

# Case Study: Ignite™

## Creating a New Thermal Process for Developing Lightweight Materials

### From Spark to Finish

Harper's Ignite™ process enables companies in the development of advanced materials, from the lab to full commercialization, helping make their ideas a reality. Utilizing our depth and breadth of experience in thermal processing, we partner with our customer to ensure success as they scale up their operations.



Harper's support to emerging industries begins in early stages of research and development, whether at corporate R&D centers, universities, government institutions, or start-ups. Our mission is to assist these customers in turning the next generation of material innovations into profitable new markets. Learn more about this success story of a customer who is paving the path of material science innovations.

### Current Industry Trend

Harper strives to stay innovative and current with industry trends. Currently, efforts are being focused on developing new processes to develop lightweight materials for use in aircraft, automotive, and electronics. One of Harper's clients is currently utilizing the Ignite process to successfully bring one of these groundbreaking materials to market.



The demand for this metal will increase as industry looks to produce lower weight, higher mileage vehicles. These metal parts are lighter than both steel and aluminum, and have the future potential to allow vehicles to weigh about 15% less. With Harper's help this client's seed of an idea could have a large impact on everyday life by developing cost-effective and energy-efficient manufacturing techniques to process and recycle metals for lightweight vehicles and other products.

### Implementation

The goal for one of Harper's prominent clients is to conduct high temperature processing through a newly designed piece of equipment to produce a more lightweight material. This client partnered with Harper to create a process to thermally break down their advanced hybrid material into its pure form with a vacuum reaction through a specific design in the most efficient and effective way possible. Harper is in the process of turning this innovation into reality by engineering the entire thermal processes necessary around this advanced design.

The Ignite process for this client's idea began with pre-engineering and fabrication on ancillary work for the entire system from the vacuum system to the oil quench collection. Everything was then built and set up at Harper's

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Technology Research Center where all of the initial testing on the design was completed in the in-house graphite box furnace.

Multiple variations of tests were performed in order to fine-tune the process. These test samples were then thoroughly analyzed using SEM and EDS to confirm whether the final results of the material were pure magnesium. These results and the product quality were then evaluated to ensure they meet the original objectives provided by the customer.

The design has been completed and procured, and repeat tests will be performed for process optimization. In the end, Harper's thermal processing expertise enabled the client's idea of the unique furnace design to be developed and will be used in full production in the near future.

### About the Technology Research Center

Harper offers clients access to research and piloting facilities for thermal processing to help develop the most efficient and effective regime to meet their goal. We understand the importance of R&D necessary for the scale up of advanced materials. Using our depth and breadth of experience in thermal process programs, we partner with our customers from day one to ensure success as they scale up their operations through process development, optimization, and piloting.

Let Harper help bring your next material innovation from spark to reality. Our Technology Research Center provides process development and optimization as you work toward commercial scale-up. Customers can utilize numerous on site thermal systems to gather data and fine tune their processes, with a focus on varying production rates, temperature regimes, processing times, atmosphere compositions, and flow rates, resulting in savings on the investment ultimately required for new thermal processing systems. With Harper, you will find a partner uniquely qualified to support the growing needs of your advanced material processing, from the lab to the global marketplace.



### About Harper International

Harper is a global leader in complete thermal processing solutions and technical services essential for the production of advanced materials. From concept to commercialization, from research scale to full production line operations, Harper is perpetually on the cutting edge. For decades, we have pioneered some of the world's most innovative, customized systems, with a focus on processing materials at high temperatures and in non-ambient atmospheres.



*Spark the future.™*