Appendix B

   - 2000 paint samples taken randomly from buildings
   - 1,999,000 possible pairs
   - 98% differentiated by microscopy and solvent tests alone (acetone, methylene chloride and concentrated sulfuric acid)
   - Only 2 pairs from different sources were indistinguishable using microscopy, solvent tests, emission spectrography and pyrolysis gas chromatography
   - Better than 99.999% discrimination power
   - All single layered paints, except blacks and varnishes, were differentiated on color and solvent tests alone

   - 500 random automotive paints
   - 124,750 possible pairs
   - 99.996% discriminated by microscopic and solvent tests alone (5 pairs not discriminated)
   - All samples requiring additional tests to discriminate had less than four layers (not refinishes)
   - All but 2 pairs discriminated with the addition of IR, PGC and elemental
   - 99.998% discrimination power
   - Indistinguishable pairs were same make, model and year

   - 500 random automotive paints
   - 124,750 possible pairs
   - 99.996% discriminated by microscopic and solvent tests alone (5 pairs not discriminated)
   - All but 3 pairs discriminated with the addition of IR and PGC
   - 99.997% discrimination power
   - Indistinguishable pairs were same make, model and year

   - 200 random automotive paints
   - 19,900 possible pairs
   - 99.97% discriminated by microscopic and solvent tests alone (6 pairs not discriminated)
   - All requiring additional tests had less than four layers (not refinishes)
   - All pairs differentiated with the addition of IR, PGC, SEM/EDX, Emission Spectrography, and NAA
   - Topcoat color survey of 43,000 vehicles on the road in Florida and up the eastern seaboard
   - More specific topcoat color survey of 2000 vehicles on the road in Florida, including light/medium/dark tints and metallic vs. nonmetallic
   - In most instances, over 90% of the vehicles on the road can be eliminated as potential sources based on their general topcoat color alone.

   - Topcoat color survey of 17,500 vehicles on the roads of Vancouver, Regina and Halifax, Canada.
   - The survey incorporated more specific color categories similar to Ryland’s second study, including light/medium/dark tints, crossover colors (i.e. red-orange, red-brown, yellow-green, green-blue) and metallic vs. nonmetallic
   - In all instances, over 90% of the vehicles on the road can be eliminated as potential sources based on their general topcoat color alone. In most instances 95% of the vehicles on the road can be eliminated as potential sources based on their general topcoat color alone.

   - Study of 260 automotive paint samples collected from recently damaged vehicles at an auction yard
   - Study yielded 32,670 possible pairs
     - Newer finishes prevalent
     - 65% using decorative flake
     - 35% having interference flake
   - Samples differentiated initially by color of finish coats (visual, stereomicroscopic, compound microscopic)
   - Indistinguishable samples compared by FTIR single reflection diamond ATR micro-spectroscopy of their clear coats
   - Following visual comparisons, 28 pairs of samples could not be distinguished
   - Following FTIR analyses of the topcoats alone, only two pairs out of 32,670 sample pair comparisons could not be distinguished. Both had OEM paint systems present.
   - Subsequent FTIR analysis of the complete layer structure of the two pairs permitted the discrimination of one of the pairs based on analyses of the primer layers.
     - This pair originated from a 1995 Acura Integra and a 1997 Acura Integra both manufactured in the same plant
- The indistinguishable pair came from cars of the same make, model, year, having their original finish systems present and were manufactured in the same assembly plant

- Study of 964 architectural paint samples collected randomly throughout North America.
- Study yielded 464,166 possible pairs
- Inter-compared by stereomicroscopy, FTIR spectrometry, SEM-EDS spectrometry, and pyrolysis gas chromatography-mass spectrometry
- Only eleven indistinguishable pairs were found, yielding a discrimination power of 99.998%
- All eleven indistinguishable pairs originated from the same respective structures and were not false inclusions