

**Mission Statement:**

To advance the science of tribology and the practice of lubrication engineering in order to foster innovation, improve the performance of equipment and products, conserve resources, and protect the environment.

STLE membership supports and expands your professional abilities through:

Education: Top-rated and affordable courses are offered live at a variety of locations or through the Members Only section of the STLE website. ([See LubeLearn courses.](#))

Certification: Earn recognition and valuable credentials through STLE-sponsored programs: Certified Lubrication Specialist (CLS), Oil Monitoring Analyst (OMA) and Certified Metalworking Fluids Specialist (CMFS).

Professional Networking: Offered at two major international conferences, local section meetings or one of 23 technical committees and industry councils.



For more information on the fall conference, [please link](#)

August 2006

[Are you familiar with how the Constructal Law of physics applies to turbulence, animal design, cracks in solids, dendritic solidification, droplet impact configuration and more? Hear one of the 100 most highly cited authors worldwide in engineering at the IJTC on October 23-25, 2006 in San Antonio.](#)

[What is in the new Handbook of Lubrication and Tribology, Volume I, second edition? And how long will it be on sale?](#)

[What was happening the year the first edition of Metalworking Fluids was published?](#)

[What was happening the year the first edition of the Handbook of Lubrication and Tribology, Volume I, was published?](#)

[What is the STLE Metalworking Fluids Forum?](#)

[How do I use the STLE Metalworking Fluids Forum? Simplified instructions here.](#)

[Table of Contents of Tribology and Lubrication Technology, August 2006](#)

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**Dr. Adrian Bejan examines Constructal Theory at 2006 IJTC**

Dr. Adrian Bejan will discuss "The Constructal Theory of Generation of Flow Configuration in Nature and Engineering" at the 2006 International Joint Tribology Conference (IJTC), Oct. 23-25 at the Hyatt Regency San Antonio in San Antonio, Texas (USA).

Constructal Theory is the view that the generation of flow configuration is a phenomenon that can be based on a physics principle called the Constructal Law. This principle predicts natural configuration across the board: river basins, turbulence, animal design, cracks in solids, dendritic solidification, earth climate, droplet impact configuration and more.

The Constructal Theory yields new designs for electronics, fuel cells and tree networks for transporting people, goods and information. Bejan's lecture introduces a new paradigm that is universally applicable in natural sciences, engineering and social sciences.



Dr. Adrian Bejan

Ranked as one of the 100 most highly cited authors worldwide in engineering by the Institute for Scientific Information, Bejan is the J.A. Jones Professor of Mechanical Engineering at Duke University in Durham, N.C. He attained his doctorate in mechanical engineering from MIT in 1975 and has authored hundreds of articles and more than a dozen books.

Co-sponsored by STLE and ASME, the 2006 IJTC features more than 200 technical presentations in four formats: technical talks based on full-length papers, special symposia, panel discussions and student posters.

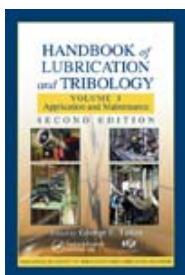
Technical tracks are organized around the following 14 areas:

- Tribomaterials
- Lubricants and additives
- Elastohydrodynamic lubrication

[here](#)

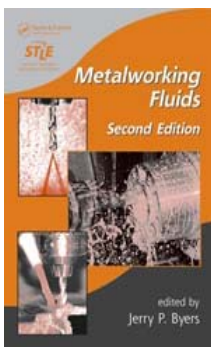


For more information on the STLE Annual Meeting, [please link here](#)



[Order online here.](#)

As a special benefit, STLE is offering savings of \$60 off the publisher's price and \$30 off the members price on **The Handbook of Lubrication and Tribology** through August 31st only. **Hurry.**



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- Hydrodynamic lubrication and fluid film bearings
- Rolling element bearings
- Engine tribology
- Machine components tribology
- Contact mechanics
- Magnetic storage tribology
- Manufacturing/metalworking tribology
- Nanotribology
- Engineered surfaces
- Biotribology
- Emerging Technologies.

Before Oct. 2 registration for the IJTC is \$495 for STLE and ASME members and \$600 for individuals who do not belong to either society. Student members register at no charge. Student non-members are charged \$100. After Oct. 2 add \$100 to these fees.

For more information and to register, log on to www.stle.org. Click on the IJTC logo and you'll link to the IJTC homepage. You can register online or through a faxable form. That site is also the fastest way to make your reservation at the Hyatt Regency San Antonio.

For more information about the 2006 IJTC, contact Cindy Tomala at ctomala@stle.org.

[Back to top](#)

What is in the new Handbook of Lubrication and Tribology, vol. 1, second edition, and how long will it be on sale?

[Order online here.](#)

Through August 31st only, STLE is offering member savings on The Handbook of Lubrication and Tribology. It is now available for a special member only price of \$190. Members will save \$60 on tribology's most valued resource which is now fully updated and reorganized.

Samples of the content from the new Handbook of Lubrication and Tribology, Volume I, second edition follow. What you need to know about Lubrication Engineering is now readily available and easily used in this new Handbook of Lubrication and Tribology, Volume I, second edition.

This book is loaded with helpful and informative pictures, diagrams, tables and formulas and is written in easy to understand and use language.

The book is set up so the first section has specific Applications, such as Steam Turbines; Compressors and Vacuum Pumps; Basic Hydraulic Pump and Circuit Design; and Tribology of Hard Disk Drives –Magnetic Data Storage Technology. The second part of the book has Industrial Lubrication Practices, including specific industries like Steel; Textile Fibers/Fabrics; and Food-Grade Lubricants and the Food Processing Industry. The third section has Maintenance, including Contamination Control and Failure Analysis; Lubricant Properties and Test Methods; and Used Oil Recycling and Environmental Considerations. There are 2 appendices and a 23 page index in the final section. The extensive Index makes finding what you are looking for easy. For example, here is the listing under Airflow.

Airflow

- Air/oil separation 6-13 – 6-14
- Oil firing 6-14
- System pressurization and sealing 6-11
 - Carbon seals 6-11
 - Brush seals 6-11
 - Labyrinth seals 6-12 – 6-13
 - Ring seals 6-13
 - Hydraulic seals 6-13
- Vent system 6-13

The following random tidbits from the Handbook give just a hint of what can be found inside.

If a table explaining the typical products for the Steel Industry by type with principle uses and pertinent information and % consumption would be helpful, then you should look at Table 18-7. Samples are Fire Resistant Fluids for invert emulsions, water glycols, and organic esters – for fluid power are used in 4 of 9 plants.

Table 23.2 is a two and a half page table on the lubrication of sawmill equipment from the Lubrication in the Paper and Timber Industries chapter. The washer machine components of motor bearings, coupling and gear case are listed, with the lubricant needed (grease, grease, and synthetic ISO 460 respectively) and the frequency for applying, inspecting and sampling.

Test Your Knowledge (August 2006)

Questions:

1. Grease is made up of the following three major components: (1.) base oil, (2.) a thickener and (3.) additives. (True or False)
2. What type of action can be taken to correct/adjust for poor water quality?
3. Under normal conditions, what is considered a slow, gradual process that continues throughout the life of a piece of equipment?
4. NLGI No. 2 grade grease is thinner than a No. 1 grade grease. (True or False)
5. Name five possible causes that could introduce water into a pump bearing oil sample.

Answers:

1. True.
2. Treat the water (i.e., deionize, etc.)
3. Wear.
4. False. (Correct answer: thicker)
5. (1.) Leaky seal, (2.) Water was in a new oil container, (3.) Water was in a secondary container used to bring oil from storage to pump, (4.) Sample container contaminated the sample and (5.) Ambient conditions.

Upcoming 2006 Exam Dates & Locations

(Note: More exam dates to be added as they become

On 28-28, close up pictures of lump growth on tool steel are shown. This is taken from the chapter on Friction and Wear in Lubricated Sheet Metal Forming Processes.

The chapter on Degradation of Lubricants in Service Use has Table 29-2 with some indicative combinations of wear elements. For example, silver, copper and lead elements would have an indicative cause of small-end bush.

The chapter on Lubrication Program Development and Scheduling has specific components that are common to a simple conveyer. Table 33.1 shows items, make, model, number, components, type, make and model of component.

The all new chapter on Centralized Lubrication Systems – Theory and Practice, is loaded with helpful diagrams and pictures on every page.

If you know or need to know exactly what joule per kilogram Kelvin (page A2-7) is or to convert the barye to pascal (page A2-11) then you should have the Handbook of Lubrication and Tribology.

These are random samples of what can be found in this comprehensive Handbook of Lubrication and Tribology, Volume I, second edition. To get your copy, [Order online here](#)

[Back to top](#)

What was happening the year the first edition of Metalworking Fluids was published in 1994?

The Dow-Jones hit a high of 3,978 and a low of 3,593 in 1994.

New words and usages during 1994 include: information superhighway, cyberspace, Internet, e-mail, netiquette, virtual [anything], Cyber- [anything], unplugged.

In the news in 1994:

Clinton Ends Trade Embargo on Vietnam
Four Muslim Extremists are Found Guilty of World Trade Center Bombings
Former football Star O. J. Simpson is Arrested in LA for Murder of wife, Nicole, and Her Friend Ron Goldman
At White House, Jordan and Israel End State of War

Notable quotes from 1994:

"I have recently been told that I am one of the millions of Americans who will be afflicted with Alzheimer's disease....I now begin the journey that will lead me into the sunset of my life" Ronald Reagan, in a letter to the nation

"Life is like a box of chocolates. You never know what you're gonna get." From the film Forrest Gump

"I'm not an Uncle Tom...I'm going to be here for 40 years. For those who don't like it, get over it." Supreme Court Justice Clarence Thomas

Advances in science and technology in 1994 include:

AZT is shown to reduce transmissions of AIDS to infants by two-thirds.
Studies reveal that anger increases heart attack risk; exercise raises HDL, the good cholesterol.
Researchers find that certain kinds of peptic ulcers, caused by the bacterium Helicobacter pylori, can be cured with antibiotics.
Laser radial keratotomy is approved for nearsightedness.
The Tokamak Fusion Test Reactor at Princeton emits 107 million watts of power, a great advance in fusion power.
Clementine travels to the moon and discovers dense polar ice.
The top quark, the 6th, one of the basic particles of matter, is identified.

Nobel Prizes in 1994 include:

George A. Olah in chemistry for new methods of manipulating hydrocarbons.
Clifford G. Shull in physics for improving neutron probes of atomic structure.
Alfred G. Gilman and Martin Rodbell in physiology or medicine for discovering G-proteins, which help cells control fundamental life processes.

[To see more of what was happening in 1994, click here.](#)

available)

July 28
(CLS, OMA I/II and CMFS exams)
Crowne Plaza Market Center
7050 Stemmons Freeway
Dallas, Texas
(214) 259-0513

Aug. 4
(CLS, OMA I/II and CMFS exams)
Doubletree Guest Suites
Esplanade Conference Center
2111 Butterfield Road
Downers Grove, Ill.
(630) 971-2000

Aug. 18
(CLS, OMA I/II and CMFS exams)
Singapore Marriott Hotel
320 Orchard Road
Singapore
+65-6735-5800

Aug. 25
(CLS, OMA I/II and CMFS exams)
Embassy Suites Hotel
4800 S. Tyron Street
Charlotte, N.C.
(704) 527-8400

Sept. 29
(CLS, OMA I/II and CMFS exams)
Holiday Inn Crowne Plaza
10 Lincoln Square
Worcester, Mass.
(508) 791-1600

For more information regarding STLE's certification exam dates and programs, please contact Barbara Rapacz, certification and programs administrator, at STLE headquarters (847) 825-5536 or brapacz@stle.org

Source:

American Chronicle Year by Year Through the 20th century by Lois Gordon and Alan Gordon. Yale University Press, New Haven, 1999 copyright.

[Back to top](#)

What was happening when the first edition of the Handbook of Lubrication and Tribology, Volume I, was published, in 1983?

As a special benefit, STLE is offering savings of \$60 off the publisher's price and \$30 off the member price on The Handbook of Lubrication and Tribology through August 31st only. Hurry. [Order online here.](#)

The **Dow-Jones** hit a high of 1,287 and a low of 1,027, exceeding 1,200 for the first time

Products for sale included Radio Shack's CB with priority switch priced at \$119.95. The Sony Walkman D-6 (with Dolby) was priced at \$229.99

In the News in 1983:

Record \$189 Billion Deficit is projected
Reagan urges high-tech antiballistic missile research
Scowcroft commission recommends single warhead mobile ICBM and MX in existing silos
Terrorists bomb U.S. embassy in Beirut, over 100 die
Industrial production rises 2.1% in one month, highest in 8 years
House votes 228-195 to bar covert Contra aid
Opposition leader Benigno Aquino is assassinated in Manila Airport on return from exile in U.S
Korean air lines 007 is shot down by Soviet missile in Russian airspace, 279 are killed
2 million in Western Europe demonstrate against the U.S missile deployment
U.S and Caribbean troops invade Grenada "to forestall Cuban takeover"

Notable quotes from 1983:

"[The USSR] is a focus of evil in the modern world." Ronald Reagan

"We do not want a Central American country to go communist on our watch."
James Baker, White House Chief of Staff, on Nicaragua

"We all felt the majesty of the body... [and] were reverent... As we saw the artificial heart beat in Dr. Clark, the feeling was not, aren't we great, but aren't we small."
Dr. William C. DeVries, surgeon

Advances in science and technology in 1983 include:

Nonsurgical destruction of kidney stones with sound waves is pioneered.
The shuttle Challenger completes four missions, including the first spacewalk since 1972; Pioneer 10 becomes the first man-made object to leave the solar planetary system.
The Pershing II missile is tested, a single intermediate-range nuclear warhead.
Evidence of the bottom quark is found at Cornell.
Studies of Alzheimer's disease, which affects 2.5 million, focus on neurotransmitter acetylcholine deficiency.
The use of cyclosporine to deactivate T-lymphocytes is shown to improve transplant success by 30 percent.
Eric Kandel demonstrates structural change as a product of learning in a one-celled animal (alypsia).

Nobel Prizes in 1983 include:

Henry Taube wins in chemistry for his work on electron transfer reaction.
Subrahmanyan Chandrasekhar and William Fowler win in physics for studying how stars age and collapse.
Barbra McClintock wins in physiology or medicine for researching genetic changes in plants.

[Back to top](#)

Fads during 1983 include:

CD players, no frills flying (PeoplExpress, Newark- London: \$149), no caffeine sodas (Coca-Cola, Pepsi) data banks, "networking," wine coolers, expensive cooking items (olive oils, goat cheese, designer ice creams, shiitake mushrooms), flavored popcorn (grape), Ray-Ban and Vuarnet sunglasses, break dancing, Cabbage Patch dolls (with birth certificate and adoption papers).

New words and usage: evil empire, Star Wars (SDI), yuppie, nuclear winter

Entertainment notes:

The largest TV audience of the year watches the last episode (251st) of M*A*S*H, begun during the Vietnam War (1972).

Newly appointed solo news anchors are Tom Brokaw and Peter Jennings.

Controversy increases over cable programming with obscenity and graphic sexuality.

Major Art sale includes Degas' "Waiting" (\$3.7 million, record price for an impressionist painting)

In Fashion, Jennifer Beals in Flashdance sets a fashion trend- clothing with holes and tears.

Movie Star News.

Sports

In Football the USFL begins with 12 teams in a spring-summer format.

NFL draftees include Dan Marino and John Elway, who signs for a record \$5 million for five years.

The NBA contract is the first in sports to include revenue sharing (53%) with players.

[To see more of what was happening in 1983, click here.](#)

Source:

American Chronicle Year by Year Through the 20th century by Lois Gordon and Alan Gordon. Yale University Press, New Haven, 1999 copyright.

[Back to top](#)

What is the STLE Metalworking Fluids Forum?

Take advantage of the Members Only section of the STLE website www.stle.org to ask a question on the Metalworking Fluids Forum. If you are studying for the Certified Metalworking Fluids Specialist examination or need to solve a question at work, take advantage of the knowledge and experience of your peers and experts. Take a look at the sample discussions below, and then ask your question day or night, regardless of your time zone.

A condensed sample of a discussion follows.

forum: stle-metal_working_fluids_forum

Machining aluminum

I would like to know the best type of coolant for machining aluminum. Is it a semi-synthetic or does it depend on the type of aluminum? Are there any differences for cast aluminum as is used in the automotive industry?

Regards,

Dennis

RE: Machining aluminum

Good Morning Dennis,

As is often the case with coolants, there is no one definitive answer.

Our experience has shown that different alloys of aluminum do not necessarily all machine with the same. About 5 years ago, we found that one cast aluminum was about 25% more difficult to machine than another cast aluminum. This caused one of the automotive companies great problems as they apparently didn't realize this and tooled up their transfer line based on the easier machining cast aluminum. Because of this, they could not make the required production.

The other thing they found was that the coolant selection was dependant upon the machining application. On the transfer line I mentioned above, this automotive company was attempting to bore and tap. The line was fed by a central coolant system that obviously only ran at one concentration. Boring is an operation that requires a great deal of cooling while tapping is an operation that requires a great deal of lubrication. When they added water to the soluble oil they were using (to improve the cooling), they ran into a problem with their taps. When they added concentrate to the system to improve the lubricity (concentration went up to 20%), they ran into a boring problem. The funny (sad) part of this story is it went on like this for a couple months. We eventually worked out a compromise concentration that gave them satisfactory tool life (not optimum) for both their bores and taps.

So that being said, the answer to your question is there may be no answer. It really depends upon what machining applications are being conducted, what the materials are, what coolant application methods are being used, and the big one, what the customer is willing to pay.

One last thing I forgot to mention is that the coolant cannot stain the aluminum or cause "white rust".

*Hope this helps,
Tom*

[Back to top](#)

RE: Machining aluminum

We suggested something similar to this but they were reluctant to try this because they felt that with time the concentration in the central system would climb resulting in the boring problem.

I'm sure you recognize that there are a number of non-coolant issues that directly related to the rest of this answer. They were running this particular coolant only in this line so they could not remove some of the mixed coolant and transfer it other lines that might have been able to use the mixed coolant. They would have had to dispose of the mixed coolant or put it into some sort of storage tanks. This would have raised the overall cost of dealing with the coolant and was outside the scope of their chemical management contract. The transfer line was brand new and there was a reluctance to redesign any part of the system.

The real secret to solving this problem was to recognize that the aluminum alloys were different and that you needed different cutting tools to resolve the issues that arose.

Tom

[Back to top](#)

How to use the Metalworking Fluids Online Discussion Forum

[Click here to print these instructions.](#)

The Forum is a free member service that allows quick interaction with experts. Ask questions in preparation for a certification exam or to solve a problem for your company. Please contact STLE at 847-825-5536 or information@stle.org if you need assistance. Make sure you are logged in with your name and member number.

To read the Online Metalworking Fluids Forum:

1. Go to www.stle.org
2. Make sure you are logged in on the left with your name and member number.
3. At the bottom of the page click on "STLE's Online MWF Forum"
4. Click on "ALREADY A MEMBER? If you are already a STLE member, click here" to access the Members Only section and the MWF Online Forum. Accept.

To ask a question, create a new message in the tab that says messages, and click ok.

To read emails once daily or as they occur you must set up your user name the first time only.

1. To get all responses conveniently in your email, go to the tab that says "My Account".
2. Go to the last drop down menu called "Membership Type".
3. Select either normal or digest to receive messages directly to your email as they are contributed or once a day.
4. Save changes.

[Back to top](#)

Table of Contents of Tribology and Lubrication Technology, August 2006/VOLUME 62/NO. 8

FEATURES**20 Minutes With ...** Tom Warren

This executive recruiter for the lubricants industry talks about the quest for qualified candidates, ways to strengthen staff capacities and the so-called 'brain drain.'

By Thomas T. Astrene

LUBRICATION FUNDAMENTALS

I get misty...no more!

Controlling mist contamination in metalworking plants is a top priority for fluid managers in protecting the environment of their operations.

By Dr. Robert M. Gresham

PRACTICAL APPLICATIONS

How to knock 'em DEAD every time

Want to keep your sales career moving in a positive direction? Focus on these four self-

attributes? Desire, Enthusiasm, Awareness and Discipline. (Third of a four-part series) By

Jerry L. Kennedy

FEATURE ARTICLE

Tribology frontiers in electrical contacts

When you get down to .000001 amps—or up to one million amps—lubricating electrical contacts becomes a whole new ballgame.

By Linda A. Day

PEER-REVIEWED PAPER (Editor's Choice)

Environmental Effects on the Friction of Hydrogenated DLC Films

By H.I. Kim, J.R. Lince, O.L. Eryilmaz and A. Erdemir

Departments**Tech Beat**

Developing a motorized nanocar; synthesis and characterization of noble metal nitrides; making biodiesel in a microreactor.

By Dr. Neil Canter

Sounding Board

Readers share their greatest failure analysis success stories and cost savings.

Test Your Knowledge**New Products**

Condition and predictive maintenance system; electrical insulating compound; ferrous debris monitor; polyalkylene glycol base fluids.

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This month's newsmakers include Uniqema, ANGUS Chemical, Cannon Instruments and more.

Resources

Keep up-to-date with the latest technical literature available in print and online.

Columns

President's Report: Lessons learned from the past.

From the Editor: Finding needles in haystacks.

Headquarters Report: A bright future for associations.

Shop Floor: Time to look in the mirror.

Cutting Edge: Remembering David Tabor.

[Back to top](#)

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http://www.stle.org/address_change/index.cfm

The Society of Tribologists and Lubrication Engineers

840 Busse Highway • Park Ridge, IL 60068-2376 • Phone: (847) 825-5536 • Fax: (847) 825-1456

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