

MARINE COLLISIONS AND THE FORENSIC EXAMINATION OF PAINT SAMPLES.

There are instances where a vessel is alleged to have collided with a fixed or moving object and where the witness evidence, or lack of it, requires support by an examination of the physical evidence. In such cases the physical evidence most often relied upon is that provided by a comparison of paint samples taken from the vessel and the object with which it is alleged to have collided. As forensic chemists many of our consultants have a detailed knowledge of paint comparisons including their chemical analysis, largely through dealing with vehicle accident work for the police, such as in pedestrian hit-and-run cases.

Normally, in criminal matters paint samples are taken by highly trained scenes of crime officers who understand what samples to take and how to take them. It may seem a simple and straightforward matter, and indeed it is, but care needs to be taken to avoid cross contamination of the samples and to ensure that proper sampling takes place.

The purpose of this note is to provide guidance on paint sampling and packaging. If the procedures are followed then there is the best opportunity of obtaining useful evidence which can be relied on in Court.

Often we receive samples of paint from apparently damaged areas, e.g. dents, scrapes/smears, from both the suspect ship and the other object. In other cases we receive additional samples from areas of the ship(s) completely remote from the suspected point of impact. Neither of these situations is satisfactory, and as a forensic chemist it can reduce the prospect of obtaining the best evidence from a paint comparison.

For the purposes of illustration, let us assume that the bow of red ship is alleged to have collided with that of a blue ship. It is very well to take a sample of paint from the damaged bow areas of each ship, and indeed that should be done. However, the paint taken from the red ship is very likely to be contaminated with smears of paint from the blue ship. This causes problems if one finds red paint fragments on the blue ship because an accurate colour comparison may not be possible and there are likely to be problems with a chemical comparison of the red paint from the red ship with the transferred red paint taken from the blue ship. To overcome this problem one should also take what are referred to as control samples. This means that a reference sample of paint should be taken from each ship close to each area of impact but not within it. In this manner the person comparing the transferred paint fragments has a clean, uncontaminated example of the paint from each ship in the relevant area. Cross contamination of samples should always be guarded against. In order to avoid this one should arrange for different persons using different tools to take the samples from each of the objects concerned. In many cases this happens anyway, on the basis that the suspect ship has left the scene of the accident in Port A and moved to Port B, and so one surveyor is employed at Port A and another at Port B. If the same person is involved in taking the samples (which is not recommended), e.g. from a ship in Port A and a pier in Port A, then the surveyor should use different tools for taking the

samples from each of the objects. It is not sufficient thoroughly to wipe down a knife, or similar blade, after taking the samples from one object and then using the same to take samples from the other object. Many transferred particles can be a millimetre or sub-millimetre in size. As such they can stick to the blade after one sample is taken and be transferred during the sampling of the other object. It is also appropriate to wash one's hands before and after sampling an object. The use of disposable rubber gloves in each case is recommended.

Once a sample has been taken it should be enclosed in a sealed package that cannot leak; envelopes are not suitable as they leak at corners. Packaged samples from one object should be kept together in another outer sealed package. Both inner and outer packages should be properly labelled. The outer packages from each object should be stored separately.

If this routine is adopted the cross contamination should be avoided.

Paint Comparisons

Collisions between two painted objects almost always result in paint transfer in one direction and in many cases there is cross transfer of paint in both directions. The paint fragment structure of control samples is normally examined first to establish the colours, layer sequence and character using microscopy. Then the samples from damaged areas are examined for evidence of cross transfer of paint. Any such paint that is found is compared for colour, layer sequence and chemical composition, with the appropriate control sample. The overall strength of the evidence derived from the paint comparison often depends on whether the paint transfer is a one-way or two-way process and how many layers have been transferred in each direction.