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URSCHEL®
The Global Leader in Food Cutting Technology

Leading Knife Technology

Urschel machines and critical parts are manufactured under one roof to make sure strict quality standards are enforced. The form and function of every Urschel cutting machine is the sum of components and craftsmanship.

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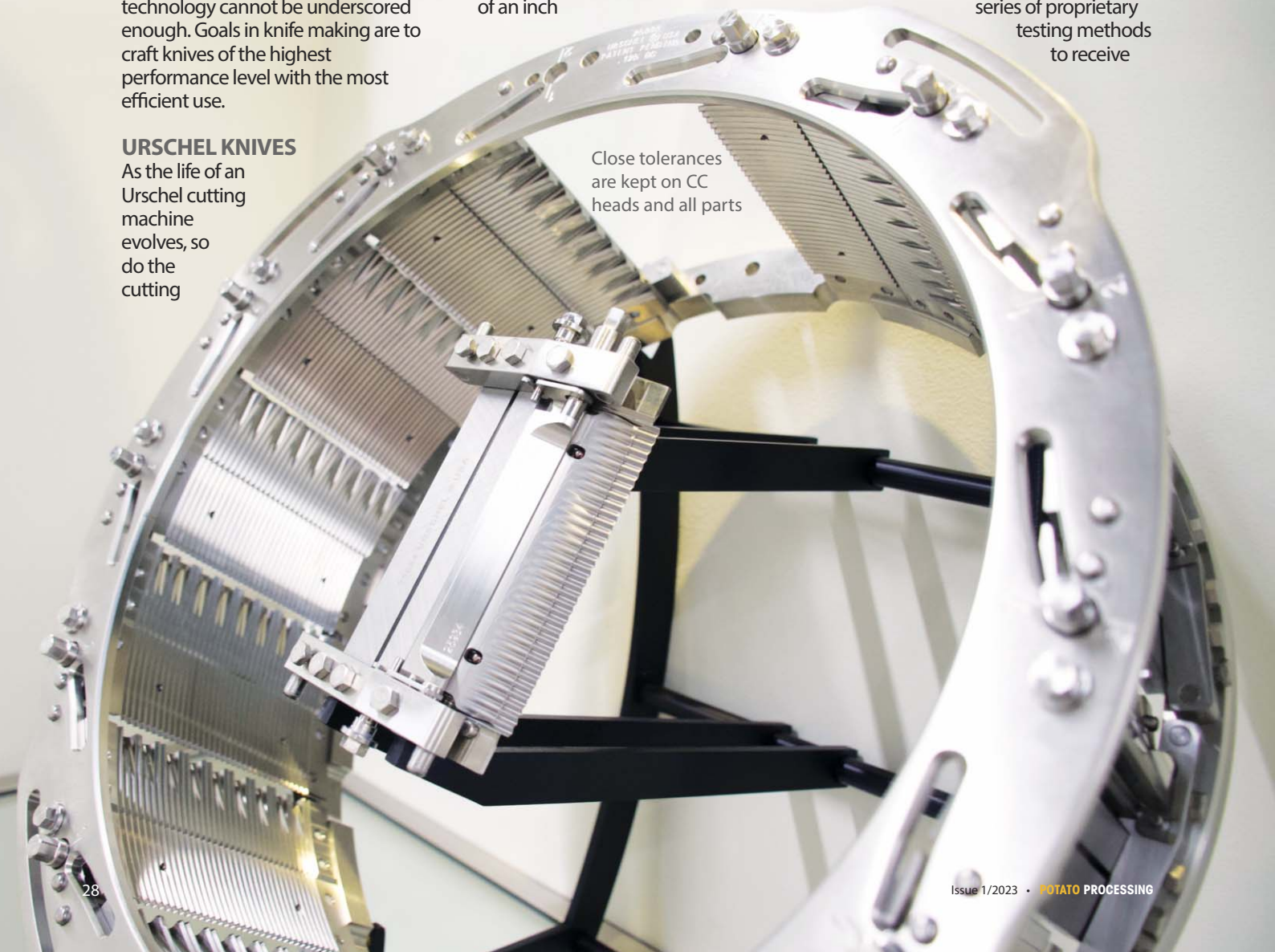
This article focuses on the precise form and function dedicated to the explicit production of Urschel knives. As the #1 Global Leader in Food Cutting Technology, Urschel has manufactured thousands of cutting machines while the number of knives manufactured per year is well **into the millions**. The expertise in designing and manufacturing precision knives throughout the company's history and remaining at the forefront of knife technology cannot be underscored enough. Goals in knife making are to craft knives of the highest performance level with the most efficient use.

URSCHEL KNIVES

As the life of an Urschel cutting machine evolves, so do the cutting applications. Fulfilling customer needs to process certain products is evident. Knives need to be constructed to stand-up to the characteristics of the product being processed. These factors include rigidity, temperature, moisture level, fat content, softness, etc. and also include incidental rocks, soil, or sand which may interact with the cutting process.

With advanced manufacturing methods, knife accuracy is controlled to less than one ten-thousandth of an inch (0.00010" = 0.00254 mm) holding traditionally aerospace engineering technology standards throughout the millions of knives that are produced. This accuracy is also seen in the spacers and feed discs commonly employed side-by-side of circular knives on a knife spindle. Urschel metallurgy plays an important role. Supplied coils of stainless steel must meet specific predetermined metallurgical standards. Coils are received and put through a series of proprietary testing methods to receive



Close tolerances are kept on CC heads and all parts

Crosscut and circular knives and spacers fit and function are key to precision, high capacity cuts

Waterknife heads built upon customer order

certification and verification before any other processes commence. The coil is then put through a number of conditioning steps before the actual knife making begins.

Urschel's in-house heat treatment facility incorporates three different styles (atmospheric, vacuum, and induction) to create the ultimate in precision, durable knives, and other Urschel parts. High tensile knife alloys used are second to none. Urschel metallurgic team maintains strict standards. Due to this in-house manufacturing, Urschel dials-in the exact conditions to optimize and stabilize the production of Urschel parts. Annealing and stress relieving, additional steps such as cryogenic tempering, and heat treat methods are precisely adhered to and work together with engineering, metallurgy, and quality-control to go above and beyond the industry standard.

CC SLICER

At first glance, the CC flat slicing knife appears simple in design. The craftsmanship and amount of research and development has mirrored the success of the rise of this potato chip/crisp industry icon. Thousands of hours of testing, different styles of potatoes grown in different areas, plus the ability to deliver a precise slice while venturing through potential sand, soil, and the occasional rock. The bevel is crucial in the successful design. A very narrow hardness range is specially engineered. If a knife is too soft, the edge will bend over. If a knife is too hard, it will tend to shatter. The knife is designed to maintain the proper edge location and degree angle imperative to long-time, precision throughout production runs. Precision slices maintain proper level of oil absorption and fryer times directly affecting the bottom line. Dull knives lead to increased waste. Dull knives may lead to surface fractures, as they 'plow' through the potato, instead of cleaning cutting, resulting in excessive breakage and increased oil consumption.

Initial CC flat knives were originally manufactured on Urschel-built production equipment and measured on an optical measuring instrument (also Urschel-built). Today, Urschel employs newer technology in a cell-driven manufacturing environment while maintaining strict quality controls. The slicing and shredding knives available on the CC have grown along with the market applications including a variety of crinkle, v, z, julienne, and corrugated options.

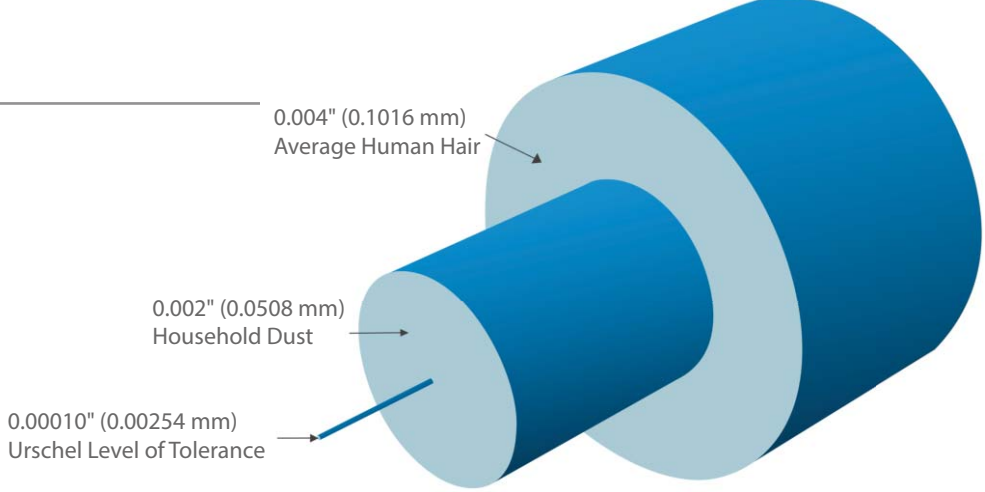
DIVERSACUT® DICER SERIES

While the Model CC delivers different styles of slices, the DiversaCut series produces 3-D cuts employing slicing, circular, and crosscut knife stations. The first cut is the slice. Slicing knives are available handled, as an easily replaceable, lower cost option, standard, with or without shaped edge, and special heavy duty. Most slicing knives are specially notched to work directly with dedicated circular knife spindle set-ups. Specially crafted

CC Series

DiversaCut® Series

TranSlicer® Series



bevels, heavy duty slots, some widely and some narrowly slotted. It all centers around precision cutting at high speeds and keeping tolerances. The second cut takes place within the circular knife spindle. The blades are crucial to cut cleanly, accurately through the product. The spindle may be made up of all circular knives, or a combination of spacers, feed discs, and circular knives depending on ascertained cut and product characteristics. Circulars, spacers, and feed discs come in thin or thick profile. Circulars may be finished with different beveled edges depending on product. Holding tolerances of all parts on the spindle is crucial, as well as the balance and geometry of the spindle component itself in order to achieve optimal cutting and avoid any part-to-part negative movement or potential crash. Tolerances of these parts are maintained at less than one ten-thousandth of an inch. The spindle and spindle shaft are designed to work with certain circular knife styles.

The third and final cut takes place at the crosscut spindle station. The crosscut knife spindle incorporates knives at an angled bend placed in parallel that horizontally cross the vertical axis of the second circular knife cut. Urschel has developed diverse styles suitable for different products including standard, light duty, blunt edge, narrow width, and different beveled edges – just to name a few. The edge of each, thickness, and thinness areas of each style takes hundreds, if not thousands of hours of R&D to determine every production step and refine this process to ensure quality and efficiency. With engineering and all manufacturing under one roof, heat treat and anneal procedures have been refined for each style and each corresponding spindle. All parts are manufactured to work together in proper geometry and balance to deliver uniform cuts.

TRANSLICER® CUTTER SERIES

The machines in the TranSlicer series are cutters containing a large cutting wheel (20" (508 mm) or 25" (635 mm) in diameter) made up of knives. The TranSlicer knives are held in place under tension.

Flat, julienne, scalloped and crinkle knives are available. With such a large wheel and lengthy knives, manufacturing them initially had many challenges when Urschel first developed the Model OV, precursor to the now TranSlicer series, the knives tended to twist or warp, instead of remaining flat for proper cutting action. After some analysis, proper metallurgy, heat treat methods, and annealing were determined combined with additional steps to resist compression of the knives and ensure knives remained under equal tension maintain balance on the cutting wheel. Proper knives, wheel rotation, and balance are imperative to delivering consistent, accurate cuts. Today's customers benefit from Urschel's expertise throughout the company's longstanding history.

WATERGUN KNIVES

As Urschel developed the Model VSC, Velocicut®, and watergun-style heads, the company continued to develop knives for universal watergun systems. The quality and longevity of the watergun knives manufactured at Urschel has been recognized in the food processing industry.

Watergun blanks are routinely stocked, and inventory replenished to expedite knife finishing and custom builds upon customer demand. Urschel custom tapers each row of blades to ensure product accurately transitions and is cut as it traverses through the head. Notched proper geometries are configured to prevent potential tapering or fracturing of product. A symbiotic balance between hardness of individual blade material and blade sharpness is crucial. Certain set-ups may or may not require tensioning of the blades depending on custom order to meet precise customer needs.

COST-SAVINGS

Urschel has specifically designed many knives with the added value of being able to resharpen the blade edge via Urschel-manufactured honing equipment. Operating any cutting machine with dull or not properly maintained knives may prove costly. Lost time and increased product waste far exceeds the cost of knife replacement. Use of dull knives increases the potential of cell rupturing, miscuts, and decreases yield and profit.

Customers are encouraged to learn more about the many knives and set-ups available to ascertain the most optimal for their product and line requirements. Urschel routinely develops and introduces new knives and cutting set-ups to improve individual cutting machine performance. Free-of-charge test cutting services are available to assist customers with R&D.

Urschel offers complete support over-the-phone, in-person plant visits, or live remotely. Urschel's significant ongoing investment in the global infrastructure of the company give clients peace of mind knowing their local office is there for complete support in terms of maintenance and training for the long life of their cutting equipment. Urschel speaks the language of food processing AND the local language, so important details in customer expectations are met. As the Global Leader in Food Cutting Technology, Urschel global personnel possess the highest degree of knowledgeable food cutting expertise. Urschel is the number one best-selling provider of industrial food cutting machinery because the company partners with customers to increase their productivity and profitability. Customers embrace Urschel advantages. Urschel designs new patented cutting methods and discovers new shape cuts to assist processors. Urschel continues to develop new knives, parts, components, and machinery to expand and grow with the everchanging demands of the food industry. •