fea INFORMATION
Engineering Solutions

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LSTC Livermore Software Technology Corp. DLFK DYNA MORE

RESCALE

YouTube Multiphysics

LENOVO

FEA Information Inc. is a publishing company founded April 2000, incorporated in the State of California July 2000, and first published October 2000. The initial publication, FEA Information News continues today as FEA Information Engineering Solutions. The publication's aim and scope is to continue publishing technical solutions and information, for the engineering community.

FEA Information Inc. Publishes:

FEA Information Engineering Solutions

FEA Information Engineering Journal

FEA Information China Engineering Solutions

Livermore Software Technology, Corp. (LSTC)

Developer of LS-DYNA One Code Methodology.

- LS-DYNA provides fully integrated, strongly coupled, solvers for extensive multiphysics capabilities.
- LS-DYNA Solvers are strongly coupled and integrated, at no additional cost.
- LS-DYNA is optimized for shared and distributed memory for Unix, Linux, & Windows Based platforms.

DYNAmore GmbH – LSTC's Master Distributor in the EU

DYNAmore is dedicated to supporting engineers with LS-DYNA to solve non-linear mechanical problems numerically.

- Has 85 engineers in Europe.
- Provides sales and teaching support,
- Co-develops the LSTC software and provide engineering services.

Finite Element Analysis * Hardware * Software * Cloud * Consulting * CAD * CAE Distribution* * Implicit * Explicit *Applications * Press Releases * Events * Training

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Hengstar Tech.


Oasys
The Software House of Arup


GOMPUTE
A GRIDCORE COMPANY

FEA Information News Sections

Articles – Blogs - News

Sections

You will notice our format has changed. We welcome our additional participants, partners, editors, and consultants

1st news

We welcome Rescale, a cloud simulation platform that helps engineers and scientists build, compute, analyze, and scale simulations with high performance computing(hpc)

2nd news

We welcome our new Editor, **Marnie Azadian,** who will be working on our special sections LSTC US & DYNAmore Ghmb On Line Resources & our section Aerospace & Automotive News.

3rd news

Dilip Bhalsod, Technical Manager of Automotive Applications, LSTC Michigan.
Starting with the September issue, Dilip has joined us as a consultant for our section Automotive Industry News & Events.

4th news

Yanhua Zhao, Editor in Chief, of FEA Information Engineering Solutions China Edition, and LSTC's Administrator of China Business & China Distributorships.
Starting with the September issue, Yanhua has joined us as consultant to the FEA Information Engineering Solutions US edition on China News and Events.

5th news

We welcome **DYNAmore Ghmb, LSTC, and Dalian Fukun**.

Sincerely, Marsha Victory – Trent Eggleston — Marnie Azadian – Suri Bala - Dilip Bhalsod – Yanhua Zhao

FEA Information Engineering Solutions US Edition

Tay with my Pony, Cody.

Tay is his rider in horse shows. Here she is very proudly displaying their winner's ribbons and buckle. Tay won the Divions for 10 years old and younger championships at the D'Alonzo Winter Series

Cray Returns to Australia's Bureau of Meteorology With New Supercomputer and Storage Contract

SEATTLE, WA -- (Marketwired) -- 07/21/15 -- Global supercomputer leader Cray Inc. (NASDAQ: CRAY) today announced the Bureau of Meteorology in Australia has awarded the Company a contract worth up to $53 million to provide a Cray® XC40™ supercomputer and a Cray Sonexion® 2000 storage system. This further strengthens Cray's leadership position in the global operational weather and climate community as an increasing number of the world's leading centers rely on Cray supercomputers to run their complex meteorological and mission critical models.

With headquarters in Melbourne and offices in each Australian state capital city, the Bureau of Meteorology is Australia's national weather, climate and water agency. Its expertise and services assist Australians to better manage the impacts of their natural environment, including drought, floods, fires, storms, tsunami and tropical cyclones. Through regular forecasts, warnings, monitoring and advice spanning the Australian and Antarctic region, the Bureau provides one of the most fundamental and widely used services of government.

This contract marks a return of Cray systems to the Bureau, which in the past ran its weather models on earlier generation Cray® X-MP™ and Cray® Y-MP® supercomputers. With the Bureau's new Cray XC40 supercomputer, researchers and scientists will have the computational resources to run nearly eight times as many more daily forecasts than their current system with five times the improvement in global model resolution.

"The Bureau of Meteorology produces a wide range of weather forecasts and meteorological services that have significant socio-economic impacts to a vast number of people, and we are honored that a Cray supercomputer will power their models," said Peter Ungaro, president and CEO of Cray. "The amazing amount of data and science embedded in weather and climate models is a great example of how data-driven our world is becoming today. Our vision and experience in helping customers leverage the increased complexity of data-intensive, production-quality supercomputers is a huge part of why the world's leading operational weather and climate centers continue to turn to Cray. We are excited to be back in the Bureau, and we look forward to a long partnership."

Cray XC40 supercomputers are engineered to meet the performance challenges of today's most demanding HPC users. Special features of the Cray XC40 supercomputer include: the industry-leading Aries system interconnect; a Dragonfly network topology that frees applications from locality constraints; optional DataWarp applications I/O flash SSD accelerator technology; innovative cooling systems to lower customers' total cost of ownership; the next-generation of the scalable, high performance and tightly integrated Cray Linux Environment that supports a wide range of applications; Cray's HPC optimized programming environment for improved performance and programmability, and the ability to handle a wide variety of processor types, including Intel® Xeon® processors, Intel® Xeon Phi™ coprocessors, and NVIDIA® Tesla® GPU accelerators.

The Cray Sonexion 2000 storage at the Bureau will be delivered in phases and, all total, will include more than 12 petabytes of high performance storage capacity. Cray's Sonexion storage system combines Cray's Lustre® expertise with a tightly integrated, unique design that allows for maximum scalability and performance. Management and operations are simplified through an appliance design with all storage components including software, storage and infrastructure.

Consisting of products and services, the multi-year, multi-phase contract includes contracted deliverables and options for future deliverables. If the options are exercised as expected, the total contract is valued at about $53 million, net of applicable taxes. The first phase of the contract is expected to be completed in 2016 and if exercised, the second phase is expected to be completed in 2019.

For more information on the Cray XC™ series of supercomputers and Cray Sonexion storage systems, please visit the Cray website at www.cray.com.

About Cray Inc. (For Complete Information on Cray, Inc. visit www.cray.com) - Excerpt: "Global supercomputing leader Cray Inc. (NASDAQ: CRAY) provides innovative systems and solutions enabling scientists and engineers in industry, academia and government to meet existing and future simulation and analytics challenges…

Safe Harbor Statement (For Complete Safe Harbor Statement on Cray, Inc. visit www.cray.com) - Excerpt: "This press release contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934 and Section 27A of the Securities Act of 1933, including, but not limited to, statements related to the timing of deployment of any system that has been or may be purchased by the Bureau of Meteorology..."

Cray, Sonexion and Y-MP are registered trademarks of Cray Inc. in the United States and other countries, and XC40, X-MP, and XC are trademarks of Cray Inc. Other product and service names mentioned herein are the trademarks of their respective owners.

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Cray Investors: Paul Hiemstra/
206/701-2044/ir@cray.com
Source: Cray Inc.

Rescale:

Cloud Simulation Platform

The Power of Simulation Innovation

We believe in the power of innovation. Engineering and science designs and ideas are limitless. So why should your hardware and software be limited? You shouldn't have to choose between expanding your simulations or saving time and budget.

Using the power of cloud technology combined with LS-DYNA allows you to:

- Accelerate complex simulations and fully explore the design space
- Optimize the analysis process with hourly software and hardware resources
- Leverage agile IT resources to provide flexibility and scalability

True On-Demand, Global Infrastructure

Teams are no longer in one location, country, or even continent. However, company data centers are often in one place, and everyone must connect in, regardless of office. For engineers across different regions, this can cause connection issues, wasted time, and product delays.

Rescale has strategic/technology partnerships with infrastructure and software providers to offer the following:

- Largest global hardware footprint – GPUs, Xeon Phi, InfiniBand
- Customizable configurations to meet every simulation demand
- Worldwide resource access provides industry-leading tools to every team
- Pay-per-use business model means you only pay for the resources you use
- True on-demand resources – no more queues

ScaleX Enterprise: Transform IT, Empower Engineers, Unleash Innovation

The ScaleX Enterprise simulation platform provides scalability and flexibility to companies while offering enterprise IT and management teams the opportunity to expand and empower their organizations.

ScaleX Enterprise allows enterprise companies to stay at the leading edge of computing technology while maximizing product design and accelerating the time to market by providing:

- Collaboration tools
- Administrative control
- API/Scheduler integration
- On-premise HPC integration

Industry-Leading Security

Rescale has built proprietary, industry-leading security solutions into the platform, meeting the needs of customers in the most demanding and competitive industries and markets.

- Manage engineering teams with user authentication and administrative controls
- Data is secure every step of the way with end-to-end data encryption
- Jobs run on isolated, kernel-encrypted, private clusters
- Data centers include biometric entry authentication
- Platforms routinely submit to independent external security audits

Rescale maintains key relationships to provide LS-DYNA on demand on a global scale. If you have a need to accelerate the simulation process and be an innovative leader, contact Rescale or the following partners to begin running LS-DYNA on Rescale's industry-leading cloud simulation platform.

LSTC
DYNAmore
JSOL Corporation

Rescale, Inc. - 1-855-737-2253 (1-855-RESCALE) –
info@rescale.com
944 Market St. #300, San Francisco, CA 94102 USA

LS-DYNA: Observations on Implicit Analysis

A series of informal articles about one engineer's usage of LS-DYNA to solve a variety of non-crash simulation problems.

By: George Laird, PhD, PE
Principal Mechanical Engineer, Predictive Engineering
George.Laird@PredictiveEngineering.com

I'm doing more and more implicit work with LS-DYNA and would like to share some of my observations on its improvement over the last couple of years. You might be surprised how far Mortar Contact and linear dynamics (e.g., PSD and general NVH) have come. This article provides a quick little overview of what is happening with LS-DYNA implicit, some tips and tricks we have learned along the way, and resources that are available to sharpen up your skill set.

Why Bother? Our work at Predictive Engineering is typically the straight-up "classic" linear analysis. Although pretty ho-hum in comparison to a massive nonlinear dynamic crash model, it is still challenging enough to keep us on our toes to get validated results. The big change we have seen over the years is that even our vanilla FEA models are pushing the boundaries with nonlinear contact or mild forms of plasticity or elastomeric materials. Using a standard implicit code is always possible but if you build for LS-DYNA from the very beginning, a world of analysis options become available and if the setup cost is the same, why not opt for more options?

Implicit First Steps - Let's do the simple stuff first; that is, LS-DYNA can match up linear, elastic stresses with the best of them. Figure 1 contours the von Mises on a quarter-symmetry, uniformly loaded plate with a hole. The results between a standard Nastran code and LS-DYNA are identical. If you build the model using hexs or tets you'll likewise get identical results. For the plate model, I'm using ELFORM=20 (CQUAD4-like element) with *DATABASE_EXTENT_BINARY
with maxint < 0 and then with the standard implicit cards. If you would like the models, just send me an email and I'll send you the commented decks.

To get the stresses to match up, one uses Extrapolate > 0 within the latest version of LSPP. Just to keep you on your toes, the LSTC team also has a new stress extrapolation routine under *DATABASE_RECOVER_NODE.

Nastran Linear Elastic Analysis LS-DYNA Linear Elastic Analysis

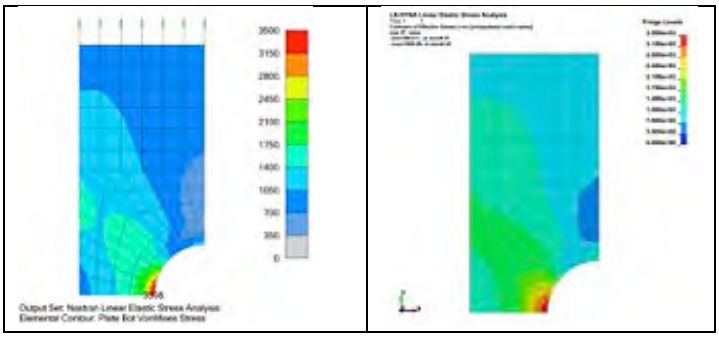


Figure 1: Comparison of linear elastic stress results

Okay, But Can It Solve Real Nonlinear Problems? And the answer is "sometimes." Of course there are limitations but that is life in the implicit world. Let's talk about reality. It is all about where you are going with the analysis. For example, in a turbine burst analysis, one can lock down large parts of the model with *BOUNDARY_SPC _BIRTH_DEATH and likewise turn off or on contacts (BT or DT options), implicitly spin up the blade and then switch over to explicit for the blade containment analysis. A more common usage is just to run the model in implicit model and then request intermittent eigenvalue value analyzes to verify that the model is behaving correctly, or just to capture its vibration response while parts are contacting and plastically deforming.

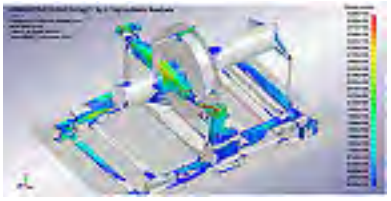
In running LS-DYNA implicit, we set modest expectations and try to get a solution. If things work well, we then crank up the nonlinearity. I strive to build small pilot models of regions that have multi-body contact or other nonlinearities and then tune the analysis to run with this simple model. Once I have the pilot model figured out, the full-scale model is not as daunting and I'm not spinning my wheels as much waiting for a solution.

The most interesting recent development is that for Mortar Contact. We have had really good success with it on a variety of models. The two models shown in Figure 2 both solved in minutes. The jet engine stand had lots of contact with material plasticity and elastomeric shock mounts. The client's specification also required a normal modes assessment under load and this was simply incorporated into the run using *CONTROL_IMPLICIT_EIGENVALUE with –NEIG (to reference an eigenvalue vs time curve). However, the eigenvalue extraction has been around for some time. What I think is particularly noteworthy is the beam-on-beam Mortar Contact model. This little model had around 15,000 beams elements and the complete torsion analysis with failure took around 10 minutes running on four CPU-cores (MPP).

esides these two examples, we have been working on a large composite structure with *MAT_54 as the material model and the workhorse *MAT_24 for the metallic components (with IACC=1). The structure has a large metallic joint along with several internal contacting components. The model ended up having 22 beam-on-beam, surface-on-surface and single-surface mortar contacts. For economy, several parts were just tied (_CONSTRAINED_OFFSET). Bolts were pre-loaded and composite failure was active with several of the load cases causing large sections of the composite shell to fail. This model is one of our crown-jewels of implicit since the client's specification had a dozen static (implicit) load cases along with drop, roll-over and rail-impact dynamic (explicit) load cases. The final model has a tad over 100,000 nodes and runs in about 15 minutes on a standard PC Workstation with MPP LS-DYNA.

Jet Engine Transport Stand

5g Lateral with Intermittent Eigenvalue



Endoscopic Medical Instrument (beam-on-beam contact)

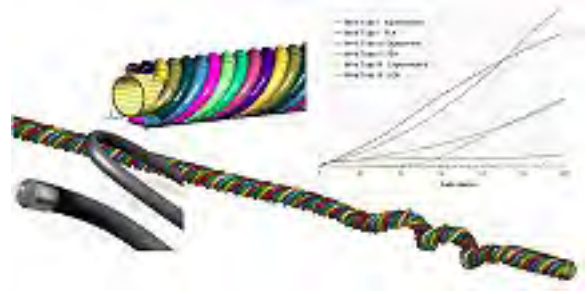


Figure 2: Examples of implicit simulation models with multiple nonlinearities

How Can I Learn More About LS-DYNA Implicit? I know this sounds a bit funny, but Google "implicit LS-DYNA" and you'll see a bunch of really great articles. My short list is the DYNAmore guidelines, an earlier publication of theirs titled "Non-linear Analysis Using LS-DYNA Implicit", followed by a slow and thoughtful read of the latest Keyword Manual. Another nice reference is the work done by Roger Grimes of LSTC (one can look within DYNAlook or Google for Roger's work).

There are no shortcuts to learning except to build from a base of understanding via small pilot models and then test your assumptions one-by-one until you have enough confidence to "jump off the cliff" toward building a more complex model.

Acknowledgment - Although I like to say that one can independently learn, the reality is that without the gracious and outstanding help from the LSTC technical team, I would have spent double the time trying to get these models to run. In paying forward their help, if you would like to have any of the Keyword decks (albeit minus the proprietary stuff), just send me an email.

George Laird, PhD, PE,
Principal Mechanical Engineer
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http://blog.lenovo.com/en/blog/social-super-fan-jin-li-becomes-an-innovator/

Social Super Fan, Jin Li, becomes an Innovator!

One of our ThinkRevolution Social Super Fans, Jin Li, has hit the first level of fandom, he is now a ThinkRevolution Innovator. Congrats, Jin!

We want to share a little information about our Social Super Fans as they progress in their quest to become a Revolutionist, here's what we learned about Jin:

Jin currently toggles between the hometowns of Melbourne, Australia and Shanghai, China. He gets to enjoy the sunshine, and hustle and bustle of the big city!

Jin is the Co-Founder of ALPAKA and Founder of ThinkScopes.com. He enjoys bringing technology and functionality together with beauty.

Jin is a technology champion! He's has been a Microsoft MVP for 5 years and Lenovo Insider and Influencer for 4 years. His love for technology transcends all Lenovo products; has had over 70 ThinkPads (I dare you to beat that number!)! He currently uses his ThinkPad X1 Carbon for traveling and the ThinkPad W550s and W530 for a little more grounded heavy-duty work. Though Jin has a love for mobile, he also owns a ThinkStation S30 for when he needs a more powerful CPU and GPU. We asked Jin what applications he uses when he is putting his workstations through the paces at ALPAKA and he told us he mainly creates using AutoCAD, SOLIDWORKS, and Adobe.

We knew that with all those applications running on his Lenovo systems, Jin had to be working on some cool projects, so we asked him what they were. Here's what he told us, "Since founding ALPAKA, I think all of the projects that I work on are pretty cool, but I would have to say that designing a modular backpack and smart bottles have been the coolest so far at ALPAKA. Most of the digital prototyping and rendering done on these projects is handled by our Lenovo Workstation, utilizing the NVIDIA Quadro GPU has really helped reduce rendering time."

It's obvious Jin is a Lenovo enthusiast so we asked him "why Lenovo?" Here's what he had to say, "I chose Lenovo because of ThinkPad, but more importantly because I believe in the brand value and what it stands for. Lenovo for me is more than just a PC or technology company; it is a company that turns dreams into reality. I often think of Lenovo as a friend, a friend that pushes you to move forward, a friend that helps you to achieve your dream. Much like the new culture model: 'Never stand still'."

We are excited Jin Li has joined ThinkRevolution as a Social Super Fan; you'll see him posting all about Lenovo from @lead_org!

August News
Multi-scale Simulation Software
The latest version of J-OCTA v1.9 has been released

For full information visit: J-OCTA News
Excerpts: Latest Version of J-OCTA

J-OCTA, an integrated simulation system for polymeric material, is widely used in material R&D Center of Industry and University. J-OCTA predicts material properties with multi-scale simulation technology (from atomic to micrometer scale) and supports the development of wide variety of high functional materials.

What's new on J-OCTA v1.9:

- OCTA8 (the latest version of OCTA) is supported.
- Drawing Speed is improved about 3 times faster (with 1 million particles,) on "COGNAC post processor".
- The file converting function from PDB to UDF is improved.
- The bond information can be generated with distance between atoms automatically. Moreover, the force field parameters can be assigned to the model on J-OCTA.
- A force field verification tool is added to the monomer modeler.
- Sheet and spherical fillers can be created based on DPD model to estimate the dispersed structures of nano-composite materials. Also,
- "VSOP".

.

dispersed structures are able to export to Digimat by using Python script on "COGNAC Modeler".

- DPD calculation with the entanglement effect is now available.
- The entanglement effect is expressed by using the slip-spring between polymer chains on

STUDENT EDITION – NO FEE
Free "J-OCTA Student Edition" has been released"

- "J-OCTA Student Edition" is a free software for materials research. Consisting of some basic function extracted from "J-OCTA" advanced simulation system, it is useful for small calculation and validation. Moreover, it is notable that the atomistic molecular modeling tool is available which is not included in "OCTA", open source version of "J-OCTA".
- Again, it is free software with no license required.
- Try it! Feel free to use it for your material research.

Blog EinNel team visits LSTC & Dr. Facundo Del Pin

www.lstc.com

Dr. Facundo Del Pin of LSTC (extreme left) located in Livermore, CA., hosted a visit by Mr. Albert Einstein and his team, from EinNel, India.

EinNel Blog **http://einnel.com/blog/?p=30**

"As part of the US visit, EinNel team had a fruitful meeting with Dr.Facundo Del Pin at LSTC office, Livermore. Dr.Facundo is one among the developers of ICFD solver in LS-DYNA. EinNel has been LS-DYNA users since a long while and the meeting helped strengthen the bond with LSTC for our future endeavors and missions".

We thank EinNEL for sharing the abve blog post on their website

KAIZENAT Technologies Pvt, Ltd Distributor - India

Kaizenat Technologies Pvt. Ltd.,
Ramesh Venkatesan –
Director | +91 98453 47769

Kaizenat Technologies Pvt. Ltd., is a long standing FEA Information Engineering Solutions Participant and LSTC distributor in India. Kaizenat Technologies Pvt. Ltd., distributes LSTC's software in India, as well as hosting LS-DYNA India conferences and training classes.

For complete information visit:
http://kaizenat.com

14th International LS-DYNA® Users Conference

Livermore Software Technology Corp. (LSTC) and DYNAmore Ghmb, welcome you to the 14th International LS-DYNA Users Conference.

The conference will host a forum for engineers, professors, students, consultants, industry leaders, and interested parties to exchange their ideas, and listen to the latest industry presentations.

Application Areas Being Accepted: Questions – send to papers@lstc.com Subject: Conf

- Transportation
- Biomechanics
- Metal Forming
- Aerospace
- Heat Transfer
- Seismic Engineering
- Civil Engineering
- Modeling Techniques
- Nuclear Applications
- Electro Magnetics
- Occupant Safety
- Ship Building
- Automotive Crashworthiness
- Compressible Fluid Dynamics
- Virtual Proving Ground
- Manufacturing Processes
- Ballistic and Penetration
- Impact and Drop Testing

Abstract Deadline: Nov. 11, 2015
Notification No later than Dec 15, 2015
Paper Deadline: March 05, 2016

The **presenter** (1) of each accepted paper will receive free admission to the conference, providing the presenter is registered at the Royal Dearborn Hotel under the LSTC Conference registration.

Abstract Length:
Approx. 300 words, please include figures, if possible

Paper Length:
Max. of 3,000 words, single-spaced, 8-1/2" x 11" paper

Format:
MS Word template will be provided

Conference Schedule & Training

Sunday, June 12, 2016:

- Registration for early arrivals,
- Training opportunities during day
- Exhibitors open in evening,
- Reception

Monday, June 13:

- Registration,
- Conference,
- Banquet

Tuesday, June 14, 2016.

- Registration,
- Conference
- Closing session - about 3pm

Wednesday, June 15

Thursday, June 16

- 1& 2-day Training at U-M Dearborn

Conference Sponsorship and Booth Information

For information on Sponsorships and Booths please contact Marsha vic@lstc.com

Previous Sponsors and Exhibitors: If you would like the same booth that you hosted, at the last conference, please let me know so I can quickly reserve your booth placement.

AEROSPACE & AUTOMOTIVE NEWS & EVENTS

The purpose of this section is to provide a place, for our automotive and aerospace readers, to share news and events relative to their company and/or products.

The criteria for submitting information is as follows:

- It has to be public information
- An internet URL
- Be technical, informational, or human interest.
- We do not accept financial quarterly information

We would welcome the opportunity to share information about your company with our readership.

You may send Title to your information and the accompanying URL to Marnie Azadian at agiac99@aol.com - Subject Line please use " A&A FEA News Section"

Submissions should be received by the 15th of each month, of the month you want your article placed. For example: We would need the title of the news or event by December 15th, 2015 to be featured in the December 2015 FEA newsletter.

Submission publications is at the sole discretion of FEA Information Inc.

The following are for August: All are copyright© to their respective companies.

- Mercedes-Benz was a general sponsor at the European Equestrian Championships 2015
- Ford Secures 1,000-Plus U.S. Jobs, Starts Production of All-New Ford F-650/F-750
- Medium-Duty Trucks in Ohio
- Toyota Groundbreaking Celebration - Sometimes a shovel just doesn't cut it.
  2015 TRD Pro Series Tundra
- U.S. Marines Corps Declares the F-35B Operational

Mercedes-Benz was a genaeral sponsor at the European Equestrian Championships 2015

Aachen, Germany

Aachen/Berlin – The history of equestrian sport in Aachen dates back to 1898. In this long history of success, 2015 ranks as a very special year. "Mercedes-Benz has a long tradition of involvement in equestrian sport, as is impressively demonstrated by its over 60 years of partnership with the CHIO Aachen. We are especially pleased to have the opportunity to make a special contribution with our general sponsorship of this year's FEI European Championships", says Dr Jens Thiemer, Vice President Marketing Mercedes-Benz Cars.

The FEI European Championships was held held from 11 to 23 August 2015 in the grounds of the tradition-steeped Aachen Soers. For the first time, five equestrian disciplines will be contested at a single location. One of the high points of the Championships, which are expected to attract some 450,000 visitors, is the team show-jumping event, the Mercedes-Benz Cup, which will take place on 20 and 21 August. Riding for their respective nations, the best show-jumpers from across Europe will compete to provide the spectators in the packed stadium with the famous Aachen atmosphere of thrilling excitement. The Mercedes-Benz Cup, with prize money of 300,000 euros on offer, will be hotly contested not only by the defending title holders from Great Britain, but also by the German team around Mercedes-Benz Brand Ambassador Meredith Michaels-Beerbaum.

Mercedes-Benz is general sponsor of the FEI European Championships: Mercedes-Benz has close, long-standing ties with equestrian sport in Aachen. It is therefore almost logical that it should now take on the role of general sponsor of the European Championships. "For decades, there has been a very special link between equestrianism and our brand. It is not just values such as elegance and sportiness; in this special year, it is above all our new products that additionally strengthen these close ties", says Dr Carsten Oder, Chairman of the Board of Management of Mercedes-Benz Cars Sales Germany and Head of Mercedes-Benz Sales Germany, enthusing about the partnership.

"For these reasons, we have also extended our partnership with the CHIO until 2018", explains Dr Oder.

New Mercedes-Benz fence: Elegance and sportiness will also be demanded of the riders competing in the Mercedes-Benz Cup – especially at an entirely new and challenging obstacle: the internationally renowned course designer Frank Rothenberger has designed a special fence for Mercedes-Benz. The riders, horses and spectators can expect an innovative design that will focus on the main design elements of the brand, the star and the colour black.

Mercedes-Benz helps out with the organization: The brand with the star is making 54 shuttle vehicles available to ALRV (Aachen-Laurensberg Racing Club). In addition, five Mercedes-Benz G-Classes will serve as course vehicles. Apart from the chauffeuring service, Mercedes-Benz will also be prominently represented in the exhibitor area, where visitors will be able to immerse themselves in the fascinating world of Mercedes-Benz's product diversity. In the tournament grounds, visitors will have an opportunity to experience 15 Mercedes-Benz models close-up on the exhibition stand. Among others, Mercedes-Benz's entire SUV range will be on view: the GL, GLA, GLC, GLE, G-Class and, of course, the new GLE Coupé.

Mercedes-Benz and equestrian sport: Mercedes-Benz has been a long-standing sponsor of top-level equestrian sport, not only with its involvement in the European Championships and the CHIO, but also with its national involvement in, among other events, the Hamburg Derby, German Masters in Stuttgart, Donaueschingen, Frankfurt, Pforzheim and other tournaments as well as with its rider forums (over 200 Mercedes-Benz rider forums across Germany since 2007 with a total of more than 85,000 visitors). More information is available at www.mercedes-benz.de/reiten .

Ford Secures 1,000-Plus U.S. Jobs, Starts Production of All-New Ford F-650/F-750 Medium-Duty Trucks in Ohio

- Ford kicks off production of 2016 F-650/F-750 for the first time in the United States; medium-duty truck lineup – previously assembled in Mexico – now built at Ohio Assembly Plant
- All-new F-650/F-750 medium-duty truck production shift to Ford's facility in Avon Lake, Ohio, helps to secure more than 1,000 UAW hourly jobs and $168 million U.S. plant investment
- 2016 Ford F-650/F-750 trucks, available this summer, deliver commercial-grade quality, capability and convenience, and feature segment-exclusive Ford diesel and gasoline engines, delivering strong performance at an affordable price

AVON LAKE, Ohio, Aug. 12, 2015 – All-new Ford F-650/F-750 medium-duty trucks roll off the line today for the first time in the United States. Production of the trucks at Ohio Assembly Plant, previously built in Mexico, helps secure more than 1,000 hourly UAW jobs and a $168 million plant investment in the United States.

2016 F-650/F-750 trucks, the toughest, smartest, best-value medium-duty trucks ever, anchor Ford's commercial vehicle lineup – America's best-selling commercial trucks for 30 straight years. Ford is the only truck manufacturer that provides vocational customers an unmatched one-stop shop to meet their needs – from the Class 1 Transit Connect cargo van to the Class 7 F-750 tractor rig.

"Our investment in Ohio Assembly Plant reinforces our commitment to building vehicles in America and to delivering best-in-class commercial trucks," said Joe Hinrichs, Ford president, The Americas. "Working with our partners in the UAW, we found a way to make the costs competitive enough to bring production of a whole new generation of work trucks to Ohio."

Offered in Regular Cab, SuperCab and Crew Cab body styles and in straight-frame, dock-height and an all-new dedicated tractor model for heavy towing applications, the 2016 F-650/F-750 line features a bold new look inside and out.

Ford is the only medium-duty truck manufacturer that designs and builds its own diesel engine and transmission combination – ensuring the powertrain will work seamlessly with all chassis components and vehicle calibrations.

Along with its 6.7-liter Power Stroke® V8 diesel engine option, Ford remains the only automaker to offer a gasoline-powered engine in the medium-duty truck segment. The 6.8-liter V10 with 320 horsepower and 460 lb.-ft. of torque now will be available for both F-650 and F-750 models with the heavy-duty TorqShift six-speed automatic transmission. The 6.8-liter can be factory-prepped for converting to compressed natural gas or liquid propane gas as cost-effective alternatives to gasoline.

Ohio Assembly Plant investment - In 2014, Ford announced a $168 million investment to shift production of F-650 and F-750 from Mexico to Ohio Assembly Plant, in addition to adding new body shop equipment and other tooling needed to produce the medium-duty vehicles. The production shift from Mexico is part of the collective bargaining agreement Ford and the United Auto Workers negotiated in 2011.

"Through collective bargaining, we were able to secure production of the Ford F-650/F-750 to Ohio Assembly Plant," said Jimmy Settles, UAW vice president and director, National Ford Department. "Building these world-class vehicles in America helps secure jobs for more than 1,000 UAW members and provides economic growth for the Avon Lake community. Strengthening the economy through job creation continues our efforts to rebuild the American middle-class and communities all across this nation."

Opened in 1974, Ohio Assembly Plant employs nearly 1,400 people and is one of the largest employers in Lorain County. In addition to now producing all Ford F-650 and F-750 models and configurations, the plant also produces Ford E-Series cutaway vans and stripped chassis.

Toughest, smartest, best-value Ford medium-duty truck ever 2016 Ford F-650/F-750 trucks are the toughest, smartest, best-value Ford medium-duty trucks ever – providing the ideal combination of value, capability and upfit readiness in the segment.

These attributes underscore the F-650/F-750's position as the future of medium-duty trucks:

•**Toughest:** Fully designed and developed by Ford truck engineers in Dearborn, Mich.; robot-tested on taxing durability courses; 500,000-plus miles of harsh dynamometer engine testing at extreme power levels and temperatures; Ford-built in the U.S.

•**Smartest:** All-new upfit-friendly chassis developed in cooperation with leading industry body makers; clean chassis capable of accommodating vocational bodies with little to no modification; all-new dedicated tractor model for heavy towing

•**Best value:** Choice of segment-exclusive 6.8-liter V10 gas engine or 6.7-liter Power Stroke V8 diesel – both backed by Ford's heavy-duty TorqShift six-speed automatic transmission enhanced for medium-duty use with great power, performance and fuel economy; includes unsurpassed five-year/250,000-mile warranty and national network of Ford service centers.

Toyota Plows Ahead with New Production Engineering Building in Georgetown

Groundbreaking Celebration Includes Donation of Vehicles to Three Local Nonprofits

Sometimes a shovel just doesn't cut it.

2015 TRD Pro Series Tundra

To break ground on its new production engineering campus in Georgetown today, Toyota called in a pro. A 2015 TRD Pro Series Tundra, that is.

During a ceremony Tuesday, the custom-designed Toyota truck took the spotlight, moving dirt to signal the start of construction on the building that will soon house the company's North American production engineering team. Located on the grounds of Toyota's largest vehicle manufacturing operation, once complete, the 250,000 sq. ft. building will include a state-of-the-art test lab and provide an innovative work space for approximately 700 team members.

Toyota's expansion in Georgetown represents a local investment of $80 million, and marks its third major groundbreaking event in North America since the start of the year.

"Bringing Toyota's production engineering team under one roof is a key element of Toyota's ongoing unification of our North American operations, which includes a new headquarters in Plano, Texas and new facilities in Ann Arbor, Michigan," said Toyota North America CEO Jim Lentz. "The impact of these investments will be felt by our customers through improved quality, adoption of new technologies and greater value of the vehicles we produce, like the iconic Camry built here in Georgetown, Kentucky."

At the ceremony, Toyota thanked the community for nearly three decades of support by announcing donations of three Toyota vehicles to local organizations. These included: •Salato Wildlife Education Center, which engages over 100,000 people annually through education about the importance of Kentucky's natural resources;

- SOAR (Shaping Our Appalachian Region), an organization formed by Kentucky Governor Steve Beshear and Congressman Hal Rogers to re-grow and diversify the economy in Eastern Kentucky;
- Scott United, an arm of the Georgetown-Scott County Chamber of Commerce aimed at advancing workforce development in the hometown of Toyota's largest vehicle manufacturing plant.
- Joining Lentz were 100 production engineering team members, many of who are soon-to-be residents of Central Kentucky. As part of the expansion, Toyota is relocating approximately 300 people to the Georgetown campus, a move that furthers Toyota's commitment to drive more local decision-making and ultimately faster, more precise response to the needs of the marketplace.

"We are excited to expand the presence that Toyota started over 25 years ago," said Production Engineering Senior Vice President, Tadahisa Isono. "From this facility, we will not only support our diverse workforce and network of manufacturing operations throughout North America, we will also equip our team to bring the future of manufacturing to the present."

Construction is expected to be complete in 2017.

About Toyota: Toyota (NYSE:TM), the world's top automaker and creator of the Prius and the Mirai fuel cell vehicle, is committed to building vehicles for the way people live through our Toyota, Lexus and Scion brands. Over the past 50 years, we've built more than 30 million cars and trucks in North America, where we operate 14 manufacturing plants (10 in the U.S.) and directly employ more than 42,000 people (more than 33,000 in the U.S.). Our 1,800 North American dealerships (1,500 in the U.S.) sold more than 2.67 million cars and trucks (more than 2.35 million in the U.S.) in 2014 – and about 80 percent of all Toyota vehicles sold over the past 20 years are still on the road today.

Media Contacts

- Rick Hesterberg 859-351-4780
- Ashley Chatham 859-473-3709

U.S. Marines Corps Declares the F-35B Operational

Despite extensively-documented capability shortfalls, and having reportedly demonstrated low availability during sea trials on USS Wasp in May, the F-35B STOVL variant has been declared operationally capable by the US Marine Corps. (USMC photo)

WASHINGTON --- The U.S. Marine Corps' F-35B Lightning II aircraft reached initial operational capability July 31, 2015 with a squadron of 10 F-35Bs ready for world-wide deployment.

Marine Fighter Attack Squadron 121 (VMFA-121), based in Yuma, Arizona, is the first squadron in military history to become operational with an F-35 variant, following a five-day Operational Readiness Inspection, which concluded July 17.

“I am pleased to announce that VMFA-121 has achieved Initial Operational Capability in the F-35B, as defined by requirements outlined in the June 2014 Joint Report to Congressional Defense Committees,” said Gen. Joseph Dunford, Commandant of the Marine Corps. “VMFA-121 has ten aircraft in the Block 2B configuration with the requisite performance envelope and weapons clearances, to include the training, sustainment capabilities, and infrastructure to deploy to an austere site or a ship. It is capable of conducting Close Air Support, Offensive and Defensive Counter Air, Air Interdiction, Assault Support Escort and Armed Reconnaissance as part of a Marine Air Ground Task Force, or in support of the Joint Force.”

Dunford stated that he has his full confidence in the F-35B’s ability to support Marines in combat, predicated on years of concurrent developmental testing and operational flying.

“Prior to declaring IOC, we have conducted flight operations for seven weeks at sea aboard an L-Class carrier, participated in multiple large force exercises, and executed a recent operational evaluation which included multiple live ordnance sorties," said Dunford. "The F-35B’s ability to conduct operations from expeditionary airstrips or sea-based carriers provides our Nation with its first 5th generation strike fighter, which will transform the way we fight and win.”

As the future of Marine Corps tactical aviation, the F-35 will eventually replace three legacy platforms: the AV-8B Harrier, the F/A-18 Hornet, and the EA-6B Prowler.

"The success of VMFA-121 is a reflection of the hard work and effort by the Marines in the squadron, those involved in the program over many years, and the support we have received from across the Department of the Navy, the Joint Program Office, our industry partners, and the Under Secretary of Defense. Achieving IOC has truly been a team effort," concluded Dunford.

The U.S. Marine Corps has trained and qualified more than 50 Marine F-35B pilots and certified about 500 maintenance personnel to assume autonomous, organic-level maintenance support for the F-35B.

VMFA-121's transition will be followed by Marine Attack Squadron 211 (VMA-211), an AV-8B squadron, which is scheduled to transition next to the F-35B in fiscal year 2016. In 2018, Marine Fighter Attack Squadron 122 (VMFA-122), an F-18 Hornet squadron, will conduct its transition.

LSTC & DYNAmore Ghmb On Line Resources

The purpose of this section is to provide an area, for LSTC and DYNAmore engineers, to share their on line resources. All distributors should use the LS-DYNA Corporate Tutorial & Content site, if they have videos to be shared in this area.

Corporate Tutorials, Videos and Content

www.youtube.com/user/lstcanddynamore -
This channel is to offer information on the general-purpose finite-element program LS-DYNA and LS-DYNA's, fully integrated, strongly coupled, solvers for extensive multiphysics capabilities. All LS-DYNA Solvers are strongly coupled and integrated, at no additional fees.

The criteria for submitting information is as follows:

- The information has to reside on line,
- URL would be either LSTC, DYNAmore or the LS-DYNA Corporate Tutorial and Content Site.
- Once uploaded to the Corporate You Tube Channel, you may send the URL to the information you would like to share.

Submit the title to your information, accompanying URL, and your photo (optional) to Marnie Azadian at agiac99@aol.com Subject Line please use "Resource - FEA News Section"

Submissions will be published in the monthly news, received prior to the 15th of any month.

Submission publication is at the sole discretion of FEA Information Inc.

YouTube Channel Multiphysics – LS-DYNA

LS-DYNA Multiphysics

Facundo Del Pin fdelpin@lstc.com

This simulation shows the extensive multiphysics capabilities of LS-DYNA.

Three LS-DYNA strongly coupled integrated solvers are used in the kettle simulation.

LS-DYNA CFD Solver
LS-DYNA Solid Thermal Solver
LS-DYNA Electromagnetism Solver

You Tube .Electric Kettle simulation using LS-Dyna

The electric kettle simulation shows the heating of water inside an electric kettle, which is plugged in to a standard 110V switch.

To simulate the electric kettle heating water, three LS-DYNA solvers are coupled.

The LS-DYNA CFD solver is coupled to the LS-DYNA Solid thermal solver, and the LS-DYNA Electromagnetism solver.

- **LS-DYNA's One Code Methodology uses fully integrated, strongly coupled, solvers for extensive multiphysics capabilities. LS-DYNA Solvers are strongly coupled and integrated, at no additional fees.**
- Optimized for shared and distributed memory with the following platforms: Unix, Linux, & Windows Based platforms
- For a 30-day no cost, demonstration license of LS-DYNA contact sales@lstc.com

FAQs

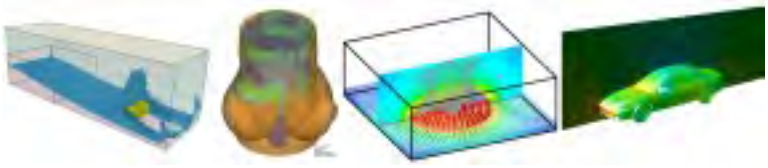
LSTC provide a huge number of FAQs at the ftp site ftp.lstc.com/outgoing/support/FAQ . Many thanks to Jim Day of LSTC for making this information available.

Some specific popular FAQs include:

consistent units
ftp://ftp.lstc.com/outgoing/support/FAQ/consistent_units
An overview of Contact
ftp://ftp.lstc.com/outgoing/support/FAQ/contact.overview
Soft Contact
ftp://ftp.lstc.com/outgoing/support/FAQ/contact.soft1
General guidelines for Crash Analysis
ftp://ftp.lstc.com/outgoing/support/FAQ/guidelines.pdf
Hourglass Control
ftp://ftp.lstc.com/outgoing/support/FAQ/hourglass_condensed
Dealing with Instabilities
ftp://ftp.lstc.com/outgoing/support/FAQ/instability.tips
Dealing with long run times
ftp://ftp.lstc.com/outgoing/support/FAQ/long_run_times
Mass Scaling
ftp://ftp.lstc.com/outgoing/support/FAQ/mass_scaling
Negative Volume in Brick Elements
ftp://ftp.lstc.com/outgoing/support/FAQ/negative_volume_in_brick_element.tips
Quasi-static simulations
ftp://ftp.lstc.com/outgoing/support/FAQ/quasistatic
Restarting Analyses
ftp://ftp.lstc.com/outgoing/support/FAQ/restart
Modeling spinning bodies
ftp://ftp.lstc.com/outgoing/support/FAQ/spin
Spring Back
ftp://ftp.lstc.com/outgoing/support/FAQ/springback
Stress vs Strain for plasticity models
ftp://ftp.lstc.com/outgoing/support/FAQ/stress_vs_strain_for_plasticity_models
User-defined materials
ftp://ftp.lstc.com/outgoing/support/FAQ/user_defined_materials.faqFAQs

LS-DYNA Support Site

www.dynasupport.com



LS-DYNA Support

At this site you will find answers to basic and advanced questions that might occur while using LS-DYNA, information about new releases and ongoing developments.

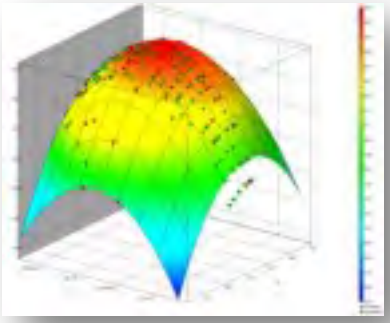
2015 Recent Changes

July 14, 2015
History Variables for Certain Material Models

Jun 08, 2015
Some guidelines for implicit analyses using LS-DYNA

May 29, 2015
Contact Energy Discrete Beam
Mar 20, 2015

Jan 15, 2015
LS-DYNA R7.1.2 (R7.95028) released



LS-OPT

LS-OPT, the graphical optimization tool that interfaces perfectly with LS-DYNA,

Allows the user to structure the design process, explore the design space and compute optimal designs according to specified constraints and objectives. The program is also highly suited to the solution of system identification problems and stochastic analysis.

The graphical tool LS-OPTui interfaces with LS-DYNA and provides an environment to specify optimization input, monitor and control parallel simulations and post-process optimization data, as well as viewing multiple designs using LS-PREPOST.

Optimization

- Size-/Shape optimization
- Constraints, mixed continuous/discrete variables, multiple load cases, etc.
- Multi-Objective optimization (Pareto Frontier)
- Reliability based design optimization

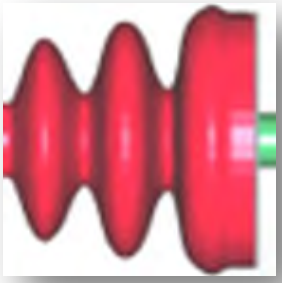
LS-TaSC

Topology Optimization

A tool for the topology optimization of non-linear problems involving dynamic loads and contact conditions. It can be used to find a concept design for most structures analyzed using LS-DYNA.

LS-DYNA EXAMPLES

www.dynaexamples.com



LS-DYNA Examples

The site presents approximately 200 LS-DYNA examples from various training classes. The input files and several class notes are available for download.

The download is free of charge, a login is not required. The majority of content has been contributed by LSTC/DYNAmore. The content is prepared for educational purposes. Hence, material properties and other parameters might be non-physic for simplification.

Among the files and Sections:

LS-DYNA Keyword Search If you are looking for an example containing some specific LS-DYNA keyword you may use the site search in the header section of this page.

Show Cases This folder contains several LS-DYNA examples focusing on specific load cases or keywords.

Metal Forming The examples in this section are from the introductory class on metal forming from LSTC. You may access the examples separately by the menu on the left. The examples are prepared for LS-DYNA 970 and upwards.

ALE The examples in this section are from the ALE (Arbitrary Lagrangian Eulerian Method) class of M'hamed Souli. M'hamed Souli is Professor at the University in Lille France. Both authors are key developers for the powerful capabilities of the Eulerian Methods in LS-DYNA. You may access the examples separately by using the menu on the left. The examples run with LS-DYNA 970 and upwards.

Thermal The examples in this section present examples about the thermal capabilities of LS-DYNA. The examples are provided by Dr. Art Shapiro. Art is working since decades on topics reated to DYNA3D, LS-DYNA and TOPAZ. He is the key developer for the thermal capabilites of LS-DYNA. Art is one of the co-founders of LSTC. You may access the examples separately by using the menu on the left.

LS-DYNA CONFERENCE PULBICATIONS

www.dynalook.com

DYNAlook

DYNAlook

The site presents papers from European and International LS-DYNA User Conferences and papers provided by other users. 1604 papers are available.

The papers are from LS-DYNA Conferences and are accessible via the search functionality.

2015 will be published soon.

13th International
LS-DYNA Conference - NEW
Detroit, 2014

12th International
LS-DYNA Conference
Detroit, 2012

9th European
LS-DYNA Conference
Manchester, 2013

8th European LS-DYNA
Conference
Straßburg, 2011 …

ATD –DUMMY MODELS

www.dummymodels.com

DUMMY Model Support - Currently, the manuals of models developed by DYNAmore are available.

This site provides detailed information on dummy models for LS-DYNA. In the near future the models developed by LSTC will be added. The LSTC dummy and barrier are models are no fee and included with the LS-DYNA license.

To license the models we kindly ask to contact your local LS-DYNA distributor. Any kind of proposal or enhancements for the models and this site is very welcome.

Among the Dummy Models on this site you can find:

Side Impact Dummies

ES2/ES2re -
DYNAmore

World SID 50%
DYNAmore

US-SID
DYNAmore

Rear Impact Dummies

BioRID-II V3.
DYNAmore

Child Dummies

P-1.5
DYNAmore
P-3.0
DYNAmore

LSTC ATD MODELS

www.lstc.com/models

LSTC Models Overview

Free or low cost FE models are important to LS-DYNA users in various fields. Therefore, LSTC is developing models with the help and support of our customers. Some of the models are joint developments with our partners.

LSTC's Models are available at no cost to licensees of LS-DYNA who are current with their annual license fees (Annual License) or maintenance fees (Paid-up License). Models are fully unencrypted and accessible. LSTC endeavors to make the models as complete, accurate, reliable, and easy to use as possible.

This section of our site was created to keep users informed about our models. It will be updated periodically to reflect changes to existing models and announce newly released models.

Feedback about the models is welcome and will be used to improve future releases. To submit questions, suggestions, or feedback about LSTC's models, please send an e-mail to: atds@lstc.com.

For news and updates about our dummy models, please join our models news mailing list.
www.lstc.com/products/models/mailinglist

Barrier Models

LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) models:

- ODB modeled with shell elements
- ODB modeled with solid elements
- ODB modeled with a combination of shell and solid elements
- MDB according to FMVSS 214 modeled with shell elements
- MDB according to FMVSS 214 modeled with solid elements
- MDB according to ECE R-95 modeled with shell elements
- AE-MDB modeled with shell elements
- IIHS MDB modeled with shell elements
- IIHS MDB modeled with solid elements
- RCAR bumper barrier
- RMDB modeled with shell and solid elements

AEROSPACE WORKING GROUP

http://awg.lstc.com/tiki/tiki-index.php

The LS-DYNA® Aerospace Working Group (AWG) is a partnership of federal agencies, corporations, and universities working together to develop and publish aerospace test cases and modeling guidelines for finite element analyses with LS-DYNA®.

The actions of the AWG serve to support the use, development, and reliability of LS-DYNA® for aerospace numerical analyses.

Some participants are partially or fully funded by the Federal Aviation Administration (FAA) in the National Aviation Research Plan 'Aircraft Catastrophic Failure Prevention Research' program, or by the National Aeronautics and Space Administration (NASA), or associated with the participants as LS-DYNA® users.

Engine Related Impact Failure (ERIF) - Arizona State University (ASU)

- Boeing
- Central Connecticut State University (CCSU)
- Federal Aviation Administration (FAA)
- General Electric Aviation
- George Mason University (GMU)
- Honda Aircraft Engine
- Honeywell
- Livermore Software Technology Corporation (LSTC)
- National Aeronautics and Space Administration (NASA)
- Ohio State University (OSU)
- Pratt & Whitney
- Pratt & Whitney Canada
- Rolls-Royce
- University of Akron
- Williams International

Cabin Interior (CI)

- B/E Aerospace
- Boeing
- Bombardier
- Central Connecticut State University
- Cessna
- Federal Aviation Administration (FAA)
- Humanetics
- National Aeronautics and Space Administration (NASA)
- Wichita State University
- Zodiac Aerospace

Participant's Training Classes

Webinars

Info Days

Class Directory

Participant Class Directory

Arup **(corporate)**	www.oasys-software.com/dyna/en/training
BETA CAE Systems S.A. **(corporate)**	www.beta-cae.com/training.htm
CAE Associates **(corporate)**	https://caeai.com/calendar
DYNAmore **(corporate)**	www.dynamore.de/en/training/seminars
ESI-Group **(corporate)**	https://myesi.esi-group.com/trainings/schedules
ETA **(corporate)**	www.eta.com/support2/training-calendar
LSTC **(corporate)**	www.lstc.com/training
LS-DYNA OnLine **(Al Tabiei)**	www.LSDYNA-ONLINE.COM

ARUP Visit the website for complete listings/changes/locations

www.oasys-software.com/dyna/en/training

To enrol on any of these courses please email Dyna Support at dyna.support@arup.com.

Date	Training Class
26 - 28 October 2015	LS-DYNA Introductory Course
26-27 January 2016	Polymeric Material Modelling in LS-DYNA
Scheduled on request	Oasys PRIMER - An Introduction
Scheduled on request	Oasys PRIMER - Automatic Assembly of Multiple Crash Cases
Scheduled on request	Oasys PRIMER - Spotwelds and Connections
Scheduled on request	Oasys PRIMER - Seat and Dummy Positioning
Scheduled on request	Oasys PRIMER & D3PLOT - An Introduction to JavaScripting

BETA CAE Visit the website for complete listings/changes/locations

www.beta-cae.com/training.htm

Basic and advanced training courses can be scheduled upon request. A variety of standard or tailored training schedules, per product or per discipline, are being offered to meet customers needs.

A number of recommended training courses offered are described below. The list is not exhaustive and more courses can be designed according to your needs.
Please, contact ansa@beta-cae.gr for further details.

Recommended Training Courses (Complete information on website)

- SPDRM
- ANSA / μETA Basics
- ANSA / μETA for CFD
- ANSA / μETA for Crash & Safety simulation
- ANSA / μETA for Durability simulation
- ANSA / μETA for NVH analyses
- Multi-Body Dynamics
- Laminated Composites
- Morphing and Optimization
- Automation
- Additional special sessions

CAE Associates Visit the website for complete listings/changes/locations
https://caeai.com/calendar

Date	Training Class
Sept 10	ANSYS SpaceClaim Direct Modeler for FEA
Sept 14	Introduction to ANSYS Mechanical (Workbench)
Sept 15	Introduction to ANSYS Mechanical (Workbench)
Sept 16	Introduction to ANSYS Mechanical (Workbench)
Sept 17	ANSYS Mechanical (Workbench) - Structural Nonlinearities
Sept 21	ANSYS Mechanical (Workbench) - Dynamics
Sept 22	ANSYS Mechanical (Workbench) - Dynamics
Sept 24	Finite Element Analysis Fundamentals
Sept 28	Computational Fluid Dynamics Fundamentals

Oct 5	Advanced Meshing in ANSYS Mechanical (Workbench)
Oct 6	Advanced Meshing in ANSYS Mechanical (Workbench)
Oct 13	ANSYS DesignModeler for CFD
Oct 14	ANSYS Workbench Meshing for CFD
Oct 15	Introduction to CFX
Oct 16	Introduction to CFX
Oct 19	FEA Best Practices
Oct 20	FEA Best Practices
Oct 26	Explicit Dynamics with ANSYS/LS- DYNA (Traditional GUI)
Oct 27	Explicit Dynamics with ANSYS/LS- DYNA (Traditional GUI)

DYNAmore Visit the website for complete listings/changes/locations

www.dynamore.de/en/training/seminars

Among the classes for the month – more on site

Date	Training Class
Sept 17	Implicit Analysis Using LS-DYNA
Sept 21	Introduction to LS-PrePost
Sept 21	Infoday Forming Trends
Sept 22	Introduction to LS-DYNA
Sept 24	Introduction to LS-DYNA
Sept 25	User Materials
Sept 28	Introduction to Passive Safety

Oct 07	ALE and FSI
Oct 09	Discrete Element Method
Oct 13	Introduction to LS-DYNA
Oct 15	Introduction to LS-DYNA
Oct 20	LS-OPT Optimization & Robustness
Oct 26	Infoday DYNAstart
Oct 27	Introduction to LS-PrePost
Oct 28	Introduction to LS-DYNA
Oct 30	

ESI-Group Visit the website for complete listings/changes/locations

https://myesi.esi-group.com/training/schedules

Date US	Training Class
15 Sep - 16 Sep 2015	VA One: FE/BEM Training
17 Sep - 18 Sep 2015	VA One: Coupled FEA/SEA Training
24 Sep - 25 Sep 2015	High frequency automotive interior acoustics
29 Sep - 30 Sep 2015	VA One: FE/BEM Training
1 Oct - 2 Oct 2015	VA One: Coupled FEA/SEA Training

Date GERMANY	Training Class
26 Oct - 27 Oct 2015	High frequency automotive interior acoustics
28 Oct - 29 Oct 2015	Low frequency automotive interior acoustics
5 Nov - 6 Nov 2015	VA One for aerospace industry (FE/BEM topics)

LSTC Visit the website for complete listings/changes/locations

www.lstc.com/training

Michigan

Date	Training Class
Sept 22-25	Optimization & Probabilistic Design Using LS-OPT (3.5 days)
Dec 10-11	Advanced Impact Options in LS-DYNA
Dec 14	Intro to LS-PrePost
Dec 15-18	Intro to LS-DYNA

California

Date	Training Class
Sept 23-24	Advanced ALE Applications
Nov 9	Intro to LS-PrePost
Nov 10-13	Intro to LS-DYNA
December 2-3	NVH & Frequency Domain Analysis in LS-DYNA

LS-DYNA On Line Visit the website for complete listings/changes/locations

www.LSDYNA-ONLINE.COM

For Information contact: courses@lsdyna-online.com or 513-3319139

Composite Materials In LS-DYNA

This course will allow first time LS-DYNA users to use composite materials. The most important elements to start using all the composite material models in LS-DYNA will be presented in the 8 hours.

Foam & Viscoelastic Materials in LS-DYNA

Objective of the course: Learn about several foam material models in LS-DYNA to solve engineering problems. Detailed descriptions are given of the data required to use such material in analysis. Examples are used to illustrate the points made in the lectures

Plasticity, Plastics, and Viscoplastics Materials in LS-DYNA

Objective of the course: Learn about several plasticity based material models in LS-DYNA to solve engineering problems. Detailed descriptions are given of the data required to use such material in analysis. Examples are used to illustrate the points made in the lectures.

Rubber Materials in LS-DYNA

Objective of the course: Learn about several rubber material models in LS-DYNA to solve engineering problems. Detailed descriptions are given of the data required to use such material in analysis. Examples are used to illustrate the points made in the lectures.

BETA CAE Systems S.A. **www.beta-cae.gr**

BETA CAE Systems S.A.– ANSA

An advanced multidisciplinary CAE pre-processing tool that provides all the necessary functionality for full-model build up, from CAD data to ready-to-run solver input file, in a single integrated environment. ANSA is a full product modeler for LS-DYNA, with integrated Data Management and Process Automation. ANSA can also be directly coupled with LS-OPT of LSTC to provide an integrated solution in the field of optimization.

BETA CAE Systems S.A.– μETA

Is a multi-purpose post-processor meeting diverging needs from various CAE disciplines. It owes its success to its impressive performance, innovative features and capabilities of interaction between animations, plots, videos, reports and other objects. It offers extensive support and handling of LS-DYNA 2D and 3D results, including those compressed with SCAI's FEMZIP software

Solutions for:

Process Automation - Data Management – Meshing – Durability - Crash & Safety NVH - CFD - Thermal analysis - Optimization - Powertrain Products made of composite materials - Analysis Tools -

Maritime and Offshore Design - Aerospace engineering - Biomechanics

CRAY **www.cray.com**

THE CRAY® XC™ SERIES: ADAPTIVE SUPERCOMPUTING ARCHITECTURE

The Cray® XC™ series delivers on Cray's commitment to an adaptive supercomputing architecture that provides both extreme scalability and sustained performance. The flexibility of the Cray XC platform ensures that users can precisely configure the machines that will meet their specific requirements today, and remain confident they can upgrade and enhance their systems to address the demands of the future.

Cray® XC40™ and XC40-AC™ supercomputers are enabled by a robust Intel® Xeon® processor road map, Aries high performance interconnect and flexible Dragonfly network topology, providing low latency and scalable global bandwidth to satisfy the most challenging multi-petaflops applications.

While the extreme-scaling Cray XC40 supercomputer is a transverse air-flow liquid-cooled architecture, the Cray XC40-AC air-cooled model provides slightly smaller and less dense supercomputing cabinets with no requirement for liquid coolants or extra blower cabinets. A reduced network topology lowers costs, and the system is compatible with the compute technology, OS, ISV and software stack support of high-end XC40 systems.

MAXIMIZE PRODUCTIVITY WITH CRAY CS SERIES SUPERCOMPUTERS

Understanding the need for nimble, reliable and cost-effective high performance computing (HPC), we developed the Cray® CS™ cluster supercomputer series. These systems are industry-standards-based, highly customizable, and expressly designed to handle the broadest range of medium- to large-scale simulation and data analytics workloads.

All CS components have been carefully selected, optimized and integrated to create a powerful HPC environment. Flexible node configurations featuring the latest processor and interconnect technologies mean you can tailor a system to your specific need — from an all-purpose cluster to one suited for shared memory, large memory or accelerator-based tasks.

Innovations in packaging, power, cooling and density translate to superior energy efficiency and compelling price/performance. Expertly engineered system management software instantly boosts your productivity by simplifying system administration and maintenance.

Maximize your productivity with flexible, high-performing Cray CS series cluster supercomputers.

CRAY www.cray.com

CRAY® SONEXION® SCALE-OUT LUSTRE®STORAGE SYSTEM

Brought to you by Cray, the world's leading experts in parallel storage solutions for HPC and technical enterprise, the Cray® Sonexion® 2000 system provides a Lustre®-ready solution for popular x86 Linux® clusters and supercomputers through Cray Cluster Connect™. As a leader in open systems and parallel file systems, Cray builds on open source Lustre to unlock any industry-standard x86 Linux compute cluster using InfiniBand™ or 10/40 GbE utilizing proven Cray storage architectures.

The Cray Sonexion 2000 system provides 50 percent more performance and capacity than the Sonexion 1600 system in the same footprint.

Simplify

- Through its fully-integrated and pre-configured design, Cray Sonexion storage gets customers deployed faster and reduces the total number of components to manage.
- The Sonexion system's compact design reduces the total hardware footprint of petascale systems by 50 percent over component-based solutions.

Scale

- Performance scales from 7.5 GB/s to 1.7 TB/s in a single file system.
- Capacity scales in modular increments; the Sonexion 2000 system stores over two usable petabytes in a single rack. Fewer drives and components reduce capital costs as capacity grows.

Protect

- New software-based GridRAID offers higher levels of data protection and up to 3.5 times faster rebuild times than traditional RAID6 and MD-RAID storage.
- Cray ensures quality, reliability and stability at scale through exhaustive thermal and real-world stress testing, system hardening and availability, and tight hardware and software integration.

OPEN ARCHIVE AND TIERED STORAGE SYSTEM FOR BIG DATA AND SUPERCOMPUTING

Cray Tiered Adaptive Storage (TAS), powered by Versity, is designed to meet the expansive data preservation and access needs driven by big data, where data needs to migrate fluidly from high performance storage to deep tape archives, while always being accessible to users.

CRAY www.cray.com

With Cray TAS you can:

- Deploy tiered storage and archives faster
- Feel confident preserving and protecting data into the future, using Linux®
- Simplify managing data using familiar tools for years to come

CRAY® URIKA-XA™ EXTREME ANALYTICS PLATFORM

Pre-integrated, open platform for high performance analytics delivers valuable business insights now and into the future

The flexible, multi-use Cray® Urika-XA™ extreme analytics platform addresses perhaps the most critical obstacle in data analytics today — limitation. Analytics problems are getting more varied and complex but the available solution technologies have significant constraints. Traditional analytics appliances lock you into a single approach and building a custom solution in-house is so difficult and time consuming that the business value derived from analytics fails to materialize.

In contrast, the Urika-XA platform is open, high performing and cost effective, serving a wide range of analytics tools with varying computing demands in a single environment. Pre-integrated with the Apache Hadoop® and Apache Spark™ frameworks, the Urika-XA system combines the benefits of a turnkey analytics appliance with a flexible, open platform that you can modify for future analytics workloads. This single-platform consolidation of workloads reduces your analytics footprint and total cost of ownership.

Based on pioneering work combining high-performance analytics and supercomputing technologies, the Urika-XA platform features next-generation capabilities. Optimized for compute-heavy, memory-centric analytics, it incorporates innovative use of memory-storage hierarchies and fast interconnects, which translates to excellent performance at scale on current as well as emerging analytics applications.

Additionally, the enterprise-ready Urika-XA platform eases the system management burden with a single point of support, standards-based software stack and compliance with enterprise standards so you can focus on extracting valuable business insights, not on managing your environment.

CRAY www.cray.com

THE URIKA-GD™ GRAPH DISCOVERY APPLIANCE IS A PURPOSE-BUILT SOLUTION FOR BIG DATA RELATIONSHIP ANALYTICS.

The Urika-GD™ appliance enables enterprises to:

- Discover unknown and hidden relationships and patterns in big data
- Build a relationship warehouse, supporting inferencing/deduction, pattern-based queries and intuitive visualization
- Perform real-time analytics on the largest and most complex graph problems

The Urika-GD system is a high performance graph appliance with a large shared memory and massively multithreaded custom processor designed for graph processing and scalable I/O.

With its industry-standard, open-source software stack enabling reuse of existing skill sets and no lock in, the Urika-GD appliance is easy to adopt.

The Urika-GD appliance complements an existing data warehouse or Hadoop® cluster by offloading graph workloads and interoperating within the existing enterprise analytics workflow.

Realize rapid time to powerful new insights.

DatapointLabs **www.datapointlabs.com**

Testing over 1000 materials per year for a wide range of physical properties, DatapointLabs is a center of excellence providing global support to industries engaged in new product development and R&D.

The compary meets the material property needs of CAE/FEA analysts, with a specialized product line, TestPaks®, which allow CAE analysts to easily order material testing for the calibration of over 100 different material models.

DatapointLabs maintains a world-class testing facility with expertise in physical properties of plastics, rubber, food, ceramics, and metals.

Core competencies include mechanical, thermal and flow properties of materials with a focus on precision properties for use in product development and R&D.

Engineering Design Data including material model calibrations for CAE Research Support Services, your personal expert testing laboratory Lab Facilities gives you a glimpse of our extensive test facilities Test Catalog gets you instant quotes for over 200 physical properties.

ETA – Engineering Technology Associates **www.eta.com**

etainfo@eta.com

Inventium Suite™

Inventium Suite™ is an enterprise-level CAE software solution, enabling concept to product. Inventium's first set of tools will be released soon, in the form of an advanced Pre & Post processor, called PreSys.

Inventium's unified and streamlined product architecture will provide users access to all of the suite's software tools. By design, its products will offer a high performance modeling and post-processing system, while providing a robust path for the integration of new tools and third party applications.

PreSys

Inventium's core FE modeling toolset. It is the successor to ETA's VPG/PrePost and FEMB products. PreSys offers an easy to use interface, with drop-down menus and toolbars, increased graphics speed and detailed graphics capabilities. These types of capabilities are combined with powerful, robust and accurate modeling functions.

VPG

Advanced systems analysis package. VPG delivers a unique set of tools which allow engineers to create and visualize, through its modules--structure, safety, drop test, and blast analyses.

DYNAFORM

Complete Die System Simulation Solution. The most accurate die analysis solution available today. Its formability simulation creates a "virtual tryout", predicting forming problems such as cracking, wrinkling, thinning and spring-back before any physical tooling is produced

ESI Group **www.esi-group.com**

Visual-Environment: An integrated suite of solutions which operate either concurrently or standalone within a common environment. It aims at delivering an open collaborative engineering framework. As such, it is constantly evolving to address various disciplines and available solvers.

Visual-Crash is a dedicated environment for crash simulation: It helps engineers get their job done in the smoothest and fastest possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support.

For LS-DYNA users, Visual-Crash DYNA allows to focus and rely on high quality digital models, from start to finish as it addresses the coupling with competitive finite element or rigid body based software. This very open and versatile environment simplifies the work of CAE engineers across the enterprise by facilitating collaboration and data sharing.

Further tools are integrated in Visual-Environment enhancing CAE engineers work tasks most efficiently.

Visual-Mesh generates 1D, 2D and 3D elements for any kind of simulation. Visual-Mesh provides automatic and guided surfaces clean up, application specific mesh generation and intuitive post mesh editing features..

Visual-Viewer is a complete, productive and innovative post-processing environment for CAE applications.

Visual-Viewer delivers a dedicated plotting and animation control solution. It offers a multi page, multi plot environment, allowing to group data into pages and plots. It is designed with a Windows GUI based on an intuitive and sleek user interface.

Visual-Process Executive is an advanced CAE environment for process customization and automation.

VisualDSS is an End-to-End Decision Support System for CAE. Manufacturers widely resort to Simulation-Based Design to gain a competitive edge in product development.

JSOL Corporation **www.jsol.co.jp/english/cae/**

HYCRASH

Easy-to-use one step solver, for Stamping-Crash Coupled Analysis. HYCRASH only requires the panels' geometry to calculate manufacturing process effect, geometry of die are not necessary. Additionally, as this is target to usage of crash/strength analysis, even forming analysis data is not needed. If only crash/strength analysis data exists and panel ids is defined. HYCRASH extract panels to calculate it's strain, thickness, and map them to the original data.

JSTAMP/NV

As an integrated press forming simulation system for virtual tool shop the JSTAMP/NV meets the various industrial needs from the areas of automobile, electronics, iron and steel, etc. The JSTAMP/NV gives satisfaction to engineers, reliability to products, and robustness to tool shop via the advanced technology of the JSOL Corporation.

JMAG

JMAG uses the latest techniques to accurately model complex geometries, material properties, and thermal and structural phenomena associated with electromagnetic fields. With its excellent analysis capabilities, JMAG assists your manufacturing process

Livermore Software Technology Corp. **www.lstc.com**

LS-DYNA

A general-purpose finite element program capable of simulating complex real world problems. It is used by the automobile, aerospace, construction, military, manufacturing, and bioengineering industries. LS-DYNA is optimized for shared and distributed memory Unix, Linux, and Windows based, platforms, and it is fully QA'd by LSTC. The code's origins lie in highly nonlinear, transient dynamic finite element analysis using explicit time integration.

LS-PrePost: An advanced pre and post-processor that is delivered free with LS-DYNA. The user interface is designed to be both efficient and intuitive. LS-PrePost runs on Windows, Linux, and Macs utilizing OpenGL graphics to achieve fast rendering and XY plotting.

LS-OPT: LS-OPT is a standalone Design Optimization and Probabilistic Analysis package with an interface to LS-DYNA. The graphical preprocessor LS-OPTui facilitates definition of the design input and the creation of a command file while the postprocessor provides output such as approximation accuracy, optimization convergence, tradeoff curves, anthill plots and the relative importance of design variables.

LS-TaSC: A Topology and Shape Computation tool. Developed for engineering analysts who need to optimize structures, LS-TaSC works with both the implicit and explicit solvers of LS-DYNA. LS-TaSC handles topology optimization of large non-linear problems, involving dynamic loads and contact conditions.

LSTC Dummy Models:

Anthropomorphic Test Devices (ATDs), as known as "crash test dummies", are life-size mannequins equipped with sensors that measure forces, moments, displacements, and accelerations.

LSTC Barrier Models: LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) model.

Oasys Ltd. LS-DYNA Environment **www.oasys-software.com/dyna**

The Oasys Suite of software is exclusively written for LS-DYNA® and is used worldwide by many of the largest LS-DYNA® customers. The suite comprises of:

Oasys PRIMER

Key benefits:

- Pre-Processor created specifically for LS-DYNA®
- Compatible with the latest version of LS-DYNA®
- Maintains the integrity of data
- Over 6000 checks and warnings – many auto-fixable
- Specialist tools for occupant positioning, seatbelt fitting and seat squashing (including setting up pre-simulations)
- Many features for model modification, such as part replace
- Ability to position and depenetrate impactors at multiple locations and produce many input decks automatically (e.g. pedestrian impact, interior head impact)
- Contact penetration checking and fixing
- Connection feature for creation and management of connection entities.
- Support for Volume III keywords and large format/long labels
- Powerful scripting capabilities allowing the user to create custom features and processes

www.oasys-software.com/dyna

Oasys D3PLOT

Key benefits:

- Powerful 3D visualization post-processor created specifically for LS-DYNA®
- Fast, high quality graphics
- Easy, in-depth access to LS-DYNA® results
- Scripting capabilities allowing the user to speed up post-processing, as well as creating user defined data components

Oasys T/HIS

Key benefits:

- Graphical post-processor created specifically for LS-DYNA®
- Automatically reads all LS-DYNA® results
- Wide range of functions and injury criteria
- Easy handling of data from multiple models
- Scripting capabilities for fast post-processing

Oasys REPORTER

Key benefits:

- Automatic report generation tool created specifically for LS-DYNA®
- Automatically post-process and summarize multiple analyses
- Built-in report templates for easy automatic post-processing of many standard impact tests

Shanghai Hengstar **www.hengstar.com**

Center of Excellence: Hengstar Technology is the first LS-DYNA training center of excellence in China. As part of its expanding commitment to helping CAE engineers in China, Hengstar Technology will continue to organize high level training courses, seminars, workshops, forums etc., and will also continue to support CAE events such as: China CAE Annual Conference; China Conference of Automotive Safety Technology; International Forum of Automotive Traffic Safety in China; LS-DYNA China users conference etc.

On Site Training: Hengstar Technology also provides customer customized training programs on-site at the company facility. Training is tailored for customer needs using LS-DYNA such as material test and input keyword preparing; CAE process automation with customized script program; Simulation result correlation with the test result; Special topics with new LS-DYNA features etc..

Distribution & Support: Hengstar distributes and supports LS-DYNA, LS-OPT, LS-Prepost, LS-TaSC, LSTC FEA Models; Hongsheng Lu, previously was directly employed by LSTC before opening his distributorship in China for LSTC software. Hongsheng visits LSTC often to keep update on the latest software features.

Hengstar also distributes and supports d3View; Genesis, Visual DOC, ELSDYNA; Visual-Crash Dyna, Visual-Process, Visual-Environment; EnkiBonnet; and DynaX & MadyX etc.

Consulting

As a consulting company, Hengstar focus on LS-DYNA applications such as crash and safety, durability, bird strike, stamping, forging, concrete structures, drop analysis, blast response, penetration etc with using LS-DYNA's advanced methods: FEA, ALE, SPH, EFG, DEM, ICFD, EM, CSEC..

Lenovo www.lenovo.com

Lenovo is a USD39 billion personal and enterprise technology company, serving customers in more than 160 countries.

Dedicated to building exceptionally engineered PCs, mobile Internet devices and servers spanning entry through supercomputers, Lenovo has built its business on product innovation, a highly efficient global supply chain and strong strategic execution. The company develops, manufactures and markets reliable, high-quality, secure and easy-to-use technology products and services.

Lenovo acquired IBM's x86 server business in 2014. With this acquisition, Lenovo added award-winning System x enterprise server portfolio along with HPC and CAE expertise.

www.penguincomputing.com

Penguin Computing provides customized build-to-order server solutions for enterprises and institutions with special hardware requirements. We complement our hardware and software solutions with Penguin Computing on Demand (POD)—a public HPC cloud that provides supercomputing capabilities on-demand on a pay-as-you-go basis.

Penguin is a one-stop shop for HPC and enterprise customers, providing solutions for a wide array of computing needs and user profiles:

HPC and cloud solutions optimized for industry-specific uses

High-powered workstations for individual power users

Highly power-efficient server platforms for enterprise computing

Private and public cloud solutions, including hybrid options.

Focus

Penguin Computing is strictly focused on delivering Linux-optimized enterprise solutions. We use a thorough, proven hardware qualification and testing process to ensure that our solutions deliver optimal performance and robustness.

Penguin's in-house development team is dedicated to providing a complete highly interoperable software stack that is tuned for Penguin hardware. As a result our solutions are easy-to-use and "just work." Our integrated approach even extends to our hybrid compute solutions, which combine local and cloud computing resources, taking ease-of-use and cost-effectiveness to the next level. Penguin customers can reduce capital expenditures by right-sizing clusters for average resource utilization and easily and quickly offload excess workload into the cloud.

Penguin also offers a full range of services and support that is backed by a seasoned team of Linux, HPC and application experts.

Distribution/Consulting	US/Canada	Distribution/Consulting

Canada	**Metal Forming Analysis Corp MFAC**		galb@mfac.com	
	www.mfac.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
	eta/DYNAFORM	INVENTIUM/PreSys		
United States	**CAE Associates Inc.**		info@caeai.com	
	www.caeai.com			
	ANSYS Products	CivilFem	Consulting ANSYS	
			Consulting LS-DYNA	
United States	**DYNAMAX**		sales@dynamax-inc.com	
	www.dynamax-inc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models		LSTC Barrier Models	

Distribution/Consulting	US/Canada	Distribution/Consulting

United States	**ESI-Group N.A** www.esi-group.com			
	QuikCAST	SYSWELD	PAM-RTM	PAM-CEM
	VA One	CFD-ACE+	ProCAST	Visual-Process
	VisualDSS	Weld Planner	Visual-Environment	IC.IDO
United States	**Engineering Technology Associates – ETA** www.eta.com		etainfo@eta.com	
	INVENTIUM/PreSy	NISA	VPG	LS-DYNA
	LS-OPT	DYNAform		
United States	**Gompute** www.gompute.com		info@gompute.com	
	LS-DYNA Cloud Service		Additional software	
	Additional Services			
United States	**Comet Solutions** Comet Software		steve.brown@cometsolutions.com	

United States	**Livermore Software Technology Corp**		sales@lstc.com	
	LSTC www.lstc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	

United States	**Predictive Engineering** www.predictiveengineering.com		george.laird@predictiveengineering.com	
	FEMAP	NX Nastran	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	LSTC Dummy Models	
			LSTC Barrier Models	

Distribution/Consulting	Europe	Distribution/Consulting

France	**DynaS+**		v.lapoujade@dynasplus.com	
	www.dynasplus.com		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	DYNAFORM	VPG	MEDINA	
	LSTC Dummy Models		LSTC Barrier Models	

Germany	**CADFEM GmbH**		lsdyna@cadfem.de
	www.cadfem.de		
	ANSYS	LS-DYNA	optiSLang
	ESAComp	AnyBody	
	ANSYS/LS-DYNA		

Germany	**DYNAmore GmbH**		uli.franz@dynamore.de	
	www.dynamore.de			
	PRIMER	LS-DYNA	FTSS	VisualDoc
	LS-OPT	LS-PrePost	LS-TaSC	DYNAFORM
	Primer	FEMZIP	GENESIS	Oasys Suite
	TOYOTA THUMS		LSTC Dummy & Barrier Models	

The Netherlands	**Infinite Simulation Systems B.V**		j.mathijssen@infinite.nl	
	www.infinite.nl			
	ANSYS Products	CivilFem	CFX	Fluent
	LS-DYNA	LS-PrePost	LS-OPT	LS-TaSC

Distribution/Consulting	Europe		Distribution/Consulting	
Italy	**EnginSoft SpA**		info@enginsoft.it	
	www.enginsoft.it			
	ANSYS	MAGMA	Flowmaster	FORGE
	CADfix	LS-DYNA	Dynaform	Sculptor
	ESAComp	AnyBody	FTI Software	
	AdvantEdge	Straus7	LMS Virtual.Lab	ModeFRONTIER
Russia	**STRELA**		info@dynarussia.com	
	LS-DYNA	LS-TaSC	LS-OPT	LS-PrePost
	LSTC Dummy Models		LSTC Barrier Models	
Sweden	**DYNAmore Nordic**		marcus.redhe@dynamore.se	
	www.dynamore.se		Oasys Suite	
	ANSA	µETA	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	FastFORM	DYNAform
	FormingSuite		LSTC Dummy Models	
			LSTC Barrier Models	
Sweden	**GOMPUTE**		info@gridcore.com	
	www.gridcore.se		www.gompute.com	
	LS-DYNA Cloud Service		Additional software	

Switzerland	**DYNAmoreSwiss GmbH**		info@dynamore.ch	
	www.dynamore.ch			
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC		LSTC Dummy Models	
			LSTC Barrier Models	
UK	**Ove Arup & Partners**		dyna.sales@arup.com	
	www.oasys-software.com/dyna		TOYOTA THUMS	
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC	PRIMER	D3PLOT	T/HIS
	REPORTER	SHELL	FEMZIP	HYCRASH
	DIGIMAT	Simpleware	LSTC Dummy Models	
			LSTC Barrier Models	

China	**ETA – China**		lma@eta.com.cn	
	www.eta.com/cn			
	Inventium	VPG	DYNAFORM	NISA
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
			LSTC Barrier Models	LS-TaSC
China	**Oasys Ltd. China**		Stephen.zhao@arup.com	
	www.oasys-software.com/dyna			
	PRIMER D3PLOT	HYCRASH	T/HIS REPORTER	SHELL
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	DIGIMAT	FEMZIP	LSTC Barrier Models	LS-TaSC
China	**Shanghai Hengstar Technology**		info@hengstar.com	
	www.hengstar.com			
	LS-DYNA	LS-TaSC	LSTC Barrier Models	D3VIEW
	LS-PrePOST	LS-OPT	LSTC Dummy Models	
	Genesis	VisualDoc		ELSDYNA
	Visual-Crahs DYNA	Visual-Proeces		DynaX & MadyX
	Enki Bonnet	Visual Environement		

India	**Oasys Ltd. India**		lavendra.singh@arup.com	
	www.oasys-software.com/dyna			
	PRIMER	D3PLOT	T/HIS	
			LS-OPT	LSTC Dummy Models	LS-PrePost
			LS-DYNA	LSTC Barrier Models	LS-TaSC

India	**CADFEM Eng. Svce**		info@cadfem.in	
	www.cadfem.in			
	ANSYS	VPS	ESAComp	optiSLang
	LS-DYNA	LS-OPT	LS-PrePost	

India	**Kaizenat Technologies Pvt. Ltd**		support@kaizenat.com	
	http://kaizenat.com /			
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	Complete LS-DYNA suite of products		LSTC Barrier Models	LS-TaSC

Distribution/Consulting	Asia Pacific	Distribution/Consulting

Japan	**CTC**	LS-dyna@ctc-g.co.jp		
	www.engineering-eye.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CmWAVE	
Japan	**JSOL**			
	www.jsol.co.jp/english/cae		Oasys Suite	
	JSTAMP	HYCRASH	JMAG	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	
Japan	**FUJITSU**			
	http://jp.fujitsu.com/solutions/hpc/app/lsdyna			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CLOUD Services	
Japan	**LANCEMORE**	info@lancemore.jp		
	www.lancemore.jp/index_en.html			
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models		
Japan	**Terrabyte**	**English:**		
	www.terrabyte.co.jp	www.terrabyte.co.jp/english/index.htm		
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	AnyBody	

Korea	**THEME**	wschung@kornet.com		
	www.lsdyna.co.kr		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	Planets
	eta/DYNAFORM	FormingSuite	Simblow	TrueGRID
	JSTAMP/NV	Scan IP	Scan FE	Scan CAD
	FEMZIP			

Korea	**KOSTECH**	young@kostech.co.kr		
	www.kostech.co.kr			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM
	eta/DYNAFORM	DIGIMAT	Simuform	Simpack
	AxStream	TrueGrid	FEMZIP	

Taiwan	**Flotrend**	gary@flotrend.tw		
	www.flotrend.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan	**APIC**			
	www.apic.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

POD (Penguin Computing on Demand) offers software including LSTC's LS-DYNA

www.penguincomputing.com/services/hpc-cloud

Penguin HPC clusters are optimized for engineering workloads and offer:

- Instant access to an HPC Cloud Cluster
- High performance InfiniBand bare-metal compute
- Free support from HPC experts
- No charges for network transfers
- Cost-effective, pay-per-use billing model
- Secure environment for private data
- Detailed billing reports for user groups and projects

Self Registration Portal – featuring rich--documentation, wiki, FAQ, pricing and more.

https://pod.penguincomputing.com/

POD Software Applications and Libraries (visit site for complete listing)

FEA, CFD and FDTD Modeling

- **LS-DYNA** / LS-PrePost LS-DYNA is an advanced general-purpose multiphysics simulation software package. Its core-competency lie in highly nonlinear transient dynamic finite element analysis (FEA) using explicit time integration. LS-PrePost is an advanced pre and post-processor that is delivered free with LS-DYNA.
- **OpenFoam:** OpenFOAM (Open source Field Operation And Manipulation) is a C++ toolbox for the development of customized numerical solvers, and pre-/post-processing utilities for the solution of continuum mechanics problems, including computational fluid dynamics (CFD).

- **ANSYS HFSS:** ANSYS HFSS software is the industry standard for simulating 3-D full-wave electromagnetic fields. Its gold-standard accuracy, advanced solver and compute technology have made it an essential tool for engineers designing high-frequency and high-speed electronic components.
- **ANSYS Fluent** ANSYS Fluent software contains the broad physical modeling capabilities needed to model flow, turbulence, heat transfer, and reactions for industrial applications.
- **Star-CD** and **Star-CCM+:** STAR-CCM+ is CD-adapco´s newest CFD software product. It uses the well established CFD solver technologies available in STAR-CD, and it employs a new client-server architecture and object oriented user interface to provide a highly integrated and powerful CFD analysis environment to users.
- **Convergent:** CONVERGE is a Computational Fluid Dynamics (CFD) code that completely eliminates the user time needed to generate a mesh through an innovative run-time mesh generation technique.
- **Lumerical:** Simulation tools that implement FDTD algorithms.

Cloud computing services
for
JSOL Corporation LS-DYNA users in Japan

JSOL Corporation is cooperating with chosen cloud computing services

JSOL Corporation, a Japanese LS-DYNA distributor for Japanese LS-DYNA customers.

LS-DYNA customers in industries / academia / consultancies are facing to the increase use of LS-DYNA more and more in recent years.

In calculations of optimization, robustness, statistical analysis, larger amount of LS-DYNA license in short term are required.

JSOL Corporation is cooperating with some cloud computing services for JSOL's LS-DYNA users and willing to provide large in short term license.

This service is offered to the customers by the additional price to existence on-premises license, which is relatively inexpensive than purchasing yearly license.

The following services are available

(only in Japanese).

HPC OnLine

NEC Solution Innovators, Ltd.
http://jpn.nec.com/manufacture/machinery/hpc_online/

Focus
Foundation for Computational Science
http://www.j-focus.or.jp

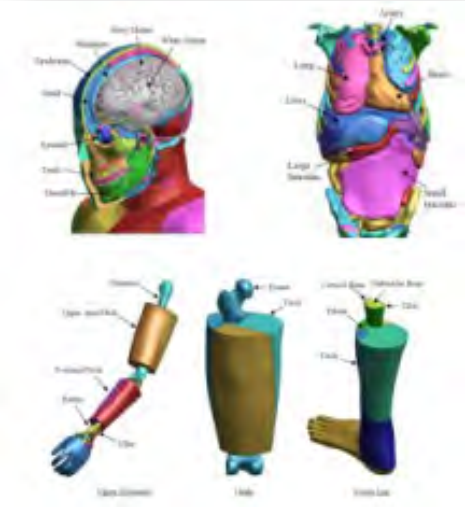
Platform Computation Cloud
CreDist.Inc.
http://www.credist.co.jp /

PLEXUS CAE
Information Services International-Dentsu, Ltd. (ISID) https://portal.plexusplm.com/plexus-cae/

SCSK Corporation
http://www.scsk.jp/product/keyword/keyword07.html

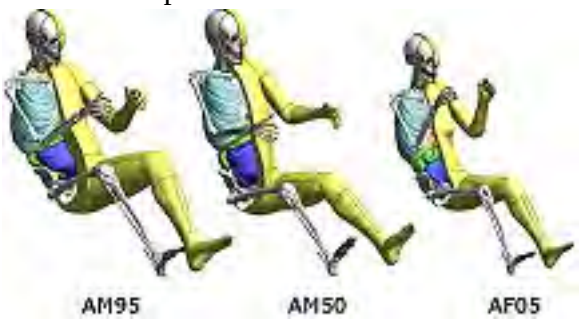
Contact; JSOL Corporation Engineering Technology Division cae-info@sci.jsol.co.jp

TOYOTA - Total Human Model for Safety – THUMS

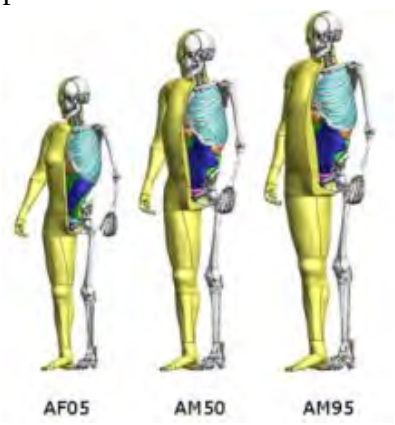


The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, and internal organs. Therefore, THUMS can be used in automotive crash simulations to identify safety problems and find their solutions.

Each of the different sized models is available as sitting model to represent vehicle occupants



and as standing model to represent pedestrians.



The internal organs were modeled based on high resolution CT-scans.

THUMS is limited to civilian use and may under no circumstances be used in military applications.

LSTC is the US distributor for THUMS. Commercial and academic licenses are available.

For information please contact:
THUMS@lstc.com

THUMS®, is a registered trademark of Toyota Central R&D Labs.

LSTC – Dummy Models

LSTC Crash Test Dummies (ATD)

Meeting the need of their LS-DYNA users for an affordable crash test dummy (ATD), LSTC offers the LSTC developed dummies at no cost to LS-DYNA users.

LSTC continues development on the LSTC Dummy models with the help and support of their customers. Some of the models are joint developments with their partners.

e-mail to: atds@lstc.com

Models completed and available (in at least an alpha version)

- Hybrid III Rigid-FE Adults
- Hybrid III 50th percentile FAST
- Hybrid III 5th percentile detailed
- Hybrid III 50th percentile detailed
- Hybrid III 50th percentile standing
- EuroSID 2
- EuroSID 2re
- SID-IIs Revision D
- USSID
- Free Motion Headform
- Pedestrian Legform Impactors

Models In Development

- Hybrid III 95th percentile detailed
- Hybrid III 3-year-old
- Hybrid II
- WorldSID 50th percentile
- THOR NT FAST
- Ejection Mitigation Headform

Planned Models

- FAA Hybrid III
- FAST version of THOR NT
- FAST version of EuroSID 2
- FAST version of EuroSID 2re
- Pedestrian Headforms
- Q-Series Child Dummies
- FLEX-PLI

LSTC – Barrier Models

Meeting the need of their LS-DYNA users for affordable barrier models, LSTC offers the LSTC developed barrier models at no cost to LS-DYNA users.

LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) models:

- ODB modeled with shell elements
- ODB modeled with solid elements
- ODB modeled with a combination of shell and solid elements

- MDB according to FMVSS 214 modeled with shell elements
- MDB according to FMVSS 214 modeled with solid elements
- MDB according to ECE R-95 modeled with shell elements
- AE-MDB modeled with shell elements

- IIHS MDB modeled with shell elements
- IIHS MDB modeled with solid elements
- RCAR bumper barrier

- RMDB modeled with shell and solid elements

e-mail to: atds@lstc.com.

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ESI Group	www.esi-group.com
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Lancemore	www.lancemore.jp/index_en.html
Lenovo	