

PRIDE

POLYETHYLENE REPOSITORY AND INFORMATION DATABASE FOR EVIDENCE

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Plastic bags, or polyethylene film products, are often used in a variety of crimes, including homicides, kidnappings, bank robberies, and drug offenses, and each plastic bag may provide clues as to its origin or manufacturing source. Polyethylene film products are produced by feeding resin pellets into a hopper. The pellets are melted and extruded through a screen and then between a mandrel and a ring-shaped die. The film is manufactured either in a tubular fashion or by a flat, casting method. In the tubular method, air is blown on both the inner and outer sides of the tube as the molten plastic is being emitted from the extruder. The tube is expanded to the desired size by the air emitted from the mandrel. After the tube is drawn upward, often several stories high, it is then flattened between a series of rollers. It is subsequently cut, possibly printed with warning labels or write-on labels, perforated, folded, heat sealed or hot knifed, and packaged. (Figures 1 through 3).

In the casting method, instead of the tube being inflated, the film is extruded through a linear die, and the film remains flat. The plastic is cooled by water, producing one flat sheet of plastic. This method is used for small bags, since the flat film can be halved and cut into smaller sections. This method is often used for products that include post-applied additions to the film, such as draw-strings and zippers, whereby the plastic can be easily folded over the additions and/or heat sealed to complete the bag (Figure 4).

As examiners of polyethylene film, there are numerous possible characteristics to evaluate when determining whether a bag found at the scene of a crime was at one time attached to a bag of known origin, or to another questioned bag from another crime scene. The difficulty arises when a sole questioned bag is collected and the investigator wants to know the type of bag, its manufacturer, or any other possible information that can be gleaned from this piece of evidence. Unfortunately, with just one evidentiary plastic bag and no known bags for comparison, the Laboratory has been unable to provide any pertinent information to assist the investigator.

The FBI Laboratory Questioned Documents Unit (QDU) recently introduced a new technology to assist in the fight against crime. We are confident it will be successful in assisting law enforcement in solving crimes.

This new database is the Polyethylene Repository and Information Database for

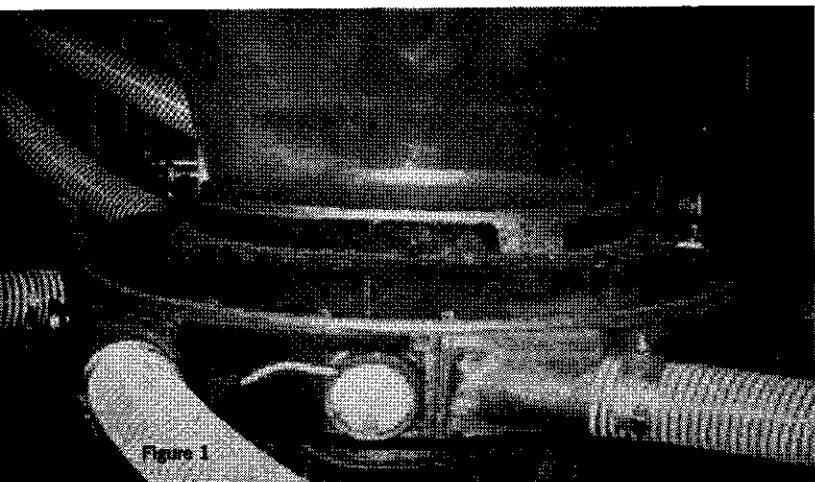


Figure 1

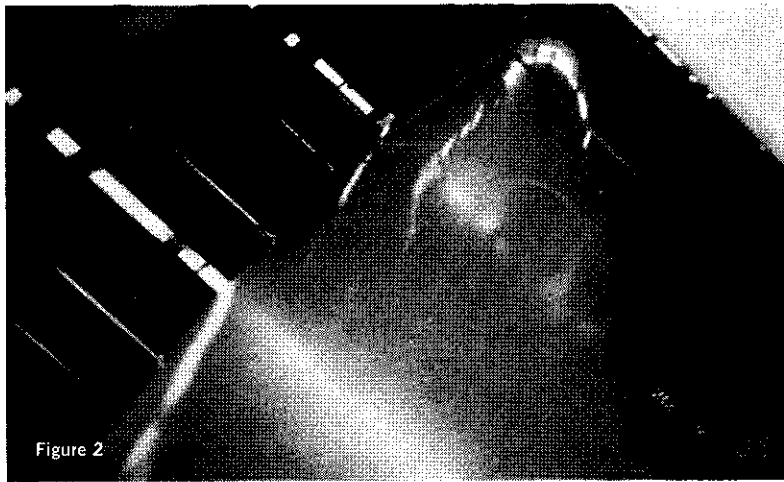


Figure 2

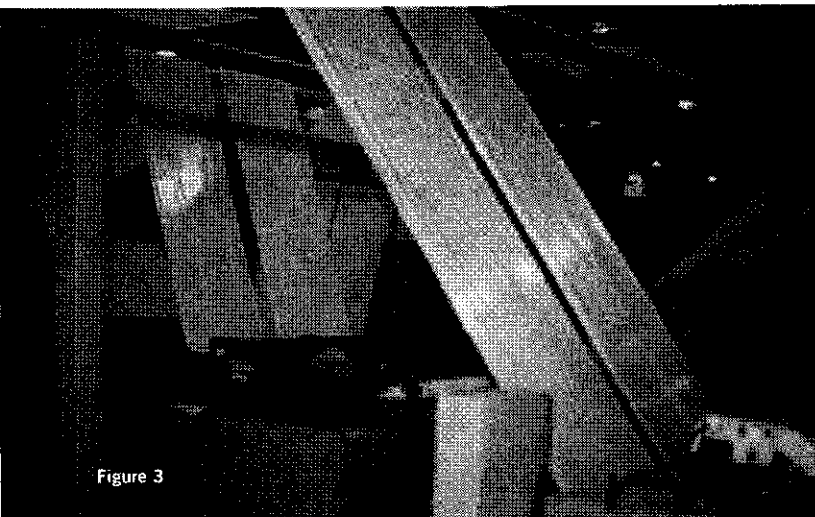


Figure 3

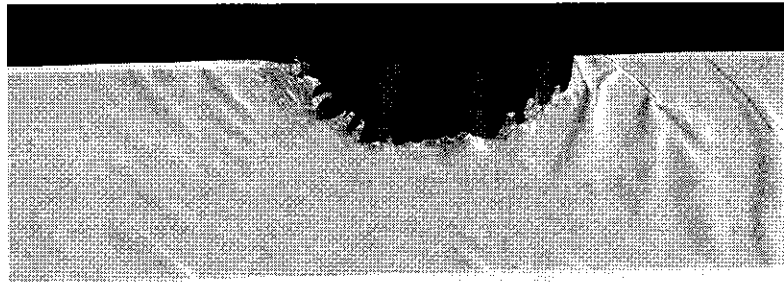


Figure 4

Evidence (PRIDE). In 2004, personnel from the QDU initiated a research project involving plastic bags and their characteristics after numerous requests by law enforcement personnel needing to know the origin of plastic bags collected as evidence. Many times a lone bag is collected from a crime scene and the field investigator is interested in any lead information the FBI Laboratory can provide. With PRIDE, the QDU is now able to provide law enforcement agencies with timely information that may be significant to their case.

PRIDE is a database that was developed by Virginia's Center for Innovative Technology, Virginia Institute of Forensic Science and Medicine, and the FBI Laboratory to assist law enforcement in providing timely information on the origin of evidentiary plastic bags. This database holds attribute information, manufacturer information, and retailer information, and it is also a repository of sample bags.

When a case is submitted to the QDU in which the PRIDE is needed for a search, the questioned bag is first categorized based on

Search

Bag Description	
Usage:	Disposer
Closure Type:	Drawstring
Color of Closure Lock Mechanism:	Yellow
Capacity:	36 - 40 Gallon
Bag Color:	Black
Brand Name:	
Product Name:	
Scented:	No
Perforations:	▼
Write-On Label:	▼
Warning Label:	▼
Gussets:	▼

Figure 5

its intended usage - either disposer, storage, freezer, sandwich, snack, or other type of bag. The next category is the closure type, which includes drawstrings, flaps, fold tops, handles, reclosable, bar seals, sliders, straps, and twist ties. If a closure is present, it is further categorized based on its color(s). The bag is then categorized by its capacity, if known. If unknown, an estimation may be given. Bag color is the next area of

categorization, followed by whether the bag is scented or unscented (Figure 5).

Other physical characteristics are examined and categorized, including seals and perforations, write-on labels, warning labels, gussets, gloss, clarity, extrusion lines, and package patterns. Many of these areas can be additionally subdivided. For example, when examining the perforations, they can be further classified based on the cut design and

the distance between perforations. When classifying the warning label, text can be added as well as whether there is a code in the text and whether the code is repeating. In addition, some of the images of warning label text have already been put into the system. If the bag being searched has the exact text, it also can be associated by this text. (Figure 6).

Few or numerous characteristics can be entered into the database to conduct the search until a reasonable number of potential associations are obtained from the search. Once this occurs, the bags are manually searched for a possible match. There are images of the bags, images of the packaging, the physical bag information, distributor information, and manufacturer information contained within PRIDE (Figures 7 through 13). In addition to the database information, there also is a repository of sample polyethylene bags that correspond with the sample data. Therefore, if necessary, not only a virtual comparison, but a physical comparison can be conducted on the plastic bags.

The PRIDE database will continue to evolve and expand as the polyethylene industry changes and introduces new products. The database is designed to be user friendly for entering and scanning each

new product as it is collected (Figure 14). Personnel from the FBI QDU will purchase the products, enter the information, and store the sample bags in the repository for future reference.

If you have any questions concerning the PRIDE database or polyethylene film examinations, please contact the FBI Laboratory Questioned Documents Unit at 703-632-8444. ★

BIOGRAPHY

Lorie L. Gottesman received a Bachelor's degree in Psychology from The George Washington University in Washington, DC, and a Master's degree in Forensic Science from National University in San Diego, CA. Lori has worked at the Federal Bureau of Investigation Laboratory's Questioned Document Unit since 1992. She is a member of the American Society for Testing and Materials (ASTM), a regular member of the Mid-Atlantic Association of Forensic Scientists (MAAFS), and a qualified Assessor for the American Society of Crime Laboratories Directors - Laboratory Accreditation Board (ASCLAD-LAB-International). She has testified numerous times in federal and state courts in the field of questioned documents and polyethylene film, for the prosecution as well as the defense.

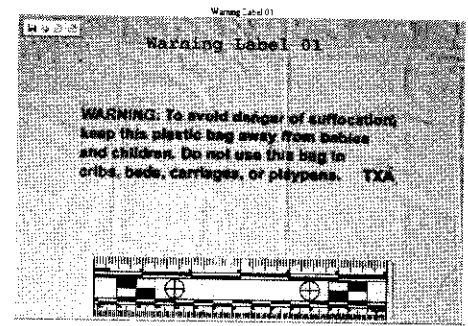


Figure 6

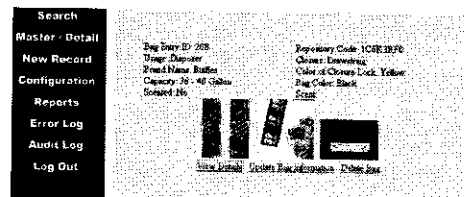


Figure 7

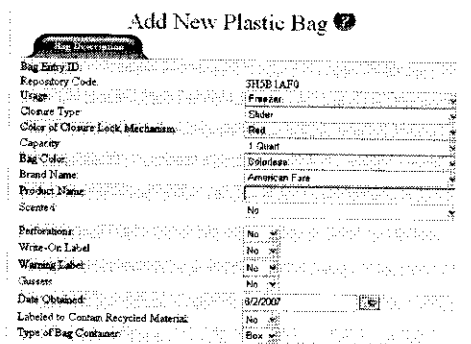


Figure 14

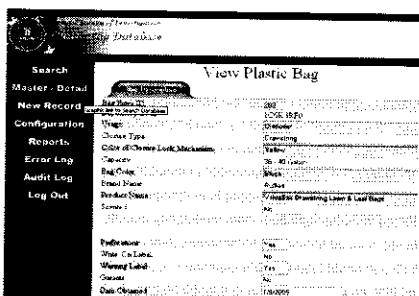


Figure 8

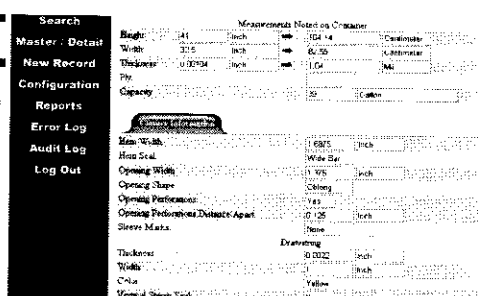


Figure 10

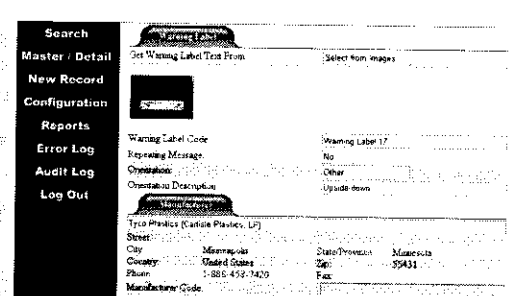


Figure 12

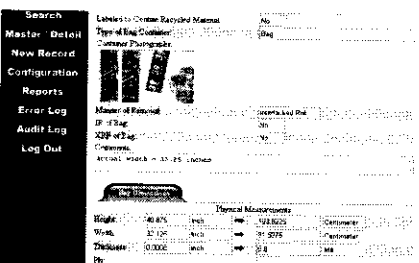


Figure 9

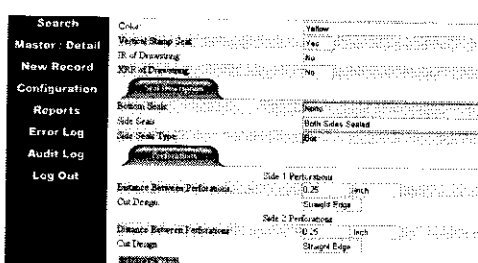


Figure 11

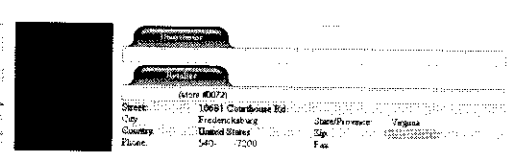


Figure 13