

## Subject Areas

### **Adhesives, Coatings, Sealants & Inks**

From paint and ink formulations to corrosive resistant coatings and the fundamentals of adhesion and wettability, this offering provides practical information for chemical engineering, manufacturing and materials engineers. Of use to engineers and metallurgists involved in the manufacture of airplanes, electronics, equipment and other machinery seeking guidance on coatings, sealants and surface treatments for environmental and wear protection, to control optical effects and improve adhesion performance.

### **Aerospace & Radar technology**

Covering all aspects of aircraft, helicopter, spacecraft and ballistic system design and manufacture, as well as the design, manufacture and operation of radar, microwave and antenna arrays. Including the MMPDS (MIL-HDBK-5), multiple volumes of the Engineering Design Handbook, unique handbooks on the use of composite materials and the fundamentals of various propulsion systems. This content offering is an essential engineering tool for aerospace, mechanical, manufacturing and materials engineers.

### **Biochemistry, Biology & Biotechnology**

Covers the structures, functions and interactions of cellular components (proteins, lipids, nucleic acids, etc.), the systems and mechanisms at work in biological and microbiological organisms, and the biotechnological methods and techniques developed to exploit these interactions and systems in the production of useful products and services. Of use to companies involved in the production of food, pharmaceuticals, medical devices, cosmetics, industrial chemicals and biopolymers, as well as environmental applications such as water and wastewater treatment, soil remediation and biodiesel production.

### **Ceramics & Ceramic Engineering**

Covers properties of ceramic materials and composites, manufacturing and processing methods, and their use as coatings. Of use to materials scientists as well as mechanical, manufacturing, aerospace engineers and chemical engineers involved in designing equipment requiring specific thermal, electrical and other physical properties.

### **Chemistry & Chemical Engineering**

Covers both chemical processes and product development, including plant design and operation, as well as analytical chemistry, catalysis, separation and synthesis used in the creation of new products. Industrial safety and process refinement are highlights of this content offering. Of use to chemists and materials scientists, chemical engineers, petroleum and process engineers working on applications as broad as food production, petrochemical processing and nanotechnology.

### **Civil Engineering & Construction Materials**

Covers structural engineering, code compliance, earth moving, green building, road construction and building with materials such as concrete, wood and steel. Of use to civil engineers designing structures and developing infrastructure projects including bridges, dams, pipelines and roadways.

## **Composites**

Provides guidance on composite materials selection, design considerations, composite material properties, analysis and testing, repair, troubleshooting and manufacturing to support the design of stronger, safer, more lightweight and fuel-efficient aircraft and vehicles, as well as civil engineering applications in infrastructure repair and maintenance.

## **Computer Hardware Engineering**

Covers digital circuit design, computer architecture, design for EMC, designing fault-tolerant systems for increased uptime and performance, and the use of design software such as Verilog. Of use to computer hardware and electronics engineers designing and integrating computer hardware in the aerospace engineering, industrial equipment and automotive industries.

## **Earth Sciences**

Covers soil mechanics, slope stability, design for scour, wave mechanics and marine hydrodynamics, and the use of seismology in mineral exploration. Of use to environmental, petroleum engineering, geotechnical and civil engineers as well as earth scientists.

## **Electrical & Power Engineering**

Covers power generation, plant design, energy storage including batteries, transmission line design and operation, electrical safety and energy efficiency. Of use to electrical, power, mechanical and civil engineers designing turbines, power generation plants, transmission towers and cabling, installing pipelines for underground transmission, and electrical safety devices.

## **Electronics & Semiconductors**

Covers analog circuit design, electromagnetic compatibility, MEMS, RFID, the use of lithography and microlithography in IC and microchip fabrication, vacuum coating methods, electro-optical devices, and silicon and other semiconductor properties. Of use to electrical, electronics, manufacturing and optical engineers designing electronics, manufacturing processes, packaging methods and testing regimes.

## **Engineering Management & Leadership**

Engineering management encompasses the “soft” skills that engineers and scientists require to perform and succeed in their professional roles. Included in this content offering is engineering information on professional ethics, fundamentals of business finance and accounting, techniques for business analysis, development of leadership skills, personnel management, and tips on written and spoken presentations that get results.

## **Environment & Environmental Engineering**

Covers soil and ground remediation, water treatment, solid waste management, recycling, air quality monitoring, environmental pollution, indoor air quality control and total life cycle design. Of use to environmental, civil and geoenvironmental engineers designing treatment processes for industrial pollution, soil remediation, water treatment plants and integrated solid waste management plans.

## **Fire Protection Engineering & Emergency Response**

Covers fire dynamics, modeling performance of suppression and ventilation systems, planning for the effective egress of people, staging of first responders and emergency management planning, fire resistant design of offshore structures, and design of fire protection systems in manufacturing and industrial applications. Of use to fire protection, mechanical, HVAC, plumbing and civil engineers designing, building and maintaining fire protection systems, equipment and plans.

## **Food Science**

Covers food safety, nutrition, tests for the purity and quality of food ingredients, properties of thousands of ingredients, food microbiology, safe packaging methods, preservation, functional foods and supplements. Of use to food scientists, chemists and chemical engineering, and manufacturing engineers.

## **General Engineering & Project Administration**

Covers energy efficiency, fluid mechanics, mathematical functions, systems engineering, design of experiments, geographic information systems, new product development and materials properties. Of use to all engineers requiring quick refreshers on fundamental engineering principles, definitions of specific terms, equations and properties data about specific materials.

## **Industrial Engineering & Operations Management**

Covers ergonomic design, human factors engineering, workspace design, equipment maintenance and facility management, project management, quality control and six sigma, and supply chain management. Of use to industrial and manufacturing engineers improving facility design, assembly processes, and worker effectiveness to improve quality, achieve faster assembly, and lower worker injuries and downtime.

## **Manufacturing Engineering**

Covers agile and lean manufacturing, design for manufacturability, engineering tools and die design, manufacturing processes, rapid prototyping, CNC machines and material forming, injection molding, working with plastics and safety. Of use to manufacturing, mechanical and aerospace engineering developing novel manufacturing methods to bring products to market faster, with higher quality, and at lower cost.

## **Marine Engineering & Naval Architecture**

Covers the engineering, design and operation of boats, ships, offshore structures, oil rigs, floating platforms, and their related mechanical and electrical equipment. Provides approaches for improving ship stability, better hydrodynamic design to minimize drag and improve fuel efficiency, improving the

corrosion-resistance of metals at sea through coatings, paint and new materials, and offers compliance guidelines for life-saving equipment and design of safer vessels and structures.

## **Mechanics & Mechanical Engineering**

Covers design of motors and drives, pipe design, hydraulics, fluid mechanics and rheology, boiler and pressure vessel design, HVAC, systems and equipment, ship and vehicle design and manufacturing, Finite Element Method, and control of vibration. Of use to mechanical, aerospace, manufacturing, plumbing and automotive engineers designing mechanical devices for improved performance, increased energy efficiency and user satisfaction.

## **Metals & Metallurgy**

Covers properties of metal and metal-composite materials, corrosion resistance, forming and fabrication, heat treatment, surface coatings, working with powder materials and testing for fatigue. Of use to materials scientists, metallurgists and mechanical, aerospace engineers and civil engineers seeking stronger metals with property requirements specific to each project.

## **Mining Engineering & Extractive Metallurgy**

Covers field geophysics, soil testing, tunnel and open pit designs, belt conveyance, blasting guidelines, soil and rock strength, road design, mine ventilation and dust control, ergonomics, mineral processing methods, waste treatment, recycling and disposal, and guidelines for working with local populations and communities impacted by the operation. Of use to geologists and mining, civil and environmental engineers developing new mineral deposits, or extending the operational life of existing mines to maximize the value extracted, while minimizing cost, risk to workers or environmental impact.

## **Nanotechnology**

Covers nanofabrication, nanolithography, MEMS packaging, microjoining techniques, nanomedicine, nanofibers and nanotube composites, and nanostructured materials. Of use to chemical, mechanical, optical, biomedical and electronics engineers working on miniaturization, ultracompact designs and manufacturing at the nanoscale.

## **Nondestructive Testing & Evaluation**

Covers designing for testability; examination of welds; development of structural health monitoring protocols; evaluation of reinforced concrete, polymer composites, steel, aluminum, etc.; evaluating the performance of structures over time and selection of appropriate NDT tests for different applications.

## **Oil & Gas Engineering**

Covers geology, reservoir simulation, drilling and completion fluids, petrophysics, seismology, buried and offshore pipelines corrosion control, refinery design and operation, safety and equipment maintenance, and the chemistry and physical properties of petroleum products. Of use to petroleum, mechanical, civil and process petroleum engineers developing new reservoirs and maintaining the production capacity of existing wells while protecting worker safety and the environment.

## **Optics & Photonics**

Covers properties of optical materials, use of optics in mechanical and electronic devices, fiber optics, applications of lasers and LED, managing optical defects in imaging applications, lens design, selecting coatings to improve the performance of optics and photolithography. Of use to optical, mechanical and electronics petroleum engineers integrating optical components in aerospace, electronics, communications and imaging products.

## **Pharmaceutics, Cosmetics & Toiletries**

Covers formulations for cosmetics and toiletries, additives and preservatives, design of drug delivery methods, and manufacturing of cosmetics and pharmaceuticals. Of use to chemists and biologists, as well as chemical engineers and process engineers improving the effectiveness of drugs, the safety of cosmetics and the efficiency of their manufacture.

## **Plastics & Rubber**

Covers plasticizers and fillers, mitigating for the effects of UV light, weather and biodegradation of plastics and rubbers, innovative and emergent formulations and manufacturing processes, design of plastics and rubber for performance at extreme temperatures, injection and blow molding, rapid prototyping, thermoforming, bioplastics, composites, testing methods and recycling. Of use to chemists and chemical engineers, mechanical and process engineers working with plastics and rubber in industrial, packaging, aerospace engineering, transportation and electronics applications.

## **Process Design, Control & Automation**

Covers automation, process control, alarm systems, SCADA security, wireless networking and security, process modeling, instrumentation, PID controllers, sensor network design and protection, and flowmeters. Of use to mechanical, process and industrial engineers optimizing manufacturing processes, designing sensor and instrumentation networks, and developing robust process control and automation systems.

## **Software Engineering**

Covers the design and programming of robust software for the operation and control of equipment, monitoring of processes for safety in industrial applications, data analysis for real-time reporting and diagnostics, human-machine interface, software security and testing, embedded software, operation of communication networks and the development of scripts to interact with databases and design software. Of use to software engineers and programmers, as well as mechanical, civil, aerospace and other design engineers who develop scripts and analytical software to support their own workflows.

## **Sustainable Energy & Development**

Covers biofuel, biomass gasification, fuel cells, photovoltaic, hydroelectric and wind power generation, wind turbines, energy efficiency, LEED design, bioplastics, sustainable building and site development, and protection of groundwater and aquifers. Of use to environmental and civil engineers improving the energy efficiency of buildings, designing and implementing sustainable energy systems, and limiting the effect of development on water resources.

## **Safety & Industrial Hygiene**

Covers industrial hygiene, firefighting, moisture and mold control in buildings, occupational safety and health, air quality, noise control, electrical safety, safety audits, toxic chemicals and substances, radiation protection, safe use of radiation in medical imaging and emergency response to chemical spills. Of use to health, safety and welfare officers, as well as environmental, civil, industrial and manufacturing engineers seeking guidance on maintaining safe and productive working environments.

## **Textiles**

Covers coated and technical textiles, flame retardants, physical testing, sustainable textiles and manufacturing. Of use to materials scientists and mechanical, manufacturing and fiber engineers improving the performance of textiles for military, industrial, water treatment and aerospace engineering applications.

## **Transportation Engineering**

Covers cargo handling and storage, intermodal freight, transportation planning, road design, paving technology, land surveying and remote sensing, GIS, LRFD bridge design, bridge management, airport design and management, railway engineering, capacity planning and modeling, traffic safety and infrastructure security, and the design of culverts and water runoff. Of use to transportation, civil, structural, geotechnical and environmental engineers designing, building and maintaining essential transportation networks.

## **Welding Engineering & Materials Joining**

Covers welding materials and fillers, methods and techniques, inspection, blueprint reading, properties of standard materials, welding process design, shape selection, weld structural design, brazing, soldering and sintering, and safety. Of use to welding, mechanical and manufacturing engineers seeking welding materials and methods to improve the performance of their welded joints while improving their throughput on the production line.

## **Premium Content Offerings**

### **AICHE/CCPS - Center for Chemical Process Safety**

AICHE (American Institute of Chemical Engineers) is the world's largest society for chemical engineers. CCPS (Center for Chemical Process Safety) publications provide the latest guidelines for all those that produce, store and handle flammable, explosive and reactive materials.

### **ASM International Materials Collection**

Filled with practical information and interactive data about the selection, processing, performance and analysis of materials, this premium offering comprises 40+ reference works and features the ASM Handbook series, Atlas of Fatigue Curves and Atlas of Stress-Strain Curves, 2nd Edition and many more trusted titles.

### **ASME Boiler and Pressure Vessel Code 2001-2013, Section II**

This internationally recognized code establishes rules of safety governing the design, fabrication and inspection of boilers and pressure vessels.

## **Chemical Resistance Database: Plastics and Elastomers**

This resource helps companies select the best plastics and elastomers for a wide range of new product and process design and manufacturing settings across specialty chemical, engineering, design & construction and other industries.

## **DIPPR Project 801**

This 2015 edition of DIPPR 801 is a renowned source of Evaluated Process Design Data of physical, thermodynamic and transport properties for industrially important chemicals used in chemical process and equipment design.

## **Knovel Polymer Matrix Composites Database**

This comprehensive resource delivers an exclusive compilation of tensile, shear, flexural, compressive and impact properties data of composites, including data for 100+ prepregs in cured and uncured states, matrix resins and fiber reinforcement. Sources include NCAMP and AGATE databases and Composite Materials Handbook-17.