

Knovel®

CHEMICAL MANUFACTURING

Solution story: Developing company-wide guidelines for preventing dust explosions

Knovel helps a global chemicals company create a unified set of procedures for dust explosion safety



Summary

A global chemicals company needed a standardized set of procedures for preventing and dealing with explosions triggered by combustible dust. The company's manager for corporate process safety used Knovel to gather a wealth of data on dust explosions, as well as case studies on previous explosions, and incorporated this data into an internal set of guidelines for combustible dust safety.



The company recognized the need for a worldwide set of procedures for handling combustible dust in a chemical process environment.

Challenge

A multinational chemicals company sought a new set of guidelines for handling combustible dust to avoid dust explosions. With 6,000 employees processing \$2.5 billion worth of specialty chemical orders in 20 plants across 100 countries, the company lacked a set of uniform procedures for dealing with the hazard of explosions involving chemical dust.

Clouds of combustible dust frequently accumulate in chemical processing environments. If an explosion bursts outward from a pressurized chamber and ignites those dust clouds, a secondary explosion can erupt across the entire facility, causing severe damage to equipment and personnel. Although encounters between hot air and wood or grain residue trigger most dust explosions, combustible dust from synthetic fibers, coal, paper and even metals can also set them off.

The company recognized the need for a worldwide set of procedures for handling combustible dust in a chemical process environment. It could have outsourced this task to an external expert, but it would have cost tens of thousands of dollars. Instead, the company assigned this task to its manager for corporate process safety, who is in charge of performing risk assessment analyses from a process standpoint.



By handling this research internally instead of outsourcing it, the company was able to save more than \$30,000.

Solution

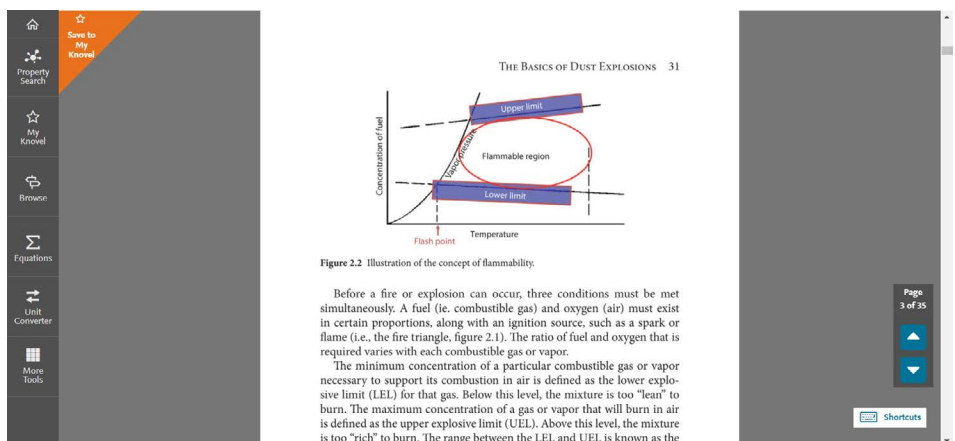
Process safety manager Felix Chausson* started by searching Knovel for a number of resources, including chemical and electrostatic analyses of combustible dust. Knovel's vast database of quantitative chemical data provides clear insights on the concentrations of various kinds of dust necessary to trigger an explosion, as well as the physics of an encounter between combustible dust and flammable vapors.

To prevent accidents, Chausson needed to understand not only the properties of the chemicals used in the plants but also the factors that have led to accidents with these chemicals in the past. Along with Knovel's information on combustible dust and gases, he also found a number of resources from the Center for Chemical Process Safety (CCPS). These resources included independently verified guidelines for the handling of combustible dusts and flammable vapors, as well as reports on specific dust explosion events, which documented the missteps that triggered each accident.

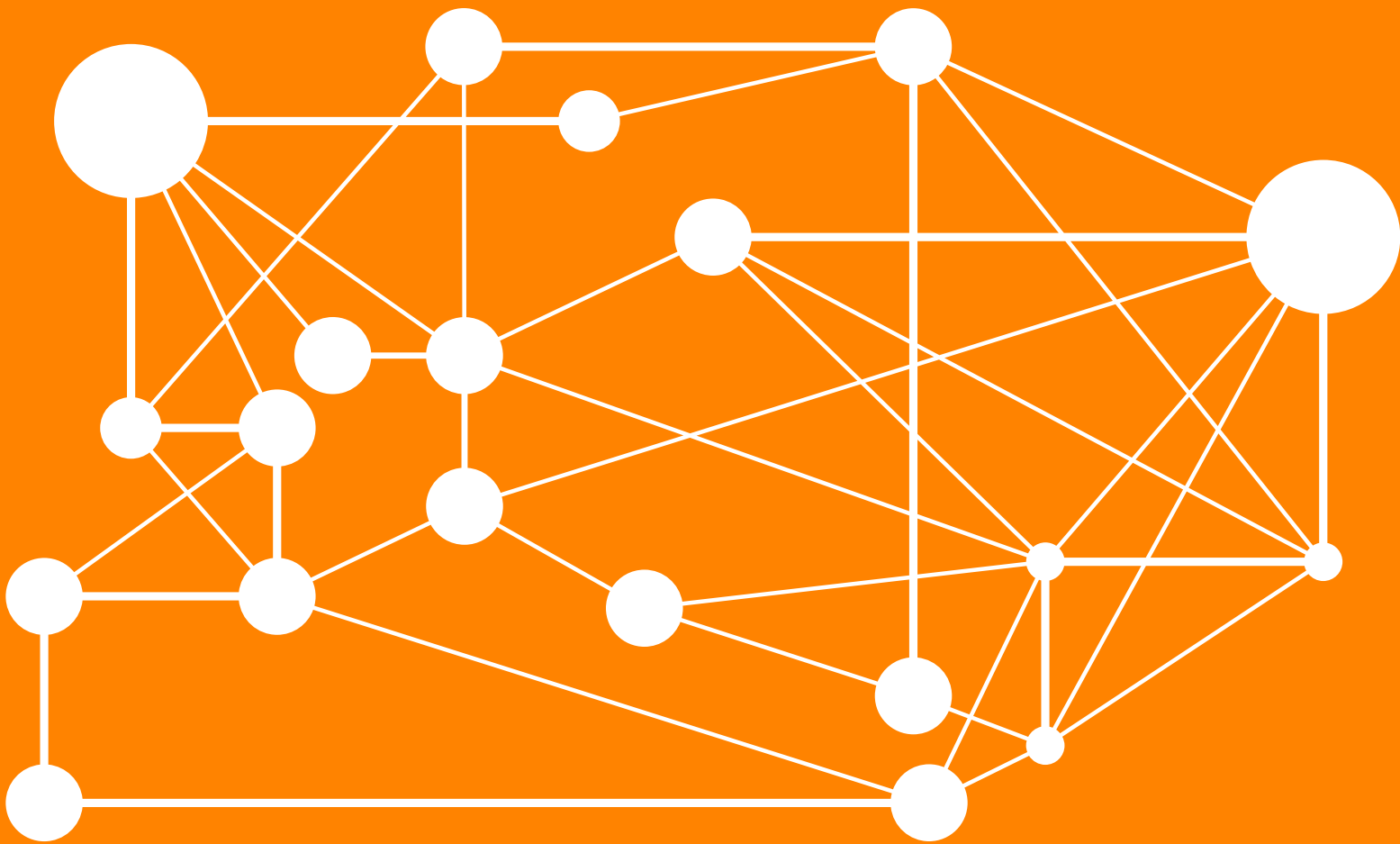
Impact

With the help of Knovel's quantitative data, material handling analysis and explosion documentation, Chausson was able to produce an internal memo on dust explosion prevention. His memo provided precise guidelines on how to handle dusts carefully in a chemical process environment and explained the factors most likely to lead to an explosion. Taking advantage of Knovel's expert insight and field-tested guidelines, he gained a clear understanding of the chemicals' physical processes and the current best practices in the field.

By handling this research internally instead of outsourcing it, the company was able to save more than \$30,000. And because the manager leveraged Knovel's wide breadth of trusted information available, including CCPS and other authoritative sources in the field, the final memo contains just as much expert insight as a document produced by a team of specialists.



* Names have been changed to protect rights to innovation



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Tel: + 65 6349 0222

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Tel: + 81 3 5561 5034

KOREA AND TAIWAN

Tel: +82 2 6714 3000

EUROPE, MIDDLE EAST AND AFRICA

Tel: +31 20 485 3767

NORTH AMERICA, CENTRAL AMERICA AND CANADA

Tel: +1 888 615 4500

SOUTH AMERICA

Tel: +55 21 3970 9300