

TROY Laser Indelible Solution™

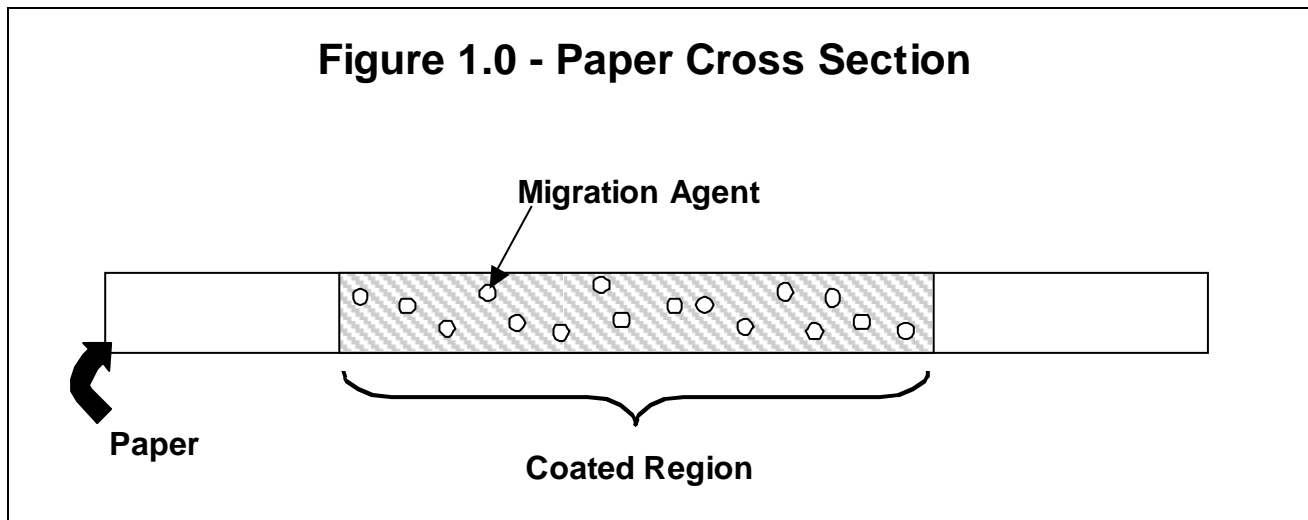
OVERVIEW

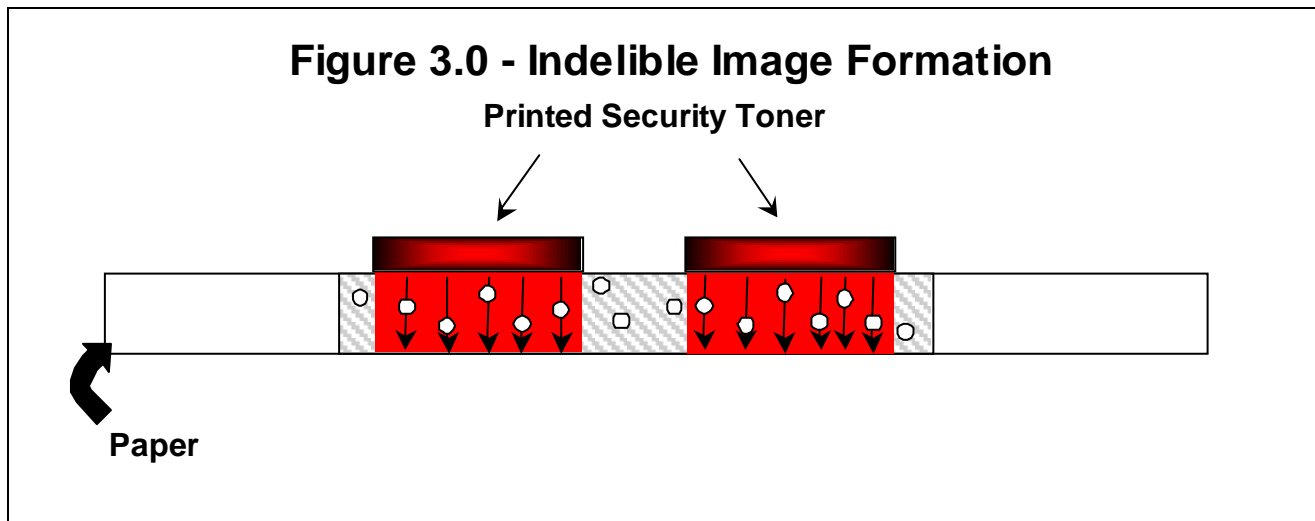
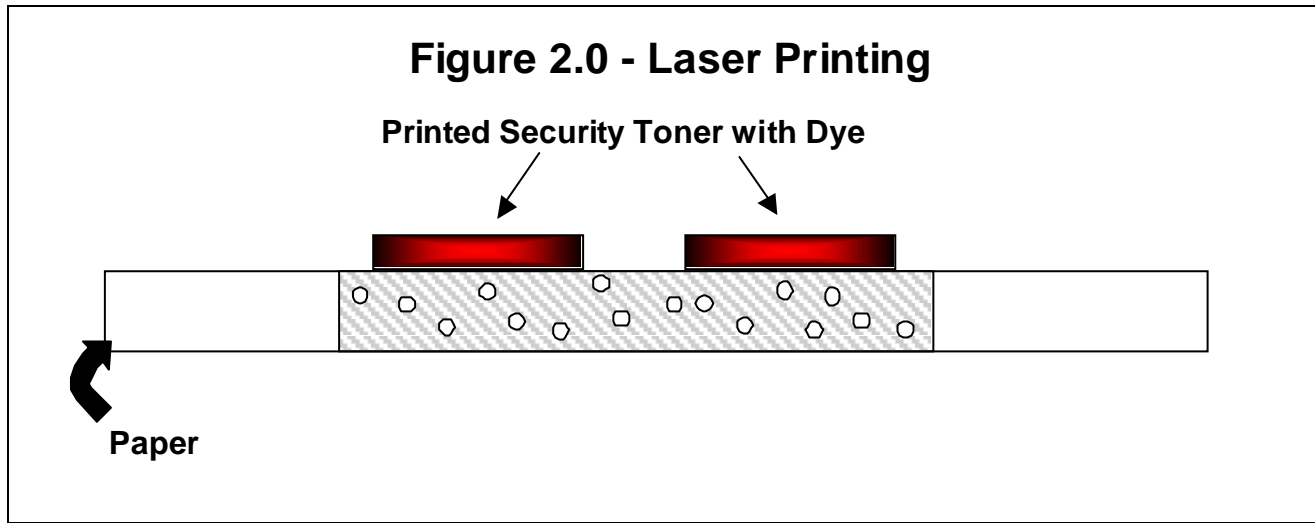
TROY Group, Inc. has developed a new digital printing technology for security printing (patents pending). This new technology is the TROY Laser Indelible Solution™. The TROY Laser Indelible Solution™ consists of TROY Security Toner and TROY Laser Indelible Paper; a toner and paper system that works together to create an indelible image on documents that are printed on laser printers.

HOW IT WORKS

The TROY Laser Indelible paper has a special coating in selective area(s) of each sheet that contains a “migration agent” that is designed to interact with the Security Toner (Figure 1.0). The TROY Security Toner is a specialty toner formulation containing a special dye (Figure 2.0). When printed, the dye in the toner is released by the migration agent and drawn through the paper (Figure 3.0). The resulting image is a black toner character or graphic on the front of a document and the same character or graphic in red dye, permeating the thickness of the paper. The red image is also visible as a mirror image of the backside of the document.

Figure 1.0 - Paper Cross Section





USING TROY LASER INDELIBLE TO REDUCE FRAUD

One of the advantages of the TROY Laser Indelible Solution™ is that sensitive regions of a document can be targeted for the Laser Indelible security. This is achieved by coating certain areas of a form, while leaving other areas uncoated. Any printing on the regions that are coated will form a red indelible image underneath. Any printing on uncoated areas will have a normal black toner appearance.

For example, check fraud is a common problem costing banks and businesses billions of dollars each year. Criminals often attempt fraud on high value business checks, bank checks and payroll checks. They try to counterfeit a check by copying an original, stealing an original and altering it, or creating a check with an official looking appearance. A common method of fraud on business and official checks is toner removal from the face of a check. Criminals use a sharp knife to scrape the toner or chemicals to dissolve the toner. They then print a new character in place of the one that is removed. Using this technique, the payee name on a

check can be changed or the amount of the check can be increased. Even on high quality check stock, with coatings designed to enhance toner adherence to the paper, a fraudster can carefully remove the toner.

Chemically reactive papers are used as a countermeasure to help reveal chemical alteration, however, they do not reveal alteration by toner removal using a knife. In addition, chemically reactive papers typically exhibit very faint blue or red dots in the area exposed to the types of solvents that are able to dissolve toner (e.g. toluene and acetone*). These faint dots can be easily overlooked by a first-line document inspector (e.g. a bank teller) if the document has a printed background. In contrast, TROY Security Toner releases a very visible red stain (see Figure 4.0) when exposed to these same solvents.

Figure 4.0 - Chemical Sensitivity of TROY Security Toner



Figure 5.0 is an illustration of a business check with the base paper coated in the payee name and the amount regions of the document. The reverse side of the check reveals that the TROY Laser Indelible Solution™ (TROY Security Toner and Indelible Paper) has been used to print this check. The visible nature of the indelible image acts as a deterrent to alteration and thereby reduces the risk of being targeted by fraud.

*Note: Bleach has no dissolving effect on TROY Security Toner.

Figure 5.0 - Example Business Check with Secure Payee Name and Amount Regions

**Front of
Check**



**Back of
Check**

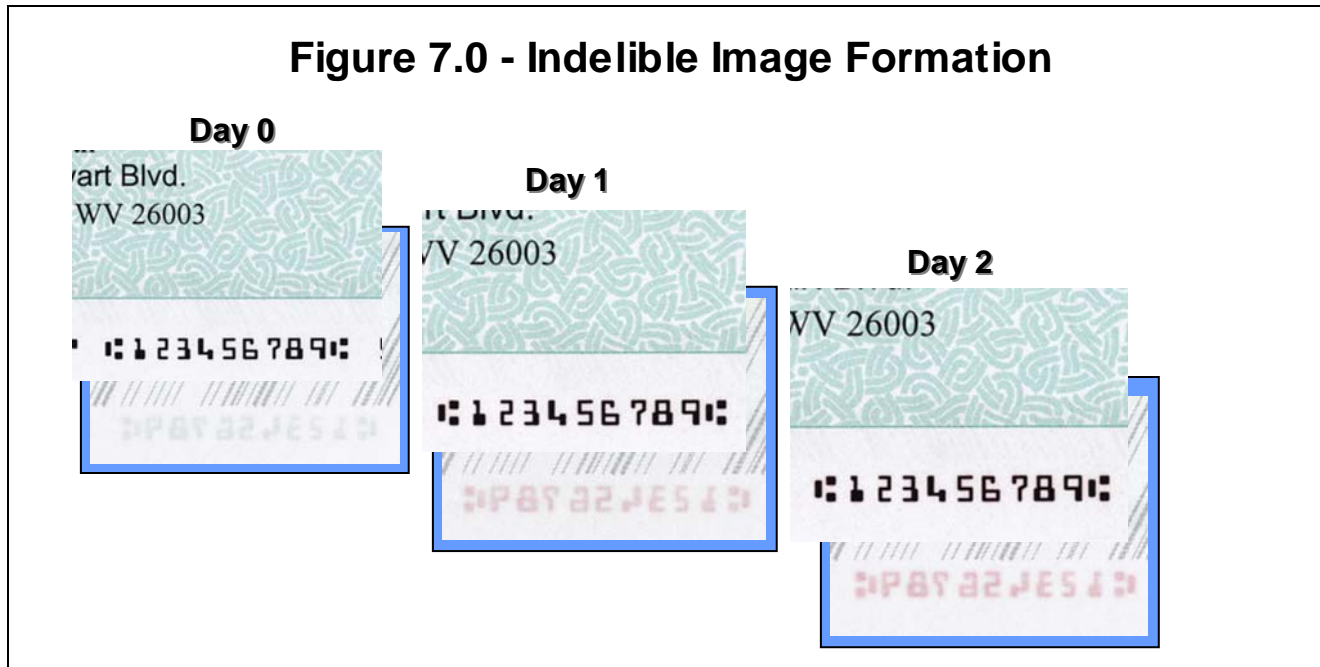


Figure 6.0 illustrates the effect of careful removal of toner from the payee name “Chris” on a check printed with the TROY Laser Indelible Solution™. In this example, the toner was removed with a repeated scraping motion using an X-acto knife. Toner removal reveals the red image underneath the toner. The dye released from the TROY Security Toner permeates the paper and cannot be removed with bleach or other solvents. As previously discussed, some solvents are able to dissolve the toner, but this will cause the dye to migrate into surrounding areas, creating a visible red stain. If chemical alteration is a concern to an organization, the TROY Laser Indelible Solution™ will create a tamper-evident stain that is easily seen by first-line inspectors.

Figure 6.0 - Toner Removal**INDELIBLE IMAGE FORMATION**

As previously noted, the red indelible image provides a visual fraud deterrent as well as an easy way to help determine document authenticity. One of the considerations when using the TROY Laser Indelible Solution™ is the rate at which the indelible image is formed. Once a document is printed using the TROY Laser Indelible Solution™, the formation of the image occurs gradually over a period of several days (Figure 7.0). If toner is removed from the face of a document, you will see the red image on the front in the first 3 or 4 hours after printing. After the first 24 hours, you will begin to see the red image on the reverse side of the document. After 48 hours, the red image is obvious on the back of the document. Over several days, the red image appears more vividly. After a week, the dye will also appear on the front side of the document, appearing as a red halo surrounding the black character. This affect is visible around the magnified “123” in figure 6.0.

Document paper and forms paper can be treated with the coating used on the TROY Laser Indelible Paper. However, paper selection is critical in achieving a uniform indelible image. It is also critical in the rate of indelible image bleed-through. Therefore, only paper provided by TROY or TROY license security printing partners is suitable for Laser Indelible printing.



APPLICATIONS

The TROY Laser Indelible Solution™ can be used for any official document that is at risk of fraudulent alteration. The TROY Security Toner used in the Laser Indelible Solution is available in a high quality TROY MICR toner formulation, so laser checks are an ideal application. Other applications include:

- School Transcripts
- Titles
- Classified documents
- Shipping documents
- Legal documents
- Gift Certificates

CONCLUSION

Document fraud continues to remain a significant financial and security concern to businesses, the financial industry, governments and many other industries. While digital imaging is here to stay, it opens up even more risk of document fraud. The TROY Laser Indelible Solution™ provides a new level of document security to print-on-demand documents. It provides a visual deterrent in the areas that are at risk of alteration. It also provides a tamper resistant indelible image, along with chemical sensitive toner, that helps to protect against both chemical and mechanical document alternation techniques. The TROY Laser Indelible Solution™ significantly “raises the bar” in document security.

For more information on the TROY Laser Indelible Solution™ visit the TROY web site at www.troygroup.com or contact the TROY sales department at 800-332-6427.