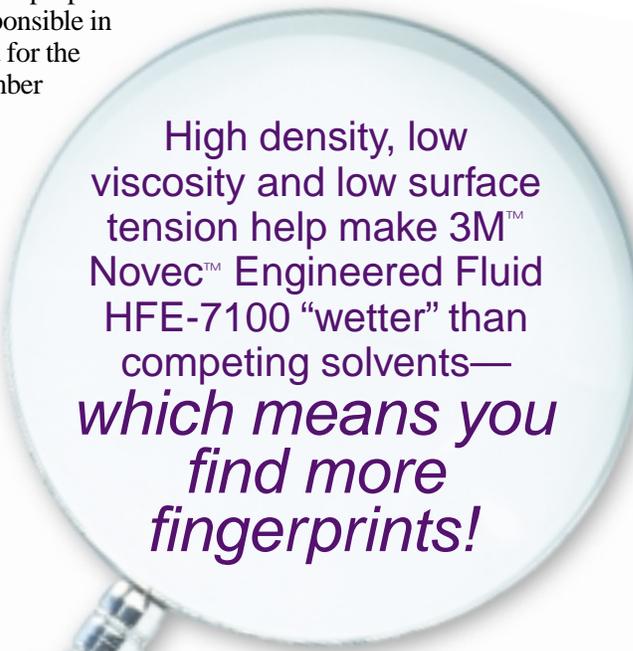


# A higher wetting index means you find more prints

There are a number of factors that go into developing a clear, distinct latent fingerprint, but 3M scientists believe that the combination of three physical properties—density, surface tension and viscosity—is responsible for the ability of 3M™ Novec™ Engineered Fluid HFE-7100 to effectively deliver ninhydrin or DFO in this application.

These properties are responsible in part for the number of



High density, low viscosity and low surface tension help make 3M™ Novec™ Engineered Fluid HFE-7100 “wetter” than competing solvents—*which means you find more fingerprints!*

fingerprints developed. In particular, the lower the surface tension of the carrier solvent, the more invasive the fluid is.

This means that it can find the “cracks” and “creases” in a porous surface more thoroughly than a solvent with higher surface tension, allowing it to develop older fingerprints—fingerprints whose amino acid signatures have gone deep into the porous surface.

In other words, you can find more fingerprints.

A parameter called the “wetting index” can help explain why density, surface tension and viscosity play such important roles. Introduced more than 20 years ago by Dr. William Kenyon, the wetting index was developed to evaluate the potential of different solvents to penetrate or “wet” tight spaces. It is based on empirical observations which indicate that a fluid with high density, low viscosity and low surface tension is better able to flow or wet a surface. 3M has found that the performance of various solvents does tend to scale with the wetting index in situations where the flow or wetting characteristics of the solvent are important.

The wetting index is calculated as:

$$1000 \cdot \text{density} / (\text{surface tension} \cdot \text{viscosity})$$

The performance of various solvents appears to correlate with its wetting index:

## The Wetting Index

| Solvent                     | Density (g/ml) | Viscosity (cp) | Surface Tension (dynes/cm) | Wetting Index |
|-----------------------------|----------------|----------------|----------------------------|---------------|
| <b>Novec fluid HFE-7100</b> | <b>1.52</b>    | <b>0.61</b>    | <b>13.6</b>                | <b>183</b>    |
| HFC-43-10mee                | 1.58           | 0.67           | 14.1                       | 167           |
| CFC-113                     | 1.56           | 0.68           | 17.3                       | 133           |
| Petroleum Ether*            | 0.74           | 0.38           | 16.1                       | 121           |
| Acetone                     | 0.79           | 0.32           | 23.7                       | 106           |
| Heptane                     | 0.69           | 0.41           | 19.3                       | 87            |

\*35°C-60°C cut

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