

  
**National**

# About National

## What are the key differences between National Steel Rule and its competition?

**We ASC.** No, that's not spelled wrong. *Asking* our customers what they wanted from their rule manufacturer, created the ASC acronym that clearly guides how we operate National today:

- ◆ **A- Availability** - The best products in the world don't mean a thing if they aren't readily available. Therefore, we maintain the *largest rule inventory* in the world today.
- ◆ **S- Speed** - Inventory, plus a huge manufacturing capacity and state of the art proprietary equipment, allow us to provide the *fastest deliveries* in the industry, standards and specials alike.
- ◆ **C- Consistency** - The ever increasing demands of our industry absolutely require that steel rule be truly consistent in its quality and characteristics. We are fully committed to providing that critical consistency.
- **Focus- Steel rule is the only product we manufacture.** It is our sole and driving focus. We have long been the industry leader in innovative rule development. To date, we have created over 75 rule innovations and consistently add new items to that list every year.
- **Experience- Our founders were originally diemakers** and used their invaluable experience to start a company whose major aim was to solve diemaking and diecutting problems. To accomplish that goal, we assembled a highly experienced, hardworking and talented staff.
- **Service-** It's been said that we are a service company disguised as a rule manufacturer. We treat our customers like we would our friends and know almost all of them on a first name basis.
- **Flexibility-** We recognize that bigger isn't always better. We strive to be large enough to effectively compete in the global marketplace, yet small and flexible enough to quickly react and respond to any changes in our customers' needs.
- **Ongoing Improvement-** We are fully committed to *continuous improvement and change*, while never forgetting our history and the things that made us the company we are today.

## The National Steel Rule Quality Policy

We recognize that what was good enough yesterday, may not necessarily be good enough today and what is good enough today, may not be good enough tomorrow. As such, our dedicated mission is to continually improve all aspects of our business to insure our relevance in an ever changing industry. We accept and embrace our small but vital role in helping to create consumer packaging that is protective, environmentally friendly and most of all, innovative.

### National Steel Rule

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**Most of the items in this catalog are available in an almost infinite number of combinations of heights, point sizes, tempers, bevels, tooth patterns, etc.**

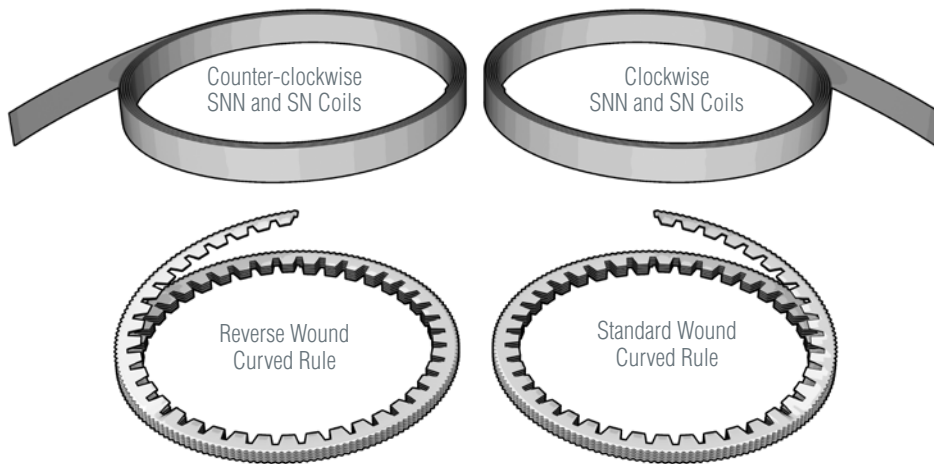
## Automatic Rule Processor Coil Specifications

Our Code (Part No.)	Wind/Feed Direction	Maximum OD	Point Size	Standard Coil Length
AC	Counter-clockwise	21" (.53 M)	3 Pt.	200' (60.9)
			4 Pt.	150' (45.7 M)
DP	Clockwise	21" (.53 M)	3 Pt.	200' (60.9 M)
			4 Pt.	150' (45.7 M)

## Metric to English Conversion

1 mm	= .039 inches
1 Inch	= 2.54 cm or 25.4 mm
1 Meter	= 39.375 Inches
30 Meters	= 98.5 Feet

## Auto Bender Guide



Thickness	Heights	30" Lengths		36" Lengths		1 Meter Lengths		48" Lengths	
		Feet/Box	Strips/Box	Feet/Box	Strips/Box	Feet/Box	Strips/Box	Feet/Box	Strips/Box
2 Pt.	0.500 - 1.125" (12.7-28.58 mm)	250 Ft.	100	300 Ft.	100	328 Ft.	100	272 Ft.	68
2 Pt.	1.126 - 1.250" (28.6-31.75 mm)	170 Ft.	68	204 Ft.	68	223 Ft.	68	136 Ft.	34
3 Pt. & 3 x 2	0.500 - 1.125" (12.7-28.58 mm)	175 Ft.	70	210 Ft.	70	248 Ft.	75	200 Ft.	50
3 Pt. Wave	0.500 - 1.125" (12.7-28.58 mm)	167 Ft.	67	201 Ft.	67	248 Ft.	75	200 Ft.	50
3 Pt.	1.126 - 1.500" (28.6-38.10 mm)	125 Ft.	50	150 Ft.	50	164 Ft.	50	100 Ft.	25
3 Pt.	1.501 - 3.000" (38.13-76.20 mm)	62 Ft.	25	75 Ft.	25	112 Ft.	34	100 Ft.	25
4 Pt., 4x2, & 4x3	0.500 - 1.125" (12.7-28.58 mm)	125 Ft.	50	150 Ft.	50	164 Ft.	50	136 Ft.	34
4 Pt.	1.126 - 1.500" (28.6-38.10 mm)	85 Ft.	34	102 Ft.	34	112 Ft.	34	68 Ft.	17
4 Pt.	1.501 - 3.000" (38.13-76.20 mm)	42 Ft.	17	51 Ft.	17	56 Ft.	17	68 Ft.	17
6 Pt.	0.500 - 1.125" (12.7-28.58 mm)	85 Ft.	34	102 Ft.	34	121 Ft.	37	100 Ft.	25
6 Pt.	1.126 - 1.500" (28.6-38.10 mm)	85 Ft.	34	102 Ft.	34	112 Ft.	34	68 Ft.	17
6 Pt.	1.501 - 3.000" (38.13-76.20 mm)	42 Ft.	17	51 Ft.	17	56 Ft.	17	68 Ft.	17
8 Pt.	0.500 - 1.125" (12.7-28.58 mm)	62 Ft.	25	75 Ft.	25	82 Ft.	25	68 Ft.	17
8 Pt.	1.126 - 1.500" (28.6-38.10 mm)	50 Ft.	20	60 Ft.	20	66 Ft.	20	40 Ft.	10
8 Pt.	1.501 - 2.000" (38.13-76.20 mm)	25 Ft.	10	30 Ft.	10	33 Ft.	10	40 Ft.	10
6 x 3, 6 x 4, 8 x 3, 8 x 4 Laser		85 Ft.	34	102 Ft.	34	98 Ft.	30	100 Ft.	25
2 Pt. Zipper Up To 1.125"		85 Ft.	34	102 Ft.	34	98 Ft.	30	100 Ft.	25
3 & 4 Pt. Zipper Up To 1.125"		42 Ft.	17	51 Ft.	17	49 Ft.	15	52 Ft.	13

## Hardness Guide

Term	Scleroscope	RC Range	Vickers
Medium Soft	50	32-35	320-345
Medium	55	36-40	350-395
Medium Hard	65	41-44	400-435
Hard	70	45-49	445-500
Extra Hard	80	51-55	525-590

Note: Not all hardnesses available for different rule sizes.

## Packaging Information

	Length per Box Straight Coils	Length per Box Curved Coils
All 2 Pt.. Rule	300 Ft. (90 M)	300 Ft. (90 M)
All 3 Pt.. & 4 Pt. Rule	100 Ft. (30 M)	100 Ft. (30 M)
All 6 Pt.. & 8 Pt. Rule	50 Ft. (15 M)	50 Ft. (15 M)
All 3 x 2, 4 x 2 & 4 x 3 Laser Crease	100 Ft. (30 M)	NA
All 6 x 4 & 8 x 4 Laser Crease	50 Ft. (15 M)	50 Ft. (15 M)
All 6 x 3 & 8 x 3 Laser Crease	50 Ft. (15 M)	NA

# Rotary Rule

The corrugated industry continues to grow and evolve, placing ever increasing demands on diemakers to produce dies that can effectively cut every board weight from E Flute to Triple Wall. Proper rule selection plays a critical role in making that possible. That's a major reason we make as many rule varieties and innovations as we do, with each rule having its own characteristics that will affect the way it performs regarding the following criteria:

- Required pressure to cut
- Penetration into the anvil or blanket
- Edge appearance and feel
- Life of the rule
- Bendability

The tough challenge is to select a rule that, while it may excel in one particular chosen area of the above criteria, it will also

perform well in the other four elements. National's founders were originally diemakers and we fully understand the many problems diemakers and diecutters face today. That is why we are proud to provide the world's widest variety of problem solving rules, helping our customers to meet the many challenges our industry faces every day.

While our ability and willingness to meet the changing demands of our industry is a hallmark of our company, we also recognize that a large majority of applications do not require a custom designed rule. Therefore, we maintain the world's largest inventory of what our customer base has determined to be "industry standards." The following pages and chart below, demonstrate our most standard products that are available for immediate delivery. If you commonly use a product that we currently do not consider standard, please ask about setting up a stocking program specifically for your use.

*National manufactures a wide variety of cutting rules for a wide variety of applications. The chart shown below can be used as a guide to help determine what tooth configuration options are recommended (or are acceptable) for specific grades of corrugated. This chart does not take into consideration liner and medium weights.*

	E Flute		B-Flute		C-Flute		EB D/W		BC D/W		Heavy D/W		Tri Wall		Plastic Corr	
	Across	Around	Across	Around	Across	Around	Across	Around	Across	Around	Across	Around	Across	Around	Across	Around
Super Six	Red	Red	Red	Red	Red	Red	Red	Red	Red	Yellow	Blue	Blue	Blue	Red	Red	Red
8 Tooth	Red	Red	Blue	Red	Blue	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
8 Tooth Arrowhead	Red	Red	Blue	Red	Blue	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
RP 8	Red	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
8 Tooth Euro-Cut	Red	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
8 Tooth Klean Kut	Red	Red	Blue	Red	Blue	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
Scalloped	Red	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Blue	Blue
Supercut	Red	Red	Blue	Red	Blue	Red	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Blue	Blue
Extreme 9	Red	Red	Red	Red	Red	Red	Red	Red	Yellow	Red	Blue	Red	Blue	Red	Red	Red
10 Tooth	Yellow	Yellow	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Yellow	Red	Red	Blue	Blue
10 Tooth Arrowhead	Red	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Red	Red	Blue	Blue
10 Tooth NZ Klean Kut	Blue	Blue	Yellow	Blue	Yellow	Blue	Yellow	Blue	Red	Yellow	Red	Yellow	Red	Red	Blue	Blue
10 Tooth Euro-Cut	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Yellow	Yellow	Red	Red	Blue	Blue
10 Tooth Klean Kut	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Yellow	Yellow	Red	Red	Blue	Blue
12 Tooth	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Red	Yellow	Red	Red	Yellow	Yellow
12 Tooth Euro-Cut	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Blue	Red	Yellow	Red	Red	Yellow	Yellow
13 Tooth Klean Kut	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Yellow	Yellow	Red	Yellow	Red	Red	Yellow	Yellow
16 Tooth	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Red	Red	Red	Red	Red	Red	Red	Red
20 Tooth	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Red	Red	Red	Red	Red	Red	Red	Red

Recommended ■

Acceptable ■

Not Recommended ■

# Rotary Rule

## 12 Tooth

A combination of cutability, durability and formability, has allowed National 12 Tooth to remain an industry standard for over 50 years. Designed with a super smooth shaved edge to minimize paper dust, 12 Tooth is available in all standard and many custom configurations. This proven performer effectively cuts a wide variety of materials, from foam to corrugated and is in common use around the world.

- Cuts with minimal penetration
- Available edge hardened or standard
- Cuts a wide variety of materials
- Provides excellent anvil life
- Minimizes paper dust



## 10 Tooth

Today, most diemakers prefer using one rule that cuts equally well across the cylinder as it does around it. National 10 Tooth effectively fulfills that preference. Engineered with a smooth shaved bevel and a unique symmetrical, radiused tooth design, (slightly deeper than competitive products) 10 Tooth cuts with minimal pressure and penetration and provides enhanced wear resistance, bendability and cutting performance. No one rule is perfect for all applications, but 10 Tooth is the most popular, versatile, and universal rotary rule and effectively cuts the vast majority of all corrugated stocks. Also available in side bevel in a standard “V” tooth style.

- Cuts well in both directions
- Cuts the widest variety of materials
- Minimizes paper dust
- Provides excellent anvil life
- Reduces edge crush
- Available edge hardened or standard
- May reduce necessary rule inventory



## 8 Tooth

When applications call for an aggressive, reduced cutting pressure rule, 8 Tooth is an excellent solution. Designed with a smooth shaved bevel and precision V ground teeth, this tooth pattern begins penetration of even the heaviest of stocks, almost on contact. A quick release, combined with reduced cutting pressure, helps 8 Tooth reduce the anvil wear normally associated with heavy duty rules.

- Cuts with minimal pressure
- Available in all standard and many custom heights, tempers and point sizes
- Excellent for heavy duty applications, including double and triple walls
- Available in standard temper or harder tempers for lead and trail applications
- May be edge hardened for longer life



# Rotary Rule

## Euro-Cut

Designed to cut with an absolute minimum of pressure and penetration, 8 Tooth Euro-Cut has gained worldwide favor and acceptance as an industry standard and is a classic example of National's innovative drive. One of our most popular rules, Euro-Cut uniquely combines a precision shaved edge with a superior tooth profile. Reduced penetration allows die rubber to recover more quickly, thus providing faster run speeds. State of the art edge hardening is standard on this rule, though it may also be ordered without edge hardening. Euro-Cut works very well on light to heavy stocks. It can be effectively used with the same rule height in both the straight and curved direction, or in the conventional manner. The reduced penetration may require an increase of .005" to .010" (1.5 to 2.5 mm) in score heights for optimum performance.



- Reduced cutting pressure and penetration
- Reduced rubber wear
- Improved die life
- Reduced edge crush
- Faster running speeds
- Excellent for recycled board

## 10 Tooth Euro-Cut



An evolution from 8 Tooth Euro-Cut, the 10 Tooth version still employs the precision shaved edge, superior tooth profile and state of the art edge hardening of the original and continues to cut with minimal pressure. This version however, penetrates less, increases blanket or anvil life, creates an improved edge appearance and feel and is actually more universal than the 8 Tooth in its many applications.

- Minimal penetration
- Improved edge appearance and feel
- Increases blanket or anvil life

## 12 Tooth Euro-Cut

Similar to the 10 Tooth version, but with an improved edge appearance and feel, 12 Tooth Euro Cut is excellent for E flutes and other light grade board.

- Minimal penetration
- Improved edge appearance and feel
- Increases blanket or anvil life
- Cuts an even wider variety of board weights



# Rotary Rule

## Klean Kut

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Originally designed to reduce edge crush on heavy board, 8 Tooth Klean Kut was uniquely created with a distinctive tooth geometry and bevel angle. Made with a proprietary hard alloy steel, other Klean Kut advantages include superior stripping, improved rule life, good bendability and increased beam strength. Excellent for lead edge knives and or long horizontal cuts. A National standard for over 25 years.

- Excellent performance both across and around the cylinder on heavy stocks
- Minimizes edge crush
- Improves stripping



## 10 Tooth Klean Kut

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Combining the tooth geometry of 10 Tooth with Klean Kut's unique bevel, this rule cuts with minimal pressure and penetration on both light and heavy board. An ideal choice for lead and trail knives on a wide variety of board weights. Lower cutting pressure and a shallower gullet, combine to provide longer anvil wear. Works well on plastic corrugated too.

- Excellent bendability
- Low cutting pressure
- Reduced anvil wear
- Works on a wide variety of board weights

## 13 Tooth Klean Kut

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Designed as a multi-purpose rule, this pattern works exceptionally well on fibrous materials, plastics and micro flute corrugated. Placing the serrations toward the waste can produce improved stripping and an excellent edge appearance and feel. A shallow gullet creates superior anvil life and works well with hard cutting surfaces. Edge hardened for ultimate rule life and available in many standard and custom heights and point sizes.

- Provides excellent anvil life
- Edge hardened for maximum wear
- Superior stripping and edge appearance
- May be used for flat die applications cutting into a resilient surface



# Rotary Rule

## Scalloped

A National classic, 8 Tooth Scalloped rule has an extremely durable edge that works well even under the most demanding conditions. Designed with a center bevel, this rule creates a clean scalloped edge on products such as fiber, rubber and various plastics. Available in harder steels or edge hardened, Scalloped rule provides effective cutting of a wide assortment of materials for both flat and rotary applications.

- Durable tooth design
- Minimal penetration
- Creates a safety edge
- Excellent for rotary and flat applications
- Also available in a 10 Tooth version



## 16 Tooth



Provides an excellent balance of the aesthetics created by a finer rule (such as 20 Tooth) with the cutting characteristics of a coarser rule (like 12 Tooth). Great for displays or any applications requiring a superior edge appearance and feel.

- Creates superior edge appearance and feel
- May be used on belts or other hard surfaces
- Also available as a symmetrically ground product.

## 20 Tooth

When edge appearance is critical, such as in display work, a fine tooth pattern like 20 Tooth is an excellent choice. Available in a wide variety of configurations, 20 Tooth performs well on lighter weight stocks and micro flute products. When using 20 Tooth it is important to ensure that the anvils are in good condition.

- Superior edge appearance and feel
- Good for light board and micro flutes
- Available edge hardened or standard
- Available as a symmetrically ground product





# Rotary Rule

## SuperCut

SuperCut is an 8 tooth rule designed to cut with minimal penetration, while creating a safety edge on a wide variety of stocks. It may be used as a multi-purpose rule because it provides a superior balance of cutability, wear, excellent anvil life, edge appearance and safety. Also available in a 10 Tooth version for improved edge appearance and feel.

- Creates a safety edge
- Cuts with minimal penetration and pressure
- Provides excellent anvil life
- Multi-purpose



## Extreme 9



A proprietary, unique innovation, this rule cuts with both low force and minimal overcut. The teeth of Extreme 9 slant or slope at a precise downward angle that creates excellent shearing ability. This allows the rule to pass through even the heaviest of materials with superb ease and in most cases, the overall penetration or overcut will be significantly less than those of conventional rules. Extreme 9 works beautifully on all heavy board, including double and triple walls and is especially well suited for long, across the cylinder cuts, where deep penetration is likely (ie: lead edge knives). This rule may not be curved.

- Excellent on heavy board and other tough materials
- Ideal as lead edge knife
- Minimal overcut

## Super Six

A hybrid of our Klean Kut and Euro-Cut, this unique rule works well on heavy board, including double and triple wall. Super Six is ground from one side to help improve stripping and cuts with less pressure and penetration. It is also a perfect companion rule for use with Extreme 9 in the straight direction, or when a curved rule may be necessary for tough applications.

- Excellent for hard to cut materials, such as triple wall
- Improves stripping and reduces cutting pressure
- Perfect curved companion for use with straight Extreme 9



# Rotary Rule

## Arrowhead

Combining the benefits of a longer shaved bevel, an induction hardened edge and the power of a symmetrically ground, extra sharp 8 Tooth, this rule cuts with less pressure, while also providing longer blade life. Like standard 8 Tooth, Arrowhead creates a medium wave on the diecut blank that acts as a safety edge. Perfect for Power Flute and other high performance mediums.

- Longer bevel improves release
- Edge hardened for longer life
- Greatly reduces edge crush
- Good for medium to heavy board weights



## 10 Tooth Arrowhead

A finer version of Arrowhead, the 10 Tooth pattern provides better anvil life and a smoother cut on medium to lighter board weights. This is an excellent rule to be used around the cylinder combined with standard Arrowhead across the cylinder. A slightly less waved edge is created by 10 Tooth Arrowhead. Also available in a 12 Tooth version for an even finer edge appearance.

- Longer bevel for superior release properties
- Symmetrical ground, hardened edge
- Perfect curved complement to straight, standard Arrowhead



## RP 8

RP8 stands for “Reduced Penetration” 8 Tooth rule. Similar in design to our Center Bevel 10 Tooth, this symmetrically ground rule has a shallower gullet than our standard 8 Tooth, allowing less penetration, improved anvil wear and excellent bendability. Standard edge hardening insures the rule will hold up on longer production runs. The radius gullet creates a type of shearing action, as heavier board grades compress into the gullet during the diecutting process.

- Minimal penetration
- Edge hardened
- Excellent bendability
- Improved anvil life



# Rotary Rule

## 10 Tooth NZ Style Klean Kut

This shallow gullet side bevel rule is ideal for tight scrap areas, such as hand holes and slots. The side bevel deforms the scrap and acts as an ejection assist to quickly remove the internal scrap. Its shallow tooth eliminates the possibility of a gullet falling at the end of a bent slot.

- Perfect for difficult scrap areas
- Improves anvil life



## 13 Tooth Shallow Profile

Like traditional shallow profile rule, 13 Tooth Shallow Profile is an ideal choice for flat applications cutting into a resilient surface. This edge hardened product has a radius tooth design and is slightly deeper and more aggressive than 14 tooth Shallow Profile.

- Ideal for flat applications
- Edge hardened for long life

## 14 Tooth Shallow Profile

This 14 TPI center bevel rule is normally made with teeth ground on one side, but can also be manufactured with either a symmetrically ground center or true side bevel. All three patterns have very shallow gullets and are extremely versatile, in both flat and rotary applications. They work well on fabrics, rubber, plastics and other materials requiring minimal penetration. A perfect choice when cutting against a belt or non-oscillating anvil. Cuts with very minimal penetration.

- Provides excellent anvil life
- Ideal for cutting against hard pads or belts
- Available in a wide range of heights and point sizes

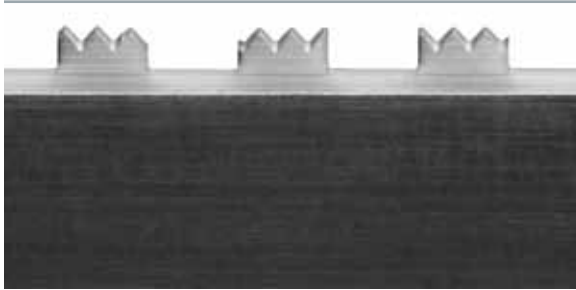
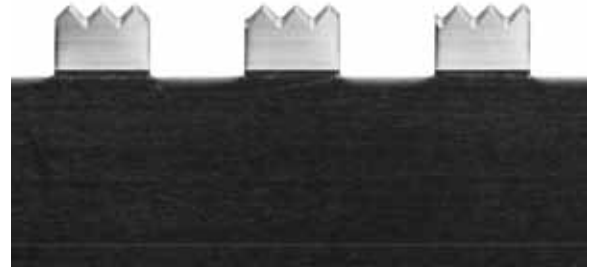


# Perforating Rule

## Rotary Perforating Rule

No other rule manufacturer offers the variety of perforating rule that National does; an almost endless selection of styles and tooth patterns. Virtually any tooth and space can be custom manufactured with only reasonable minimums required.

Whether you are using perforating rule for folding, holding blanks together or simply tearing, National has a rotary perf to meet your needs. We recommend serrated perf for any tooth size above 1/4" (6.35 mm). The serrated teeth allow easier penetration and reduced board crush. The standard gullet depth is 3/16" (4.76 mm) but other depths may be specified. We don't recommend gullet depths in excess of 3/16", unless the back notch is lowered, otherwise the gullet may fall directly above the notch, weakening the rule.

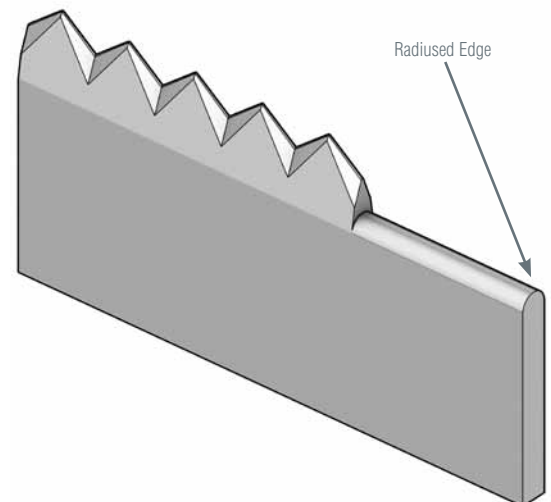


## Combination Cut Crease Rule

Combining a precise tooth or cut section with a specified gullet depth, Combo Perf enhances folding in both corrugated and folding carton applications. National offers the widest variety of tooth, space and depth of gullet configurations in the industry.

## Radius Gullet Combination Cut Crease Rule

Our industry has long suffered with the problems created by sharp corners on conventional combination rules. National has solved those problems by creating this family of rules that takes advantage of a unique method that rounds off (radiuses) those sharp corners. Available for both rotary and flat applications.



# Specialty Perforating

## Rotary Slit Score (5 Tooth)

Rotary diecutting has always had the limitation of only being able to crease from the inside of the sheet. This has made reverse folds difficult at best. National's 5 Tooth Slit Score is designed to cut through the inner liner and medium, without cutting through the outer liner. The trick is a combination of sharp pointed teeth and choosing the proper relationship between the cutting rule and the slit score rule. We recommend using a slit score approximately 1/16" (1.5mm) lower than the highest cutting rule being used in the die. While this rule is designed not to cut through the outer liner, it is possible that the points may pierce the outer liner. This could be the result of not being able to precisely control the rule penetration. Also available in a 6 tooth version.



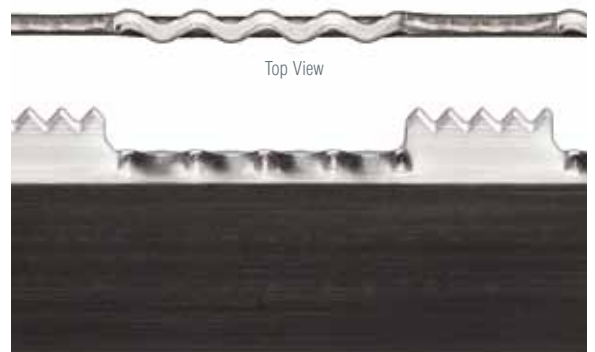
## Prism Perf

An alternative to serrated perf or serrated combination rule, Prism Perf is designed to cut through corrugated board with minimal pressure. Available as either a traditional perf rule (deep gullet) or as a perf-score rule (a defined gullet depth) in 1/4" x 1/4" (6.35 x 6.35mm), 3/8" x 3/8" (9.5 x 9.5mm) and 1/2" x 1/2" (12.7 x 12.7mm).

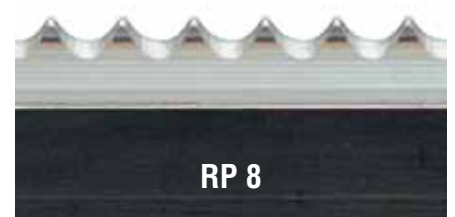


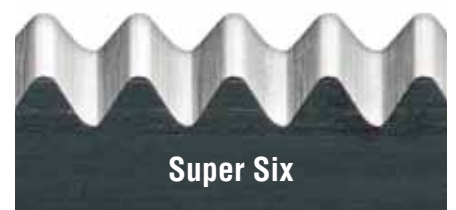
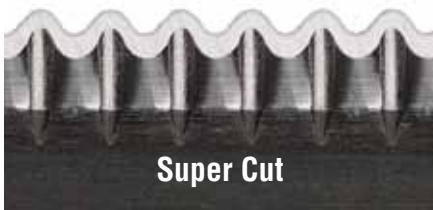
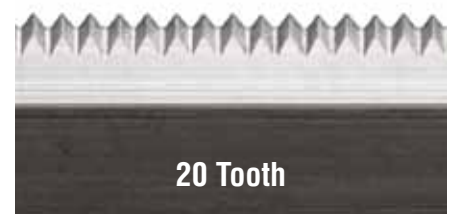
## Platinum Combo Score

National's newest perf innovation allows you to achieve a wider crease on a 4 Point perf-score. The sharp serrated teeth easily penetrate the substrate, while a waved crease crushes the paper between the perf, allowing for an easier fold. Compressing a wider area, allows reduction of fracturing, which is quite common when a 4 PT crease hits between the tips of the flutes.



# Rotary Rule Overview

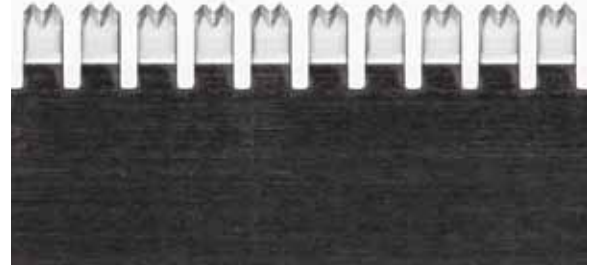




# Specialty Perforating

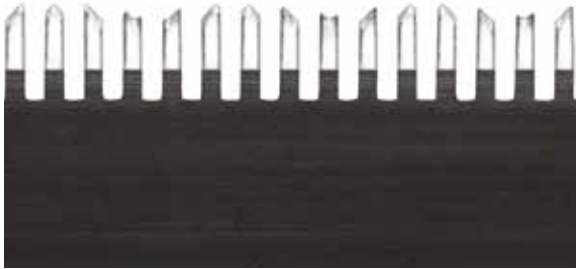
## Bundle Breaker Rule

As the name implies, this innovative rule keeps diecut bundles securely together until separation (automated or by hand) is required. Utilizing extremely small ties or spaces, (as small as .045" or 1.14 mm) these rules create an edge that has excellent appearance and feel. Various strengths of hold, ranging from 22.5% up to 37% are provided by this five product family of rules. May also occasionally be used as a shelf ready (retail ready) perforation and for display openings. Custom patterns may be made to order. For more durable holding strengths, refer to our PERFormaX line below.



Medium Bundle Breaker shown here.  
(Available in Extra Light, Light, Medium, Heavy and Extra Heavy patterns)

## PERFormaX Rule



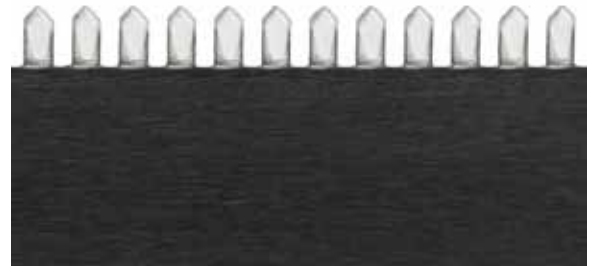
Standard PERFormaX Rule shown here.  
(Available in Light, Standard and Heavy patterns)

Specifically designed for corrugated shelf ready applications, PERFormaX primarily uses small ties or spaces in multiple combinations to create easy to tear characteristics with required box strength or integrity. These rules utilize the CUT/GAP relationship to precisely determine the break/tear resistance of each specific perf. The higher the percentage of hold, the stronger the box will be in regard to resisting shipping, handling and other normal stresses. The hold strengths range from 50% to 58% in a family of 3 products. The three versions specifically called PERFormaX are: "Light" (.045" x .045"- 1.14 mm x 1.14 mm) which provides a 50% hold strength, "Standard" (.045" x .055"- 1.14 mm x 1.40 mm) which provides a 55% hold strength and "Heavy" (.050" x .070"-1.27 mm x 1.78 mm) which provides a 58% hold strength.

Other patterns that may often be used to create similar results to PERFormaX include:

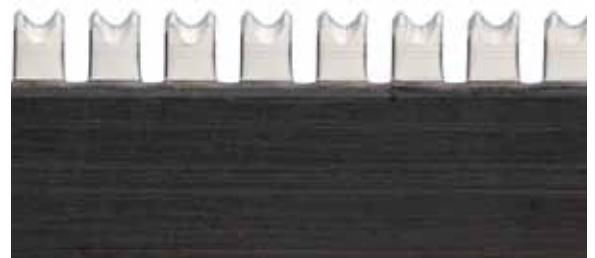
## 8 Tooth EZ Strip

A long time standard, this perf usually has an .050" (1.27 mm) space or tie (also available in other space choices). It is often used in short pieces to eliminate the need for nicking and provides 41% hold strength. The single pointed geometry offers a uniform penetration and an extremely sturdy tooth.



## 10 Tooth x .066 Gap (AKA "Prenick")

A perf pattern that may also be effectively used to eliminate the need for standard type nicking and is excellent for tear out applications, this rule provides 36% hold strength.





# Specialty Perforating

## Tear Edge Rule (AKA Zipper Rule)

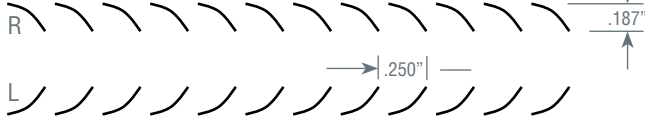
4A – Standard 1/2" Pitch (12.7mm) right hand & left hand zipper rule



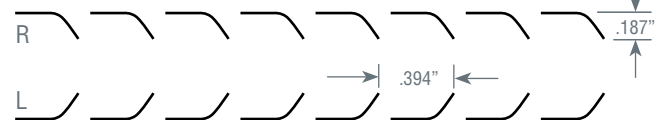
4J – Open type right and left hand zipper rule



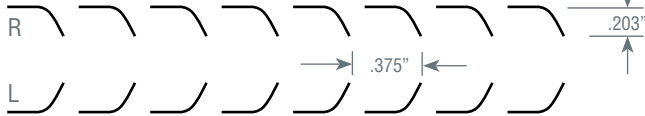
4B – 1/4" Pitch (6.35mm) right hand and left hand zipper rule



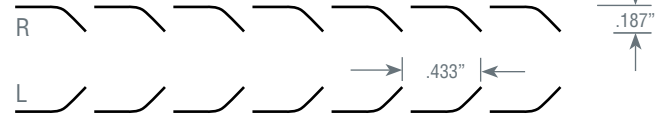
4K – 10mm Pitch (.394") right and left hand zipper rule



4C – 3/8" Pitch (9.53mm) right hand and left hand zipper rule



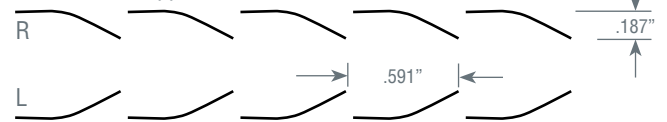
4L – 11mm Pitch (.433") right and left hand zipper rule



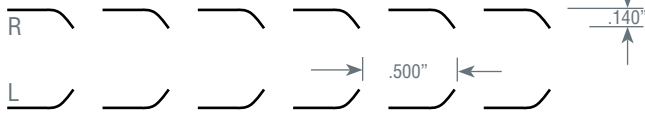
4D – 1/2" Pitch (12.7mm) 3/16" Gap (4.75mm) right hand and left hand zipper rule



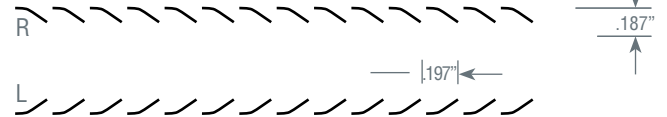
4M – 15mm Pitch (.591") 7 x 8mm (.276" x .315") right and left hand zipper rule



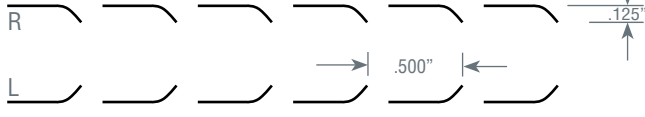
4E – 1/2" Pitch (12.7mm) 1/8" Gap (3.18mm) right hand and left hand zipper rule



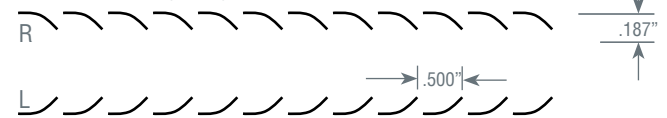
4O – 5mm Pitch (.197") right and left hand zipper rule



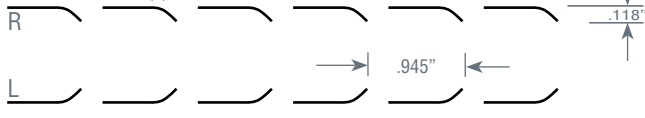
4F – 1/2" Pitch (12.7mm) 1/16" Gap (1.57mm) right hand and left hand zipper rule



4P – 6mm Pitch (.236") right and left hand zipper rule



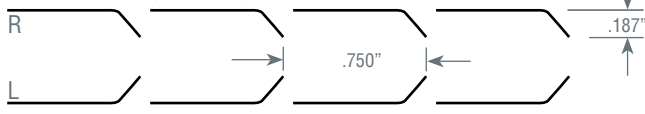
4G – 24mm Pitch (.945") 6mm Gap (.236mm) right and left hand zipper rule



4T – .400" Pitch (10.10mm) .250" x .150" (6.35mm x 3.81mm) right and left hand zipper rule



4H – 3/4" Pitch (19.05mm) right and left hand zipper rule



Above illustrations are not to scale and do not necessarily match the actual pattern. Please check our website [www.steelrule.com](http://www.steelrule.com), as other patterns may become available in the future.

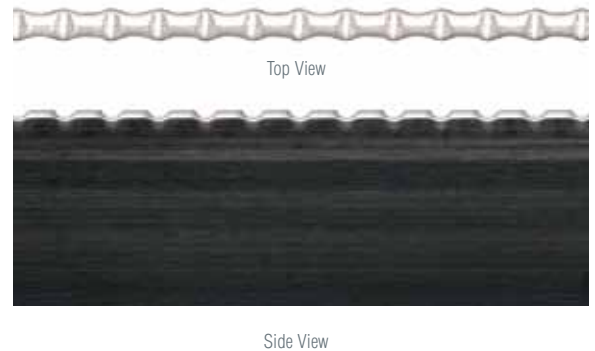
# Creasing Rule

## Rotary Creasing Rule

The importance of crease rule in a rotary die cannot be overstated, as it is the crease that controls the sheet as it passes through the press. Too high a crease and scores may crack. Too low a crease and dimensional problems may occur. Available in 4, 6, and 8 point, rotary crease comes with a standard radius profile, however, a square or a square with broken corners, can be ordered. A very large inventory of all standard height and point sizes in both straight and curved are available for prompt delivery.

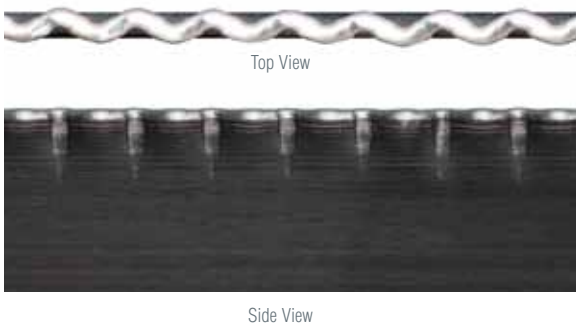
## MicroTrak Crease Rule

A proprietary, innovative rule that uses one of two patterns of smoothly machined, small “teeth” that wave the rule up and down, causing it to “break” up the crease face that contacts the stock. MicroTrak reduces the stress often associated with creasing, providing significantly reduced or fully eliminated score cracking and score rollover. MicroTrak provides improvement in sheet control and is also excellent for use on heavy, dark ink lay-downs. Ideal for most types of materials, but especially good for dry board and highly recycled stocks. Often allows faster folder gluer speeds. Available in 2 versions- 8Tooth and 13Tooth.



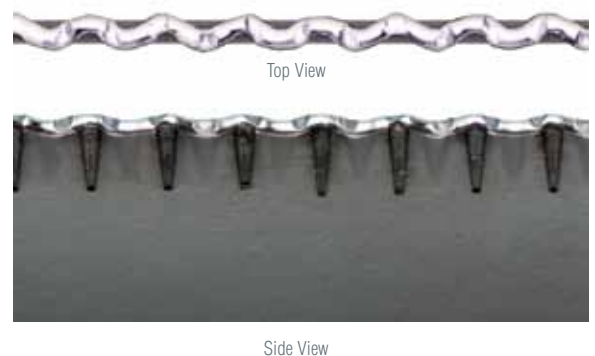
## Wave Score

Employing a precise new sine wave pattern to standard crease rule, Wave Score goes across the board flutes creating a more effective, less likely to roll over crease in many tough applications.



## Duo-Score

This latest National innovation combines the advantages of both Wave Score and MicroTrak, by waving conventional crease in both up and down and back and forth directions. Provides ease of folding, reduced or eliminated score cracking and rollover and excellent for heavy dark ink laydowns.



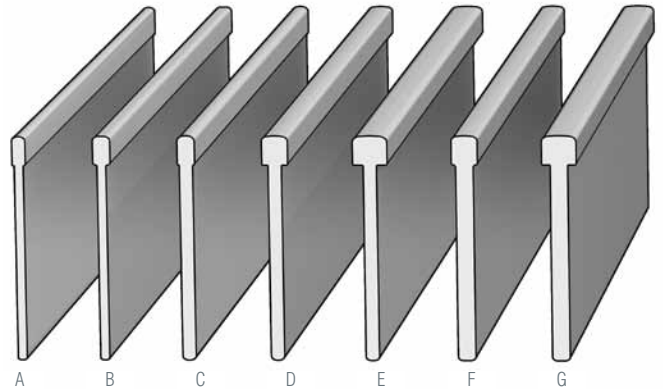
# Laser Crease Rule

## Rotary Laser Crease

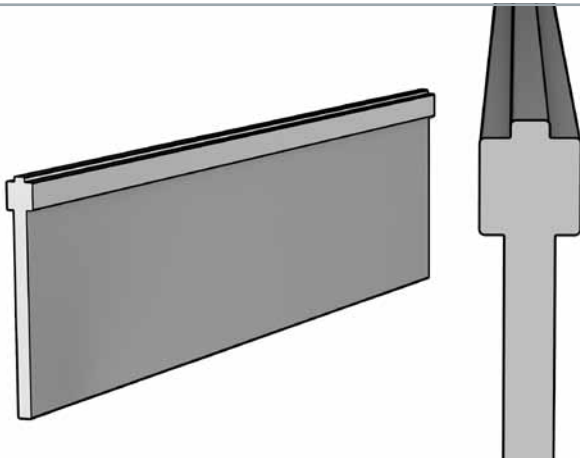
National's Laser Crease was uniquely designed to save time and money. Laser Crease enables you to burn a dieboard faster by eliminating the need to cut thicker lines if a wider score is needed and also allows you to alter the width of a score without having to go back and recut a line. Laser Crease does not distort when bridged. While the drawings shown demonstrate the standard edge profile, other edging options are available. The 6 and 8 point rules come with a standard crown cap (square with broken corners) but a full radius top is also available.

### Standard Profiles

A.	3 ON 2	STD	RADIUS TOP	D.	6 ON 3	STD	CROWN TOP
B.	4 ON 2	STD	RADIUS TOP	E.	8 ON 3	STD	CROWN TOP
C.	4 ON 3	STD	RADIUS TOP	F.	6 ON 4	STD	CROWN TOP
				G.	8 ON 4	STD	CROWN TOP



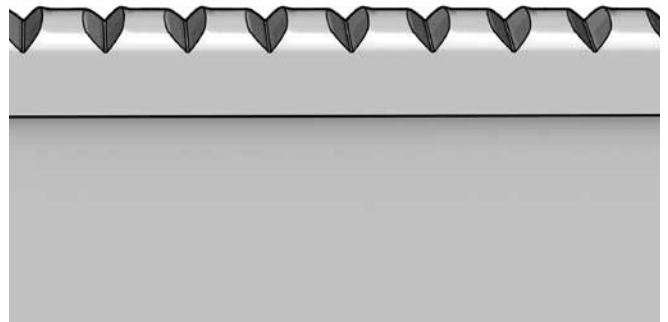
## Tru Fold Laser Crease



Originally engineered to provide accurate folds in the direction of the corrugation on heavy board, Tru Fold has a bead formed on the 8 point head that provides accurate score lines with a steel shoulder support. The thinner score minimizes stretch of the outer liner while still providing room for the board to fold. In multiple field tests, Tru Fold reduced ropey scores, improved dimensional accuracy and reduced checking in laminated label applications. Available for both flat and rotary applications.

## MicroTrak Laser Crease

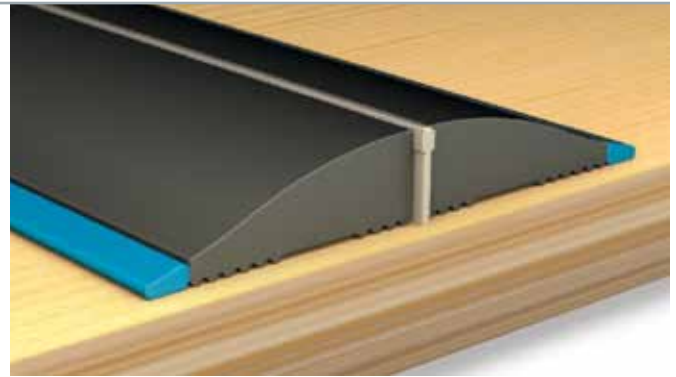
The MicroTrak patterns may also be applied to various Laser Crease rules to add the features and advantages of MicroTrak to Laser Crease applications.



# Ejection Material

## Kushion Crease

Designed to reduce score fractures in the corrugated direction often caused by dry or highly recycled stock, this unique product gently crushes the inner liner and the medium. Kushion Crease allows the scoring rule to form an accurate line crease on virtually all grades of corrugated. Should be used approximately .035" (.9 mm) below the scoring rule. Available in 2 styles: Standard and Color Coded. Standard provides a more gradually tapered crush, while the Color Coded crushes the board in a more defined area.



Color Coded Kushion Crease

- Can be used on all board from E-Flute to Triple Wall
- Best when used .035" (.9 mm) below the scoring rule

Heights Available	Color	Wood Size	Crease Size
.175" (4.45 mm)	Brown	.625"	.812" to .835"
.200" (5.08 mm)	Red	.625"	.840" to .860"
.225" (5.72 mm)	Grey	.625"	.870" to .890"
.250" (6.35 mm)	Yellow	.625"	.895" to .915"
.275" (6.99 mm)	Green	.500"	.800" to .812"

Heights Available	Color	Wood Size	Crease Size
.300" (7.62 mm)	Gold	.500"	.820" to .825"
.315" (8.00 mm)	Blue	.500"	.825" to .850"
.335" (8.51 mm)	Purple	.500"	.860" to .870"
.355" (9.02 mm)	Orange	.500"	.870" to .890"
.375" (9.61 mm)	White	.500"	.890" to .900"
.395" (10.03 mm)	Pink	.500"	.920" to .940"

## Dura Strip



While this microcellular elastomer was originally designed for extremely demanding automotive applications, Dura Strip has proven to be an excellent die ejection material, that works extremely well for slots, trim breaker and punch ejectors, in both flat and rotary applications. Benefits include:

- Highly stable
- Very durable
- Stands up to heat
- Consistent
- Perfect for slots and punch ejection
- Does not shrink or get harder with age
- Available in a wide range of thicknesses

# Rotary Serrated Punches

## Serrated Punches

National's line of serrated punches are designed with one thing in mind – superior stripping. Our punches cut cleanly through all board grades, including double wall and wet board right off the corrugator. Made from the highest quality tube steel, National punches are case hardened to a depth of .003" to .005" to insure uniformity. Available with either an inside or center bevel, our punches can be serrated with an 8 Tooth, 12 Tooth, Shallow Profile, or Klean Kut tooth configuration.\*

Available in standard heights of .990" (25.15mm), 1.000" (25.40mm), 1.023" (25.98mm) and 1.030" (26.16 mm). Other heights as well as outside bevel punches are available on special order.

\*For descriptions of these tooth configurations, see the section on rotary rule (pages 3-9).

Center Bevel Tube Diameter	Cut Size			Outside Bevel Tube Diameter
	Fractional	Decimal	Metric	
NA	3/16" *	.187" *	4.75 mm*	NA
5/16"	1/4"	.250"	6.35 mm	3/8"
3/8"	5/16"	.312"	7.92 mm	7/16"
7/16"	3/8"	.375"	9.52 mm	1/2"
1/2"	7/16"	.437"	11.10 mm	9/16"
9/16"	1/2"	.500"	12.70 mm	5/8"
5/8"	9/16"	.562"	14.27 mm	11/16"
11/16"	5/8"	.625"	15.88 mm	3/4"
3/4"	11/16"	.687"	17.45 mm	13/16"
13/16"	3/4"	.750"	19.05 mm	7/8"
7/8"	13/16"	.812"	20.62 mm	15/16"
15/16"	7/8"	.875"	22.22 mm	1"
1"	15/16"	.937"	23.80 mm	1-1/16"
1-1/16"	1"	1.000"	25.40 mm	1-1/8"
1-1/8"	1-1/16"	1.062"	26.97 mm	1-3/16"
1-3/16"	1-1/8"	1.125"	28.57 mm	1-1/4"
1-1/4"	1-3/16"	1.187"	30.15 mm	1-5/16"
1-5/16"	1-1/4"	1.250"	31.75 mm	1-3/8"

Cut size and tube diameter on Inside Bevel Punches are equivalent.

\* Only available for Inside Bevel Punches



8 Tooth Inside Bevel



12 Tooth Inside Bevel



12 Tooth Center Bevel



Klean Kut

# Notching and Curving

## Back Notching

Accurate, burr free back notching is absolutely critical if rotary rule is to perform effectively. The most standard back notch is 1/2" (12.7 mm) on 1/2" centers, allowing an accurate method to determine bridge placement. We provide several notch patterns (see illustrations) and can further alter the notch to perfectly suit your application. The proper notch allows accurate rule seating, which minimizes premature rule failure. Accurate back notching, combined with our Accu Curve Method, is the best way to ensure proper seating of the curved rule. Notch depth may be altered as needed

## No Notch Curved Rule

Another National innovation, No Notch Curved rule is extremely accurate, adds strength in specific areas of the die, is more secure in the dieboard and works extremely well in all the new, advanced rule processors.

## Accu Curve Method

Our exclusive Accu Curve system insures the best possible seating of the curved rule. Our unique thermal transformation system, causes the steel to lose its "memory" and allows it to stay securely in the dieboard.

# Special Processes

## Edge Hardening

When optimum rule life is a must, our custom induction edge hardening is an excellent answer, optimizing the relationship between bendability and wear resistance.

## Coatings

### Titanium Nitride and/or Boron

These processes produce a super hard edge that improves rule life dramatically, without sacrificing rule bendability.

### Teflon

Our rules can be coated with a durable Teflon coating that adds tremendous lubricity. This can be very helpful when cutting pressure sensitive or other "sticky" materials. Teflon prevents buildup on the rule, as well as aiding in release.

## Most Commonly Used Notches



1/2" (12.70 mm) Centers  
Standard depth- 1/2" (12.70 mm).  
Other depths available on special request.



.312" (7.92 mm) Centers  
Standard depths - either 21/32" (16.67 mm) or 1/2" (12.70 mm).  
Other depths available on special request.



3/8" Centers (9.53 mm)  
Standard depth - 1/2" (12.70 mm).  
Other depths available on special request.



.265" (6.73 mm) Centers  
Standard depth- 1/2" (12.70 mm).  
Other depths available on special request.



.431" Centers (10.95 mm)  
Standard depth - .525" (13.33 mm).  
Other depths available on special request.

## Custom Engineered Rule

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By combining multiple height, thickness, hardness, bevel and tooth configurations, the number of products we can manufacture is almost infinite. National has created more rule products than any other rule manufacturer in history. To date, over 25,000 varieties and more are added every week. We can modify an existing design to specifically meet your particular need. This flexibility assures you that we won't ever force your application to fit within our product line, but rather, we will make our product to effectively fit your specific application.



## Testing, Development and Consulting Service

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We view our customers as valued partners and are firmly committed to providing them any technical assistance that may be needed. To do this effectively, we maintain a full service testing facility. This enables us to evaluate a specific rule's performance on various materials customers may send us and to recommend one or more rule and or process solutions to the specific converting problem or need. This free service can often reduce costly trial and error testing. Just send us the material in question and we'll do the rest.

## Our Commitment To You

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All National products come with an unconditional guarantee of satisfaction. We know our reputation is on the line with each and every product we manufacture, which is why all our rules go through rigorous inspection throughout every facet of the manufacturing process to consistently insure optimum quality and performance.



# National Steel Rule

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