

When is it useful?

Textile damage assessment is potentially useful in any case type where garments or fabrics may have been damaged by some mechanism including:

- Stabbings
- Rapes
- Sexual assaults
- Burglaries
- Arsons
- RTAs

Damage assessments can also complement other evidence types; for example, when targeting areas of garments in sexual assault cases for perpetrators, DNA when clothing has been torn or forcibly removed, or with assisting the interpretation of blood patterns on potential weapons in stabbing cases.



If medical information, which may include photographs, is available that details the nature and number of injuries, this should be taken into account when assessing the damage and, in particular, when determining the number of possible actions required to cause the damage.

Consider the possibility that the fabric could have been folded at the time the damage was produced and the effect this would have on the number of actions involved.

IDENTIFICATION
INTERPRETATION
INNOVATION

TEXTILE DAMAGE ASSESSMENT - providing real-time intelligence



Specialist expertise
in examination
& interpretation

IDENTIFICATION
INTERPRETATION
INNOVATION

Introduction

In forensic science examinations, the scientist is frequently asked to form an opinion concerning the nature of damage to clothing. Questions often asked include whether the damage is from a cutting or tearing action, whether a cut is a stab or slash, which type of implement(s) may have caused the damage, and whether the damage is “recent”.

Cellmark’s scientists are able to recognise what is “in-place” and “out of place” in order to make sense of what has been observed in the context of a crime investigation. Any damage feature is assessed in light of the overall condition of the garment or fabric surface in question.

Damage is generally divided into a series of sub-sets:

- Wear and tear
- Tearing
- Abrasion
- Environmental
- Heat
- Cutting/puncturing

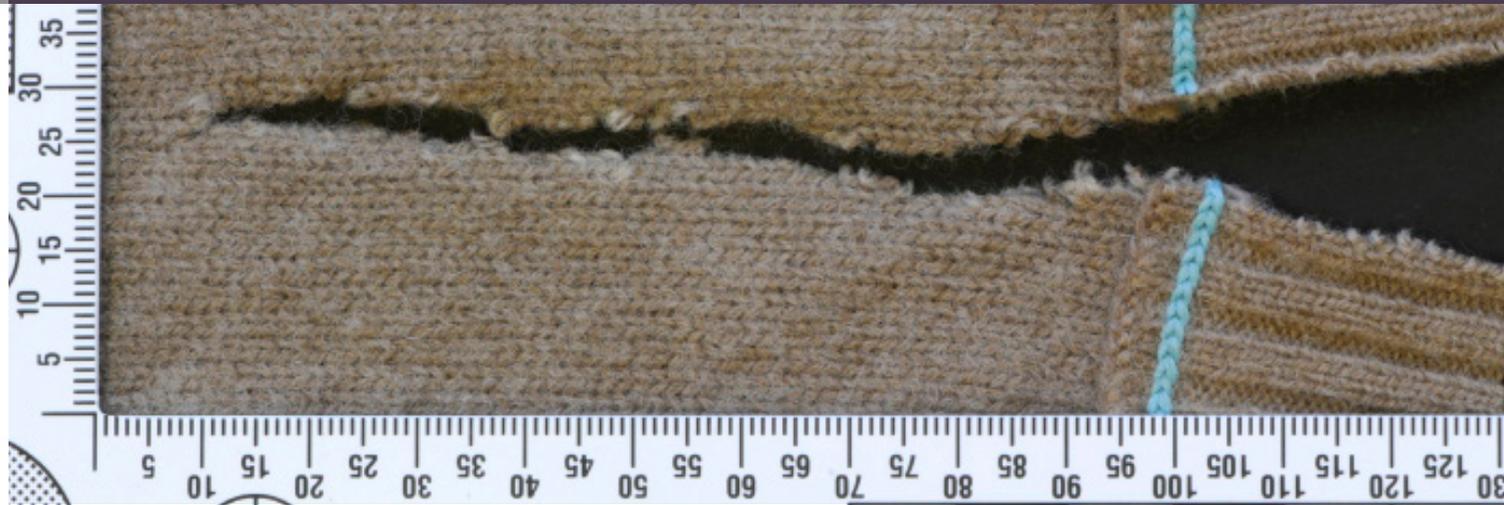
TEXTILE DAMAGE ASSESSMENT - providing real-time intelligence

Cellmark's scientists are able to provide answers to key questions from the investigating team such as:

- Is the damage recent? Damage is considered to be recent if it occurred since the garment/fabric was last washed or repeatedly worn/used.
- Could any damage observed be due to normal wear and tear? Was it intentionally created by the manufacturer?
- What is the nature of the damage and how was it caused? What type of weapon may have been used, if any?
- To what extent does the damage penetrate the fabric and is it associated with any staining, such as blood?
- Is the damage feature coincident with similar damage features in another garment that may have been worn in conjunction?



- How many separate actions may have caused the damage observed?
- Do the findings fit with an item of clothing having been forcibly removed?
- Is there any evidence to suggest that the wearer of a garment may have exited a moving vehicle?
- Does the analysis fit with what is alleged?



Types of Damage

Wear and Tear:

Damage observed as loose/unravelling hems, split or stretched seams, stained fabric, pilling, thinning or snagging.

Tearing:

Pulling that causes fabric to stretch/break, typically leaving ragged or irregular edges, often following lines of least resistance such as seams or along the weave or knit of a fabric. Also shows as thinning and splitting, ragged, linear holes or L-shaped holes.

Abrasion:

Caused by everyday fabric rubbing, leading to thinning or scuffing when creases or folds are subjected to regular movement or by violent movement against a surface such as a dragging action.

Environmental damage:

Damage caused as a result of the environment in which it is found – chemical, insect, animal, microbial or decomposition.



Heat:

Scorching, burn holes or localised melting.

Cutting/Puncturing:

Includes stabbing, slashing and scissor cuts.

Cuts begin and end at a point. Penetration may be partial, complete or intermittent.

Stab cuts – penetration of a pointed implement through a fabric, such as a knife blade, often generating neat linear holes. The cross section shape and nature of an implement may be reflected in the shape and nature of any cuts.

Slash cuts - where a sharp edge is pulled across the surface of a fabric that may produce intermittent cuts and score lines where the implement has not actually cut through the fabric.

Scissor cuts - where two opposing blades produce a shearing action.

Punctures – piercing/breaking through a fabric often tearing an irregular hole.

How did the damage occur?

A scientific analysis based on looking at a number of factors:

- The location of the damage on the garment and how much damage is observed.
- Comparison to the inherent points of weakness in the fabric and the construction of the garment
- The general robustness of the garment
- The size and weight of the wearer
- How much force may have been required to produce the level of damage observed.

Reconstructions

In order to assess whether a particular implement or action could produce the textile damage seen on a given item, the implement (or one of a similar type) may be used to produce areas of test damage on the item in question (or one of similar construction and condition). Any specific actions that are alleged to have generated a particular damage feature may also be replicated. The characteristics of the areas of test damage are then compared to the characteristics of the areas of evidential damage.

Physical fits

The comparison of two or more pieces of fabric with a view to determining whether they were once a single item. This type of examination can be carried out if a piece of fabric is recovered from a scene of crime, and a potential item or garment to which it might have once been an integral part has been located elsewhere.

