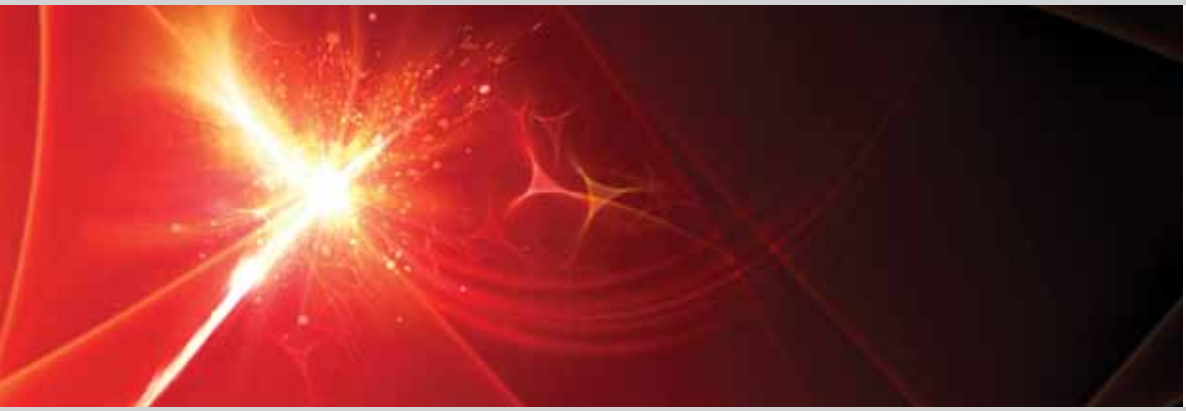
Oxidation Ovens

Higher degrees of innovation for carbon fiber processing.



Harper International

Spark the future.™

Oxidation Ovens

Revolutionary carbon fiber processing furnaces weren't enough.
Check out our state-of-the-art oxidation ovens to match.

Harper offers advanced Oxidation Oven technology to complement its industry-leading furnaces for carbon fiber processing. Our state-of-the-art oven designs are available for tow bands from 300mm to greater than 4000mm, and incorporate a multitude of improvements beyond what's available on the market today. Some of these design improvements include:

- Superior atmospheric seals
- Continuous monitoring of supply, recirculation and exhaust flow rates
- Improved, patent-pending nozzle design
- Process-based instrumentation array
- Quadrant construction for improved installation

For the customer, these technology advancements equal faster oxidation, improved velocity uniformity and range, assurance of temperature uniformity at a variety of flow rates, and optimal control of the reaction, ultimately enhancing fiber quality. These improvements come in the form of clearly stated performance guarantees.


A.


B.


C.

After more than 85 years at the forefront of thermal processing solutions for cutting-edge materials, we're just getting warmed up.

A. We offer oven designs available for tow bands from 300mm to greater than 4000mm.
B. Harper's design advancements ensure optimal control of the reaction, ultimately enhancing fiber quality.
C. Our ovens have shown a 90% reduction in labor versus similar field erection times into a full-line system.
D. Harper's unique end seal reduces fugitive emissions, increases the active volume of the oven, and offers reduced energy consumption over alternatives.
E. Our complete thermal processing systems include gas treatment and handling solutions.

Improved efficiencies. Expanded horizons.

The most distinctive feature of Harper's cutting-edge design, the end seal, reduces fugitive emissions, increases the active volume of the oven, and offers reduced energy consumption over alternatives. The seals have independent adjustment of the top and bottom, inside and outside slots. Additionally, the design includes separation plates between passes, so each pass sits within its own muffle. Each pass has an independent vent with adjustable draw control, and the exhaust plenum connects to a dedicated fan/VFD. As a result of these innovative design features, there is no vertical mixing in the seal, less air ingress, and virtually no process gas escape.

Harper's instrumentation improvements include a two-tier balancing methodology, responsive quench system and rapid cool down system, emissions monitoring, and an inherently safer pressure relief system. Additionally, Harper's modular construction design is another advancement that sets us apart from the competition. Our ovens have shown a 90% reduction in labor versus similar field erection times into a full-line pilot system (300mm).

Additionally, Harper's proprietary research oven technology offers parallel, cross and down airflow directions in a single oven, which allows for true evaluation of different flow techniques with balance of line under similar conditions. The oven's uniformity specifications meet or exceed best in class for each flow regime.

Thermo. Dynamic.

Harper is the industry standard in continuous thermal processing technologies for the carbon fiber industry. Our involvement in carbon fiber began at the market's inception in the 1970s, and since then we have been helping fiber manufacturers reach new and greater heights with our evolutionary design innovations.

We tailor each design to the customer's requirements, considering the best possible solution for your needs, spanning a variety of precursors including PAN, pitch, lignin, polyethylene, and rayon in tow, nonwoven mat, or discontinuous, loose fiber form. Harper's philosophy is not only to deliver comprehensive systems with the latest technologies, resulting in distinctive solutions, but also to design features that ensure the most efficient and effective operations. Whether it's optimized waste gas treatment, control systems with predictive maintenance, or energy-efficiency techniques, Harper always has the complete solution in mind.

With Harper, you will find a partner uniquely qualified to make your thermal process challenge a success. No one else offers an end-to-end service approach with an all-encompassing range of technology solutions, delivered by a passionate and exceptionally skilled staff. That's why world-leading material technology companies, as well as cutting-edge start-ups, depend on Harper for ingenious, first-of-a-kind systems.

"Taking core technology designs and catering them to our customer's special and unique thermal processes. That's where we really shine."

– Peter Witting Ph.D.
Chief Engineer

"We truly believe that problems are multi-disciplined. As a result, there's a whole culture over here, where people really believe in innovation."

– Arun Bodapati Ph.D.
Technology Development

Harper International Corporation
West Drullard Avenue
Lancaster, New York 14086-1698 USA
Ph: 001.716.684.7400
Fax: 001.716.684.7405
harperintl.com

Harper International

Spark the future.™