

Applied Molecules

Using Albert Breakthrough AI to Accelerate Formulation

Development from 3 Months to 2 Days



APPLIED MOLECULES

Case Study | **Albert**

Competitive Edge with Albert



Paul Snowwhite
CEO

2.5 years ago, we adopted Albert Invent’s workflow in our lab and plant. It’s brought speed, lower costs, high quality, and global regulatory compliance from idea to commercialization. The nimbleness of a small team with the power of a big one.

APPLIED MOLECULES



A Snapshot of Success

Applied Molecules has redefined its R&D and manufacturing workflows with Albert Breakthrough, Albert Invent’s AI-enabled platform.

15%

faster formulation development

30%

more accurate manufacturing cost predictions

25%

improvement in chemist productivity

99.5%

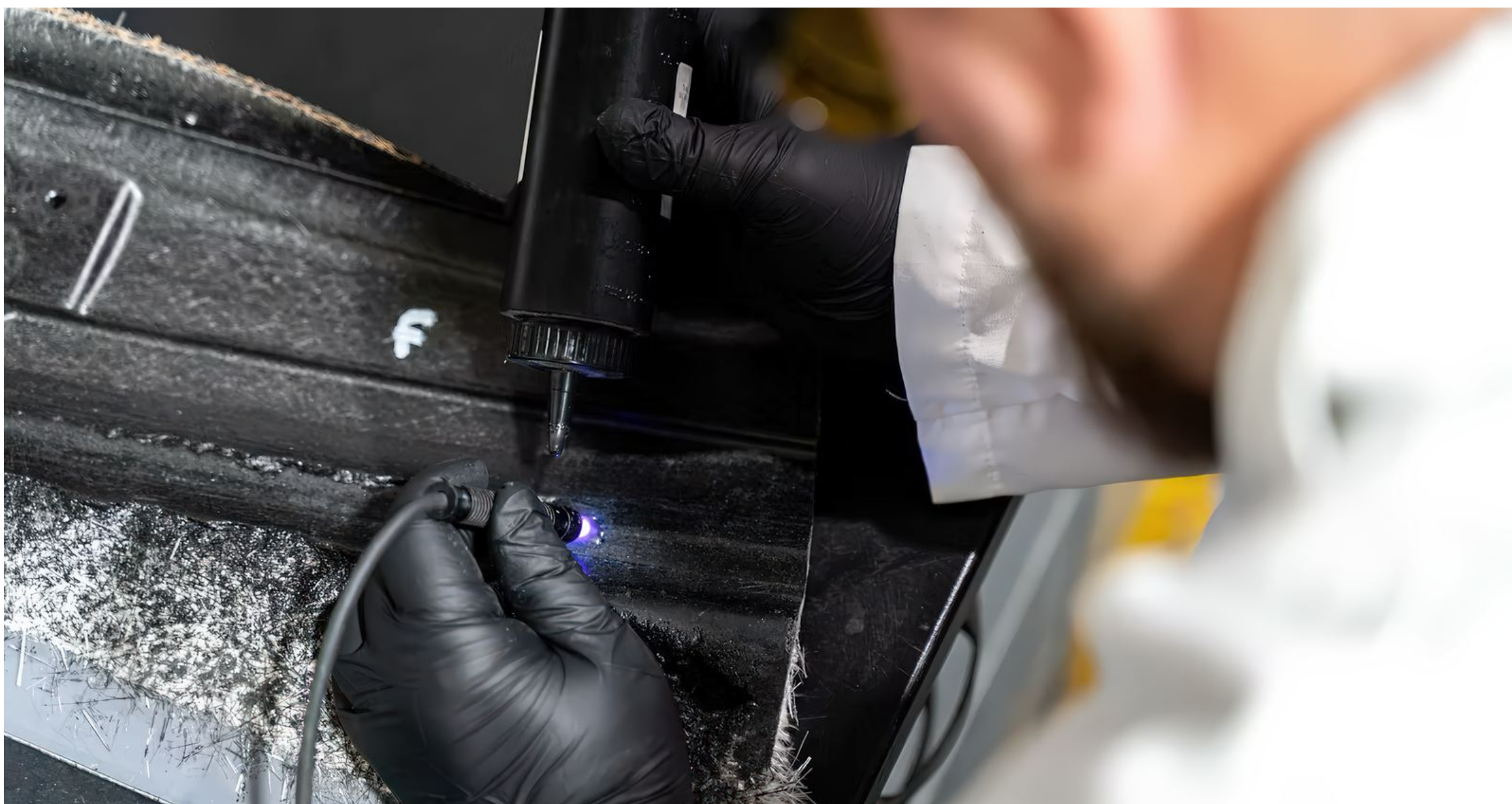
inventory accuracy, improved from 95%

10 seconds

to generate a product SDS

3 months → 2 days

reduction in development time with AI-enabled formulation



The Challenges of a Growing Chemistry Company



Bella Snowwhite
Material Specialist

Before Albert, we were using tons of Google Sheets. We'd print them out, hand them to people, write notes, and save them in boxes. The data was spread out, and it wasn't easy to communicate between the plants and the lab.

Applied Molecules is a dynamic, young chemistry company at the forefront of materials science innovation. Specializing in cutting-edge sealants, adhesives, and 3D print resins, this agile team of scientists and manufacturers punches well above their weight in a competitive industry dominated by larger players.

As Applied Molecules grew, they grappled with several key challenges:

- 1. Data Management** | Relying on spreadsheets and paper records made data retrieval time-consuming.
- 2. Communication** | Coordination between R&D and manufacturing teams across different locations was complex.
- 3. Resource Limitations** | With a small team, efficiency and automation were crucial to compete with larger companies.
- 4. Inventory Management** | Tracking raw materials and forecasting needs was a manual process.
- 5. Quality Control** | Ensuring consistent product quality and traceability was challenging without standardized systems.
- 6. Formula Optimization** | Through traditional trial-and-error R&D, it could take months to develop new products to meet customer specifications.

The Solution:

Implementing Albert Breakthrough for Integrated R&D and Manufacturing



Cameron Darkes-Burkey
Senior Chemist

When a customer says they like a particular batch, we can instantly pull up all the details. It's a level of traceability and professionalism that gives us a big competitive edge.

To improve efficiency and accelerate growth, Applied Molecules turned to Albert's end-to-end R&D platform. Albert's comprehensive solution transformed their operations, providing them with capabilities typically associated with much larger organizations.

1. Centralized Data Management Accelerates R&D

Solution | All formulations, batch tasks, and property data are now stored in one accessible system.

Impact | 15% faster formulation development

- Quick access to historical data for trend analysis and customer inquiries.
- Faster formulation development with built-in Excel replacement (Workbook).
- AI-assisted formulation design to further accelerate innovation.

2. End-to-End Platform Streamlines Manufacturing

Solution | R&D and manufacturing teams can now easily share information and track progress across locations.

Impact | 30% more accurate manufacturing costs

- Seamless transfer of formulas from R&D to production.
- Real-time tracking of manufacturing progress, resource utilization, and batch costs across locations.
- On-site QC validation at manufacturing plants reduces turnaround time for customers.

3. Automated Workflows Optimize Resources

Solution | Task assignment and tracking have been automated and streamlined, increasing overall efficiency and maximizing resources.

Impact | 25% improvement in chemist productivity

- Efficient use of chemist hours allows the company to stay lean.
- Automated workflows free up time for innovation and customer service.

4. Real-time Inventory Management and Cost Optimization

Solution | Accurate, real-time tracking of raw materials with automated alerts for reordering.

Impact | 99.5% inventory accuracy, improved from 95%

- Accurate pricing based on real-time raw material costs.
- Automated alerts prevent stockouts and overstock situations.
- Reduced waste and greater efficiency through up-to-date inventory management.

5. Enhanced Quality Control and Regulatory Compliance

Solution | Standardized QC templates and lot traceability ensure consistent product quality.

Impact | 10 seconds to generate an SDS, improved from 24 hours

- Automated SDS generation makes regulatory compliance fast and easy.
- Full lot traceability from raw materials to finished products allows Applied Molecules to rapidly pinpoint and resolve any issues.
- Professional appearance with detailed labeling and barcodes improves customer experience.

6. AI-Enabled Formulation Optimization

Solution | Albert Breakthrough enables rapid, iterative formulation optimization.

Impact | AI-enabled formulation reduced development time from 3 months to 2 days

- In the development of dampening materials, Albert Breakthrough significantly reduced experimental cycles to just three overall iterations before numerous on-target candidates were validated.
- When optimizing five parameters simultaneously for 3D printing resins, chemists identified an entirely new combination of materials with Breakthrough that produced candidates with exceptional performance.
- Breakthrough's iterative learning from experimental data, combined with domain knowledge from chemists, accelerated optimization.

Albert Breakthrough in Action: From 3 Months to 2 Days



Nicholas Gripp
Senior Chemist

I had a meeting with our customer today, and they were very impressed. They thought it was all simulation data that I was showing them, but nope. I had generated a bunch of formulas with Breakthrough, tested them on our new equipment, and we already had eight candidates that met the customer's specifications.

Using [Albert Breakthrough](#), their team was able to tackle both challenges, accelerating the development of dampening materials from three months to two days and optimizing multiple related properties in 3D printing resins.

- Breakthrough generates an initial round of formulas, based on the chemist's targets and restrictions, as well as past experiments and available inventory.
- With its initial round of formulas, Breakthrough optimizes for mapping out the discovery space as efficiently as possible. We're not expecting to get a perfect result the first time around – instead, we want to train Breakthrough as well as possible with as few experiments as possible.
- Chemists use their domain knowledge to set constraints (such as reasonable targets or ingredient concentration ranges) and select candidates to test. Experimental data then feeds back into Breakthrough, improving the model for further research.



Cameron Darkes-Burkey
Senior Chemist

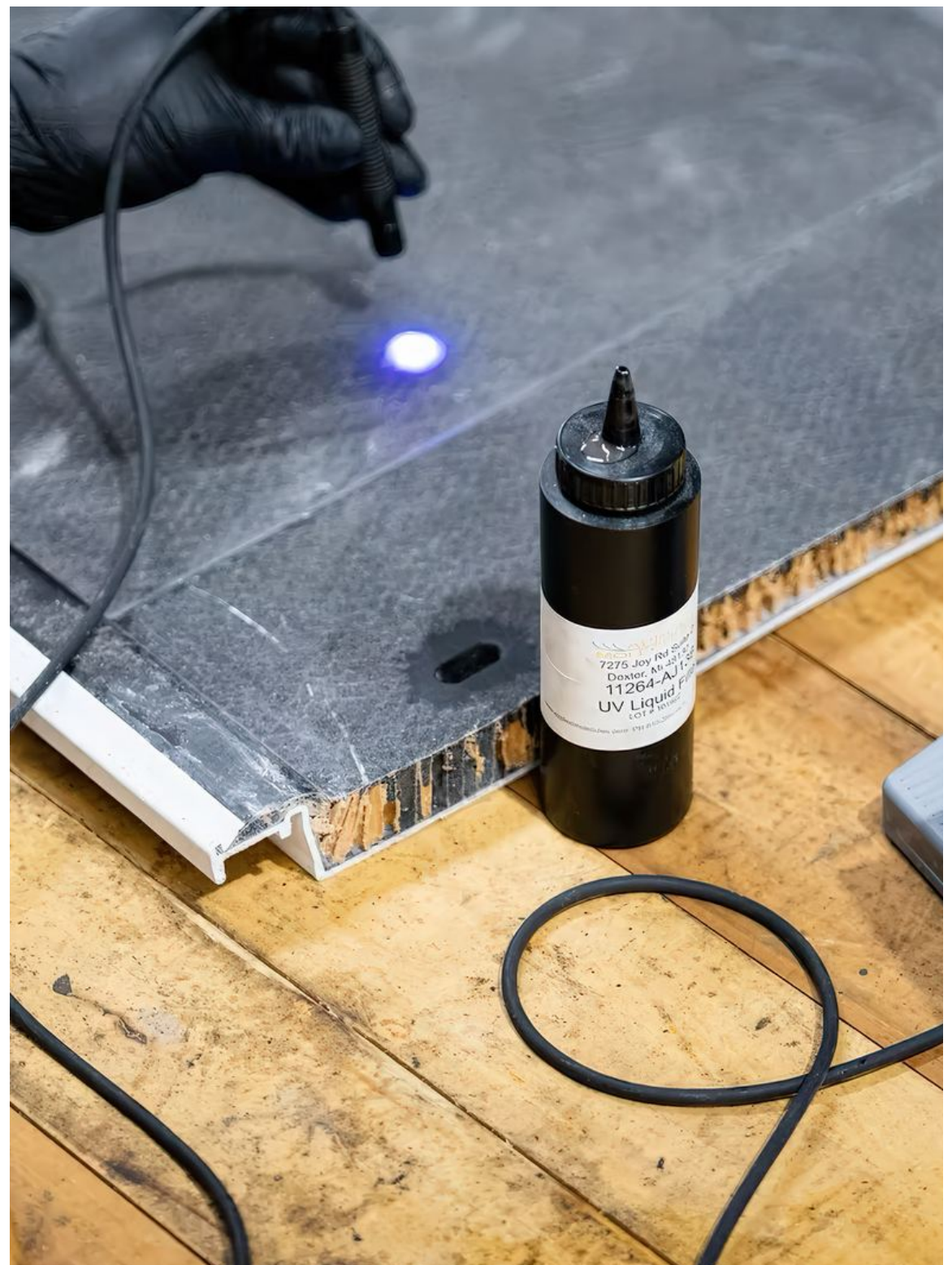
When a customer says they like a particular batch, we can instantly pull up all the details. It's a level of traceability and professionalism that gives us a big competitive edge.

For the dampening materials, chemists discovered that photo-initiator concentration, rather than polymer chain length, was the key determinant in achieving the desired modulus, leading to a plethora of on-target candidates in the third round of formulas from Breakthrough. For the 3D printing resins, chemists were able to combine domain knowledge and empirical data with Breakthrough to simultaneously optimize five interconnected properties using an entirely novel combination of raw materials.



Nicholas Gripp
Senior Chemist

We initially focused on adjusting monomer blends for flexibility, but Breakthrough helped us see that fine-tuning photo-initiator concentration had a far greater impact on modulus than expected. That insight alone saved us weeks of unnecessary iterations.





Conclusion:

Empowering Growth and Customer Satisfaction



Zach Leszczynski
Assistant Plant Manager

Albert will be a big benefit as we scale. I don't have to be in three places at once anymore.

By implementing Albert's end-to-end R&D platform, Applied Molecules has transformed from a promising startup into a formidable competitor in the materials science industry. This digital transformation has allowed them to punch well above their weight, delivering value to their customers in ways typically associated with much larger organizations.

As Applied Molecules continues to grow, Albert's scalable platform will play a crucial role in maintaining their competitive edge. The system's ability to accommodate increased data volumes, new product lines, and additional team members ensures that Applied Molecules can expand without sacrificing efficiency or innovation.

For Applied Molecules' customers, the benefits are clear and tangible:

- 1. Faster Time to Market** | With streamlined R&D and manufacturing processes, customers receive innovative products more quickly.
- 2. Consistent Quality** | Enhanced quality control measures ensure that customers receive reliable, high-quality products batch after batch.
- 3. Responsive Service** | Centralized data management allows Applied Molecules to respond swiftly and accurately to customer inquiries and requests.
- 4. Regulatory Peace of Mind** | Automated SDS generation and comprehensive lot traceability provide customers with the documentation and assurance they need for their own regulatory requirements.
- 5. Competitive Pricing** | Optimized inventory management and resource allocation enable Applied Molecules to offer competitive pricing without compromising on quality.

By providing enterprise-grade digitalization to their agile team, Applied Molecules has positioned themselves to compete effectively with industry giants while maintaining the responsiveness and creativity of a smaller company — offering their customers the best of both worlds.

Curious what this would look like in your lab? [See Albert in action.](#)