

# SOLAR CASE STUDY

*Manufacturing a high density XLPE  
tape to mount solar panels onto  
aluminum frames*

## BACKGROUND

H-O Products has long been a leader in innovation, new product and process development. The company recently utilized its engineering experience and technical expertise to successfully develop and deliver a high-strength, double-coated high density XLPE foam tape to secure solar panels to aluminum frames for one of the world's largest manufacturers of solar panels.

The solar client produces an average of 15 million panels a year across four plants located around the globe. H-O Products developed the first prototype within eight weeks. After product modifications and several rounds of testing, H-O Products delivered a finished product that met all of the client's specifications for resistivity, adhesion, and compression. Full-scale production of the tape began one year from the inception of the project – a very aggressive production timeline that the client's previous tape provider could not accomplish.

## CHALLENGES

1

Project specifications required a very high density, high dielectric, high adhesion tape to mount solar panels to aluminum frames. The volume resistivity of the tape had to exceed  $4.8e + 120$  ohms\*cm.

2

The tape had to be processed effectively and efficiently with the existing high speed automatic application equipment at the client's production facilities.

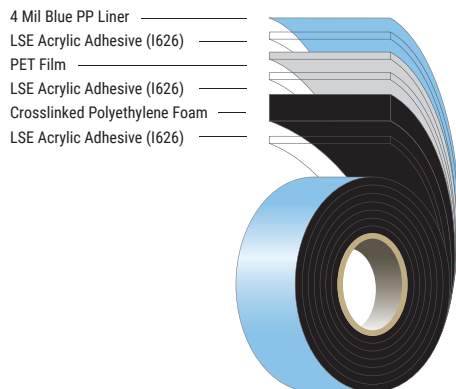
3

Annual production requirements of this tape would be in excess of 20 million LF per year, once adopted.

# SOLUTIONS

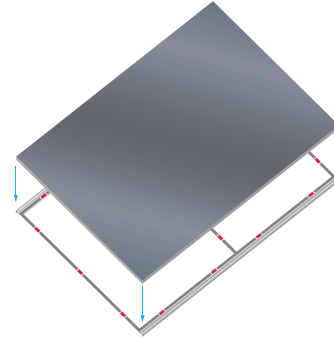
H-O Products collaborated with the client's R&D Department, Quality Manager, and Supply Chain Manager while evaluating and testing different substrates and adhesives combinations for the tape. H-O Products secured qualified industry partners who were able to produce the double-coated high density XLPE foam in large volumes to meet the stringent product and quality specifications. H-O Products produced a preliminary prototype using XLPE foam with acrylic adhesive within eight weeks.

The final product construction prototype was produced four months later using a high density XLPE foam and an LSE acrylic adhesive combination. A PET film was also added to the tape construction. This prototype met 95% of the resistivity requirements after testing.



One month later process refinements were made which enabled the product to pass all

resistivity requirements. Shortly after, a trial run of 30,000 LF was successfully run on the client's fully-automated production line. The tape was cut into 1-inch long strips, then applied automatically in multiple locations on the frames using the client's CNC/robotic technology.

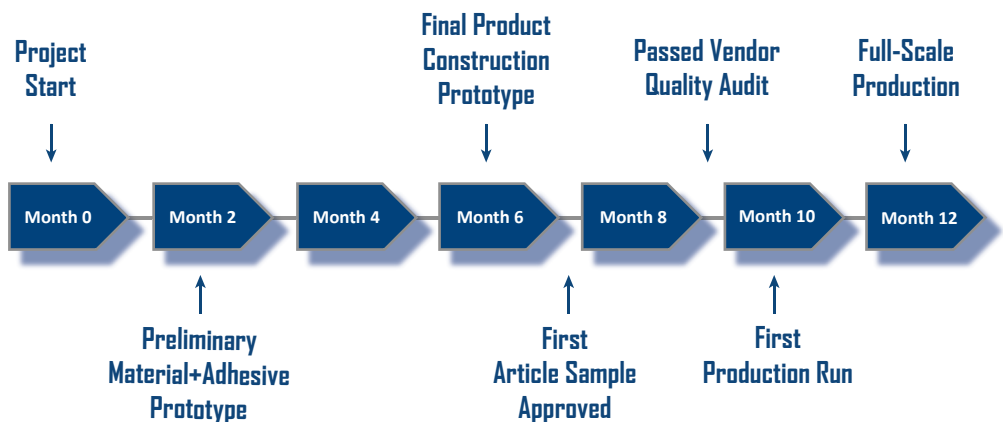


The client performed a quality audit at H-O Products after the first article samples were approved and the successful production trial. The first production run was shipped a month later and full-scale production to all 3 plants worldwide commenced one year from project inception.

H-O Products provided logistics support, helping coordinate international shipments, expediting materials, coating and slitting as required to meet a very aggressive production plan. Through every step of the process, from the initial contact until the final product was audited and certified, the H-O Products team stayed in constant contact with the client's key personnel, keeping them informed of all new developments, obtaining direction, and securing necessary approvals.

## CAPABILITIES UTILIZED

Material & Adhesive Specification  
Product Design  
Rapid Prototyping  
Process Development  
Logistics Support



# RESULTS

The client achieved full production capacity in all of their automated production lines worldwide using the 12# ClipFoam™ Frame Tape one year from project launch. The client was also able to meet their aggressive growth plan of increasing solar panel production by approximately 25% a year, the past three years.

After the COVID-19 pandemic began, H-O Products doubled output of the 12# ClipFoam™ Frame Tape to ensure that their client had at least two months of inventory available in the event any supply chain production lines were shut down. In 2020, H-O Products produced approximately 22 million linear feet of the 12# ClipFoam™ Frame Tape. H-O Products is continuing to provide the tape as originally designed and engineering teams are working on additional improvements and new product designs for future use.

H-O Products began performing product testing in-house after the first year of full production using a Keithley 6517B Electrometer High Resistance Meter and CSZ Micro Climate Environmental chamber. It took the client about a week to do testing in-house. H-O Products was able to do all the testing within 1-2 days. This eliminated a bottleneck in the supply chain and improved throughput.

## Additional Challenge

Shortly after full production started, the client had to redesign the automatic application equipment in order to add another support to the frame. This redesign took place over the course of 6 months. To prevent shutting down production, the client asked for the tape to be cut into individual 1/2" x 1" pads. Approximately 15 million pieces were required. The pads had to be applied by hand until all of the automated equipment could be re-configured. H-O Products quickly devised a way to manufacture these parts by configuring specialized rotary tooling equipment. Within three weeks, H-O Products was producing approximately 500,000 pieces per week, keeping the client's lines up and running.

## ABOUT H-O PRODUCTS

H-O Products Corporation founded in 1971, designs, develops and delivers high-quality, custom-engineered tapes, pads and gaskets for mounting, sealing, cushioning, and packaging solutions. H-O Products serves more than 1,200 clients in more than 20 different industries including Energy, Construction, Fenestration, Window & Door, Electronic OEM's, Appliance Manufacturers, Acoustics HVAC, Military and Defense. Since 2000, H-O Products follows the Lean Manufacturing/Kaizen Approach for Continuous Improvement. H-O Products is an ISO 9001:2015 registered company.



**H-O PRODUCTS**  
CORPORATION



(860) 379-9875 [www.h-oproducts.com](http://www.h-oproducts.com)

12 Munro Street, Winsted, CT 06098 • 03/08/21