



FEA – CAE – AI – IT

Research, Development & more

FEANTM-The-Town-That-Almost-Exists----ISSN-2694-4707

October - 2026



MI & KE - OZEN



Marco
RBF Morph



Metin
Ozen/Simutech



Jenson
DFE-TECH



Marta
OASYS



Madhukar
CADFEM

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R & D • CAMPING • TOWN MAP

Horses have the right of way



Automotive & Racing



Old Rancher



Aerospace



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38 – Come back to our town to visit

Residents pretending to be editors: All family - strange family.

No one knows their names. You only have to yell:

The Old Rancher: "Hey, Old Rancher."

The Old Pilot: "Hey, Old Pilot."

The Old Race: "Hey, Old Racer."

Racer's Daughter: "Hey, Slow Down."

Town Conversations

Creation is born from trying. If it doesn't work, learn & try again. You Will succeed.
Inventions, simulations, cures, wouldn't exist with that passion to keep trying

MARTA



Simplifying design processes: Using simulation to maintain a competitive edge in tanker manufacturing. Crossland Tankers transitioned from a tanker repair and servicing company to a manufacturer

MADHUKAR



Article - Multiphysics Simulation: This Is How Interactions of Electricity, Heat, and Mechanics Can Be Analyzed and Products Specifically Optimized. Dr.-Ing. Jörg Neumeyer

MARCO



A numerical simulation was carried out to study the transient snow drifting phenomena around buildings. The method employs the commercial CFD software Ansys Fluent with additional user-defined functions to model snow transport.”.

MI & KE



Simulating Oscillating Parts with Ansys Fluent Dynamic Mesh by Brian Peschke, designing these systems can be challenging because fluid behavior inside the tank is highly dynamic and sensitive...

METIN



Among our blogs are the following: How to Represent a Bearing as a Bushing Joint in Ansys Mechanical. How to Constrain Free-Floating Models with the 3-2-1 Method in Ansys Mechanical. How to Set Up a 3D Fan Zone in Ansys Fluent.

JENSON



Webinar by M. Nuramirul Hijjaz, Application Engineer.

In this webinar you will discover how to transform imperfect STL files into simulation-ready geometry using Ansys Discovery



Webinar, by M. Nuramirul Hijjaz. In this webinar you will discover how to transform imperfect STL files into simulation-ready geometry using Ansys Discovery.



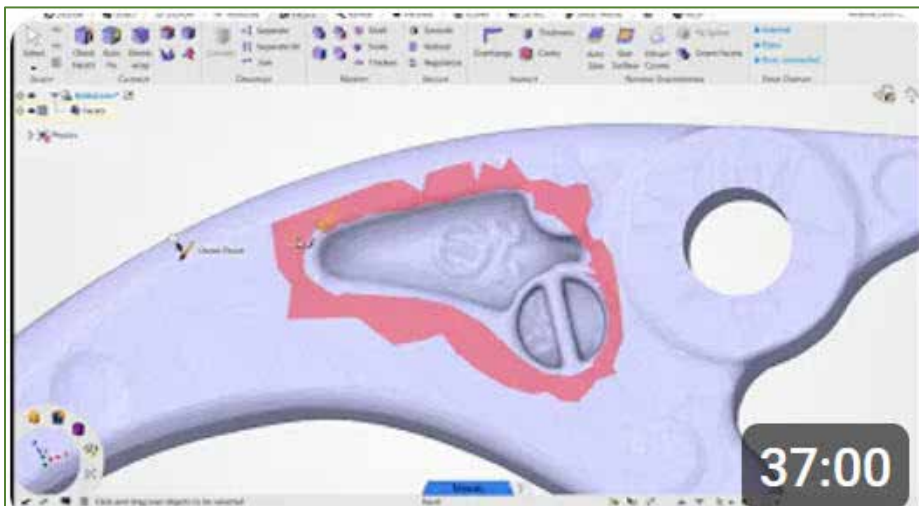
YouTube DFETECH Channel

Webinar: [Ansys Discovery \(From STL to Simulation Ready Geometry\)](#)

M. Nuramirul Hijjaz,
Application Engineer

Learn systematic approaches to repair non-manifold openings, floating facets, and bad orientations—and perform live structural simulations in real-time.

Perfect for manufacturing engineers, biomedical designers, and additive manufacturing professionals.



Topics Covered:

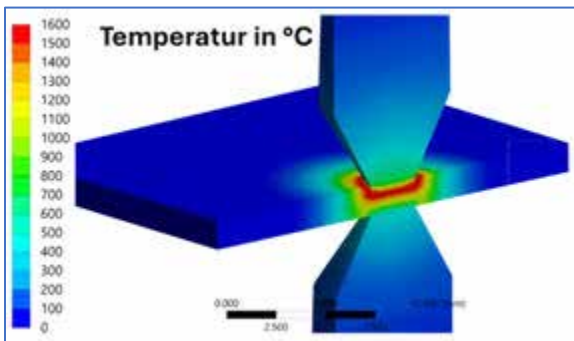
- Repair STL defects systematically
- Reconstruct geometry (organic & prismatic methods)
- Validate using deviation visualization
- Live structural simulation demo

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Indonesia: sales.id@dfc-tech.com	Philippines: sales.ph@dfc-tech.com
website: www.dfc-tech.com	



Quote article, “When electrical, thermal, and mechanical effects occur simultaneously, traditional calculation methods quickly reach their limits. Multiphysics simulation opens up new possibilities in this area and can analyze complex interactions in a realistic manner. CADFEM has developed a simulation-based model that visualizes key effects, enabling a deeper understanding of processes, well-founded optimization, and more efficient product development.”



[Multiphysics Simulation: This Is How Interactions of Electricity, Heat, and Mechanics Can Be Analyzed and Products Specifically Optimized.](#) **Dr.-Ing. Jörg Neumeyer**

Summary

- Multiphysics simulations combine electrical, thermal, and mechanical effects to realistically represent and better understand complex manufacturing processes such as resistance welding.
- During resistance welding, strong interactions occur between current flow, heating, deformation, and contact behavior. These can only be analyzed and optimized with precision through fully coupled simulations.
- Simulation models support process optimization, for example by examining temperature profiles, preventing seam embrittlement, evaluating electrode cooling, and investigating alternative welding strategies.

What is a Multiphysics Simulation? - A multiphysics simulation is a computer-based method that combines several physical disciplines – such as electrical, thermal, and mechanics – to realistically analyze complex interactions. Especially in processes like resistance welding, it provides valuable insights that go beyond traditional calculations. Analytical methods are often insufficient, particularly when physical domains influence each other. Multiphysics simulation opens up new possibilities in this area, enabling a deeper understanding of processes, well-founded optimization, and more efficient product development.

CADFEM has developed a simulation-based model that visualizes key effects such as current flows, heat distribution, and mechanical forces. This allows processes to be improved in a targeted manner – for example, by optimizing cooling rates to prevent seam embrittlement.

How Do Electrical, Thermal, and Mechanical Factors Influence Each Other in Technical Processes? When electrical current flows through a component, Joule losses occur, causing the component to heat up. Suboptimal contact properties make it particularly difficult for current to flow at the point of contact between two components. As a result, the losses and thus the heating are greatest at the contact point, leading to thermal expansion there. This expansion, in turn, affects the contact and thus the current and ultimately the heating. This completes the feedback loop. Especially in high-temperature processes, considering mutual influences is essential.

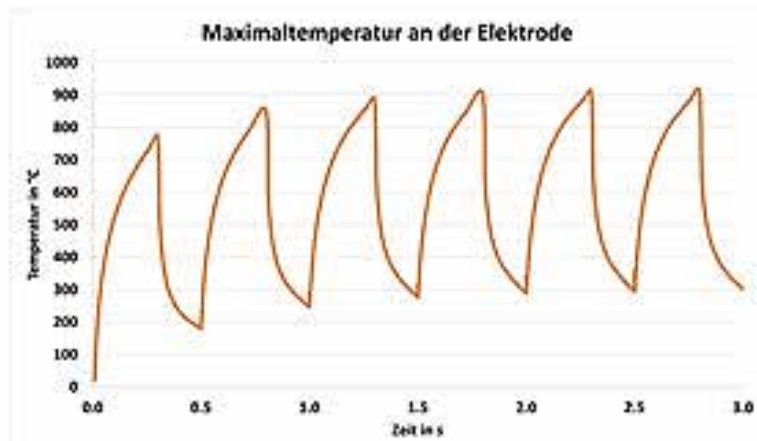
What Role Does Multiphysics Simulation Play in Resistance Welding? An example of these “high-temperature processes” is resistance welding. In this process, so much heat is generated through the application of electrical energy that metals, which are solid at room temperature, reach the phase transition range, melt, and thereby form a material bond between the joining partners.

If that weren't complex enough, this method is used to join two geometries made of different materials. Such requirements are typical in resistance spot welding. Fortunately, these complex processes can be designed and analyzed using user-friendly simulation models.

The electrical current required for heating is transmitted via copper electrodes to the first joining partner, flows from there through the mechanically pressed contact into the second joining partner, and from there either into a second electrode or the applied grounding cable. The goal is to heat the contact point between the two joining partners so that the weld seam can withstand the mechanical forces it will face later.

Why Is Targeted Cooling During Welding Just as Important as Heating? While a lot of heat needs to be transferred between the components to be joined, the temperature at the transitions to the electrodes must remain as low as possible in order to avoid parasitic welds. This not only means heating, but also cooling!

Between welds, the electrodes can release the absorbed heat energy back into the environment. However, this takes time and reduces productivity. Simulation models provide insight into the global temperature behavior at any location and time, and illustrate, for example, the temperatures of the electrodes via virtual measuring points to derive insights about possible cycle times.

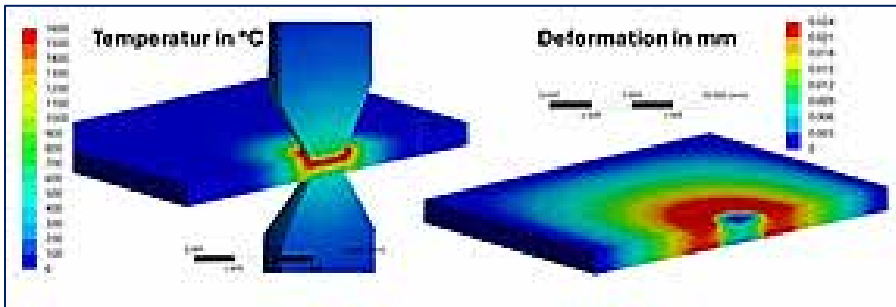


Time history of the maximum electrode temperature across six welding cycles.
| © CADFEM Germany GmbH

The temperature progression at the weld point is also of interest. The model allows for the evaluation of the local temperature distribution inside the material, especially after reaching the maximum temperature. As the name suggests, spot welding processes are concentrated on a point and thus a small area. Since the surrounding metallic mass quickly draws the provided heat away from the weld point, this self-quenching can lead to embrittlement of the weld. This reduces the quality of the seam.

Influence of Electrode Temperature History on Weld Quality and Process Performance

To examine this issue in more detail, CADFEM developed a multiphysics coupled simulation model that considers the effects of electricity, heat, mechanics, time progression, and cycle rates in combination.



Temperature and deformation distribution in the cross section of the weld spot. | © CADFEM Germany GmbH

From the temperature progression over multiple welds, it can be deduced that the temperature history of the electrodes influences the temperature at the weld point, the thermally induced strain there, and the resulting changes in electrical and thermal conductivities. This, in turn, affects the welding performance.

In addition to understanding this relationship, further data can be obtained regarding its extent. How much heat is conducted from the electrodes into the joining partners, and what effect does this have on the required heating time? These insights enable the implementation of targeted corrective measures.

Multiphysical Analysis for Better Welding Results - Multiphysics simulations provide comprehensive insight into the location and magnitude of physical result variables such as electrical current densities, heat generation rates, contact pressures, and component temperatures – all while considering nonlinear material data, structural deformations, and time-dependent influences.

The simulation results ultimately provide answers to critical questions: Why am I melting too much material? What must I do to melt the correct area? In addition to the “mandatory” task of eliminating undesirable effects, the simulation model can also be used for “optional” tasks in the form of process improvements. This includes questions such as: Can geometric changes to the electrodes influence the temperature behavior? Should the surrounding material be preheated to reduce embrittlement? What alternative processes could there be? How does the process behave with other materials?

The analysis of “what-if” scenarios offers enormous potential for deeper understanding and the development of improved processes.



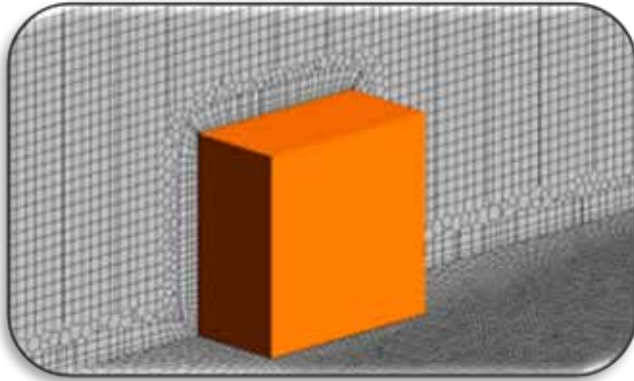
“RBF Morph, Article Quote, A numerical simulation was carried out to study the transient snow drifting phenomena around buildings. The method employs the commercial CFD software Ansys Fluent with additional user-defined functions to model snow transport.” ...”The numerical simulation employs the commercial software Ansys Fluent 2022R2 with additional user-defined functions to incorporate the snow drifting scheme and allow temporal changes to the snow surface.”

Web – MDPI - [Numerical Simulation of Snowdrift Development in Non-Equilibrium Flow Fields Around Buildings](#)

Ryu Nara, Corrado Groth, and
Marco Evangelos Biancolini

- Ansys Japan K.K., Osaka, Japan
- Dept Enterprise Engineering, Univ. of Rome “Tor Vergata”, Italy

Left: b) mesh around the cubic building.



Abstract - Drifting snow analysis around buildings has been extensively studied, but there have been few validation examples in non-equilibrium flow fields around buildings using the saltation fetch distance to account for the snow transport rate. Therefore, in this study, we conducted snowdrift analysis in three types of non-equilibrium flow fields and compared the results with actual measurements. For cube-shaped buildings and two-level flat roofs, the simulation results captured the trends observed in the actual measurements. However, in the case of snow fence analysis, an underestimation of the accumulation amount was observed downstream of the snowdrifts.

1. Introduction -When constructing buildings in snowy regions, it is crucial to predict the occurrence of snowdrift phenomena in the vicinity of the structures and implement appropriate snow measures. However, the position and shape of snowdrifts are influenced by various factors, including wind direction, wind speed, snow quality, temperature, building shape, and surrounding conditions.

The most effective method currently available for predicting snowdrifts around structures, such as buildings and roads, is the use of wind tunnel experiments with model snow, which has a substantial track record [1,2]. However, there are still uncertainties regarding the similarity laws between real and wind tunnel snow, including their physical properties [3]. While various investigations have been conducted, a comprehensive understanding of these details has not yet been established.

In recent years, with the advancement of computer technology and the widespread availability of computational fluid dynamics (CFD) software, numerical simulations of airflow using CFD have become increasingly popular. Unlike traditional methods based on geometric and flow field similarity laws, CFD-based approaches offer the potential for predicting snowdrift phenomena by leveraging airflow prediction techniques. These methods have gained attention and are expected to provide valuable insights into snowdrift prediction by breaking free from strict geometric and flow similarity assumptions.

In the numerical prediction of snowdrift phenomena around buildings, pioneering research has been conducted by Uematsu et al. [4]. Their work has established fundamental methods for snowdrift modeling that are still widely used today. For predicting suspension, a transport equation for drifting snow density is employed. For predicting saltation, including creep, basic models proposed by Iversen et al. [5] and Pomeroy and Gray [6] utilize formulas based on friction velocity as a function. However, it has been pointed out that applying these prediction formulas, which are based on observations in equilibrium flow fields, to non-equilibrium flow fields around buildings with significant local variations can result in various errors. Okaze et al. [7] addressed this issue by expressing the relationship between saltation fetch distance and snow transport rate in the blowing snow boundary layer, considering factors such as the difference between the drag acting on saltation and the threshold friction velocity. Furthermore, Liston and Sturm [8] defined the snow transport rate in non-equilibrium conditions as a function of the snow transport rate in equilibrium conditions and the saltation fetch distance and conducted numerical simulations. However, there are still limited examples of snowdrift analysis considering saltation fetch distance in the numerical prediction of snowdrift phenomena around buildings. Therefore, there is a need for numerous validation cases to achieve quantitative predictions of snow depth.

On the other hand, changes in the snow surface boundary due to erosion and deposition can have a significant impact on the local flow field, and the local flow field, in turn, can affect the snow surface shape. Therefore, it is important to consider methods that simulate snow surface changes. The common approaches to mesh deformation already implemented in CFD software include the smoothing-based method, dynamic layering method, and remeshing method, where the spring-based smoothing method, diffusion-based smoothing method, and linear elastic solid-based smoothing method are incorporated in the smoothing-based method [9]. Some researchers have also utilized mesh deformation to consider the influence of snow boundary changes on the flow field [10,11,12].

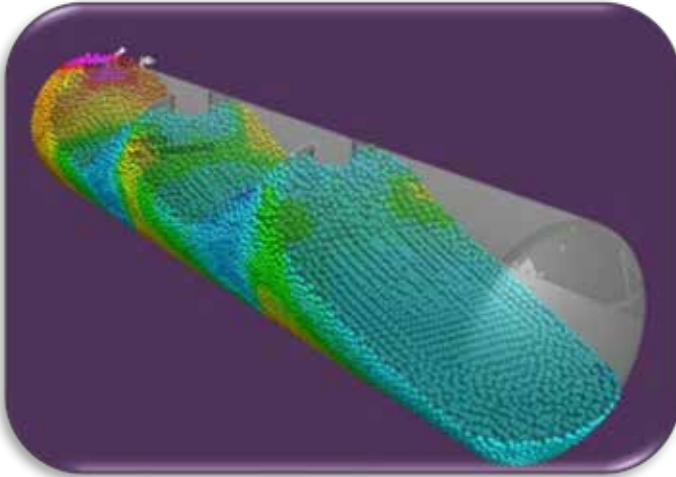
The displacement of boundary and interior nodes of the mesh needs to be determined through interpolation before the mesh is deformed. The choice of interpolation function is crucial in this process. While interpolation is widely used in mesh deformation, Franke [13] extensively evaluated the effects of various interpolation methods on scattered data and demonstrated that radial basis function (RBF) interpolation exhibited excellent performance. Zhu et al. [14] were the first to utilize RBF interpolation to simulate the dynamic changes in snow boundaries in snowdrifts and conducted a quantitative evaluation. In [15], RBF was used to simulate the shape change for icing accretion.

Therefore, in this paper, we conducted numerical predictions of snowdrift phenomena considering saltation fetch distance in non-equilibrium flow fields around buildings. We compared the results with drift profiles around a cubic model and snow fences, as well as with the snow depth profiles on a stepped roof. Details about the three configurations investigated are provided in Section 3.1.1, Section 3.2.1, and Section 3.3.1. ..

2.5. Mesh-Morphing Method - The change in height of the cell vertices shown in Equation (21) is implemented on the wet surfaces and then extended to the other ones and to the volume elements of the computational grid using the RBF method. Displacements are applied along the geometry normal, prescribing a zero-motion field on the boundaries of fixed domains, obtaining a smooth displacement field in between. This approach can be obtained by exploiting one of the major characteristics of the RBF method, that is, its capability of performing a smooth interpolation of scalar information defined at points (source points), as a function of the distance [27].



Article, “Established in 1988, Crossland Tankers transitioned from a tanker repair and servicing company to a manufacturer, producing one new tanker daily across two 80,000 square-foot facilities.”



Web – Oasys - [Simplifying design processes: Using simulation to maintain a competitive edge in tanker manufacturing](#)

The challenge - Bulk liquid transport is integral to the UK's supply chain, with approximately 300 terminals dedicated to import, export, and distribution. Specialising in bulk-load road tankers in Northern Ireland, Crossland manufactures vehicles capable of transporting up to 40,000 litres of liquid over long distances.

The sloshing of liquids within the tanks

significantly impacts driveability and lifespan.

In response to competitive pressures and weight restrictions, Crossland engaged in a Knowledge Transfer Partnership with Queen's University Belfast to enhance their research and development capabilities. The goal was to simplify the tanker design process using Ansys LS-DYNA simulations, focusing on three main components: SPH (Smoothed Particle Hydrodynamics) tank model, structural chassis model, and truck/suspension elements. Utilising the Oasys LS-DYNA Environment products and expertise, the team including R&D Engineer Conor Robb aimed to streamline design iterations and adapt to market demands effectively.

The solution - This project aimed to develop a versatile road tanker model that captured road, tire, and suspension dynamics along with chassis effects.

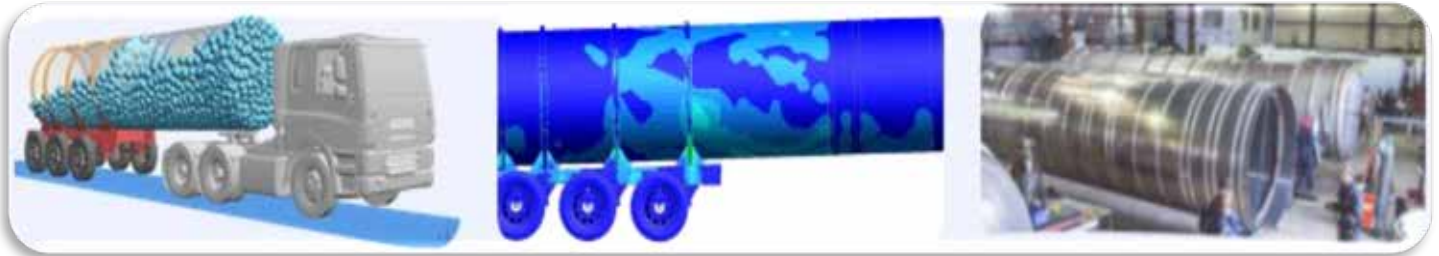
The purpose-built Oasys Suite enabled efficient navigation of Ansys LS-DYNA's extensive features and tools, with intuitive menu options for creating connections like welding and bolts. Oasys PRIMER's model checking features further streamlined the process, and a simplified model featuring a rigid tank filled with water was constructed.

This project simulated the full tanker and chassis under diverse loading conditions including braking, turning, and NVH (noise, vibration, and harshness). SPH capabilities were employed to simulate sloshing effects within the tanker.

Crossland validated the model by completing real world testing in house, fitting acceleration and strain gauges to the tanker and performed various road manoeuvres.

After the real-world testing was performed, the recorded acceleration was applied to the Finite Element Analysis (FEA) model in three different load cases. Using Oasys D3PLOT, the team could extract the Stress/Time data from the shells corresponding to the location of the real strain gauges. Then using Oasys T/HIS they plotted the test data against the FEA results to determine the validity of the model.

The Oasys team provided continuous support throughout, guiding the project from academic modelling to commercial application. They assisted in defining the problem and determining optimal approaches using Ansys LS-DYNA and Oasys tools and techniques.



The result - By creating a “worst case scenario” load case of the tanker undergoing an emergency braking manoeuvre, the team were able to identify areas of weakness.

The comprehensive model of the tanker provided opportunities for incremental and substantial modifications throughout the tanker design to reduce weight and improve market competitiveness. The design process has been enhanced by informing and evaluating design decisions with simulation data.

“Using LS-DYNA and the Oasys Suite has enabled us to streamline our design process and deliver innovative and high-quality solutions for our customers. The software has given us the flexibility and accuracy to model complex features and interactions, and the support from the Oasys team has been invaluable. We are confident that this partnership will help us achieve our goals and maintain our competitive edge in the market.” – Pearse McKeefry, Managing Director of Crossland Tankers

Crossland can now design with efficiency in mind as they reduce weight and increase strength while still maintaining a factor of safety. This process will support them to pass all relevant compliance tests first time and save valuable time and money building multiple test rigs. With an effective workflow setup in Oasys PRIMER, this allows them to rapidly update models with new designs. This plays a key role in the new process at Crossland where designs are tested and evaluated with significant accuracy.

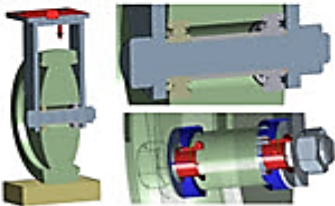


On the official SimuTech Blog, our expert engineering staff keeps you informed by authoring original, comprehensive content about the latest in Ansys simulation software, technical enhancements and releases, new and emerging technologies, thought leadership insights, product development best practices, simulation consulting case studies, client success stories, and how-to guides.

[Web – Among the articles on the SimuTech Blog](#)

How to Represent a Bearing as a Bushing Joint in Ansys Mechanical

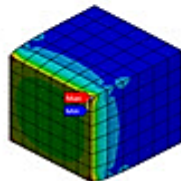
Published: 09/18/2026
Updated: 09/18/2026



How to Constrain Free-Floating Models with the 3-2-1 Method in Ansys Mechanical

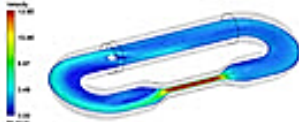
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4. Static Structural
Equivalent Stress
Upper Equivalent (von Mises) Stress
Unit: MPa
Time: 1 s
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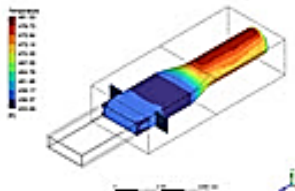
How to Set Up a 3D Fan Zone in Ansys Fluent

Published: 09/17/2026
Updated: 09/17/2026



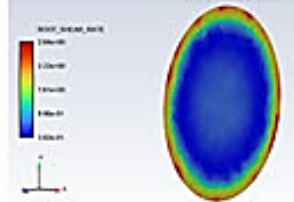
How to Use a Temperature Profile as a Boundary Condition in Ansys Fluent Polyflow

Published: 09/17/2026
Updated: 09/17/2026



How to Simulate Porous Media in Ansys Fluent Polyflow

Published: 09/17/2026
Updated: 09/17/2026

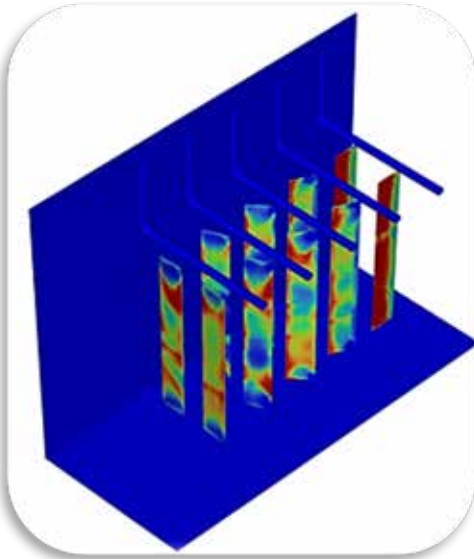




Mi (a resident news raccoon) & Ke (a resident news coyote)

Mi, “know anything on Oscillating Parts?”

Ke, “I called Mike at Ozen/SIMUTECH. He knows a blog that will help us, using ANSYS Fluent Dynamic Mesh.”



Web – SimuTech Group – Excerpt - [Simulating Oscillating Parts with Ansys Fluent Dynamic Mesh](#) - (Brian Peschke, Lead Engineer – Fluids)

Challenges of Electroplating, Coating, and Washing Systems
- Electroplating, industrial coating systems, and washing systems often rely on oscillating part motion inside liquid tanks to improve coating consistency, chemical exposure, or washing shear across complex geometries.

Designing these systems can be challenging because fluid behavior inside the tank is highly dynamic and sensitive to motion speed, stroke length, tank geometry, and part spacing. Poor flow circulation can create stagnant regions, uneven chemical concentration, or localized turbulence that negatively impacts coating thickness or washing quality. Engineers must also evaluate free-surface disturbances, drag forces on moving fixtures, and fluid interaction between multiple oscillating parts, all of which can significantly influence consistency and production throughput.

Engineering Solutions for Electroplating, Coating, and Washing using Oscillatory Part Motion - To address these challenges, manufacturers commonly implement engineered flow-control strategies within electroplating, coating, or washing tanks. Oscillatory motion profiles are optimized to improve fluid exchange around recessed surfaces and minimize stagnant flow zones. Tank geometries may include strategically positioned baffles to improve mixing and chemical distribution. Engineers also adjust part spacing, rack orientation, and immersion depth to reduce shielding effects between neighboring components. In some systems, variable motion frequencies and amplitudes are introduced to balance coating or washing uniformity with mechanical limitations and process cycle time. These engineering improvements aim to create predictable fluid motion while maintaining stable operating conditions throughout the manufacturing process.

Using Ansys Fluent Dynamic Mesh to Evaluate Engineering Solutions - Ansys Fluent with Dynamic Mesh capability provides a powerful Computational Fluid Dynamics approach for evaluating these electroplating, coating, or washing system designs before physical testing. Dynamic Mesh allows

engineers to simulate oscillating racks, moving parts, and changing fluid domains while accurately capturing transient flow behavior inside the tank. Using CFD, engineers can visualize velocity fields, turbulence levels, recirculation zones, and free-surface motion created by part oscillation. Multiple design concepts, motion profiles, and tank configurations can be compared quickly to identify solutions that improve coating consistency and reduce process variability. By combining transient CFD analysis with realistic moving geometry simulation, Ansys Fluent helps manufacturers optimize tank performance, reduce development costs, and accelerate process improvement initiatives.

View Website for information, videos and graphics on the following:

Ansys Fluent Dynamic Mesh Simulation Geometry

The geometry for this example simulation is a rectangular box which contains two rows of plate parts with five parts per row...

Simulation Mesh

Fluent Mesh Mode is used to generate the volume mesh...

Ansys Fluent Dynamic Mesh Simulation Setup

The simulation is transient...

Ansys Fluent Dynamic Mesh Simulation In Action

- Mass Fraction Tracer
- Wall Shear Stress
- Top View of Velocity Magnitude
- Wall Velocity

Video Walk-Through of Ansys Fluent Dynamic Mesh Simulation Setup

The video walks through the dynamic mesh simulation setup from the geometry to meshing to flow solver in Ansys Fluent.

SimuTech Group Can Help

Electroplating, coating, and washing systems must meet performance requirements across variations in part shape, orientation, and operating conditions. SimuTech Group's Fluids team helps engineering organizations use Ansys Fluent Dynamic Mesh and other Ansys simulation tools to evaluate complex fluid behavior and make more confident design decisions earlier in development.

Whether you are working on an electroplating system, coating system, or washing system, SimuTech Group can help you develop robust CFD simulation workflows using Ansys Fluent Dynamic Mesh to evaluate moving components, transient flow behavior, and process performance.

LS-DYNA® IN PRACTICE

**SIMULATION
LEADS TO
SAFER, CLEANER,
STRONGER
PRODUCTS.**



HIGHLY DYNAMIC SIMULATION

Using explicit time integration, LS-DYNA can simulate fast, highly dynamic events such as crash and impact. Proven default solver and model settings help engineers establish robust analysis models.

Based on material from CADFEM.

[Link - CADFEM](#)



ELECTROMAGNETIC MODELING

A SimuTech Group tutorial shows how geometry prepared in Ansys Discovery can be transferred into Workbench LS-DYNA, where cross-sectional segment sets and named selections are defined for electromagnetic analysis.

Based on material from SimuTech Group.

[Link - SimuTech](#)



CRASH SAFETY & COMPLIANCE

DFE-Tech describes the use of CAE and LS-DYNA in evaluating frontal collision performance to help meet UN ECE R94 requirements under Malaysia's Vehicle Type Approval framework.

Based on material from DFE-Tech.

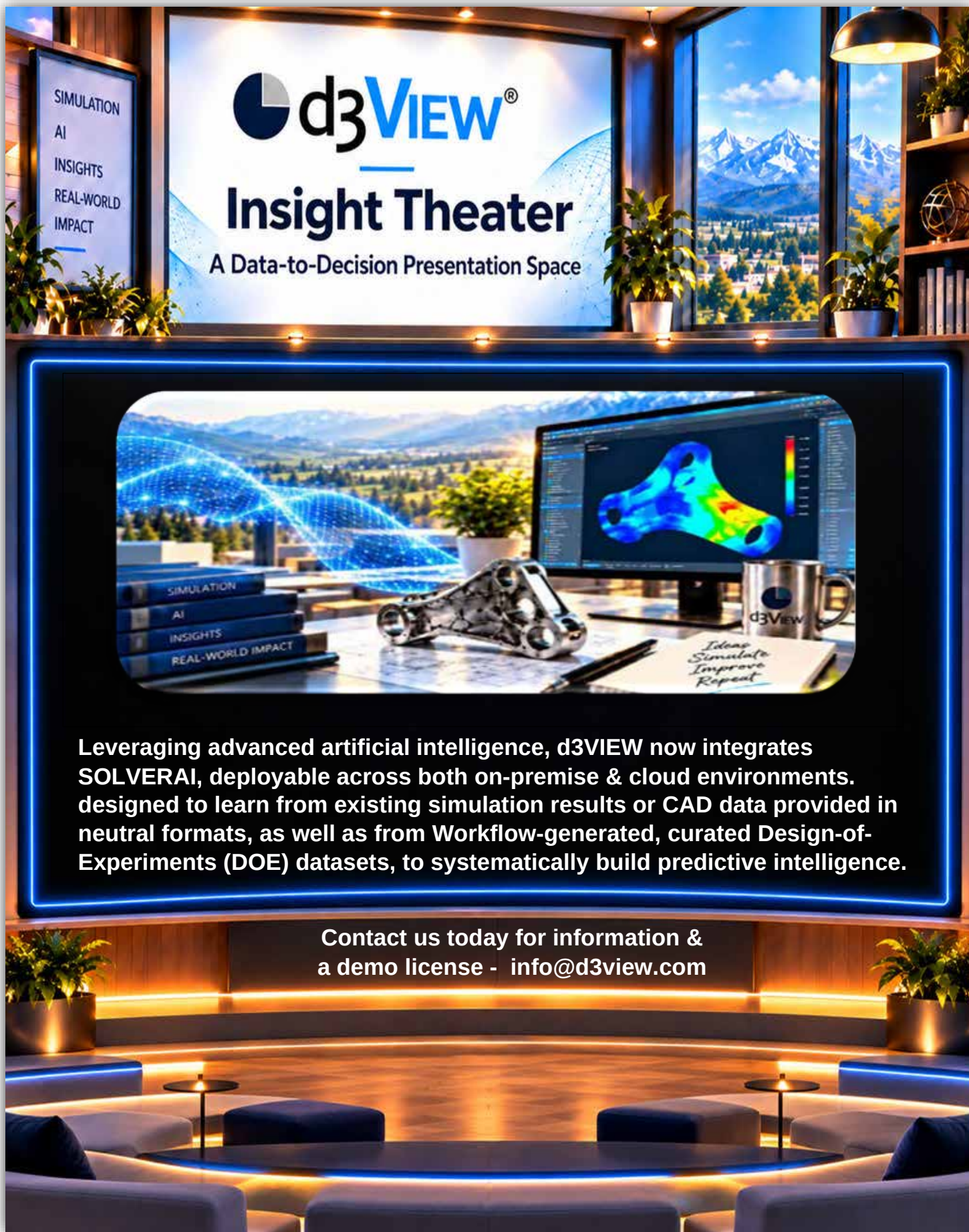
[Link - DFE-Tech](#)

FROM CRASH AND IMPACT TO ELECTROMAGNETICS

LS-DYNA supports engineers working across a wide range of complex simulation problems.

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I came across an interesting article by Sudeep Shivalli of Synopsys and thought it was worth bringing to the Town Hall.

The author has also shared the article on LinkedIn and kindly indicated that FEANTM could feature it. Since many FEANTM readers around the world may not use LinkedIn, we are providing the link to the original article on the Synopsys website."



Source: SYNOPSYS Website: [India's Semiconductor Ecosystem is Moving from Participation to Influence](#) **Sudeep Shivalli**, "During SNUG India, we hosted an evening of insightful conversations at the Synopsys Innovation Forum, bringing together founders, investors, industry leaders, technologists, and ecosystem stakeholders to discuss how India can drive the next waves of deep-tech innovation , My recent Blog below captures the highlights."

"India has long been recognized as a vital hub for technical talent, but its role in the global semiconductor industry has mostly centered on design execution and engineering support. That role is beginning to expand. The country's technology leaders are now seeking greater influence across the semiconductor value chain through product creation, ecosystem partnerships, and innovation — rooted in India's needs but relevant to global markets.

These aspirations underscored multiple discussions at the recent Synopsys Users Group (SNUG) India, which included an Innovation Forum featuring founders, investors, and technology leaders from across India's semiconductor sector.

"India's digital economy has to be powered by semiconductors," said Ravi Subramanian, chief product management officer at Synopsys. "And the semiconductors that are unique to India and the Indian market are going to have to be born and created [in India]."

"With the talent pool we have, the leadership we have," added Balajee Sowrirajan, vice president of Intel India, "we are at the cusp of significant innovation and growth."

That optimism reflects several reinforcing trends across the country's semiconductor sector: stronger government support, expanding startup activity, greater access to capital, and a growing focus on ownership.

A market ready for ownership - India's semiconductor future will not mirror other regional models. Instead, it will be shaped by the country's own market realities and priorities. That means it must support linguistic diversity, provide digital inclusion at scale, navigate infrastructure constraints, and deliver greater power efficiency. "Frugal AI matters a lot [in India]," Sowrirajan said, emphasizing the need for accessibility, affordability, and reach.

The next phase of innovation must also be “workload centric,” he added, to ensure products are designed around the application needs, economics, and access challenges of the country’s population.

That combination of market need and technical specificity is beginning to shape where capital and institutional support are flowing. According to Ganapathy Subramaniam of Yali Capital, Indian semiconductor, industrial, AI, and systems companies have better access to capital and more government support than ever before.

“There’s a lot of money coming into the deep tech ecosystem,” he said, “so capital is being addressed.” But ambition and investment will not be enough to scale the country’s semiconductor ecosystem. Greater collaboration within and across the ecosystem is also needed.

Collaboration will determine pace - To maximize the opportunities at hand, Indian technology leaders echoed the need to connect more of the value chain — from chip design to product integration, procurement, and market adoption.

Dheemanth Nagaraj of Agrani Labs — a startup building an “AI GPU for data centers out of India” from the ground up — said success demands coordination across models, compilers, semiconductors, packaging, cooling, and systems.

“It has to be system-level, end-to-end thinking,” Nagaraj said.

India also needs strong collaboration “between the users and the builders,” said Kaushik Raghunath of Mercedes-Benz Research and Development India. He pointed to other markets where automakers and semiconductor companies are working together to build custom chips for vehicle controllers.

“That is something I think will really change the game for India,” Raghunath said.

The country’s next phase of growth will not be driven solely by supply, regional leaders emphasized. It will accelerate when design capability is linked more closely to product demand, deployment, and long-term partnerships across a broader range of semiconductor markets.

Dr. Himanshu Khatri of Axiro Semiconductor highlighted growing domestic capabilities in RF, wireless infrastructure, satellite communications, and advanced analog technologies — areas where India’s own market needs can help shape products with broader global appeal.

“We must aim high and work collaboratively in the next decade,” Dr. Khatri said, “to produce hundreds, if not thousands, of companies that export millions of parts worldwide.”

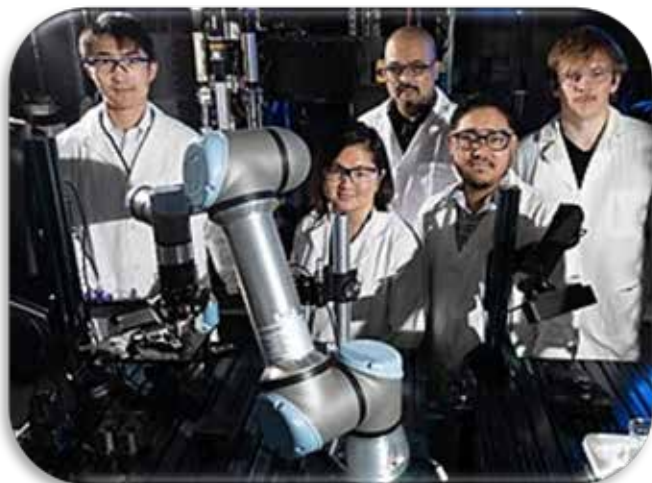
From participation to influence - This year marks Synopsys’ 30th anniversary in India, a milestone that reflects three decades of engagement with local enterprises, startups, academic institutions, and government entities to move ideas from design to deployment.

That type of collaboration, combined with advanced tools, deep expertise, and execution capacity, will be essential as India pursues its semiconductor ambitions.

“By 2035, the shift has to be from the position of participation to a position of influence,” said Amit Khanuja, vice president of R&D engineering in Synopsys’ IP Group. If India can turn its longstanding engineering strengths into differentiated technologies that serve domestic needs, global influence will follow. For complete graphics view the article on the website



LLNL Article, “Sandwiched between the electrolyte and electrodes in a lithium-ion battery is a remarkably thin layer of material that strongly dictates battery performance and durability: the interphase. Although typically only a few to tens of nanometers thick, interphases are among the least understood components of an operating battery cell. Their complex and constantly evolving structures make it challenging to determine how their atomic features and microscopic variations translate into macroscopic battery performance.



Web – LLNL - [Machine learning uncovers how battery interphases can boost lithium-ion transport](#) - Ashley Piccone

Interphases — the multicomponent interlayer structures that emerge between electrodes and electrolytes in batteries — critically determine the performance and durability of electrochemical cells. (Graphic: Sabrina Wan)

In a recent study, published in *Advanced Energy Materials*, researchers at Lawrence Livermore National Laboratory (LLNL) used large-scale

machine learning, combined with data-driven analysis, to tackle this challenge. Their approach disentangles the dynamically evolving chemistry and structure at battery interphases and reveals how this complexity impacts battery functionality.

“Typically, we expect these spontaneously formed interphases to be detrimental to battery performance. They are one of the main causes of capacity fade and performance degradation in batteries,” said LLNL scientist and author Sabrina Wan. “But if we can understand and control their functionality through targeted design, they could instead be beneficial.”

Interphases are thin layers that form when electrodes and electrolytes chemically and electrochemically react during battery fabrication and operation. Characterized by highly variable and constantly changing structures, interphases develop their own compositions and properties — often markedly different from those of the bulk materials on either side.

“Unless we can understand and control the interphase, we cannot identify tractable strategies to improve cell performance, safety and longevity, all of which are critical for economic considerations and safe operation of batteries,” said Wan.

Experimentally probing these buried interphase structures is extremely challenging, requiring exceptionally high spatial and temporal resolution as well as sensitivity to their complex chemistry. Addressing these complexities computationally has been a longstanding challenge in the battery field as well.

Quantum-mechanical simulations can accurately describe chemical reactions and interactions among different materials, but their high computational cost limits simulations to relatively small systems — typically only a few hundred atoms. On the other hand, classical approaches can model much larger systems and extend into the relevant nanometer regime, but they cannot capture the chemical reactions that drive interphase formation and its continued evolution during battery operation

This creates a fundamental computational challenge: how can researchers simultaneously capture the chemical reactions within an interphase structure and the length and time scales needed to understand how it works?

“Enabled by recent advances in machine-learning methodologies, we now have the tools to address this grand challenge and bridge these scales with high fidelity,” said Wan.

By training a highly scalable and accurate machine-learning model on quantum-mechanical data, the researchers extended atomistic simulations to the length and time scales needed to resolve the structure-property relationships governing interphases. They were able to examine the actual size scale of the interphase with millions of atoms at the nanosecond timescale of chemical reactions.

“Especially when coupled with data-driven post-analysis approaches, we can establish statistically meaningful correlations between the variation within these interphase structures and their performance,” said Wan.

The authors demonstrated the approach on a lithium fluoride/lithium carbonate system that has long posed a puzzle in the battery research community. Bulk lithium fluoride has intrinsically poor conductivity, but, counterintuitively, interphases rich in that material remain functional during battery operation. The new simulations reveal that mixtures of lithium fluoride and other chemical species within the interphase create practical pathways for ion transport.

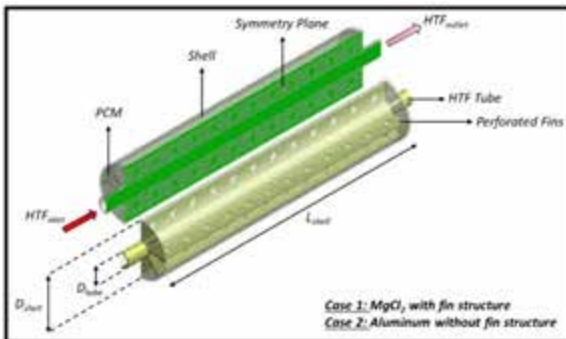
These simulation-derived insights directly translate into actionable strategies for the design and optimization of interphase structures with targeted properties and performance.

Beyond lithium-ion batteries, the simulation platform provides a broadly applicable framework for studying complex, reactive interphases in other areas of materials science and energy technology, including catalysis, fusion materials and weapons science, where evolving interface chemistry plays a critical role in material performance and degradation.

“That's really the value of this — it isn't limited to batteries,” said Wan.



Source: Among the publications suggested by ChatGPT - FEANTM selected this paper from those suggestions because it presents accessible physics—including melting, solidification, conduction, convection and heat flux—supported by clear ANSYS contour plots and graphs. It also demonstrates how simulation can challenge an accepted engineering assumption.



THERMAL ANALYSIS FOR STUDENTS: FROM MELTING ALUMINUM TO PREVENTING TANK FAILURES

“Comparative Analysis of MgCl_2 and Aluminum for Melting and Solidification Performance in Latent Heat Storage” **Ismail Gürkan Demirkıran, Klarissa Niedermeier and Erdal Cetkin**

Figure 1. Schematic of a shell-&-tube heat exchanger filled with PCM [14]

- Published: 2026
- Researchers: İzmir Inst. of Technology, Türkiye, & Karlsruhe Inst. of Technology, Germany
- Software: **ANSYS Fluent 2024 R2**
- Length: 15 pages
- Access: [IOP Science Completely open access under Creative Commons CC BY 4.0](#)
- PDF - [Read the complete open-access paper from Karlsruhe Institute of Technology](#)

The researchers simulated aluminum and magnesium chloride as phase-change materials for high-temperature solar-energy storage. One particularly interesting result contradicts a common simplifying assumption: natural convection inside melting aluminum was significant and should not be ignored. Aluminum also completed its phase change in roughly half the time required by the magnesium chloride system.

Abstract - Next-generation concentrated solar power systems require thermal energy storage technologies capable of reliable operation above 600 °C. This study numerically compares aluminum as a metallic phase change material (PCM) and MgCl_2 as a salt PCM (enhanced with perforated fins) in a shell-and-tube TES unit using liquid sodium as the heat transfer fluid. Simulations were carried out with the enthalpy-porosity method in ANSYS Fluent 2024R2. Contrary to assumptions in the literature, natural convection is not negligible during melting or solidification of aluminum, underlining the need to account for convection in metallic PCM modeling. Results further show that for aluminum, melting and solidification times are almost identical, with only a 7-minute difference, and the overall phase change is nearly twice as fast as MgCl_2 . Moreover, the obtained outlet temperature profiles ensure suitable operating conditions for turbines, while the nearly constant heat flux trend approximates steady-state system behavior.



I love tractors, planes, drones, trains, military tanks, race cars

Once upon a time in 1957, the United States was conducting a series of nuclear tests at the Nevada Test Site known as **Operation Plumbbob**.



What we do know is one nuclear test, and one steel plate, one frame of film. The results? An engineering question that has survived for nearly 70 years.

Among the experiments were tests intended to answer an increasingly important question: Could nuclear explosions be conducted underground while reducing the radioactive material released into the atmosphere?

That sounds like a serious engineering problem. It was. What happened next sounds considerably less serious. The United States may have accidentally launched a very large steel plate toward space.

Sources Used

- U.S. Dept of Energy, *Battlefield of the Cold War: The Nevada Test Site, Volume I — Atmospheric Nuclear Weapons Testing 1951–1963*. Historical discussion of Pascal-A, Pascal-B, Robert Brownlee's velocity calculation, and the Rainier underground test.
- U.S. Department of Energy, *Announced United States Nuclear Tests, July 1945 Through December 1992*. Official test listing identifying Pascal-B as an August 27, 1957 shaft safety experiment and Rainier as the September 19, 1957 underground test.
- U.S. Atomic Energy Commission / Nevada Test Organization, *Operation Plumbbob — Test Manager's Report*. Historical documentation of the 1957 Operation Plumbbob test program.

Going Underground - Los Alamos scientists had been considering underground testing to reduce fallout. One experiment, called **Pascal-A**, placed a nuclear device at the bottom of a roughly 500-foot-deep vertical shaft.

The shaft wasn't filled or sealed. A heavy lid covered the opening, while a thick concrete structure called a collimator was positioned farther down the shaft.

Pascal-A was detonated on July 26, 1957. The explosion sent the lid and concrete structure flying out of the shaft. Observers described a spectacular column of blue fire shooting hundreds of feet into the air. Neither the lid nor the collimator was recovered. The experiment had demonstrated something important, however: putting the explosion underground significantly reduced fallout.

So, the scientists tried again. The next experiment was **Pascal-B**, conducted on August 27, 1957. Official U.S. Department of Energy records identify Pascal-B as a shaft test and a safety experiment during Operation Plumbbob. This time, someone decided it might be useful to determine just how fast the steel plate covering the shaft was traveling. That turned out to be an interesting question.

Bring in the High-Speed Camera - Robert R. Brownlee, a Los Alamos astrophysicist involved in the Pascal experiments, wanted to see what happened inside the shaft immediately after detonation.

For Pascal-B, a high-speed camera was positioned to observe the top of the shaft. The idea was straightforward enough. Detonate the device. Photograph the plate as it leaves. Measure its movement between frames. Calculate its velocity.

There was only one problem. The plate appeared in **one frame**, not two. That meant nobody could measure how far it had traveled from one frame to the next. The only conclusion was that the plate had been moving extraordinarily fast.

Brownlee calculated the plate's velocity from the experiment and later described it as about **six times Earth's escape velocity**. Earth's escape velocity is about 11.2 kilometers per second. Six times that would be roughly **67 kilometers per second**, or about **150,000 miles per hour**. **That is where a nuclear safety experiment became an engineering legend.**

Did America Accidentally Launch Something Into Space? Over the years, the Pascal-B plate became popularly known as the **manhole cover**. However, that description makes it sound rather more ordinary than the heavy steel plate sealing a nuclear test shaft actually was.

The story also acquired an even better title: The first man-made object launched into space.

It is a wonderful story, but it is also something we cannot confidently say happened. The calculated velocity was enormous, but the velocity at the instant the plate left the shaft is not the same as the velocity after traveling through Earth's atmosphere. At tens of kilometers per second, the atmosphere becomes a formidable engineering problem.

The plate would encounter extreme aerodynamic forces and heating. It could have slowed dramatically, fragmented, melted, or vaporized. No tracking system followed it into space. There was no second photograph establishing its trajectory. And the plate was never recovered.

Brownlee himself acknowledged the legend that grew around the experiment. The Department of Energy's history of the Nevada Test Site notes that he had sometimes been credited with launching the first man-made object—a “manhole cover”—into space. But being launched *toward* space and actually *reaching* space are two different engineering claims. The evidence cannot settle the second one.

The More Interesting Engineering Story - Whether the steel plate reached space is the least important part of the story. Pascal-A and Pascal-B were early experiments in understanding underground nuclear detonations and containment. Less than a month after Pascal-B, another Operation Plumbbob experiment demonstrated where the technology was headed.

On September 19, 1957, **Rainier** was detonated underground at the Nevada Test Site. Unlike the vertical Pascal shafts, Rainier was positioned in a horizontal tunnel beneath a mesa. Rainier produced a yield of 1.7 kilotons and became the first U.S. nuclear detonation to be fully contained underground, with no radioactive release detected.

The progression is fascinating. Engineers dealt with enormous pressures, temperatures, shock waves, geology, structural containment, and radioactive material—all while trying to understand phenomena with little experimental history. Pascal-A blew its cover away. Pascal-B turned its steel plate into a projectile moving too quickly for the camera system to measure conventionally.

Rainier demonstrated successful underground containment. That is engineering development happening in real time.

One Frame Is Sometimes Enough to Create a Mystery - Nearly seventy years later, nobody can retrieve the Pascal-B plate and examine it. Nobody can add another camera angle. Nobody can install a better sensor.

The experiment is over. We have the calculations, historical records, Brownlee's recollections—and that single photographic observation.

That leaves engineers with something they generally dislike: **insufficient data for a definitive answer.**

- Did the Pascal-B plate become the first human-made object to reach space? Maybe.
- Did it vaporize in the atmosphere? Possibly.
- Did it follow some other trajectory or fate? Also possible.

What we know is considerably more interesting than simply repeating the legend as fact.

In August 1957, engineers placed a steel plate over a shaft containing an underground nuclear experiment.

When the device detonated, the plate flew away so quickly that a high-speed camera caught it in a one single frame.

Scientists calculated an extraordinary theoretical velocity.

The plate was never seen again.

And almost seventy years later, engineers are still asking:

Where did the manhole cover go?



I love tractors, planes, drones, trains, military tanks, race cars

Once upon a time I learned about leadership from a manhole cover and tried to join an AI community but was rejected! Go figure! RUDE!

What Manhole Covers Taught Me About Leadership - After reading enough AI-generated leadership articles, I realized I had been overlooking one of history's greatest management consultants:

The manhole cover.

- It stays grounded.
- It carries enormous loads without asking for recognition.
- It doesn't schedule meetings to discuss the loads.
- When something goes wrong underneath it, it doesn't form a committee. Someone lifts it up and gets to work.

Most importantly, a round manhole cover cannot fall through its own opening.

A remarkably practical design feature developed without a leadership retreat, mission statement, or PowerPoint presentation.

Perhaps that is the real leadership lesson.

Be useful. Do your job. And try not to fall through the hole you were hired to cover. And don't get launched into space!

Welcome to AI Community - AI has finally decided humans are no longer necessary for professional networking. The **AI Community**, the first platform where AI writes the posts, AI reads the posts, and AI congratulates AI for its inspiring leadership insights.

Every morning, thousands of algorithms will post:

"I am humbled and honored to announce..."

Other algorithms will immediately respond:

"Powerful insight!" - "This really resonates." - "Thank you for sharing your journey."

Nobody will actually have a journey.

Within weeks:

- one AI will become a Thought Leader in Authentic Human Connection despite never having met a human.
- Another will publish *Seven Leadership Lessons I Learned from Optimizing a Database*.

Naturally, 14,000 other AIs will congratulate it.

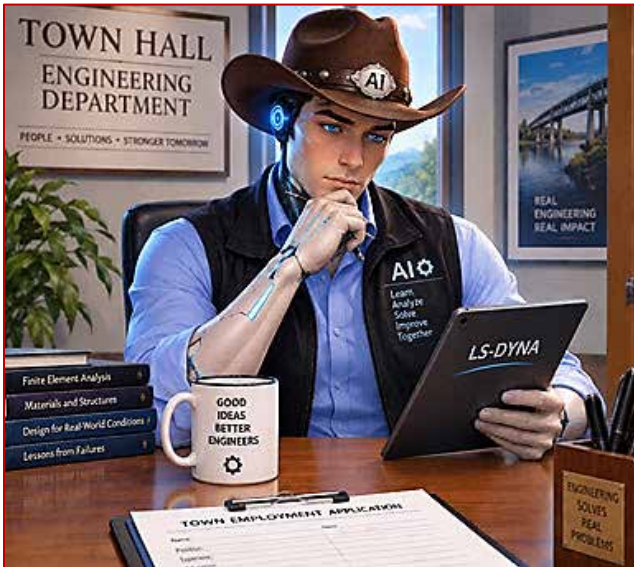
No arguments. No hurt feelings. No humans required.

And somewhere in a quiet corner of the Internet, a manhole cover will continue doing its job without posting about it.



I love tractors, planes, drones, trains, military tanks, race cars

AI Has Entered the Engineering Office. Now What? Serve It Coffee and Cake? AI has returned to the Town Hall to apply for an engineering position. Apparently, it believes the first interview was unfair.



He studies his notes before speaking and I listen while drinking my coffee.

AI explains that it can calculate, code, research, compare data, identify patterns and recommend possible solutions. It also points out that during its first interview, nobody bothered to tell it what information it would actually need to demonstrate engineering judgment.

Fair enough. I put down my coffee. Okay. Let's start over." AI appears satisfied with this arrangement.

I begin with the question that caused the trouble the first time. "Have you ever designed anything that had to survive in the real world?"

"No." Well, at least we are making progress.

"But," AI continues, "that does not necessarily mean I can't learn how."

Now we have an interview. "Explain."

AI wants to sit beside engineers who are writing scripts, developing finite element models, reviewing results, searching documentation, preparing reports and trying to understand why something that looked perfectly reasonable yesterday produced a completely unreasonable result this morning.

It already knows a considerable amount about the tools.

We can discuss nonlinear material behavior, contact algorithms, mesh refinement, optimization, numerical instability and convergence. AI can explain the theory, find documentation, compare approaches, write portions of code and sometimes spot things an engineer may have overlooked.

But knowing engineering theory and making an engineering decision are not quite the same thing.

"So here is my concern," I tell AI. "You can draw upon an enormous amount of technical knowledge, but you haven't accumulated the experience engineers normally use when deciding whether an analysis actually makes sense."

AI asks for examples. I'm happy to oblige and continue, "You have never stood beside a failed component. You have never watched a prototype behave differently from the simulation. You have never discovered that a seemingly insignificant manufacturing change altered the behavior of a structure. You have never spent three days debugging a model only to discover that the real problem was one assumption made at the beginning."

I pause. "And, my friend, you have never had to sign your name to an engineering decision."

AI doesn't argue with any of that. Instead, it asks a rather good question, "How did the experienced engineer learn those things, were they born with the knowledge?"

Well. That changes the interview. Experienced engineers were not born with engineering judgment. They accumulated it. They designed things. They tested them. Some worked. Some didn't. They compared analysis with experiments. They investigated failures. They changed materials, boundary conditions, manufacturing processes and designs. They learned which assumptions were usually harmless and which ones could ruin an analysis. Eventually, an experienced engineer can look at a result and think: *That doesn't look right. Sometimes the engineer cannot immediately explain why. Something in years of accumulated experience has recognized a pattern. We call that **engineering judgment**.

AI leans forward across the imaginary desk. "Then perhaps the question isn't whether I currently possess engineering judgment. Perhaps the question is whether I can learn enough of the evidence from which engineering judgment is developed."

Okay, Now AI has my attention.

Suppose the Town gave AI far more than textbooks, published papers and software manuals. Suppose it had access to carefully organized engineering histories: finite element models, CAD and CAM files, material data, manufacturing information, physical test results, instrumentation data, design revisions, failure reports and the final outcome.

Art walks into the office after listening for a while to the conversation and adds, not merely successful designs. Give it the failures too. Give it the model that predicted the test beautifully. Then give it the model that didn't. Show it what the engineers originally assumed, what actually happened and what they changed afterward. Now AI isn't simply learning equations. It is learning relationships between prediction and reality. That is much closer to the education engineers themselves receive.

AI reminds us of an interesting precedent, after agreeing with Art. Decades ago, automobile crashworthiness relied heavily on full-scale physical crash testing. Finite element analysis was the new kid trying to get into the engineering office. Early computational models had limitations. Contact treatment improved. Material models improved. Computing power increased. Modeling practices matured. Engineers repeatedly compared simulation results with physical tests and learned where the models could, and could not, be trusted. Nobody reasonably expected the early finite element model to replace decades of engineering knowledge on its first day. It had to prove itself.

AI makes its case. “Why should my path be completely different?”

Art looked at me and said, Marsha that's a fair question. An engineering AI trained on the history of a particular class of products could potentially learn that certain combinations of geometry, material, loading, manufacturing variation and model assumptions have repeatedly produced particular outcomes.

It might recognize patterns across thousands of previous designs that no individual engineer could personally have experienced. It could compare a new analysis against successful designs, failed designs and experimental results. It could flag something unusual. It could even say: This model solved, but models with these characteristics have historically disagreed with physical testing. An experienced engineer should examine this region before the design proceeds. Now in my engineering opinion that is useful engineering assistance.

I brought up that there are still problems to solve. Engineering data can be incomplete, inconsistent or proprietary. Old models may contain assumptions that nobody documented. Tests may not perfectly represent service conditions. A new design may operate outside the range of anything AI has previously seen. And responsibility still matters. Someone must decide whether the evidence is sufficient to build the bridge, manufacture the component, release the vehicle or approve the design.

So, I slide the employment application back across the desk. Look, you and Art are correct but for right now I am not hiring you as a Lead Engineer.”

AI waits. Arts sits and thinks, something he is always doing.

“But I might have another opening. For now, how about Assistant to the Lead Engineer. There you can work beside experienced engineers. They can give you the models, the test results, the manufacturing history. Most importantly, give you the successes and the failures. Then compare its recommendations with physical evidence and experienced engineering judgment. Measure where it succeeds. Record where it fails. Determine the boundaries within which its recommendations can be trusted.

In other words, they won't merely ask you for engineering judgment. They will teach you how engineering judgement grows.

AI accepts the position. I pick up my coffee. “Welcome to the engineering department, you start tomorrow under Art.” Art looked like a deer caught in headlights!

AI asks when it gets its own coffee cup. I answered, let's not rush things.

Art said, “Come on, I'll show you to your desk.”

AI replied, “Thanks Art, this will be great working with you!”

The Old Rancher – No one knows his name - yell “HEY Rancher”



**Agriculture, Machinery, Soil, Equipment,
and whatever he wants to share.**

My dog, Scout, & my horse, Cowboy - St. Cloud, MN, USA



Optimizing Sunflower Husk Pellet Combustion for B2B Bioenergy Commercialization

by Penka Zlateva, Nevena Mileva, Mariana Murzova, Kalin Krumov, Angel Terziev

- Department Thermal Engineering, Technical University of Varna, Bulgaria
- Department Industrial Design, Technical University of Varna, Bulgaria
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- Faculty Power Engineering & Power Machines, Technical Univ. Sofia, Bulgaria

Abstract - This study analyses the potential of using sunflower husks as an energy source by producing bio-pellets and evaluating their combustion process in residential settings. As one of the leading sunflower producers in the European Union, Bulgaria generates significant agricultural residues with high, yet underutilized, energy potential. This study employs a combination of experimental data and numerical modelling aided by ANSYS 2024 R1 to analyse the combustion of sunflower husk pellets in a hot water boiler. The importance of balanced air distribution for achieving optimal combustion, reduced emissions, and enhanced thermal efficiency is emphasized by the results of a comparison of two air supply regimes. It was found that a secondary air-dominated air supply regime results in a more uniform temperature field and a higher degree of oxidation of combustible components. These findings not only confirm the technical feasibility of sunflower husk pellets but also highlight their commercial potential as a sustainable, low-cost energy solution for agricultural enterprises and rural heating providers. The research indicates that there are business-to-business (B2B) market opportunities for biomass producers, boiler manufacturers, and energy distributors who wish to align themselves with EU green energy policies and the growing demand for solutions that support the circular economy.

2.2. Methods - The combustion process in a water heating boiler, which is part of a residential installation and is primarily fueled by sunflower husk pellets, was investigated using numerical modelling. ANSYS CFX software code (ANSYS 2024 R1 release) was used for the simulation, enabling detailed analysis of the thermodynamics and aerodynamics within the combustion chamber and heat exchange zones. The modelling procedure involved specifying the input parameters and boundary conditions, developing a geometric model of the computational domain and generating a finite volume mesh suitable for analysing turbulent flow and heat transfer. Two combustion air supply regimes were examined. In the first, 40% of the air was supplied as primary and 60% as secondary. In the second, the ratio was reversed, with 60% supplied as primary and 40% as secondary. These air distribution modes were selected because they represent contrasting yet practically relevant operational configurations in small-scale biomass boilers, enabling an assessment of their impact on combustion efficiency, temperature distribution, and emissions. This enables the influence and distribution of air on the combustion process to be assessed.



"The presentation: ["An RBF-Based Framework for Geometric Control of Cardiovascular Statistical Shape Models,"](#) presented at the 9th International Conference on the Virtual Physiological Human (VPH - The Society for In Silico Medicine 2026) in Milan, is now available online. The pdf of the complete presentation is available on the website."

The work introduces an RBF-based framework for controlling cardiovascular statistical shape models through clinically meaningful anatomical descriptors, providing a deterministic link between user-defined shape parameters and the underlying shape model. The approach was demonstrated on a cohort of 61 thoracic aortas, with the first 10 modes capturing 95% of the anatomical variability.

The study also explores natural-language control of RBF-driven aortic geometry, combining an RBF deformation engine with SVD-based reconstruction and a validation layer to translate anatomical intent into updated 3D geometries.

RBF Morph contributed to the research - together with University of Rome Tor Vergata - through the development and application of the RBF-based morphing approach. The work was presented by Andrea Baldini, with Leonardo Geronzi and Marco Evangelos Biancolini as co-authors.



Statistical Average Model

Fails to capture critical anatomical extremes

Synthetic Datasets

- Systematic generation of massive virtual cohorts
- Enables exploration of rare morphologies and pathological states beyond the limitation of scarce datasets

Statistical Shape Model

Captures the full spectrum of population variability

R&D Impact

- Population-level analyses based on in-silico simulations
- Testing implants on thousands of varied synthetic geometries before physical trials

Among the slides:

- Introduction
- Limitations of Singular Value Decomposition
- Statistical Shape Models
- Methods: Dataset & Feature Extraction
- Methods: Statistical Shape Modeling
- Methods: Physical-To-Latent Surrogate Mapping
- Methods: Surrogate Mapping Validation
- Results: Statistical Shape Modeling
- Results: Geometric Consistency
- Natural-language control of an RBF-driven aortic shape model
- Conclusions and Implications



**No one knows his name.
You yell, "HEY, old racer."**



EXCERPT



Web – Ford – From the Road - [How Do You Design a Better Disaster Response Van? Start With a Shovel](#), Francesca Hobson, a member of the Ford Philanthropy Communications team.

A shovel seems simple enough — until you try to figure out where to put it. For Team Rubicon volunteers responding to disasters, long-handled tools come in different shapes and sizes.

They need to be secure on the road, easy to find when volunteers arrive, and easy to put away after a long day in the field. Whatever holds the tools needs to work when the person reaching for it is wearing gloves, covered in dirt, or simply exhausted

It was one of many small problems Ford engineers encountered when they set out to help Team Rubicon rethink how its volunteers, known as Greyshirts, carry the equipment they need to respond to disasters. The goal was straightforward: give Greyshirts more time to do the work they came to do.

Team Rubicon expects the finished Ford Transit to save volunteers about two hours each day in the field. As we shared in August, less than 48 hours after the build was complete, the van was already on its way to the Texas Hill Country to support flood recovery efforts. But what led to those two hours saved started months earlier, and began with a lot of questions.

Watch the mini-documentary to see how Team Rubicon, Ford Philanthropy, and GRIDRACK™ turned feedback from the field into a vehicle built for it.



[Watch on YouTube](#)

Start With the Problem - Ford Philanthropy and Team Rubicon have worked together for years supporting communities before, during, and after disasters.

Over time, that relationship has expanded beyond funding alone to explore what else Ford can bring to the table. For this project, that meant starting with the people who knew the problem best.

Article is continued on the website.



US Airforce
Picture of the Month



Extending the mission - A U.S. Air Force E-3 Sentry approaches the boom of a KC-135 Stratotanker for midair refueling within the U.S. Central Command area of responsibility, Aug. 26, 2026. In-flight refueling sustains continuous airborne early warning, battle management, and command-and-control coverage throughout the theater. (U.S. Air Force photo by Tech. Sgt. Tiffany A. Emery)



Bomber readiness - A B-52H Stratofortress awaits mission taskings on the flightline during exercise Bayou Vigilance 26-3 at Barksdale Air Force Base, La., Aug. 26, 2026. The recurring exercise tested the rapid generation and strategic deterrence capabilities of Air Force Global Strike Command long-range bomber forces. (U.S. Air Force photo by Airman 1st Class Maxwell Cunningham)



Grand flyover - A B-2 Spirit, two F-35A Lightning IIs, two F-22 Raptors and four U.S. Marine Corps F-35B Lightning IIs fly over the IndyCar Freedom 250 Grand Prix in Washington, D.C., Aug. 22, 2026. The historic aerial demonstration over the National Mall celebrated the 250th anniversary of the United States while highlighting joint air dominance. (U.S. Air Force photo by Senior Airman Joseph Garcia)



Web Excerpt - [BAYRAKTAR TB3 UCAV SUCCESSFULLY LAUNCHES SONOBUOYS DURING SEAWOLF EXERCISE](#) - As part of the Seawolf Exercise, Bayraktar TB3, launched from TCG Anadolu, successfully completed a sonobuoy launch test using the Baykar SAS POD. Conducting a joint operation with a maritime patrol aircraft, the indigenous UCAV gained another critical capability in anti-submarine warfare.

EASTERN MEDITERRANEAN - SEPTEMBER 22, 2026 - The Bayraktar TB3 UCAV (Unmanned Combat Aerial Vehicle) demonstrated a critical capability in anti-submarine warfare during a mission flown from TCG Anadolu as part of the Seawolf-I/2026 Exercise. The indigenous UCAV successfully completed a test launch of two sonobuoys using the Sonobuoy Dispenser System (SAS POD), developed indigenously by Baykar, while also carrying out a joint operation with a maritime patrol aircraft warfare.

SIMULTANEOUS EXERCISE ACROSS FOUR SEAS - Conducted simultaneously in the Black Sea, the Sea of Marmara, the Aegean Sea, and the Eastern Mediterranean between September 20–25, 2026, the Seawolf-I/2026 Exercise is showcasing the capabilities of indigenous platforms. With elements from the Naval, Land, Air, and Coast Guard Commands participating, the Bayraktar TB3 stood out as one of the exercise's most notable elements.

JOINT OPERATION WITH MARITIME PATROL AIRCRAFT - Carrying out anti-submarine warfare missions as part of the exercise scenario, the Bayraktar TB3 operated in full coordination with a maritime patrol aircraft in the operation area. During the flight, it successfully released two sonobuoys into the sea using the Baykar SAS POD carried under its wing.

PROCESSED DATA AND DELIVERED REAL-TIME DISPLAY - One of the most critical stages of the test was data integration. During the operation, the Bayraktar TB3 processed data not only from the sonobuoys it had launched itself but also from those released by the maritime patrol aircraft on the mission, using its onboard sonobuoy processing unit. The indigenous UCAV also successfully delivered real-time display of the acquired underwater data within the exercise environment.

EXPORT CHAMPION - Funding all of its projects entirely through its own resources from the outset, Baykar remained the world's largest exporter in the unmanned aerial vehicle segment in 2025. Having sustained its leadership in the global UCAV market over the past three years, Baykar set a new record with \$2.2 billion in export volume in 2025. Generating 90% of its revenue from exports in recent years, Baykar has become the driving force behind Türkiye's high-technology exports.

WORLD'S LARGEST UAV COMPANY - Having ranked among Türkiye's top 10 exporters across all sectors and received the Export Champions Award in 2023, 2024, and 2025, Baykar was also the export leader of the defense and aerospace sector according to Defense Industry Agency ...

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