Course Contents
Metalworking Fluids 115: Basic Metal Removal Fluids
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 one day introductory course on metal removal fluids covers the key concepts needed to better understand how metalworking fluids are prepared, used and maintained. Students will be informed about the reasons for using metal removal fluids and their functions. Key metal removal operations will be covered and information provided about reasons why specific metal removal fluids are needed for particular metal removal operations. The chemistry of metal removal fluids, insight into the need to control microbial contamination and the importance of adopting a health & safety program in a facility machining metal are all covered in this course. Among the key topics is measures needed to understand and control metal removal fluid failure. Students completing this course will gain information that can help them prepare for the Certified Metalworking Fluid Specialist exam.

METAL REMOVAL OPERATIONS presented by John Steigerwald, Etna Products, Inc., Chagrin Falls, OH

John has been in the metalworking lubricants business for over 30 years. He spent the first 19 years with Cincinnati Milacron Products Division as it was known at the time. He held various positions including: Technical Services Manager, Product Marketing Manager, Fluid Management Program Development Manager, Market/Business Development and North American Business & Operations Manager. He has been with ETNA for the last 12 years. John has been very active in the STLE, SME and ILMA organizations. He has presented at the national and local chapter STLE Meetings and participated on the SME Speaker tour on metalworking fluids for over 10 years. John has participated in the ILMA organization actively for the last 24 years in various capacities; Used Oil Task Force, Triazine Task Force, Chairman of the MSDS Task Force, Chairman Worker Health & Safety Committee, Chairman Metalworking Lubricants Committee, Chairman of the 50th Anniversary, Board of Director, Officer and Past President. He is currently a member of the ILMA Ethics Committee and Membership Drive Committee. He is also currently serving on the STLE Steering Committee of the Metalworking Fluid Certification and Certificate Programs, Marketing Chair for the Metalworking Fluid Certification Program and serving on the Subcommittee for the Metalworking Certificate Program. He graduated with honors from the University of Cincinnati with a business and industrial management degree and a lifetime member of the 1440 Club's Time Management Club of the University of Cincinnati Career Dynamics Center.

This presentation provides a comprehensive review of metal removal operations from a user perspective including video of some of these machining operations.

METALWORKING FLUID CHEMISTRY & TANKSIDE ADDITIVES presented by Neil Canter, Chemical Solutions, Willow Grove, PA

This module covers the basic types of additives used in metalworking fluids with an emphasis on fluids for use in metal removal operations. Additives that can be added tankside to an actual metalworking fluid are also covered. Examples of metalworking fluid additives include: rust preventatives, lubricity additives, emulsifiers and antifoaming agents.
CONTROLLING MICROBIAL CONTAMINATION IN METALWORKING FLUIDS
presented by Al 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.

INDUSTRIAL HYGIENE OF METALWORKING FLUIDS presented by Fred Passman, BCA, Inc., Princeton, NJ

Dr. Fred Passman has over 35 years of experience in environmental-industrial microbiology. After receiving his A.B. in Microbiology from Indiana University, Dr. Passman entered the U.S. Navy, where he served as an Engineering Office aboard a destroyer. He left active duty and entered the Reserves in 1973 to pursue his Ph.D. in marine microbiology at the University of New Hampshire. Since 1973, Dr. Passman has conducted research and consulted to government and private industry on topics as diverse as composting municipal sewage sludge, U.S. EPA criteria for various groups of toxic substances in fresh water systems, microbially enhanced oil recovery, and microbial contamination control in industrial process-fluids. Dr. Passman is a member of the editorial board of for the International Journal of Biodegradation and Biodeterioration. Dr. Passman has received STLE's Wilber Deutsch Memorial Award for writing excellence. He has more than 30 publications to his name. Dr. Passman has chaired ASTM Subcommittee D.02.14 Task Force on Fuel Microbiology since its inception in 1989. He has also received an ASTM Award of Appreciation for his efforts within D.02.14. Dr. Passman is also Chair of the ASTM Subcommittee E.34.50 Health and Safety of Metalworking Fluids and an active member of E.35.15 Antimicrobial Pesticides. He has drafted ASTM Standards for each of these committees.

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.

UNDERSTANDING AND CONTROLLING METAL REMOVAL FAILURE presented by John Burke, Houghton International, Inc., OH

John Burke is the Global Director of Engineering Services for Houghton International. He received his engineering degree from the University of Dayton in 1971. He has 40 years of experience in the metalworking industry and has five US patents. John has been an instructor for the STLE Metalworking Fluid Education Course for over 20 years. He received the P.M. Ku Award from STLE in 2006. He was the Chairman for the Third Symposium for Metal Removal Fluids Symposium in 2008. He has received Governors' Awards for waste minimization in the States of Ohio and Tennessee for a metalworking fluid recycling system design. John received an award from President George Bush at the White House in 1991 for advances in waste minimization.

This module describes the basic mechanisms of metal removal fluid failure and provides techniques that need to be used in controlling failure and extending fluid life. Typical problems that can be encountered in using metal removal fluids are discussed. Troubleshooting techniques are furnished to assist with overcoming these problems.
METALWORKING FLUID CONDITION MONITORING presented by Neil Canter, Chemical Solutions, Willow Grove, PA

Techniques are discussed for measuring the concentration of and assessing the condition of metalworking fluids in use. Several methods are described for carrying out each of these procedures.

FLUID CONDITION MANAGEMENT presented by Alan Eckard, Monroe Fluid Technology, Chester, NY

Dr. Eckard received a BSc. in chemistry from Rensselaer Polytechnic Institute and a Ph.D. in physical chemistry from the University of Liverpool, England. He was a research fellow and later a Lecturer in Chemistry at the University of Keele, England. He returned to North America as a research fellow at the University of Toronto. Dr. Eckard worked for Pennwalt (Atochem) in the specialty chemicals group as a research director and product manager prior to assuming senior technical positions at several manufacturers of metalworking and finishing products. He was most recently associated with Witco Corp (now Chemtura Corp) as director of research for their petroleum specialties group. With over 30 years experience in formulation technology and additive chemistry, Dr. Eckard has been at the forefront of technology for lubrication, corrosion protection and surface finishing for metalworking and fabrication of metals. Dr. Eckard is now Vice President of Technology for Monroe Fluid Technology. He holds numerous patents and has published widely in various trade and technical journals and is currently affiliated with the New York Section of STLE.

Steps that need to be taken to determine the state of a metalworking fluid in use are covered in this module. Parameters to troubleshoot are reviewed and sample data showing the condition of a metalworking fluids system is examined.