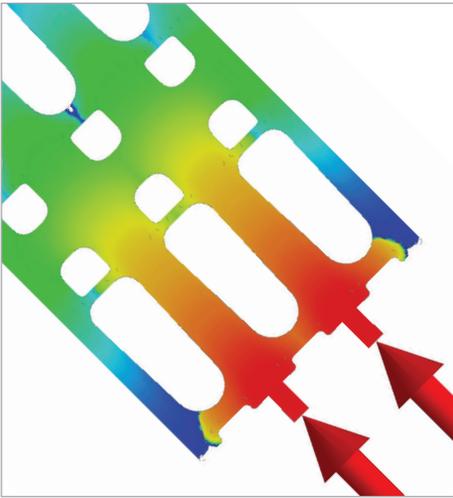


Altair Partner Alliance Offers Flexibility and Enhancements in Development Process at Manufacturer of Interconnect Products



Amphenol®

Key Highlights

Industry

Electronics

Challenge

Evaluate product design during the initial concept phase and provide simulation support during the life cycle of the product.

Altair Solution

Use HyperWorks and APA to access software encompassing the entire development process, all within one platform.

Benefits

- Access to needed tools on demand
- Ability to handle all simulation tasks within one software platform
- Control of software expenses and access

Customer Profile

Amphenol is one of the largest manufacturers of interconnect products in the world.

The company designs, manufactures, and markets electrical, electronic and fiber optic connectors, coaxial and flat-ribbon cable, and interconnect systems. In 2010 Amphenol reached sales revenues of more than \$3.6 billion. The primary end markets for the company's products are communications and information processing markets, including cable television, cellular telephone and data communication and information processing systems; aerospace and military electronics; and automotive, rail and other transportation and industrial applications.

The Challenge: Expand CAE capabilities while optimizing existing licensing resources

Amphenol has been using the HyperWorks range of applications since the second quarter of 2009. The company was

introduced to the Altair Partner Alliance program when looking for complementary tools to handle molding simulations.

As a management initiative and directive, it was important for Amphenol to find simulation products that could be added to their existing HyperWorks tools, and which would fulfill the following requirements:

- Provide reliable results that will further assist the development of connector designs feasible for production.
- Flexible licensing scheme that utilizes software licenses to the optimal level.
- Be a cost effective solution in terms of software costs, licensing, support, maintenance and administration.

The intention of the Amphenol engineering department was to turn to the APA to expand their existing CAE capabilities.

Amphenol Success Story



“Altair’s broad offer including the APA has immensely enhanced our capabilities in building a strong CAE structure to effectively support the design team. All in all, our company is able to present our customers more reliable and virtually robust design concepts based on the results and reports generated with HyperWorks and APA software.”

Aravind R. Chakravarthi
Simulations Specialist
Amphenol IT & Communications

They hoped to further validate their connector assembly design concepts, not only for structural integrity, but also for feasibility of the design with respect to injection molding manufacturability and life cycle strength.

The Solution: Flexible and Cost-Effective CAE Platform To Expand Software Access

The Altair Partner Alliance was the perfect choice for Amphenol since it offered them access to a very broad range of tools. Both HyperWorks tools and APA applications are invoked using recyclable tokens called HyperWorks Units, so Amphenol was able to leverage their existing units to use Altair

products like HyperMesh, HyperView, HyperGraph and BatchMesher, as well as third party APA tools for injection molding and life cycle strength simulation (Moldex3D and nCode DesignLife) without any additional investment. With a combination of these tools, Amphenol could cover their simulation needs in a very cost effective way for the entire development process, from concept design to simulation support, in particular when compared to the costs of licenses for similar tools from different independent providers.

“We as an engineering department have adopted the approach to deploy simulation capabilities to the best possible level.

In order to validate design concepts in all of the needed areas simulations are a part of our design life cycle and we intend to evolve further to reach an optimum level of CAE software utilization through the APA scheme,” said Aravind R. Chakravarthi.

To allay initial concerns about the APA program and the software’s reliability, Altair provided technical support, introduction to the software, and training in cooperation with its partners Simpatech (for Moldex3D) and HBM nCode (for DesignLife).

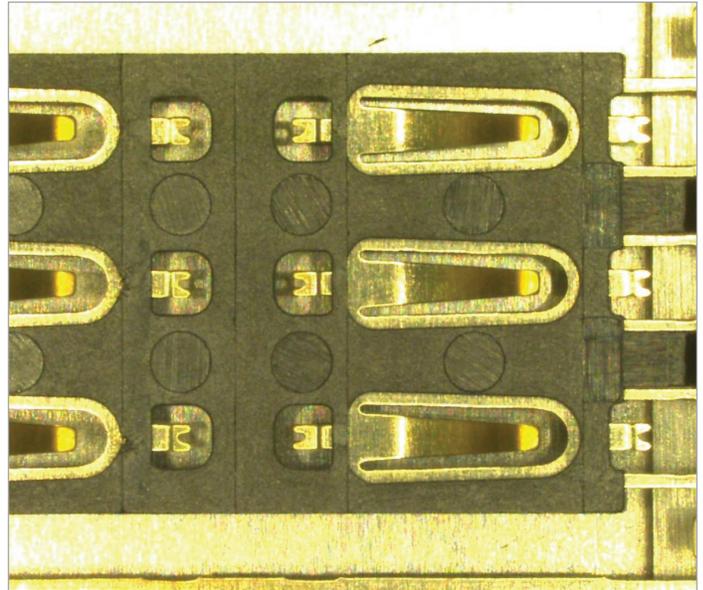
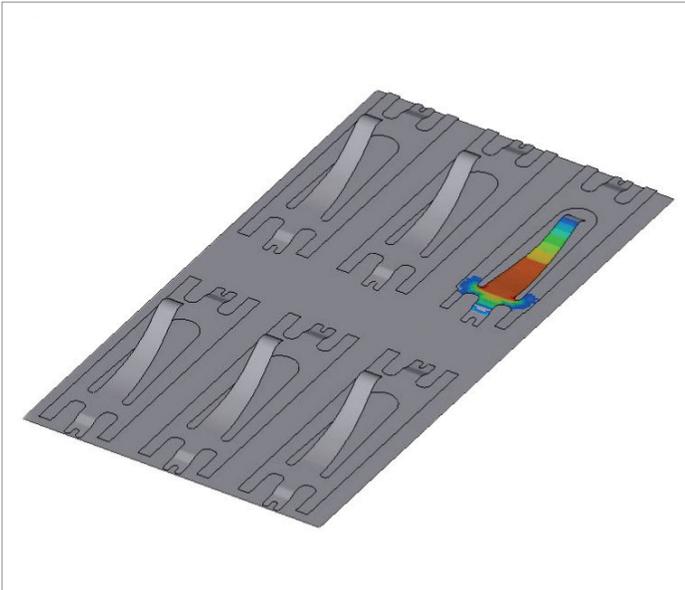
The tools Amphenol has in use are employed for the following purposes:



SIMLOCK® SIM Card Readers



Scalable Clip Family



The conceptualization and the maturity of the 0,3 mm SIMBLOCK® design was achieved by the optimum utilization of HyperWorks and APA tools, which included pre and post processing, injection molding and life cycle calculations.

HyperMesh: As a pre-processing tool for all structural simulations (static and dynamic) on the Amphenol line of mobile connectors.

HyperView: As a post processing tool for all structural simulations (static and dynamic) on the Amphenol line of mobile connectors.

BatchMesher: As a meshing tool for certain simple connector geometries before they are further processed in the HyperMesh environment.

Moldex3D: As an injection molding software in order to evaluate the feasibility of the connector plastic component geometry and the effect of various injection molding process parameters.

nCode DesignLife: In order to study the durability of metal components under cyclic loads against customer specified product life cycle requirements.

The Results: Creating One of the Thinnest SIM Card Readers in the World

One of the projects the Amphenol Engineers carried out with HyperWorks and the APA tools was the Amphenol 0,3 mm SIMBLOCK®, one of the thinnest SIM card readers in the world. The initial concepts of the SIM Card reader were structurally validated with HyperWorks. Once the design of the metal parts was completed,

the Amphenol engineers supported the prototype personnel with reliable results of an injection molding simulation, defining the process parameters of the injection molding tool for providing robust parts. During the life cycle of the product, the engineers used the HyperWorks suite and the APA tools Moldex3D and DesignLife in order to fine tune the design, to meet the subtle but profound changes in customer requirements.

Definitely, the biggest benefit of using these tools and processes was the time saving factor, by speeding up crucial and cost effective decision making. Due to input parameters that went through a series of fine tuning, reliable simulation results were produced. And these results were presented to the customer with more confidence, subsequently moving the project cooperation forward to meet delivery targets.

By using the HyperWorks licensing system for the products included in the APA, Amphenol engineers have been provided with the flexibility to use their HyperWorks Units to access each necessary tool exactly when needed without investing in additional software licenses.

Moldex3D has provided the engineers with the ability to propose optimal injection molding parameters and to highlight showstoppers for the design and functions of the plastic parts they develop from the design concept phase to prototype phase,

thus preventing the company from having to invest into the expensive process of alternative physical tryouts. The use of nCode DesignLife is expected to provide vast insights into the design optimization of connector components in order to surpass the specification requirements for Life Cycle made by customers. The efficient utilization of the Altair license pool always provides the department with the flexibility to move the licenses to the respective tools needed. The APA has enhanced the capabilities of the Amphenol engineers by building a strong CAE structure that effectively supports the design team. The company is now able to provide its customers with more reliable and robust design concepts based on the results and reports generated with HyperWorks and the tools included in the APA.

“We see the APA as a great business model that will allow Altair’s customers to explore possibilities to enhance their CAE capabilities and offerings in order to cater and surpass the expectations and requirements of the end customers. As an extensive recipient of the APA, we would surely recommend this license utilization model to any other engineering entities that require greater flexibility in exploring various CAE tools that will in return enhance their performance in creating optimized and robust design concepts,” concludes Aravind R. Chakravarthi.

Visit the HyperWorks library of
Success Stories
at www.altairalliance.com

About Altair

Altair's vision is to radically change the way organizations design products and make decisions. We take a collaborative approach to solving diverse and challenging problems through the strategic application of technology and engineering expertise. Developing and applying simulation technology to synthesize and optimize product development processes for improved business performance is our specialty.

From computer-aided engineering to high performance computing, from industrial design to cloud analytics, for the past 29+ years Altair has been leading the charge to advance the frontiers of knowledge, delivering innovation to more than 5,000 corporate clients representing the automotive, aerospace, government and defense industries and a growing client presence in the electronics, architecture engineering and construction, and energy markets.

altair.com

About Altair Partner Alliance

One Platform. One License. One Source. **All Access.**

Altair's HyperWorks® platform applies a revolutionary subscription-based licensing model in which customers use floating licenses to access a broad suite of Altair-developed, as well as third-party software applications on demand. The Altair Partner Alliance effectively extends the HyperWorks platform from more than 20 internally developed solutions to upwards of 60 applications with the addition of new partner applications. Customers can invoke these third-party applications at no incremental cost using their existing HyperWorks licenses. Customers benefit from unmatched flexibility and access, resulting in maximum software utilization, productivity and ROI. For more information about the Altair Partner Alliance, visit:

www.altairalliance.com



Altair Engineering, Inc., World Headquarters: 1820 E. Big Beaver Rd., Troy, MI 48083-2031 USA
Phone: +1.248.614.2400 • Fax: +1.248.614.2411 • www.altair.com • info@altair.com

Listed below are HyperWorks® applications. Copyright© 2014 Altair Engineering Inc. All Rights Reserved for: HyperMesh®, HyperCrash®, OptiStruct®, RADIOSS®, HyperView®, HyperView Player®, HyperStudy®, HyperGraph®, MotionView®, MotionSolve®, HyperForm®, HyperXtrude®, Process Manager™, Templex™, Data Manager™, MediaView™, BatchMesher™, TextView™, HyperMath®, Manufacturing Solutions™, HyperWeld®, HyperMold®, solidThinking®, solidThinking Evolve™, solidThinking Inspire®, Durability Director™, Suspension Director™, AcuSolve®, AcuConsole®, HyperWorks On-Demand™, HyperWorks Enterprise™, PBS Works™, PBS Professional®, GridWorks™, PBS GridWorks®, PBS™, Portable Batch System®, PBS Analytics™, PBS Desktop™, e-BioChem™, e-Compute™ and e-Render™. All other marks are the property of their respective owners.