

REPAIR SHED SOLVES COFFEE-POT CRISIS

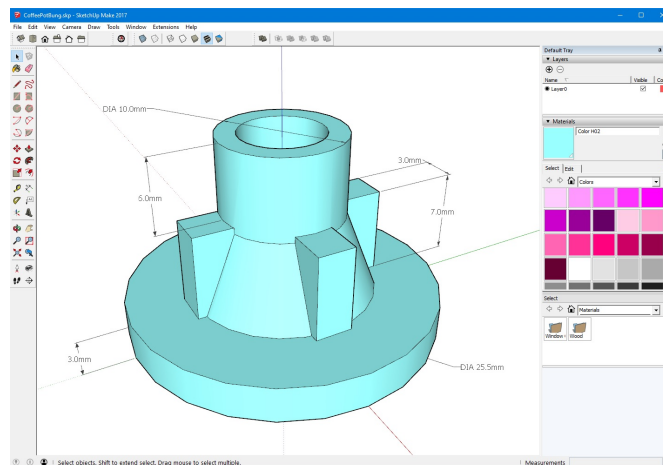
South Solihull u3a found itself in hot water when it's pump-action coffee-pot failed to dispense the essential liquid at their last core meeting.



The fault was quickly diagnosed as a missing connector between the lid and the body.

As it happened, the Repair Shed Group was due to hold a special session on 3D printing, so nine members of the group took on the challenge of fabricating a replacement connector as a case-study for the session.

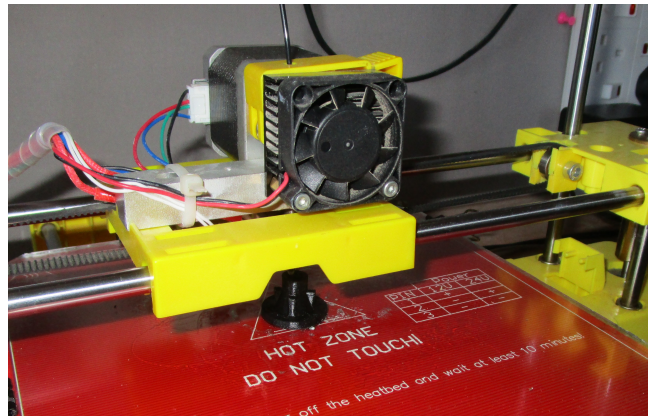
Not having the original connector to copy, the replacement had to be designed from scratch. After taking careful measurements of the coffee-pot, they used 3D drawing software to design a new connector that they thought would do the job. Because the connector had to make an air-tight seal in the coffee-pot, it was important to get the dimensions exactly right.



The drawing was then processed into instructions for the 3D printing machine for manufacture the part.

3D printing consists of extruding melted plastic filament, layer-by-layer, to build up a shape. The print-head is computer-controlled to 'draw' the shape of each layer accurately on top of the previous one. In this case, 53 layers were needed, which took about 15 minutes to print.

There are many materials that can be 3D printed, so the choice of the right material was important. Primarily, the plastic had to have a high melting point to withstand the temperature of the hot coffee in the pot. The group also chose a black material to match the existent interior of the pot.



After printing the new connector was ready for testing.



The group were delighted to find that the connector fitted perfectly and the coffee-pot has been restored to full working order.



3D printing has found its way into most industries, and is gradually being adopted in the home. It has many advantages: First, convenience. You can print what you need (and only what you need) when you need it. There is no need to keep a stock of things that you can print.

Second, economics. The connector in the above case-study cost about 5p (material plus electricity), and saved about £30 for a new coffee-pot. Third: ecology. It is most likely that our broken coffee-pot would have found its way into landfill. It now has a new lease of life and there was no wastage of materials in doing the repair. Re-cycling plastics to make 3D printer filament is becoming common and most plastic material used in 3D printing is recyclable, which creates a closed-loop in which there is little waste.

You don't have to be an engineer to take advantage of 3D printing. Although we designed our component from scratch, there is a vast resource of 'ready-to-print' designs on the internet. We foresee a day when a domestic 3D printer is just another appliance, like the washing machine or dishwasher.