Course Contents
Metalworking Fluids 125: Basic Health and Safety
STLE Annual Meeting 2012

Course Chairman: Neil Canter, Chemical Solutions, Willow Grove, PA

Neil Canter received his PhD in Chemistry from the University of Michigan in 1983 and his BS in Chemistry in Brown University in 1978. He has been working in the metalworking fluid industry for over 25 years. Neil previously worked for Stepan Company and Mayco. Presently, Neil runs his own consulting company called Chemical Solutions. He specializes in commercial development, marketing, product development and regulatory support for the metalworking fluid industry. Neil is a member of the American Chemical Society, SAE and STLE. He is currently a contributing editor responsible for writing the monthly Tech Beat column in STLE’s TLT magazine. Neil is also the Chairman of the STLE’s Metalworking Education & Training Subcommittee and is a member of the STLE Education Committee. Neil has been actively involved in making presentation at past STLE Annual and Local Section Meetings and Education Courses.

This is a one day introductory course that discusses health & safety issues involved in the use of metalworking fluids. This course is designed for those new to the metalworking fluid industry from a chemical supplier, formulator, fluid maintenance and end user perspectives. Students will be informed about the reasons metalworking fluids can cause health & safety problems and ways to minimize them. Topics covering microbial contamination issues, metalworking fluid and additive toxicology, industrial hygiene and mist effects will give the student a good feel for the challenges facing metalworking fluid suppliers and end users. The course will be capped by student participation in a metalworking fluid mist case study. Students will be given an opportunity to solve an actual real world problem. Among the key concepts covered in this course are: Metalworking fluid microbiology, controlling microbial contamination, toxicology of metalworking fluids and additives, industrial hygiene, factors affecting the generation of metalworking fluid mist, and the health effects of metalworking fluid microbes.

METALWORKING FLUID MICROBIOLOGY presented by Terry Williams, The Dow Chemical Company, Spring House, PA

Dr. Terry Williams has over 30 years of experience in applied and environmental microbiology. He received his Ph.D. in Microbial Ecology and M.S. in Environmental Pollution Control from The Pennsylvania State University. His bachelor’s degree is in Biology from Gettysburg College. He was a National Science Foundation post-doctoral fellow prior to joining the industrial biocide business. He started his career with Rohm and Haas as a Senior Scientist in the Biocides Research department with a focus on antimicrobial treatment in industrial water and metalworking fluid applications. He designed model systems to demonstrate the effects of biocide treatment on microbial fouling, mechanism of action, and environmental fate. He has also developed patented technologies for stabilizing biocides in metalworking fluids and various biocide combinations. Terry joined The Dow Chemical Company in 2009 and is a Principal Microbiologist in the Dow Microbial Control division. He is responsible for global biocide technical service and customer support for metalworking fluids, water treatment, paper mill, mineral processing, natural gas, and oilfield applications. Terry has published over 46 articles and technical papers on microbial ecology and biocide applications. He has given over 86 presentations at national and international conferences, including STLE. Terry is the co-editor of a reference book and author of a book chapter on biocide selection and application. He currently holds 7 granted US patents on biocide technology and has 3 patents pending. Terry currently serves as the Chairman of the TAPPI Microbiology Committee and the Vice Chairman of the NACE Biocide Application Committee. He has also participated in several ASTM biocide/microbiology committees. He is a member of the Society for Tribologists and Lubrication Engineers, Association of Water Technologists, American Society for Microbiology and the Society for Industrial Microbiology.

In this introductory presentation, Dr. Williams will review the fundamentals of metalworking microbiology. He will first explain the cost of quality impact of uncontrolled microbial contamination. Within this context, he will describe what microbes do to metalworking fluids, machines, recirculated coolant systems and production. He will discuss where microbes are most likely to grow in coolant systems, explain how they get into coolants and provide a brief overview of what microbes are.
CONTROLLING CONTAMINATION AND MICROBIAL GROWTH IN METAL FORMING FLUIDS presented by Alan Eachus, Consultant, Villa Park, IL

Dr. Alan C. Eachus is a recent retiree from The Dow Chemical Company. He has more than thirty years of technical-support experience in nitroparaffin-based technology and antimicrobial chemistry applications, and has authored or co-authored numerous publications in US, European and Asian technical and trade journals. Dr. Eachus earned a B.S. in chemistry from Syracuse University and a Ph.D. in organic chemistry from the State University of New York, College of Forestry at Syracuse, and an M.B.A. in marketing and finance from Northwestern University in Chicago. His professional memberships include the American Chemical Society, the Society for Industrial Microbiology, the Society for Tribologists and Lubrication Engineers and the New York Academy of Sciences.

Strategies for controlling microbial contamination in metalworking fluid systems are discussed in this module. Included is a discussion of physical and chemical treatment options. A thorough review is made about how to use and assess the effectiveness of antimicrobial pesticides.

METALWORKING FLUID TOXICOLOGY presented by Fred Passman, BCA, Inc., Princeton, NJ

Dr. Fred Passman is an STLE Fellow and Certified Metalworking Fluids Specialist with 35 years experience in environmental-industrial microbiology. Since 1973, Dr. Passman has conducted research and consulted to government and private industry on topics as diverse as composting municipal sewage sludge. US EPA criteria for various groups of toxic substances in fresh-water systems, microbially enhanced oil recovery, and microbial contamination control in industrial process-fluids. Before founding BCA Inc. in spring 1992, Dr. Passman was Business Manager of ANGUS Chemical Company's Biocide Division. Dr. Passman is a member of numerous professional societies. Within STLE, He has served as Associate Editor for Tribology and Lubrication Technology, Chair, STLE Education Committee, and Chair, Metalworking Fluid Management Education and Training Subcommittee. He is presently Chair, Certified Metalworking Fluid Specialist Certification Steering Committee. Dr. Passman is the Vice-Chair of ASTM Subcommittee D.02.14 on Fuel Cleanliness and Stability. He chairs ASTM Subcommittee D.02.14 Task Force on Fuel Microbiology, is Vice Chair of ASTM Committee E.34 on Industrial Health & Safety, Chair of ASTM Subcommittee E.34.50 Health and Safety of Metalworking Fluids and is an active member of E.35.15 Antimicrobial Pesticides. He has drafted ASTM Standards for each of these committees. Dr. Passman has twice received STLE's Wilber Deutsch Memorial Award for writing excellence. He has more than 40 publications to his name.

This presentation will review the critical aspects of MWF toxicology and risk assessment that are critical for MWF manager to understand.

INDUSTRIAL HYGIENE presented by Eugene White, Cimcool Industrial Products, LLC, Cincinnati, OH

Dr. White holds a Ph.D. degree in Environmental Health from the University of Cincinnati College of Medicine, and a Master of Science (M.S.) degree in Environmental Sciences from the University of Cincinnati College of Engineering. Since 2001, he has been the Environmental, Health, and Safety Manager at Milacron LLC/CIMCOOL Global Industrial Fluids. Previously, he was a research scientist and industrial hygienist at the National Institute for Occupational Safety and Health (NIOSH) where he investigated worker exposures to endotoxin, bioaerosols, and metalworking fluids. While at NIOSH, he contributed to the widely cited “Occupational Exposure to Metalworking Fluids” criteria document (1998). Dr. White has published numerous peer-review papers dealing with metalworking fluid exposures, and other industrial hygiene topics. He contributed chapters to the “Metalworking Fluids” (2nd Edition) textbook on the health effects and regulation of metalworking fluids. He is a past chairman of the Safety, Health, Environmental and Regulatory Affairs Committee of the Independent Lubricant Manufacturers Association (ILMA). Dr. White was a member of the planning committee for the 3rd Symposium on Metal Removal Fluids in Dearborn, Michigan (2008), and an invited speaker at the 4th Symposium on Metal Removal Fluids in Barcelona, Spain (2011).

The risk of hazards that can be encountered in working with metalworking fluids are discussed in this module. Steps that can be handled to minimize exposure are examined. These include the need for developing a health and safety program.
FACTORS AFFECTING MIST GENERATION AND PLANT MIST CONCENTRATION presented by John Howell, GHS Resources, Inc.

John K. Howell, Ph.D. has over forty-one years experience in metal finishing and metalworking technology and in safety, health and environmental affairs. John received his BS and PhD degrees in Chemistry from Drexel University, Philadelphia, PA and a Master's degree in organizational development from Loyola University, Chicago. After over twenty-three years at Castrol Industrial North America and predecessor companies, and five years with DA Stuart as Safety, Health and Environmental Advisor, John now is a principle with GHS Resources, Inc. Previously, John has served as Chairman, Independent Lubricant Manufacturers Association H&S Task Force, as a member of OSHA's Metalworking Fluids Standards Advisory Committee, as Chairman, ASTM Committee E34 on Occupational Health & Safety and as Chair, Subcommittee E34.50, Health & Safety Standards for Metalworking Fluids. John is also past Chair of the STLE Metalworking Fluid Steering Committee and Certification Subcommittee. He has participated as a member of ORC-Worldwide Metal Removal Fluids Task Force, and has published or presented many technical papers on metalworking fluid health and safety topics.

This presentation covers the cause and impact of mists in a metalworking fluid facility. Real world techniques for managing mists and reducing their impact on the manufacturing environment are covered.

HEALTH EFFECTS OF METALWORKING FLUID MICROBES presented by Fred Passman, BCA, Inc., Princeton, NJ

Over the past decade our understanding of health risks associated with employee exposure to metalworking fluid microbes has increased substantially. This molecule will provide insights into what we now know about diseases caused by metalworking microbes or biomolecules, and what remains theory and speculation.

MIST CASE STUDY presented by John Howell, GHS Resources, Inc.

The course's final module will apply much of the knowledge covered six proceeding module to walk participants though a case study. In this case study, workers in parts of the plant were complaining about respiratory irritation. We will discuss the diagnostic effect, investigator observations, and recommendations, the plant’s actions and the effect of those actions.