

## NAWCWD – TechLink Quick Facts

<b>Patent Marketing Summary Title</b>	Instant, Accurate, Fumeless, Latent Fingerprint Detection
<b>Patent Marketing Summary Sub-title</b>	Easy to use fumeless powder detects prints up to 30 days!

VITAL STATISTICS					
<b>Patent #</b>	8574658	<b>Patent Date (MM/DD/YYYY)</b>	11/05/2013	<b>Branch of Military</b>	Navy
<b>DoD Lab</b>	Naval Air Warfare Center Weapons Division, China Lake, California				
<b>Patent Title</b>	Fumeless Latent Fingerprint Detection				
<b>What is it</b>	Smart Powder				<a href="#">TechLink to Patent</a>
<b>Inventors</b>	Cambrea; Lee R. (Ridgecrest, CA), Harvey; Benjamin G. (Ridgecrest, CA)				

OFFICIAL PATENT ABSTRACT
A fumeless latent fingerprint detection system using fluorescent particles.

MARKETING SUMMARY
<p><b>Existing Technology</b></p> <p>Current methods of detecting latent fingerprints rely on older fuming methods that require a special humidity controlled chamber that limits the object size, requires power, and is difficult to field. Additionally, this method takes up to 24 hours and requires special operator skills to properly develop prints. Traditionally, fresh fingerprints (measured in hours) are detected by dusting with a powder that contrasts in color to the background. Older, latent fingerprints (days to weeks) are detected by a developing process using noxious chemicals. The reaction typically uses superglue vapors heated in a sealed chamber to react with fingerprint residues in a complicated process.</p>
<p><b>New Technology</b></p> <p>Acting in quick response to an urgent need by the U.S. Special Operations Forces, China Lake researchers developed a smart powder that revolutionizes all of this and requires no chambers. Detection can be done easily in the open air in seconds. The new smart powders specifically/chemically bind to fingerprint residues. A solid-state reaction (as opposed to fuming gas or applying liquid) significantly reduces operator error and enhances ease of use. For one application, the DoD needed to get quick prints off of IEDs in the field. Likewise, for technology transfer applications, this technology allows forensic units to quickly take quick prints from large and fixed items in the field, such as automotive doors and trunks, office windows and elevators. In many cases, these items would need to be removed and physically taken to a lab in order to obtain highly accurate results.</p>
<p><b>How It Works</b></p> <p>The invention adds the chemistry of fuming superglue to a powder that can be applied by simply dusting. The powder chemically reacts with fingerprint residues in a manner similar to fuming superglue but requires no special chamber, heat, or fumes. This simplified method allows large objects to be checked for prints in the field, and provides for fluorescence detection under ultraviolet light. Prints are also visible with white light, so a digital camera flash will enable a detailed print to be captured electronically. The new method detects level 3 details, such as skin pores, and is shown to be effective on latent fingerprints as old as 30 days! In addition, it is superior to current commercial powders in response to stresses resulting from rough handling. Prints dusted with the new powder can withstand temperature changes, water exposure, and light rubbing. It has unlimited applications for detecting finger, nose, and paw prints for crime scene evidence collection and military applications.</p>
<p><b>Who Benefits</b></p> <p>New technology benefits all types of forensic agencies including local, state, and federal law enforcement agencies and military forensic units.</p>

BENEFITS (Prioritized Bulleted List)
<p><b>Major Benefits</b></p> <ul style="list-style-type: none"> <li>• Allows for real-time print identification in the field</li> <li>• Decreases detection time from hours to seconds</li> <li>• No power or special operator requirements</li> <li>• Detects level 3 details such as skin pores</li> <li>• Allows for detection up to 30 days after the print was laid down</li> <li>• Allows for detection of prints that would otherwise be difficult or impossible to obtain with conventional techniques</li> </ul>

<b>Additional Benefits</b>	
<ul style="list-style-type: none"> <li>• Allows print residues from fingerprints, nose prints, footprints, animal prints, or any combination of prints</li> <li>• Allows for large objects to be checked for prints in the field, and provides for fluorescence detection under ultraviolet light</li> <li>• Eliminates the complicated and time-consuming toxic fuming process that can destroy the evidence or substrate</li> <li>• Decreases the potential for errors because fewer steps are involved and travel time back to the lab is eliminated</li> <li>• Increases stability of prints for travel or shipment</li> <li>• Amenable to high-throughput imaging systems</li> </ul>	

<b>OPPORTUNITY</b>					
<b>Applicable Industries / Customers</b>					
New technology benefits all types of forensic agencies including local, state, and federal law enforcement agencies and military forensic units.					
<b>Technical Readiness Level (TRL) (1-10)</b>	2-3	<b>Available for License (Yes/No)</b>	Yes	<b>Express Licensing (Yes/No)</b>	Yes
<b>Notes</b>					
Potential for collaboration with Navy researchers					
<b>Prototype Available (Yes/No)</b>	Yes				
<b>Description</b>					
Sample kit exists at China Lake. Kit includes two functionalized fluorescent powders with two brushes and UV light in a plastic box.					
<b>Prototype Testing Description</b>					
Five grams of the nanoparticle powder were delivered to the National Forensics Science Test Center in Tampa, Florida. Also, six kits containing green and red functionalized fluorescent powder (micron sized) were delivered to the US Army Criminal Investigation Laboratory for testing.					
<b>Background / Developmental Testing</b>					
The project began in FY10 with an 18-month turnaround time for development, laboratory testing, and delivery of five field ready kits. A second 6-month extension was provided to transition the technology from nano-based to micron-based smart powders. The patent application was filed in 2011 and granted in 2013.					
<b>Key Search Terms (alphabetical order)</b>					
Fumeless latent fingerprint detection, fumeless powder, smart fingerprint powder					

<b>SUPPLEMENTAL PUBLICATION INFORMATION</b>	
<b>Items Downloadable</b>	<b>Description</b>
Quick Facts	All pertinent patent/invention data in one quick downloadable form
Papers / Reports	Fingerprint technical paper available for download
<b>VISUAL AIDS</b>	
Posters / Displays	Poster available for download
Photos	Numerous photos available via other downloads

<b>POINTS OF CONTACT</b>					
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