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more counterfeit-proof,
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Wolfgang Neuß, Specialist for banknotes and security paper machines, Voith Paper

The way to keep banknotes clean longer

Protection coat for banknotes

The life of a banknote is sometimes very short. Like the famous Thaler coins, it travels from one hand to another, transforming in the process from a clean note to a wrinkled, dirty scrap of paper. There is a new protection coat that can be used to improve the durability of banknotes and make them more impervious to soil.



Some years ago, it was a common notion that banknotes would increasingly be replaced by electronic cash. This has yet to be proven, and the banknote is still a means of payment as much as it ever was. The banknote paper sector has seen a growth rate of five percent, thus giving it a top position in the paper sector.

“The production of banknote paper is constantly being developed in order to make banknotes more counterfeit-proof, more soil-resistant and more durable,” according to Wolfgang Neuß

of Voith Paper. No other specialty paper captures so much attention in the development of new production and counterfeit-proofing methods than banknote paper. In addition to paper mills, banknote producers also include security paper printers, security inks producers as well as security threads and hologram makers. These producers strive to ensure that banknote paper is unmistakable to those using it.

Yet this specialty paper is also given a great deal of negative attention as well. Despite all security precautions

and measures taken, money counterfeiters time and again succeed in making duds that consumers are only able to recognize with great difficulty as counterfeit. In Canada, for example, 26-year-old criminal Wesley Wayne Weber was able to introduce 67,000 counterfeit 100 dollar bills into circulation between June of 2000 and July of 2001. The Canadian economy suffered total damages in the amount of 6.7 million Canadian dollars. As a reaction to the incident, the Canadian Bank introduced a new generation of 100 dollar notes having better anti-



The multi-tone watermark and safety thread that is inserted are worked into the production on the Voith paper mill in the sheet forming section.

counterfeiting attributes. Since 2001, bands of counterfeiters in Europe have mainly been focused on making 20 Euro and 50 Euro notes, which make up around 80 percent of all fake notes. About 60 percent of these fakes are made using professional offset printing machines and the remaining 40 percent with inkjet printers.

According to Europol, 11 offset printers and 58 counterfeiters were exposed in 2004, the majority of which were located in Bulgaria and Colum-

bia. In 2005, 13 offset printers were busted, ten of which were found in the Euro zone.

Authenticity through intaglio printing and specialty paper

The printing of banknotes usually involves a combination of lithographic printing (offset printing) and intaglio printing. With intaglio printing, engraved steel plates are used which carry an image in recess. The recesses of the plates are filled with security ink. The printing ink is then embossed in-

A brief cultural history:

Banknotes

Paper money was issued for the first time around 1024 in China as an emergency currency for financing a war in a time when there was a coin shortage. In 1402, paper money was abolished again in China because the emperor had large quantities of banknotes printed without paying attention to their funding.

In Europe, the first paper money appeared in 1483 in Spain, again, as a temporary replacement for lacking coinage.



MasterVat with ShortFormer B.

to the paper at a very high pressure. This creates noticeable embossed patterns that can be felt easily with your fingernails. For laymen it is an attribute of authenticity that is easy to recognize. Due to stricter security checks it is nearly impossible for counterfeiters to get their hands on the intaglio printing machines.

In the past, all counterfeits had one thing in common: They were not printed on genuine banknote paper with the typical multi-tone watermarks and with the security thread that is



embedded into the paper. Both of these authenticity attributes are worked into the paper during the forming section of the machine. The double-layer forming system from Voith Paper, which consists of the Master-Vat and the ShortFormer B, makes Voith the market leader in this technique. Nearly all European banknote paper mills produce the second paper layer using the ShortFormer B that Voith Paper has continued to develop.

Clean note policy makes everything clear

Signs of use on the banknote can make it considerably more difficult to determine authenticity. The dirtier a banknote is, the more difficult it is to identify the attributes of authenticity. For this reason, many countries have adopted what is known as a “clean note policy.” Soiled banknotes are quickly taken out of circulation and replaced by new ones when signs of wear are discovered. A 20 Euro note, for example, is taken out of circula-

on after six to ten months. A 500 Euro note, which changes hands less frequently, can remain in circulation for several years. The clean note policy is very expensive, however. Depending on the type and authenticity attributes, it costs on average 4.5 cents to produce a banknote. The annual consumption per capita in Europe is approximately 15 banknotes. This means that in Germany, a country with a population density of approximately 80 million people, a total of 1.2 billion banknotes are consumed annually - or an expenditure of 54 million euro!

It is therefore no surprise that banks have a vested interest in procedures that make banknotes more soil-resistant and durable. Many producers of banknotes offer durable or long-life banknotes that have a protection coat. In late 2006, Voith Paper was commissioned by a renowned maker of banknotes to perform coating trials using the Voith SpeedSizer at Voith's pilot coater in Heidenheim. The tests performed both with an online and

offline method allow reliable conclusions to be made concerning how the protective film applied to the paper affects the security threads and watermarks in the paper. Outstanding results were achieved. In the online process, where the speed is limited by the watermark, speeds of up to 120 m/min were tested. In the offline process, production speeds of up to 750 m/min were possible. The Voith SpeedSizer, which is tried and tested in many other paper mills, also emerged as the right choice for the ideal coating head.

Contact



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In a special Voith Paper machine for banknote paper, the MasterVat and ShortFormer B are used for the double-ply sheet forming.



A brief cultural history:

Banknotes

Large and small currency

After the US Dollar, the Euro is the most widespread currency used worldwide. On July 31, 2008, there were about 12 billion Euro banknotes with a value of 686,546 billion euro in circulation. The Falklands Pound is a drop in the bucket in comparison: With only 5,000 users, it is the rarest currency used around the world.

Counterfeit money

During the first half of 2008, the German Central Bank registered 19,913 counterfeit Euro banknotes. Among the 6,103 fakes, 50 Euro notes were the most frequently counterfeited banknotes, closely followed by 100, 200 and 20 Euro notes. This resulted in an actual loss of approximately 1.8 million euro. Counterfeit money is not replaced. He who does not want to walk away from the bank empty-handed should therefore always verify his notes by inspecting the integrated attributes of authenticity: Do the holograms change when tilting the banknote? Can you feel the embossing texture on the note? Is there a watermark recognizable in a non-printed area?