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July 2022

BELT
TECHNOLOGIES, INC.

Precision on the **Move**

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If Only Just In Time Were
Just That Easy!

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Welcome to the new issue of the Gateway! We're going to start the way we've been ending a lot of these introductory thoughts in the event we're too busy to read to the end.

If you've got a story you'd like to share, we'd love to hear it. Send us anything you've got, and we'd be happy to consider it for publication in the pages of this magazine. If you have an idea you'd like to check in with us first before dedicating time to it, by all means, reach out to chris@thegatewaymag.com and he'll set you straight on whether or not it's something we'd be interested in running. That said, he's interested in just about anything, so don't be shy!

This magazine exists to put the spotlight on YOU. So take advantage of it. If you're not sure how it works or where to start, we can guide you. It's easy. It's painless. And it's effective. Just ask anyone who has had a spotlight published in the past. People are paying attention. So why not shift their attention to what you're working on and how your business can help them with theirs.

Okay, with that out of the way, here's what we have in story for our July edition:

Our friend Paul Critchley is back with the latest installment of his "Lean" series of articles. This new piece dwells on the notion of "Just In Time" manufacturing and how we ought to be thinking about it, rather than how it may be currently perceived. It's an interesting article to think on.

The second feature is written by Denis Gagon, CEO of Belt Technologies down in Agawam, Massachusetts! Denis put together a piece entitled "Incorporating Improved Automation for Increased Production and Lower Costs," which positions technology and innovative processes to bolster manufacturing efficiencies. It's a great read. We hope you'll think so too!

Hope you're all keeping cool out there!

THE Gateway MAGAZINE

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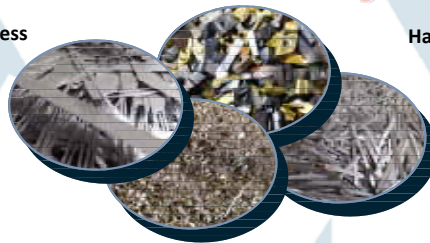
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Precision on the *Move*

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As demonstrated in virtually every industry today, we are in a new age of automation. Manufacturers across the globe are significantly increasing both efficiency and employee productivity by incorporating various automated elements into their operations. In addition to its primary benefits, many facilities discovered that a reliance on automation allowed them to keep up with demand during the COVID-19 pandemic. In the face of widespread labor shortages, improved automation helped businesses keep pace—and even thrive. But how can manufacturers prepare for similar scenarios in the future and begin reaping the benefits of increased productivity and decreased operating costs? The answer: by switching to PureSteel® metal conveyor belts and ditching the fabric, rubber or PVC alternatives.

Using sophisticated technology and innovative manufacturing processes, Belt Technologies, Inc., has been producing PureSteel® stainless steel conveyor belts, timing belts and pulleys for automated applications and conveyor systems for more than 50 years. These products are already in use in industries including food processing and packaging, solar cell assembly, UV and thermal curing, vacuum conveying, carriage positioning and many more. Utilizing these belts in automated assembly applications has become an increasingly popular option for several reasons, including the high strength-to-weight ratio, accurate positioning, cleanliness and overall reliability that they possess over alternative options.

1) Strength-to-Weight Ratio

Stainless steel has a tensile strength of 180-300 KPSI (thousand pound-force per square inch), depending on the chosen alloy and temper. Due to this strength, relatively thin and lightweight belts can be designed to handle the stresses of almost any application, as more of the conveyor's input horsepower can be devoted to moving the product and not the belt—boosting efficiency and reducing operating expenses.

Stainless steel belts can be further strengthened by stacking them in a multilayer configuration, consisting of several bands ranging in thickness from 0.003 to 0.005 in. This configuration provides the combined strength of all layers while retaining the reduced bending stress of each individual layer, increasing the modulus of elasticity and helping to resist backlash. In this way, the stacked configuration improves the strength of the belt without sacrificing precision or flexibility in tight spaces.



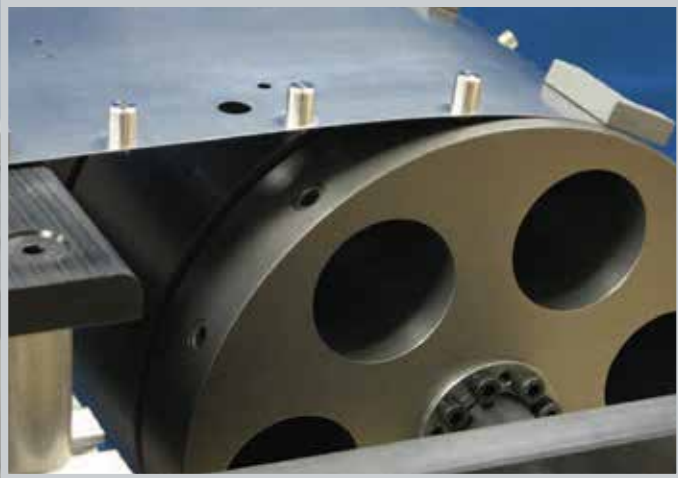
2) Accurate Positioning

Metal belts can be fabricated with a pitch accuracy (the gap between perforations or timing pins) of 0.0005 inches. This is extremely valuable in designing, indexing, positioning or processing equipment as it ensures enhanced precision and repeatability. And it's not just about the fabrication; stainless steel also retains its accurate positioning benefits during use. Other belt types can generate chordal action (when the chain transitions from its flat state to being wrapped around a sprocket), which leads to a pulsing motion in the chain. Continuous stainless steel belts are free from this pulsation of chordal action, resulting in precise translation of the control system motion profile.

3) Cleanliness

Belts made from polymeric materials often incorporate fibers for added strength. This comes with a major downside: at various locations throughout a conveyor system, the belt may rub against guides or rough edges. The repeated abrasion could then lead to small portions of the belt becoming detached and releasing dust and particulates into the air. Unlike these alternatives, stainless steel belts don't generate dust or particulates that could ultimately necessitate frequent cleaning or even a production shutdown. The longevity of PureSteel® belts under intense operating conditions provides cost savings to manufacturers because of fewer belt changes and reduced downtime.





4) Reliability

Virtually non-stretchable, metal conveyors, drive tapes and timing belts maintain operations precisely and accurately without requiring expensive replacement or repairs. Whether it's extreme temperatures or unforgiving environments, PureSteel® metal belts can be engineered to handle virtually any condition you can throw at them. Inferior materials will warp, burn or fall apart at significantly lower temperatures, and shrink or become brittle in the cold. Stainless steel has a low thermal coefficient of expansion, enabling it to better resist high and low temperatures.

Belt Technologies offers several alloys that resist distortion and perform well in applications with extreme temperatures. For instance, Invar will remain flat when operating in environments up to 400°F, compared to 300-series stainless steel which can start to see distortion at temperatures below 400°F. What's more, Inconel 625 and 718 can operate in environments

Unlike other belt materials that need to be removed from the conveyor for regular cleaning, metal belts can be cleaned in place with no removal required. Stainless steel is also resistant to corrosion, meaning it can be sanitized by high-pressure steam, high-pressure wash or chemical cleaning. Overall, this combination of a bacteria-resistant material and the superior manufacturing standards of solid endless conveyor belts and drive tapes offers diverse advantages, virtually endless applications and a lower-cost / higher-benefit ratio.



with temperatures up to 1,600°F. With this wide array of alloys, all of which are corrosion resistant and vacuum compatible, industries of every kind are sure to find the optimal PureSteel® product for their application.

Every problem needs a customized solution, especially those within the manufacturing world. Whether you're looking for a stronger, more accurate, more hygienic or more reliable option, a metal conveyor belt or drive tape may be the solution your facility requires.

Belt Technologies is unique as they have their own in-house machine shop and highly skilled engineers who can deliver automation solutions to improve processes and production quality across the gamut of industries. As their advanced manufacturing technology allows for

up to 1,000,000 custom perforations to be designed into a single belt, the company can create conveyors to any specifications. For instance, in addition to horizontal conveyor systems, Belt designs vertical and vacuum conveyor systems that also use PureSteel® stainless steel belts.



Precision on the Move

About Belt Technologies, Inc.

For more than 50 years, Belt Technologies, Inc., has produced PureSteel® metal conveyor belts, timing belts and pulleys ideally designed for automation applications. Committed to providing customized solutions to meet exact specifications and treating every project with an individualized approach, Belt helps customers achieve optimal performance while maintaining standards for the most stringent levels of safety. If you're ready for your facility to take advantage of all the benefits of automation, you can learn more at belttechnologies.com.

The team has also developed and implemented disruption plans to avoid delays due to the inevitable supply chain issues we see in today's manufacturing landscape.

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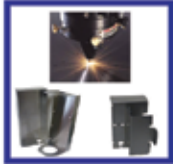
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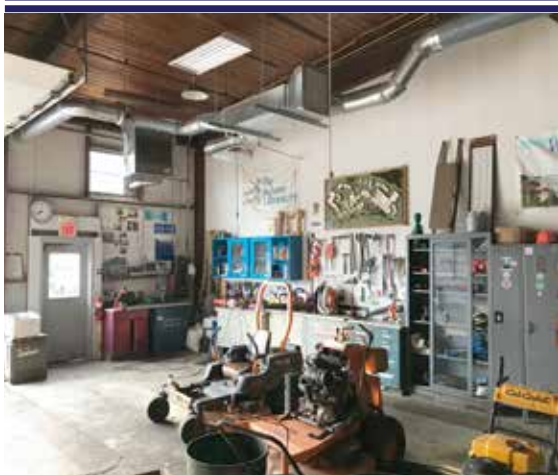
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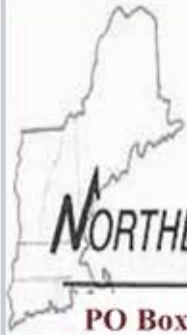


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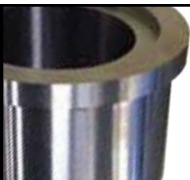
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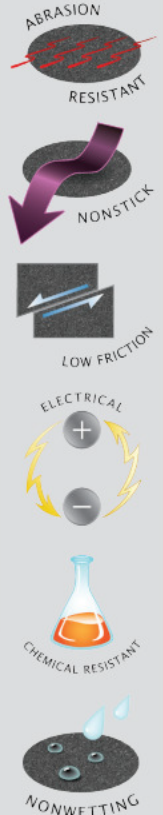
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IF ONLY JUST IN TIME WERE JUST THAT EASY!



Written by
Paul Critchley

Why do so many people misunderstand Just In Time (JIT)?

Just-In-Time. On the surface, this seems to be a pretty easy concept to understand. Cut inventory down to free up cash and floor space, then time your deliveries so that they can be supplied to the production floor “just-in-time” to be used. Accountants love it because it saves a lot of money, and production types love it because it gives them more floor space to do other things. As long as the proper amount of lead time is figured in, it’s a beautiful system! And it’s wrong.

Unfortunately, mainstream media outlets don’t do anyone any favors when they push out misinformation about JIT. These articles make the same critical error regarding Just In Time manufacturing... they think it’s only about inventory reduction, when in fact, that’s merely a resultant of doing a lot of other things right.

Just In Time is not a way to drive inventory down to zero

When Toyota developed JIT manufacturing as part of the Toyota Production System in the 1950's, it was part of the overarching goal of shortening the time between customer order and receiving cash. This endeavor was something they had to do, given the state of Toyota's (and Japan's) economy following WWII. They didn't have the luxury of "buying in bulk" to reduce their per piece price like Henry Ford did with mass production. Instead, they focused on building their processes to be robust enough so that they didn't need mountains of inventory to cover up for inefficiencies like long setup times and poor machine reliability. And this, dear friends, is the point of differentiation – where people who practice Lean and seek to understand its methods diverge from what the media's portrayal of what Just In Time is.

First remove the rocks; then lower the water level

In the analogy we often use to describe Just In Time, we envision a body of water as Inventory. Holding Inventory hides many sins, as it's a fantastic "pressure relief valve" that allows us not to have to move to quickly when things go awry. Machine went down? That's okay – we've got a few weeks' worth of inventory that we can ship off of. The last batch of parts all have a quality defect? That's cool – thankfully we overran the last order, so we've got a safety net...

Where many companies go wrong with JIT is that they think inventory reduction comes first. They hack and slash their inventories, then push their suppliers to do the same in order to reduce part costs. This all works fine when things are running well, but it also makes the supply chain extremely fragile – any small "blip" and you'll get what we're seeing in the United States right now – empty grocery store shelves and empty car dealerships.

In order to be able to enjoy the fruits of pursuing Just In Time, organizations must first remove the rocks (i.e., the parts of the system that cause

downtime). Only then should inventory levels be reduced. To go the other way around is putting the cart before the horse. We must first look at our processes and aggressively attack those things that cause problems:

- Utilize Setup Reduction to reduce our machine setup times,
- Use Total Productive Maintenance to reduce machine downtime,
- Employ Design for Manufacture to make products easier to make & assemble,
- Engage Respect for People to ensure that employees' voices are being heard.



Utilize local suppliers to reduce Transportation wastes

Chasing overseas low-cost suppliers is, by definition, not Just In Time. There's no way that a literal slow boat from China (which is currently running about 8-12 weeks) can be called Just In Time. This is also where mainstream media gets JIT wrong. Ordering products within lead time, so that they are delivered "Just In Time" is not the same a true Just In Time manufacturing. I've been accused of claiming "No True Scotsman" on this, but hear me out, because it's an important distinction and will literally be the difference between success and failure.

In the mid-1990's, Toyota decided to build a plant in Buffalo, WV (TMMWV). Initially slated to make 4-cylinder motors, today it produces a cadre of engines, transmissions, and hybrid drivetrains. Around 1998, Toyota made a crucial decision that greatly impacted my professional trajectory – it decided to localize the Camry's automatic transmission, and they did this in support of Just In Time.

You see, Toyota already produced this exact transmission in Japan. They had it all set – good suppliers, a robust design... the supply chain was humming along and on time delivery was great. But Toyota realized something that a lot of other companies perhaps would never have questioned under those circumstances – with their USA Camry sales increasing, shipping components 1/2 way around the world was allowing the waste of Transportation. Not only did it take a long time, it was risky. What if there were storms? Container shortages? A global pandemic?

So, they made the very expensive decision to “localize” the Camry transmission to the United States to support USA sales. They adjusted the plant layout, and engaged with all-new suppliers, including my employer. We won the business, and ultimately lunched more than 30 bearings and bearing components into production. Our plant was 7 hours from theirs, which is a bit of a drive, but it's still a heck of a lot closer than Japan! And – there are a lot fewer problems that can happen in 400 miles versus 6,600!

Just In Time is a process

It's very easy to look at empty store shelves, hear the words “Just In Time” and draw a conclusion that it's to blame for all of our current supply chain problems. Certainly, the above articles seem to be drawing that conclusion as well. However, that's not really Just In Time manufacturing. It's lazy procurement. It's rolling the dice that nothing will disrupt the supply chain when we've done nothing to shore it up first. This is the key difference; achieving lower inventory levels is the result of a lot of other Lean work – Setup Reduction, TPM, Gemba walks, Daily Management... all of these things must be undertaken first, and the supply chain analyzed for weakness prior to inventory levels getting reduced. Sometimes in our quest to save costs and please our managers (or shareholders) we jump to the end before we adequately support the middle.

Paul is a former Board Member of the Northeast Region of AME, holds a B.S. in Mechanical Engineering, a M.S. degree in Management and a M.S. in Organizational Leadership.

He is passionate about Lean and creating organizational cultures that are sustainably engaged. He co-authored his first book - The Whole Professional, A Collection of Essays to Help You Achieve a Full and Satisfying Life to bring a fresh perspective on Work/Life Balance and how individuals and organizations can work together to achieve greater levels of attainment.

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sultans_of_steel I finally got around to making a Pitbull Fixture by @miteebite - it worked perfectly! I had been trying to face down these alum plates to within .001 thickness, but it was proving impossible just holding it with vises. So it became the perfect opportunity to try these out! I am only bummed I haven't used them sooner!

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10 COMPELLING REASONS WHY YOU NEED WATERJET CUTTING

Let's keep the dialogue moving here... The following is an article featured in ICS's blog entitled:

“10 Compelling Reasons Why You Need Waterjet Cutting”

While there are many options when selecting a cutting process, none quite match the versatility and flexibility of waterjet cutting. Waterjet cutting is a process that first emerged in the 1800s but has since advanced dramatically. In the 1930's the waterjet technology was first used outside of the mining industry, in the 1950's ultra-high pressure water systems were explored, in 1970 the method was commercialized, and, finally, in the 1980s abrasive cutting was developed. These advancements in technology have expanded the use of waterjet cutting and allowed numerous industries to take advantage of the process in their manufacturing operations. Despite being such an exceptional development, many people aren't aware of the advantages of utilizing waterjet cutting. Keep on reading to learn the top 10 compelling reasons why you need waterjet cutting for your next project!

#1 NO THERMAL DISTORTION OR DAMAGE

Waterjet cutting is a cold cutting erosion process that uses a mixture of high-pressurized water and garnet (sand) to cut through the material. This process has no heat input which means there is no thermal distortion or damage to the materials being cut. Alternative processes such as plasma, laser, and EDM cutting all require a heat input which results in thermal damage and distortion to some degree.

#2 CAPABLE OF CUTTING VARIOUS MATERIAL

Unlike other fabrication techniques, waterjet cutting is a process that can handle virtually any material. This technology allows you to cut metals, stone, ceramic, plastics, rubber, foam, composites, and even glass. Comparable cutting methods typically only allow for the cutting of metals, primarily steel, stainless steel, and aluminum.

#3 HIGH MACHINE ACCURACY

Waterjet cutting is a highly accurate process. State-of-the-art waterjet machines can achieve a parts tolerance of $\pm .001$ ". In addition, ICS exclusively uses the Flow waterjet machines, which are known for their accuracy and minimal kerfs. The minimal kerf (.30" -.40"), is a result of the extremely narrow stream. It is for this reason that waterjet cutting is often the preferred choice for cutting precision parts and is utilized in the aerospace & aviation industry.

#4 LARGE SCALE CUTTING CAPACITY

Waterjet machines vary in terms of table size but can support both small and large-scale projects. Typical table sizes range from smaller machines such as a 5' x 5' machine and can be as large as 27' x 14'. At ICS we have two Flow Mach 500 machines which have a table size of 10' x 14' and one Flow Mach 300 machine with a 5' x 10' table size.



#5 MULTIPLE CUTTING AXIS CAPABILITIES

Precision abrasive waterjet cutting is made possible by having multiple cutting axes available. All ICS machines feature 2-axis and 3-axis cutting, and our two Mach 500 machines also possess 5-axis cutting capabilities. This technology allows you to cut practically any shape including those which have bevels.

#6 NO EDGE CLEANUP NECESSARY

With traditional cutting methods such as plasma and laser cutting, heavy deburring and slag removal are often required. Waterjet cutting however eliminates the need for these finishing processes and parts can be used as-is after cutting is complete.

#7 QUALIFIED TO CUT THICK MATERIALS

One of the main characteristics which differentiate waterjet cutting from other processes is its ability to cut thick materials. Waterjet cutting allows you to cut varying materials up to an impressive 11” in thickness. In comparison plasma can cut material up to 3” in thickness and laser can cut up to 1” in thickness.

#8 SUPERIOR EDGE QUALITY

Edge quality is one of the most compelling reasons why industry professionals prefer waterjet cutting. The waterjet cutting process produces a smooth and uniform edge, even on thicker materials. Edge quality is so exceptional because of the machine’s pressure, speed, and small nozzle size.

#9 EFFICIENT & COST EFFECTIVE

Waterjet cutting is an efficient and cost-effective process because of the high level of precision. Waterjet cutting reduces kerf, which means that by implementing this cutting process you can save money on waste disposal, and allows you to maximize material utilization. Many professionals are also able to streamline the process and save additional time by cutting stacked material.

#10 VERSATILITY OF INDUSTRY UTILIZATION

Waterjet cutting is exceptionally versatile and can be utilized in almost every industry. While a lot of Intelligent Cutting Solution’s work does come from the aerospace & aviation industry, we also serve the medical, defense, automotive, and architectural industries.

To read more, visit www.icscuts.com/blog.

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MOMENTUM MANUFACTURING GROUP NAMED #7 U.S. FABRICATOR ON FAB 40

GEORGETOWN, MA, June 20, 2022 – Momentum Manufacturing Group (MMG), a strategic metal manufacturing partner to original equipment manufacturers (OEMs) and product manufacturers across a variety of industries, has been named to The FABRICATOR magazine's 2022 FAB 40 list. This year marks the company's third consecutive year on the list, moving up to the number seven position from last year's number eight spot.

The annual FABRICATOR list identifies the top 40 most successful U.S.-based metal fabricating operations, as determined by the previous year's revenue and other reported company information. Companies that earn most of their revenue from contract and custom manufacturing involving sheet metal and plate fabrication are eligible for inclusion on the list.

"We're honored to be recognized again by The FABRICATOR as one of the top ten fabricators in the country," said MMG's CEO, James Moroney. "Moving up to the number seven spot reflects the tremendous growth we've experienced over the last year as we continue to expand our capabilities to serve more of our customers' needs."

MMG operates 11 manufacturing facilities throughout New England providing a broad range of metal fabrication, precision machining, aluminum extrusion manufacturing, custom cabling, finishing, and assembly services.

"We remain focused on investing in our operating capabilities to gain greater efficiency and to solve more of our customers' supply chain challenges," explained MMG's COO, Steve Gore. "This includes installing state-of-the-art technology and automation throughout our facilities to ensure we meet customers' quality, cost, and time-to-market goals."

NEW HAMPSHIRE BECOMES 19TH STATE AND FIRST IN NEW ENGLAND TO PASS ADVANCED RECYCLING LAW

WASHINGTON, DC (June 2022) — New Hampshire Governor Chris Sununu signed S.B. 367 into law, which will help create a more circular economy for plastics while attracting new jobs to the state.

New Hampshire is the 19th state since 2017—and the first New England state—to enact legislation that recognizes the economic and environmental benefits of advanced recycling. S.B. 367 will appropriately regulate advanced recycling technologies as manufacturing operations rather than solid waste disposal, supporting investments in advanced recycling facilities and new manufacturing jobs for New Hampshire residents.

Advanced recycling is a manufacturing process that converts used plastics into high-quality new plastics. With advanced recycling, more types of plastics can be recycled compared to traditional recycling methods. Thanks to advanced recycling, mixed and even some soiled plastics can be remade into new plastics approved for food, pharmaceutical, and medical use. A 2021 report by Closed Loop Partners estimated that advanced recycling could double the plastics packaging recycling rate in the U.S. and Canada by 2030.

Advanced recycling legislation passing in New Hampshire demonstrates how awareness and recognition of these transformative technologies are growing. By remaking more used plastics into brand new plastics, advanced recycling diverts plastics from landfill, decreases greenhouse gas emissions

associated with virgin plastic production, and creates opportunities for new jobs and revenue streams.

“As the first governor in New England to sign legislation on advanced recycling into law, New Hampshire continues to lead the way,” said Governor Chris Sununu. “Commonsense efforts like this which benefit our environment while attracting new business and good paying jobs to the Granite State is a win for everyone.”

ACC applauds the co-sponsors of S.B. 367, Senator Kevin Avard and Representative Howard Pearl, for passing this bill through the legislature, and Governor Sununu for signing S.B. 367 into law to support economic opportunities and environmental stewardship in the state.

Learn more at: <https://www.americanchemistry.com/chemistry-in-america/news-trends/press-release/2022/new-hampshire-becomes-19th-state-and-first-in-new-england-to-pass-advanced-recycling-law>

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