Tissue is passed through the press in a continuous roll, which enables the pattern to be cut for fitting and keeps production flowing.

The Company

Burgess and Leigh (Burleigh) was founded in 1851 and moved to their current site at the Middleport Pottery in 1889. Burleigh is probably the last continuously working pottery to inhabit the same factory site. In 2009, the Prince’s Regeneration Trust, purchased the site to retain the skills and heritage of a Victorian working pottery. Meanwhile the pottery company was bought by Denby Pottery, who agreed to continue making ceramics on the Middleport site for at least the next twenty-five years. They currently employ forty workers of whom fifteen are employed in the tissue printing and application process with two machines that print from the hand engraved etched rollers. They employ one engraver who was brought back from retirement to continue the tradition.

The factory site retains all of its Victorian splendor, from the offices with their Victorian signage through to the old processes in the factory. The site still retains the old bottle kilns, which are no longer in use, and it has only recently ceased using its 19th-century drying systems. Burleigh still retains an extensive mold store of all of its original patterns and, in addition, has a full store of all its hand engraved copper flat printing plates alongside the hand engraved roll store with patterns that go back as far as the founding of the company.

The company was purchased in 2000 by the Dorling Family, who recognized even then that the pottery was facing closure, resulting in the loss of an important aspect of Britain’s industrial heritage. This purchase enabled the company’s survival until the collaboration between the Prince’s Regeneration Trust and Denby. In 2013, the company faces a secure future but has the problem of how to make a 19th-century process fit a 21st-century commercial environment.

The Project

The biggest problem facing the company is the need to quickly respond to customer demand. This is a particular issue as it takes three months to engrave a new copper roller. Once engraved the copper roller is chrome faced but printed using a scraper bar. The abrasive properties of the metal oxides in the ink, combined with a steel scraper against the chrome means that the chrome will only withstand a week’s continuous printing before the roller needs re-facing. As each roller takes three months to engrave, and even re-chroming a roller takes a week, it is not possible for Burleigh to quickly produce a number of trial prints to test the market and quickly respond to customer demand. Additionally, Burleigh’s extensive historic pattern books cannot be commercially exploited as it would take decades to work through each of the existing patterns, notwithstanding the added ability to create new patterns.

We created a new intaglio process using a steel roller core with a hard rubber coating that is laser engraved with a scanned image converted to a digital vector file. The initial project aim was to create a flexographic process, but laser engraving proved to be more efficient and we are now creating rollers for a fraction of the cost of a copper roller. However, this cannot occur without a reappraisal of the printing ink. Currently, Burleigh uses an ink that contains pine oil. When heated to the required 40°C for printing, the ink gives off unhealthy

Volatile Organic Compounds (VOCs). Secondly, the ink varies in printing quality dependent upon the oxide with which it is mixed. Each oxide has a different molecular structure that creates a different surface topography to the oxide particles. Therefore, each oxide requires different oil volumes to coat the surface topography of the particles evenly. For example, Cobalt blue prints easily but is hard to apply, as the ink bleeds and rubs off onto the hands of the applicators. Black can be very hard to get to even stick to the biscuit. Traditionally the ink medium was a heavy linseed oil measuring around 400 poise (UK measurement scale for viscosity) and number 7 in the American scale. In order for the ink to be tacky enough to stick to the ware, tradition dictates that the ink and the plate are heated to loosen the ink to a stage that is akin to traditional etching ink. Once printed dry or wet onto the tissue, the ink becomes very viscous and sticky as it dries, thus creating a good transfer ink.

Application

Applying potter’s tissue is an extremely skilled process—most of the female employees who apply the tissue at Burleigh gained their skills over many years. In fact, it is clear that a good tissue applicator requires several years of training before becoming very proficient in the process. Once printed, the tissue is cut and applied to the pot with a stiff brush and soft soap. First, the applicator rubs the tissue to the pot to get the tissue to stick to the biscuit surface, then a small amount of soft soap is applied to the brush and the tissue is vigorously burrushed onto the biscuit surface transferring the maximum amount of print and allowing clean release of the tissue. The tissue applicators use very stiff brushes and hard toothbrushes for the compound surfaces. The object is then allowed a few hours for the print to dry before the tissue is washed off, leaving the print—printing medium and underglaze oxide—attached. The biscuit ware pot is then fired to approximately 600°C to remove the printing medium and fuse the oxide to the biscuit surface. The pot is then glazed and fired for the third and final time.

In conclusion, Burleigh will not give up printing their traditional copper plate rollers in the foreseeable future, but now have the capability to respond to the market and introduce both old and new patterns quickly and efficiently without risking major investment in market trials.

4 Burns, R. Printing Inks. Pitman Press, UK. 1947

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nceca 85 Journal 2014 • Lectures