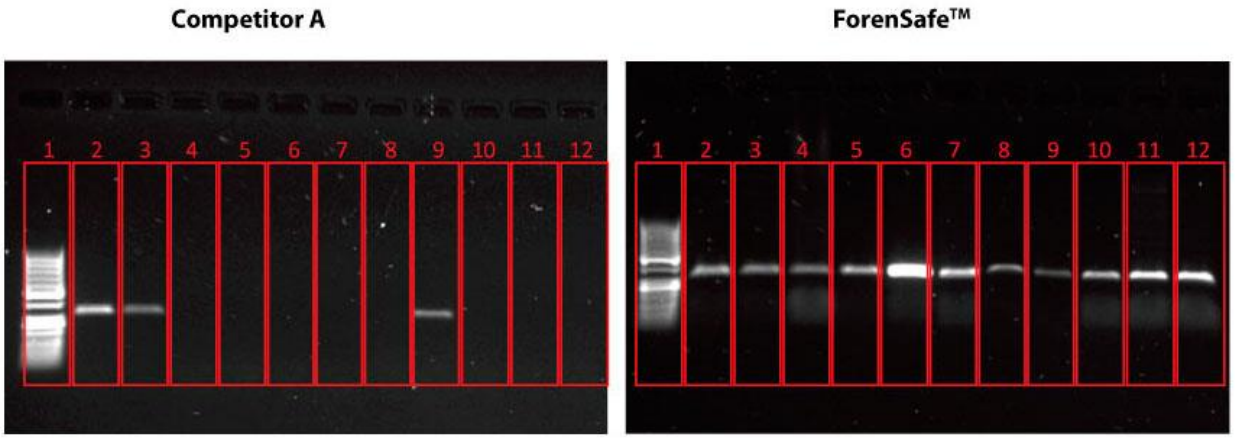
ForenSafe™ – a polymerase with improved performance for contaminated forensic samples

Success rates for amplification of trace DNA from (skin shreds, finger prints, lip marks, etc.) are limited due to the presence of PCR inhibitors from the crime scene. Basically, all DNA found in crime scenes is more or less contaminated with substances that can inhibit the PCR reaction. Removal of inhibitors by various extraction methods (silica, magnetic beads, organic solvents, chelating resins, or salting) or dilution of samples will improve amplification success rate. On the opposite, DNA extraction will significantly reduce the amount of DNA available for analysis for low DNA amounts (Bond et. al.2008). Recovery rates for trace DNA will be reduced even further with amplification failure as result. ForenSafe™ opens for new methods in forensics for trace DNA analysis, eliminating need for recovery reducing extraction methods.

The improved tolerance allows for running direct PCR that not only eliminates recovery losses during extraction, but also improves recovery of DNA (Templeton, et. al. 2015). Below are gel images comparing the most common polymerase used in forensics today with ForenSafe™. The inhibitor levels are deliberately high to show the extent of improvement that ForenSafe™ offers. AlphaHelix aim is to provide further data to ensure forensic scientists that ForenSafe™ is the safest first choice for trace DNA analysis.



1. Size marker
2. No inhibitors
3. Calcium 0.7 µM
4. Collagen 40 ng/µl
5. Melanin 1 ng/µl
6. Indigo 400 µM
7. Indigo carmine 400 µM
8. Ammonium nitrate 11 µg/µl
9. EDTA 0.8 µM
10. Humic acid 2.5 µg/µl
11. Hematin 1.5 µM
12. Tannic acid 2 ng/µl

Alpha Helix