

I've always been fascinated by how products are designed and I think a lot of people in the archery industry feel the same way. That's one reason we're fortunate to have a whole crop of new products to help stoke the buying interest of bowhunters and competitive archers each year. "Product Focus" is a new column we'll use throughout the year that will let us go beyond what our writers already do well in product reviews. We'll single out one product, tell readers what went into the design and why it's made the way it is.

I decided to use a new 4" vane from Norway Industries for this issue's subject. There is a lot of interest in new styles of vanes at present and plastic extrusion is something I'm well acquainted with. Before launching ArrowTrade I spent over a year as the production supervisor for Bohning. Part of my job description at the plant I oversaw included hiring, training and testing extruder operators, so naturally one of my first challenges was to learn the ins and outs of the extrusion and injection molding processes myself.

Extruded products abound in the archery industry. Most bow risers today start as a profiled slab of aluminum that has been extruded at high temperature through a costly die. Sights like the popular Copper John Dead Nuts make extensive use of aluminum extrusions, because it's a very efficient way to produce strong metal components. Rubber and plastic parts can also be extruded, and that's just what the majority of vane producers do, before stamping out your finished vane.

Extruding precision polymer ribbon that can be die-cut into fletching is far from an easy task. It starts with a mix of plastic and/or rubber pellets that when melted, blended and reformed will give the desired combination of durability and flexibility. Norway Industries guards its formula closely, preferring to do the final blending in-house rather than trust any supplier with the complete recipe for Duravanes. To this base formula the Norway staff add col-

ored plastic pellets that hold the particular dyes needed to impart the final color.

The dry colored mix is fed into a hopper above an extruder. Polymer extruders use powerful variable speed electric motors to turn a hardened steel screw inside a heated barrel. The combination of heat and pressure melts the plastic, mixes it and forces it out the end through a heated die that is an oversized cross section of the finished part.

Extruder operators work around high heat (typically above 300 degrees) and high voltage (for efficiency, many extruders operate on 480 volts), and they work around water. Liquid or misted water is needed to cool the plastic ribbon as it forms in front of the die. Just to make things even more exciting, static electricity can be formed by the moving plastic ribbon. When

Norway Industries Founder Tom Coffman began extruding vanes in the mid-70s, he could only produce vanes on cloudless days until he developed a way to combat the static charge. When you consider that some colors may require different settings than others, it's not surprising that extruder operators are referring to a manual as they get things dialed in.

Extruder operators will snag a bit of the molten plastic as it forms at the die opening, then guide it through the cooling bath and past rollers that tension and guide the ribbon. The tension, the die and barrel temperatures, the screw speed and the pressure inside the barrel all affect the dimensions of the finished product. So does the temperature of the cooling bath and the distance between the liquid or mist and the die opening. Samples are cut from



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3-D Duravanes by Norway

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Product Focus

3-D Duravanes by Norway

the ribbon and checked with micrometers and maybe an optical comparator (something like an industrial microscope with a projection screen) until the finished product is within tolerances and vane production can begin. All the ribbon run up to that point, along with what's left of the ribbon after the vanes have been stamped from it, is reground to mix back in a future batch.

Some vane producers have to spool and cure ribbon before it can be cut. They may also apply a chemical to the base for better adhesion. Norway Industries has long used a formula that allows in-line cutting of the vanes, and no use of an activator. Retailers who have experimented with different brands of vanes can decide for themselves which offer the qualities they want. From veteran suppliers like Marco, Flex Fletch and Bohning to more recent entries like Sims and New Archery Products, each strives to provide what they see as the best mix of durability, arrow guidance, price, ease of application and (in the case of LimbSaver vanes) arrow silencing.

Norway's original market consisted of high volume arrow producers that were using the Norway

Automatic Fletching machines produced at the same Myrtle Point, Oregon plant. Several years ago it introduced a thicker version of its Dura-loc instant adhesive to appeal to the thousands of retailers and

archers that fletch arrows. 3-D Duravanes, which have a lower profile and some other characteristics to improve high speed flight properties, were introduced in 2000. But those vanes were primarily in the shorter sizes commonly used by competitive archers.

What the company sent me and what it will make available to retailers stopping by its booth at the ATA Show are samples of a new, 4 inch vane for competition. With 15 colors in four sizes, it is already offering 60 choices in Duravanes and dozens more in the 3-D Duravanes. Now Janis Melton said it will drop some of the lesser used Duravanes colors in the 2.5 and 5 inch sizes. That's because there seems to be a growing market for low profile vanes in the 4 and under range that can be used to outfit high speed hunting arrows. As the newest of its 3-D Duravanes, the 4 inch models will be available in white, florescent yellow, lime, red,



At the 2004 ATA Show, Janis Melton spoke with dealers in the background while her father, Tom Coffman, stood by the latest version of the air powered, microchip controlled Norway Automatic Fletcher.

blue and black.

These new vanes measure about 3/8 of an inch in height, compared to the 1/2 inch or 9/16 inch height of other styles. They also have a very gentle taper before reaching that maximum height about 1 inch from the rear. Compared to other 4 inch vanes I've used, there's less to them: They look sleek on an arrow yet provide plenty of gluing surface. Naturally what Norway Industries wanted to offer with this vane was lighter weight, better clearance through the rest and less wind resistance. While a 4 inch feather fletch may be lighter still, arrows fletched with these aerodynamic new vanes should catch up with them not far downrange. And the easy tuning aspect shouldn't be overlooked if you have some customers or some bow models that offer problems getting a "normal" vane past the cable or across the rest.

Melton said Norway Industries has done its own in-house testing of the new vane and has also gotten outside confirmation from selected users that precision arrows could go faster and fly flatter with this new fletch. "While the statistics look good, it is the response from the users that excites me about the prod-

uct. From hunters and competitors, equally, we are getting very positive responses."

"These vanes will be packaged in clamshells of not less than 50 pieces which will have the same invoice price as the current competition vanes," Melton said. Samples of these new vanes will be available at the ATA show in January, and the entire color line will be available for purchase then as well.

"As a small company we pride ourselves on being responsive which

means that our ears are always open to suggestions from Duravane users," Melton said. "In, fact, this new length competition vane is a direct response to that kind of communication. Our R&D department has recently been re-directed so you will see more and more sample vanes as we explore new ways to make those arrows fly. After all, the entire archery industry depends on sending arrows through the air and we think Duravanes are the best ways to do that." ←

The new 4 inch 3-D Duravane is shown at right, while a standard 4 inch Duravane is at left.



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