it is where the most metal-on-metal contact and movement is happening. Lithium grease is a hardcore lubricant for this type of job; it can survive many, many turns of the lever before needing to be applied again. The screw that holds the loop up, emphatically, is made of steel, as are almost all screws. We can derive this based on traditional screw production as well as the screw’s visual brilliance. However, brilliance isn’t everything, as demonstrated by the poles that hold up the two soap containers. Upon first glance, they may appear to be stainless steel rods. This type is most frequently used in lab and professional equipment. However, when we inspect them closer, we find that they appear to have oxidized. Stainless steel does NOT oxidize/rust; tin, which looks just like the silvery poles in the picture when cast in such a shape, has plenty possibility of oxidizing. This would be especially possible in that there is water involved in the soap production. These tin rods being exposed to that water accelerates their oxidation.

It’s all fine and good that someone would be able to dye soap red with this machine, but… why? It’s certainly true that people wouldn’t want to dye their skin red just by washing their hands. Here is where the application of the WotsitTM comes in: being that this machine seems to have been constructed for efficiency (based on the practicality of the cooling container’s clamp and the cost-effective option of using tin supports instead of steel), it is more probably used in a manufacturing setting than in a domestic one. It is plausible that this masterpiece of soap dyeing equipment would be used in a factory, and the soap be used to both dye clothing red *and* clean it at the same time. The most likely clothing candidate for this task would be t-shirts.

There was definitely one problematic aspect of the materials found in this WotsitTM: the lack of rubber. The scarlet nubs underneath each container for the soap appear to be nothing other than rubber; many types of lab equipment contain rubber in a similar method to that which appears so with our equipment. If the nub below the drying canister were of rubber and were removable, it seems possible that there would be a small pathway into the canister; we could attach an air compressor and shoot some air into it to eject the soap bar more easily. There would expectedly be rubber, also, on the illustrated bottom of each of the Plexiglas tools, were rubber a part of the list of materials. It would help facilitate an airtight seal between a finger and the tube. This is purely a minor obstacle. The biggest reason that there is residual soap with erythrosine still inside this machine is due to it partially being made of Plexiglas; it is acrylic plastic. It is much more likely than glass to receive external substances into its molecules and imperfections, similar to what happens when spaghetti sauce is heated by a microwave while inside a cheap plastic leftover container. It seeps into the microscopic layers and stays there. This soap making machine is improvable, but it is certainly efficient with its materials and dimensions when it comes to making a quality bar of soap that fits the norm of production.