



## Consumer Product Safety Commission Issues and Recalls

Dr. John Fildes conducts accident and failure analysis investigations for insurers and litigators. His cases typically involve the performance of materials, materials compatibility, friction and wear, lubrication, the design process, and issues involving installation, maintenance, and adherence to codes and standards. He also offers consulting services to support companies, insurers, and attorneys dealing with Consumer Product Safety Commission issues and recalls.

Dr. Fildes is experienced with supporting companies, insurers, and attorneys with developing the data they need in dealing with the Consumer Product Safety Commission (CPSC) and with recalls. CPSC issues and recalls require quick response and innovative, but reliable approaches to testing, and we are uniquely qualified to meet this need.

## Litigation Technical Investigations

CPSC issues and recalls often require testing that is different than quality control tests typically performed by companies. Dr. Fildes' physical-science based investigative approach is ideally suited to this need because the physical sciences (physics and chemistry) are the basis for test methods and test instruments. His physical-science background enables us to understand a wide range of issues and to develop practical and reliable, but non-standard, tests. He also is highly experienced with sensors, measurement technology, controls, statistics, and modeling. Dr. Fildes has decades of experience with both bench-scale and full-scale testing, which is critically important for investigation CPSC issues and recalls. Bench-scale testing can accurately replicate the motion, contact geometry, and friction, of mechanical systems allowing wear and lubrication performance to be investigated under a wide range of highly controlled conditions. He also conducts full-scale testing, sometimes in a limited way to validate the results of bench-scale testing, and sometimes as the primary investigation method. For batteries, sensors, electronic and semiconductor devices, electronic materials, and corrosion resistance, Dr. Fildes has outstanding experience and uses sophisticated instrumentation for electrochemical testing and impedance spectroscopy. Dr. Fildes has collaborations that provide unique resources at his disposal such as equipment and engineering design capabilities and competencies that include motion control, motors, pumps, regulatory control systems, and supervisory control and data acquisition systems. This allows Dr. Fildes to quickly and reliably implement the non-standard tests that are needed. Another core capability of that is rare and is especially relevant today is electrochemistry. This means that he is able to provide the insight companies, insurers, and litigators need.

## Experience and Case Study

Matches – Dr. Fildes assisted a company with determining if matches that were supplied as part of a kit could ignite unintentionally. To do this, he first tested the matches to establish the force and length of strike needed to cause ignition. He also tested if any other components of the kit could easily ignite the matches. He then instrumented the kit with an accelerometer and established the nature and magnitude of the motions and forces the kit experienced in everyday use. That information was used to design an instrumented machine to subject the kit to a large number of simulated usage cycles that would also detect if the matches ignited unintentionally.

Li-Ion Batteries – Dr. Fildes assisted a company with determining if it was safe to ship lithium-ion batteries that were being recalled. He assessed the implications of the reasons for the recall to establish the likely state of the battery, and then used his electrochemical knowledge to determine the issues that may arise.

Consumer Product Fire – Dr. Fildes assisted a company with determining the cause of a fire with a consumer product. He examined similar units and also instrumented them to measure the electric current and temperature at various locations. This allowed the identification of a wire crimp as the source of the fire.



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Dr. John Fildes

*Dr. Fildes' experience for conducting the type of work described above is extensive, spanning his entire career from graduate education to the present. He has a doctorate degree in physical chemistry and the concepts of thermodynamics, underlying combustion and chemical reactivity, and of quantum mechanics, underlying the strength of materials and failures, provide the underpinnings of much of chemical, mechanical, materials, and electrical engineering. Statistical analysis, data mining, and modeling the properties of materials and chemical systems and making predictions based on those models was central to his Ph.D. Dissertation and was used numerous times in conducting his over \$27.5 million of funded R&D starting at Borg-Warner's Corporate Research Center, as Director of Sensors and Controls at IIT Research Institute, as the founder and co-director of Northwestern University's Advanced Composite Materials Intelligent Materials Processing Center, and through his Army-funded work in tribology (the science of friction and wear).*

*He has done extensive research in process control that was funded by the Gas Research Institute, the Army, the Navy, the State of Illinois, and the Great Lakes Composites Consortium. The Gas Research Institute (GRI) used him to help define their research agenda in combustion control. He was an invited workshop panel member for a report on Intelligent Process Control Systems for Materials Heat Treatment prepared by the National Materials Advisory Board of the National Research Council (NMAB-457, National Academy Press) and an invited speaker on intelligent process control of chemical processes organized by the Defense Advanced Research Agency (DARPA). He led the process control activities for the Great Lakes Composites Consortium involving a team including Grumman, Northrop, and McDonnell Douglas. He was invited to provide a demonstration of intelligent process control to Congress, which he did provide. His work in materials processing and process control was the basis for establishing Northwestern University's federally funded Advance Composite Materials Intelligent Processing Center. He also has project experience with predicting the properties of numerous materials, sintering ceramics, sensors and control methods and systems, semiconductor physics and materials, and innovative ceramic-like armor. His CV contains additional relevant experience.*

*Although Dr. Fildes does not practice engineering, he has extensive experience with engineering. He served as a post-doctoral research associate in the Department of Chemical Engineering at Virginia Tech and instructed in a course on chemical process control. He led two substantial engineering companies licensed in Illinois as both Professional Engineering and Structural Engineering organizations, and a group of 28 scientists and engineers at Northwestern University, which gives him much experience with the conduct, application, and principles of engineering. His oversight of major research labs at Northwestern University, Borg-Warner's Corporate Research Center, and the Illinois Institute of Technology Research Institute gives him broad experience with issues involving chemical and materials safety.*

<p><b>Our gatekeeper approach provides:</b></p> <ul style="list-style-type: none"> <li>✓ The quickest and best possible outcome.</li> <li>✓ A unique opportunity for early resolution based on knowing 60% to 80% of what might ultimately be uncovered.</li> <li>✓ Superior technical insight for even complex and multidisciplinary issues.</li> <li>✓ A reliable basis for expert testimony that meets rules for admissibility established by the Supreme Court.</li> <li>✓ A strategic advantage with corporate clients since they already appreciate that this approach improves outcomes and lowers costs through use of all existing knowledge and elimination of duplication.</li> </ul>	<p><b>Our gatekeeper approach uses information research and analytics early in technically related cases and establishes the key MAKE OR BREAK technical issues and everything that is known about them. This approach requires someone who has the extensive experience with both contemporary R&amp;D methods and litigation-related expert witness investigations so as to adapt the corporate R&amp;D technical investigation process to the unique aspects of litigation expert witness investigations. Our experience to do this is reflected in our process to bring litigators the R&amp;D technical investigation techniques that have revolutionized industrial R&amp;D, providing litigators with the better outcomes and lower costs that industry has achieved in overcoming similar investigation challenges.</b></p>
	<p><b>1. Define the Technical Issues</b> – Inspections, insight from litigation parties, and broad literature searching are conducted to gather information from prior related cases, trade association publications, patents, manufacturer's marketing materials and reports, and Internet forums to establish the key technical issues.</p> <p><b>2. Use Analytics to Establish What is Known About the Technical Issues</b> – The data gathered above is analyzed using contemporary tools for data mining and modeling to adapt the available data and fill the gaps that always exist in litigation investigations.</p> <p><b>(3) Reliably Define the Testing Needed</b> – The data that has been collected and analysis that has been done ensures that: existing knowledge is not recreated, the remaining work is properly focused, and all involved parties understand the challenges, methods, and progress.</p> <p><b>(4) Coordinate, Oversee, and Effectively Communicate</b> – This approach ensures that the overarching technical concepts are effectively framed and communicated, and it eases report preparation. The results are well supported, clear, and compelling even to people not knowledgeable of science and engineering.</p>