

Making a case for stone packaging

Stone Age Packaging is targeting the plastic and synthetic paper markets with material made from stone. David Pittman reports

Stone paper is a paper-like product manufactured from calcium carbonate bonded with high-density polyethylene (HDPE). The process for creating stone paper was first developed by Taiwan Lung Meng Technology during the late 1990s and is patented in more than 40 countries worldwide, where it is marketed under a variety of trade names such as Parax Stone Paper, TerraSkin, ViaStone, Kampier, EmanaGreen and Rockstock.

Stone Age Packaging, with offices in Canada and the US, was formed in 2010 with the aim of promoting stone paper products as an environmentally-friendly alternative to fiber-based materials. The stone paper production technique, it says, differs from the wood pulp papermaking process through the exclusive blend of mineral powder and a small infusion of a non-toxic resin. As a result stone paper production uses no trees and produces no water pollution, and without any harmful gaseous waste being released into the environment.

Sam Farhangi, global sales and marketing director at Stone Age Packaging, notes that the only water used in the production process is a small amount to cool the machines. 'The process to produce stone paper is a dry process, with no water used,' Farhangi says, and which contributes to its 'green' credentials alongside reduced energy consumption, waste production and air pollution.

At the heart of stone

Available in sheets or rolls from Stone Age Packaging, and in finished and semi-finished varieties for labels and specialty coated for larger format application, Farhangi draws attention to the provenance of stone paper, which is produced from material sourced from government-licensed quarries, as well as waste from the quarrying process, and the natural bright white color and smooth finish owing to the properties of calcium carbonate

"Taiwan Lung Meng technology has also been cradle-to-cradle certified by McDonough Braungart Design Chemistry, a member of the US Green Building Council and originator of the Cradle to Cradle design framework"

that means no chlorines or acids are needed in the production process.

Further key properties of stone paper products include being waterproof, insect and moth-proof, tear- and fire-resistant, grease-repellent, RoHS-certified for electronics and electrical equipment, and photodegradable, as well as being fully recyclable with both post-industrial and post-consumer recycling possible.

Scraps from the production line are reused to produce a recycled range, R-Series, for example, while post-consumer recycling can lead to pure stone powder reused to make more stone paper and residue from incineration used as an ingredient for other purposes, such as construction materials and fertilizer.

This helps create an 'endless loop of material utilization', according to Stone Age Packaging, and fits into the ethos of 'reduce, reuse, recycle'. Taiwan Lung Meng Technology has also been cradle-to-cradle certified by McDonough Braungart Design Chemistry, a member of the US Green Building Council and originator of the Cradle to Cradle design framework that helps companies 'go beyond minimizing harm to the environment and move towards creating a wholly positive impact on the planet'.



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Further applications include FDA-compliant food packaging, such as cake boxes, ziplock bags, sandwich wraps and takeaway food cartons



Stone paper is suitable for a variety of packaging applications, and can be treated with a variety of finishes

Applications

The properties of a material made from stone and the processing possibilities result in myriad of applications, ranging from packaging, labels and tags to bags, manuals and even waterproof products like maps, charts and notebooks, which are resistant to tearing, stains and collapse when they come into contact with water.

The stone paper portfolio on offer through Stone Age Packaging includes: S-Eco, made from 80 percent calcium carbonate and 20 percent HDPE; S-Board, which is 60 percent calcium carbonate and 40 percent HDPE; S-Film, made in a 70/30 mix; and S-Thermo, which has a composition of 60 percent calcium carbonate and 40 percent HDPE.

100 μ -thick S-Eco can be laminated with flexible packaging or in a thicker composition of 140 μ for wine labels, while 300 μ -thick S-Board is suitable for applications such as cookie boxes. In addition, 50 μ -thick S-Film can be used for various food wrappers and soft packaging, and S-Thermo for thermforming various products, from lunch boxes and soap trays to chocolate box liners and meat trays.

These four lines are also available as R-Series products, which are produced using 20-100 percent recycled stone paper material and can be recycled through post-consumer processes themselves. This range also includes the new R-Pallet stone paper pellets that can be melted down for injection molding to create 'plastic' products.

Further applications include: FDA-compliant food packaging, such as cake boxes, ziplock bags, sandwich wraps and takeaway food cartons; wine labels, bottle tags and shelf tags; cavity wall insulation; gift wrap, bags and boxes; and wide format outdoor advertising.

'The use for stone paper is only limited by your imagination,' Stone Age Packaging's corporate literature states.

Printing

Stone paper can be printed using a variety of processes, such as flexo and gravure, although 'is essentially made for offset and UV printing,' says Farhangi, adding that digital printing, while possible, remains part of the stone paper roadmap as work takes place to make the material more suited to the machine and printing specifications related to that process.

The substrates can then be given a variety of finishes such as embossing, debossing, hot-foil stamping and spot varnishing. As such, stone paper products are suitable for decorative printing, often supplemented by coating and corona treatment to mitigate the surface structure and maximize printability. For instance, a double-sided coating on S-Eco is recommended to counter the powdery surface as a result of the high calcium carbonate composition of that product, with corona treatment on laminated S-Film advised to make the surface receptive to inks, as with the normal processing of plastic films.

Depending on the application, stone paper products can also be gusseted, heat sealed, sewn, mounted with grommets, and outfitted with hemp, nylon and rope.

For Farhangi, a key target is to increase stone paper's penetration into the plastic and synthetic paper markets. 'Due to the unique properties of stone paper and benefits, there is big growth potential in the luxury paper, industrial and commercial markets, like wallpaper and insulation for example,' he says.

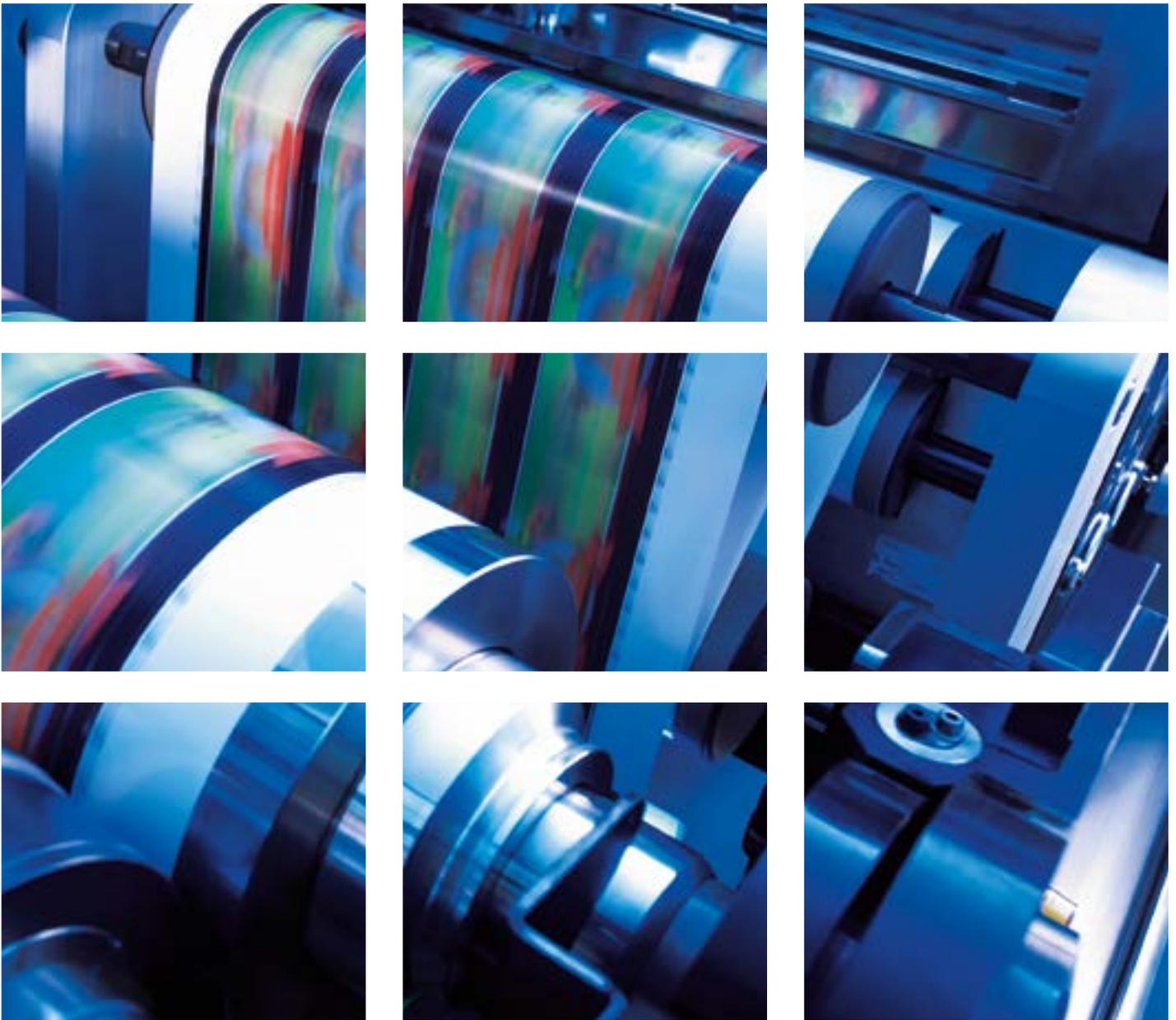
'Research and development is ongoing, and constant progress is being achieved in the development of new processes as well as extensions of new applications.'

US demand for pouches to reach \$9.4 billion

Demand for pouches in the US is projected to increase 4.6 percent per year to \$9.4 billion in 2018. According to analyst Esther Palevsky, 'Growth will be fueled by continued solid opportunities for stand-up pouches.' Overall pouch unit demand is expected to expand 2.7 percent yearly to 92 billion. Advantages of superior aesthetic appeal, portability, light weight, reduced material use, and significantly lower shipping costs relative to rigid containers will foster strong acceptance in a broad range of consumer packaged goods uses. Food and beverage markets comprise the majority of pouch demand, accounting for 80 percent of the total in 2013. Nonfood markets for pouches will grow more rapidly than food and beverage markets, based on the further development of new applications in consumer goods resulting from sustainability advantages and strong opportunities for dissolvable pouches for laundry detergents. These and other trends are presented in Pouches, a new study from The Freedonia Group, Inc., a Cleveland-based industry market research firm.

Stand-up pouches will remain a major growth segment in the overall packaging industry, with demand forecast to expand 6.5 percent annually. Advances will reflect rising interest among packaged goods companies based on cost savings due to lighter weight and lower material use compared to rigid containers. Also supporting gains will be the ability of stand-up pouches to differentiate and draw attention to products on store shelves due to their large front panel billboard space and the perception of pouches as a more contemporary packaging format.

Demand for flat pouches is forecast to increase 4.0 percent annually, driven by faster advances for four-side-seal pouches in medical and pharmaceutical markets. Four-side-seal pouches will also experience favorable growth in certain food applications such as meat, poultry, and seafood, and sauces and condiments. Robust gains are anticipated in nonfood uses such as soaps and detergents due to the rising popularity of unit-of-use products packaged in dissolvable pouches. In general, however, flat pouch demand will lag increases for stand-up pouches due to already-high usage in many markets and competition from stand-up pouches.



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