

Case Study - Ceramic Tiles

How the installation of an Xtract Glaze / Engobe Reclamation System to recover valuable raw materials is saving money for our client every year.

At full capacity, the system delivers 1,680 tonnes of reclaimed material per year, saving on average £500,000 annually, with the ROI achieved in just over one year.



Abstract

This study describes how a major ceramic tile manufacturer has benefited from the installation of an Xtract Glaze / Engobe Reclamation System to recover valuable raw materials and save money.

Glaze is a clay and silica based material which is processed on site from a mixture of mineral raw materials and water. The fired glaze is the glossy hygienic surface of ceramic tiles which in some cases also provides the final colour. Engobe is a precoat layer of material that is applied to the dry clay tile to provide a suitable surface for the application of glaze.

The Client

With 50 years of manufacturing experience, the client is one of the world's largest manufacturers and exporter of ceramic tiles. The company exports to over 50 countries from the America and Europe to the Middle East and Asia-Pacific.

Modern manufacturing facilities in its plants employ the latest production technologies and design to meet ever growing global demands and expectations. The company also boasts a dedicated R&D centre at which comprehensive analysis and testing of raw materials are conducted according to stringent measures, resulting in unmistakable quality and reliability that are the hallmarks of its tiles.

The Challenge

During the production process, engobe is applied to the tile as a pre-coat to the glaze. Liquid waste, in the form of a dilute glaze or engobe material, is generated from cleaning down all application process equipment, storage vessels and glaze / engobe manufacturing process equipment. The company's senior management team recognised that a huge saving could be made, not only by reclaiming and reusing the glaze and engobe materials, but also by reducing the challenge to the downstream Waste Water Treatment Plant. It was estimated that the amount of raw materials available to be reclaimed was over 1,000 tonnes / year.



xtracting solids from liquid xtracting liquid from solids xtracting profit from loss

The Solution

The Xtract reclamation system extracts water from dilute engobe and glaze slurries to produce a consistent high density material which is then re-used within the operation. An important aspect of the Xtract technology is to retain all particulates, maintaining the particle size distribution and achieving density such that the reclaimed material is identical to that of the virgin material. It can subsequently be simply blended prior to re-use, a major benefit to the manufacturing process.

After successful trials on samples of dilute glaze slurry at Xtract's factory in the United Kingdom, more extensive trials were subsequently undertaken at the client's facility in 2015. The dilute slurries were processed to remove excess water, raising the density to that of the virgin material with no discernible difference in properties. The reclaimed glaze / engobe could then be blended with virgin material for use.

Following the success of the on-site trials, a suitable system to cope with the large volumes of dilute slurry was specified.

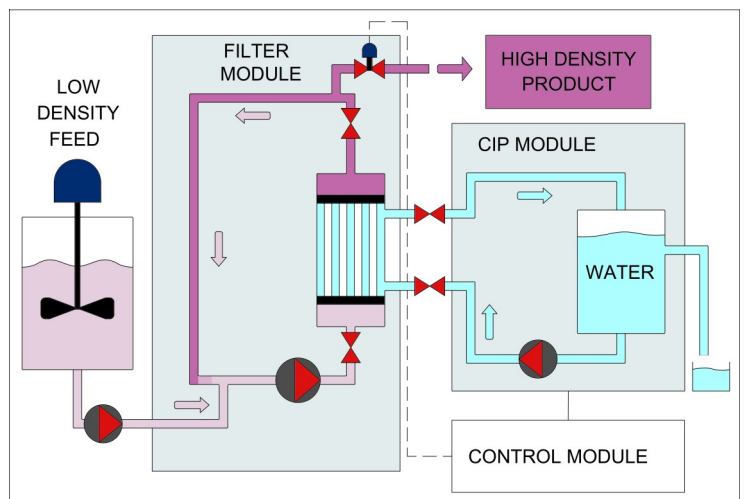


The Xtract System comprises three modules :

1. Filtration Module
2. Control Module
3. Clean in Place (CIP) Module

In operation, dilute washings are fed from the agitated storage tank to the Xtract system where they are separated into clean water (permeate) and high density material (retentate).

The Filtration Module incorporates Xtract filtration housings located in re-circulation loops. Low density washings are continuously pumped from the feed tank into the recirculation loops where the de-watering of the washings occurs. This process raises the concentration to the required 'final density'.



The reclaimed material is continuously discharged from the system via an automated control valve. This provides a consistent density material for reprocessing. "Clean water" permeate is discharged from the system and fed either to drain or to the storage tank for recycling.

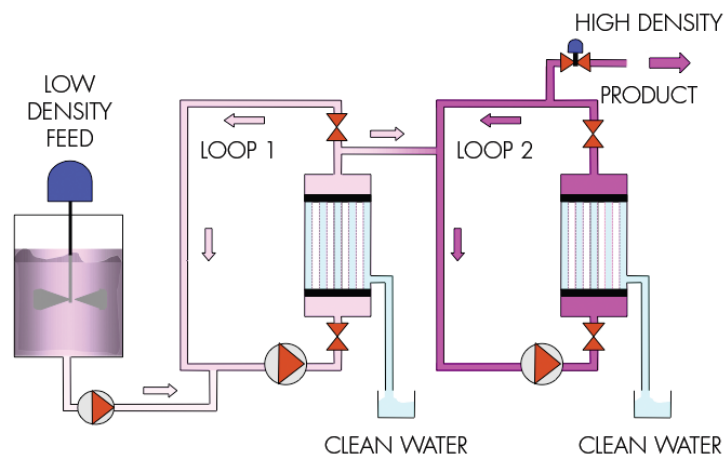
xtracting solids from liquid xtracting liquid from solids xtracting profit from loss

The Results

The Glaze / Engobe Reclamation System was delivered to site and installed in December 2015. It was commissioned in January 2016.

The Xtract system delivers 5,000 kg/day of reclaimed material at a density of 1.720 kg/litre. To achieve this, the system is presented with 53,575 litres/day of low density feed at a density of 1.060 kg/litre. The system is also capable of processing the low density feed within a range of starting densities, from 1.040 to 1.450 kg/litre.

At full capacity, the system delivers 1,680 tonnes per year of reclaimed material, saving on average £500,000 annually and the ROI achieved in just over 1 year.



Summary

Xtract is the leading Ceramic Industry specialist in the design and manufacture of glaze and slip reclamation equipment, and also specialises in the reclamation of submicron viscous slurries from any industrial processes to improve efficiency and profitability.

With installations worldwide, Xtract processes thousands of tonnes of valuable raw materials each year, saving its customers money every day.



For more information about Xtract's raw material recovery and filtration systems, please contact:

info@xtractfiltrationsystems.com

xtracting solids from liquid xtracting liquid from solids xtracting profit from loss