



QUALITY SERVICE COMMITMENT

# NCCM Mill Rolls

*Leading Industry in the Right Direction*



**NCCM Mill Rolls, made with 3M material and technology, are the premium choice for roll operations.**

NCCM Mill Rolls have proven their capability of supplying outstanding value by being produced from premium components and having unique NCCM-patented technology that yields performance advantages no other roll coverings can offer.

# NCCM™ Mill Rolls

Made with 3M material, and a unique technology that offers savings and performance advantages.

**NCCM Mill Rolls:**

1. Neutral Mill Roll Premium Performance
2. CX-Series Mill Roll Premium Performance in Chemicals
3. RK Mill Roll Premium Bridle Roll
4. Wiper Bars
5. Mill Wipes

NCCM Mill Rolls are premium roll covering products that optimize countless metal sheet processing applications in primary metals and AOEM (automotive original equipment manufacturer) stamping plants. They also show exceptional value in other industries such as lithography.

NCCM Mill Rolls are designed to replace traditional roll coverings, like rubber, urethane, non-wovens, various fabrics, and carbide coatings. NCCM Mill Rolls have features and properties that no other non-woven rolls offer.

NCCM Mill Rolls are an exceptional roll covering alternative because of the total value they supply. When properly prepared and applied, NCCM Mill Rolls are designed and expected to save the end user considerable costs and worries.

**Why are NCCM Mill Rolls the Premium Choice for Roll Operations?**

NCCM Mill Rolls are produced from 3M material components and contains NCCM patented technology.

A major physical property that makes NCCM Mill Rolls unique among non-woven rolls is that these discs are bonded together to form a single, unified sleeve. Non-woven rolls from other manufacturers are produced from simple discrete discs of web compacted onto the support shaft. In addition, this unified sleeve design makes NCCM Mill Rolls far stronger and more stable compared to their non-woven competitors.

This bonding feature also makes repairing a damaged NCCM Mill Roll relatively simple. Typically only the portion that has been damaged needs replacing, allowing a less costly option to return the roll to service relatively quickly.

**NCCM™ Mill Rolls outperform conventional rubber rolls.**

NCCM MILL ROLLS	RUBBER ROLLS
• Compressible; resist cutting, gouging for more up time	• Non-compressible; susceptible to cuts.
• Porous, open surface for consistent strip contact even when wet.	• Non-porous, closed surface. Can hydroplane when wet.
• Repairable for better return on your investment.	• Non-repairable.
• Self-healing for more up time compared to rubber rolls.	• Cuts propagate.
• High coefficient of friction on many surfaces for better material control.	• Low coefficient of friction on wet/oiled surface conditions.

**NCCM™ Mill Rolls Availability and Characteristics**

PRODUCT	COLOR	pH RANGE	DENSITY					TYPICAL APPLICATIONS
			3	5	7	9	11	
Neutral	Yellow	2-10	X	X	X	X	X	<ul style="list-style-type: none"> <li>• Wringing • Ironing • Oil applicator</li> <li>• Bridle • Tensioning • Steering rolls</li> <li>• Deflector • Snubber • De-oiling • Metering</li> </ul>
Type CX	Mottled brown	0-14		X	X			<ul style="list-style-type: none"> <li>• Wringing applicator for chemtreat solutions</li> <li>• Wringer for chemical solutions</li> </ul>
Type CX Plus	Mottled black	0-14			X			<ul style="list-style-type: none"> <li>• Wringer for chemical solutions/ Higher pressure and temperature capability</li> </ul>
Type RK	Blue	2-10	NA					<ul style="list-style-type: none"> <li>• Bridle • Snubber • Table Rolls</li> </ul>

A variety of sizes are available. Contact your NCCM Mill Products Specialist or authorized NCCM Mill Roll distributor.

# NCCM™ Neutral Mill Roll

The NCCM Neutral Mill Roll is considered the finest, general-purpose non-woven roll covering for primary metal and AOEM stamping operations. NCCM mill rolls are the only rolls in the market place made from 3M's leading non-woven technology.

The Neutral roll is available in five densities (relating to hardness) for a whole array of application requirements.

**Outstanding Characteristics:**

Life, Cut Resistance, Fluid Control, Coefficient of Friction, Strength, self healing.

**They can make a significant contribution to increased productivity in the following ways:**

**More Uptime**

NCCM Mill Rolls can last significantly longer than rubber rolls, so they require changing less frequently, which can result in fewer unplanned stops.

**Increased Line Speeds and Productivity**

Due to higher friction durability and improved line control in certain applications, the NCCM Mill Roll has been able to more than double line speeds.

**Reduced Chemical Cost**

By reducing carry-out and cross-contamination, NCCM Mill Rolls can help reduce your oil or chemical consumption – and cut the cost of waste disposal.

**Reduced Maintenance Cost**

Because they are self-healing and resistant to cuts and gouges, NCCM Mill Rolls require fewer repairs than can

rob you of productivity. When problems do occur, NCCM Mill Rolls are easily repaired, avoiding the cost of roll replacement.

**Improved Process Quality and Control**

The uniform porosity of NCCM Mill Rolls, and their ability to maintain tight contact with the coil, makes thinner, more consistent coatings. And their high coefficient of friction reduces slippage and hydroplaning, for better material control.

**Maintain Integrity of Process Fluids**

The compressibility and porosity of NCCM Mill Rolls allows them to conform to variations in gauge thickness and maintain consistently tight contact across the strip. This not only ensures uniform wringing, but has also demonstrated a significant reduction in carry-out of chemical from tank to tank, and reduced staining.

**Fewer Defects on Coil Surface**

Metal shards and debris can become trapped on the surface of rubber rolls, causing defects on the coil. The porous non-woven material of NCCM Mill Rolls tends to “pull” small particles into itself, where it is less likely to come into contact with the coil.

**Lower Energy Costs**

Because of their high coefficient of friction, the use of NCCM Mill Rolls can often eliminate the need for auxiliary motor – while in most cases allowing faster line speeds and better tracking. And, because they provide through, uniform wringing, NCCM Mill Rolls can reduce or eliminate the need for mechanical drying in many applications.



*Individual discs of non-woven synthetic fiber bonded together with a tough flexible adhesive for a unique combination of characteristics – resiliency, gouge resistance, self-healing, porosity, and absorbency.*

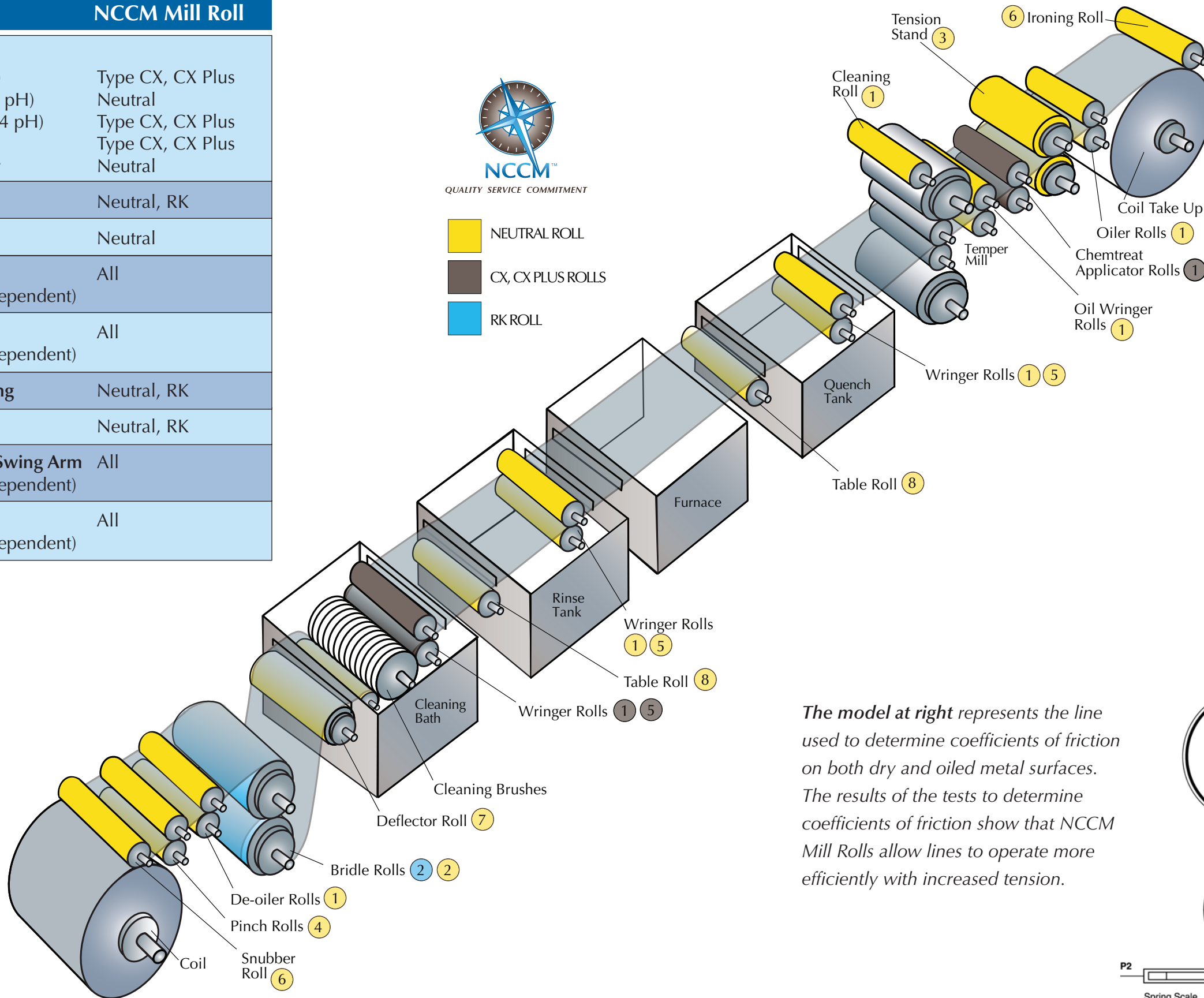
# NCCM™ Mill Rolls

NCCM™ Mill Rolls – proven effective in a wide variety of applications.

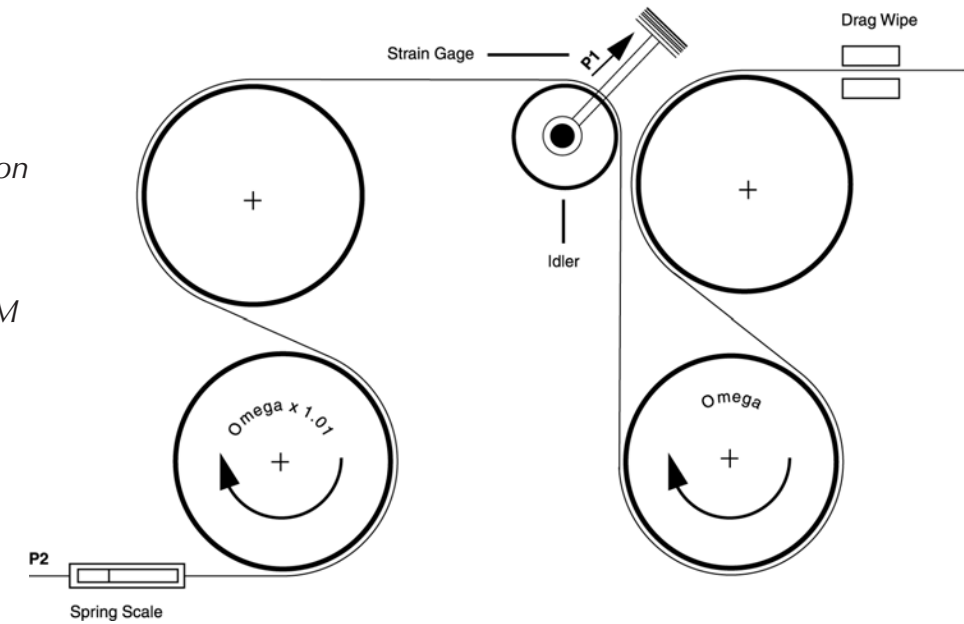
Application	NCCM Mill Roll
<b>1. Wringer</b> • Acid (0-2 pH) • Neutral (2-10 pH) • Caustic (10-14 pH) • Chemtreat • Oiler/de-oiler	Type CX, CX Plus Neutral Type CX, CX Plus Type CX, CX Plus Neutral
<b>2. Bridle</b>	Neutral, RK
<b>3. Tension</b>	Neutral
<b>4. Pinch/Feed</b> (environment dependent)	All
<b>5. Steering</b> (environment dependent)	All
<b>6. Snubber/Ironing</b>	Neutral, RK
<b>7. Deflector</b>	Neutral, RK
<b>8. Table/Carrier/Swing Arm</b> (environment dependent)	All
<b>9. Measuring</b> (environment dependent)	All



- NEUTRAL ROLL
- CX, CX PLUS ROLLS
- RK ROLL



The model at right represents the line used to determine coefficients of friction on both dry and oiled metal surfaces. The results of the tests to determine coefficients of friction show that NCCM Mill Rolls allow lines to operate more efficiently with increased tension.



# NCCM™ Mill Rolls

Higher coefficient of friction for faster line speed and more.

With a higher coefficient of friction than rubber, urethane, or carbide coated rolls, NCCM Mill Rolls can increase tension levels for tighter coils. Compared to rubber, for example, tension can be up to 45 times greater. Tighter coils can provide the following benefits:

- Faster line speed with less slipping
- Fewer defects related to slipping
- Minimized sag
- Better line control
- Straighter edge registry
- Reduced droop and movement in annealing furnaces

When used as tension and bridle rolls, NCCM Mill Rolls provide a coefficient of friction 50 percent higher than rubber or urethane on dry steel, and more than 40 times higher on oiled steel. And you don't need to texture the surface like rubber or urethane to improve friction.

### Coefficient of Friction Comparison

Material Condition	NCCM Mill Rolls	Rubber Rolls
• Dry steel	.52	.36
• Oiled steel	.36	.01
• Dry aluminum	.52	.36
• Oiled aluminum	.23	.01

# NCCM™ RK Mill Roll

Reduces Slipping for Better Line Control

## High Technology Offers Key Advantages Over Conventional Rolls

RK rolls are used in place of rubber, steel, urethane and felt rolls on continuous coil lines and sheet processing lines. In wringer, oiler, tension/bridle and support applications, in test after test, RK rolls consistently last longer and perform better than these conventional rolls.

## RK Rolls Increase Productivity

RK rolls are resilient, gouge-resistant and self-healing — you can expect them to last much longer than rubber rolls reducing down time and maintenance time.

## Higher Coefficient of Friction

RK rolls can generate tension levels from 1.5 to 45 times the tension levels achieved with rubber rolls. Higher tension means tighter coils, minimized sag, improve line control, maintain straighter edge registry and reduce droop and movement in annealing furnaces. Overall, there's less slipping and, therefore, fewer defects on the strip surface.

RK rolls don't require surface dicing or slashing commonly needed with conventional rolls.

## Roll Construction

RK rolls are made of a non-woven nylon fiber material mounted on a shaft. Unlike dense rubber rolls, RK rolls are porous, offering approximately 35% void volume. This void area provides a degree of absorption which aids in squeegee, tension and oiler functions. Additionally, the nylon construction reduces noise and marking when used in place of steel rolls.

RK rolls have a durometer of 80 - 90 shore A.



## NCCM RK Rolls Outperform

### RK Rolls

- Somewhat compressible; resist gouging, cutting
- Self-healing
- High coefficient of friction on many surfaces
- Stay in contact with metal when wet

### Rubber Rolls

- Non-compressible; susceptible to cuts
- Not self-healing
- Low coefficient of friction on wet/oiled surface conditions
- Hydroplane when wet

# Compressible NCCM™ Mill Rolls

Tight contact for consistent wringing, oiling, and de-oiling.

## Wringing

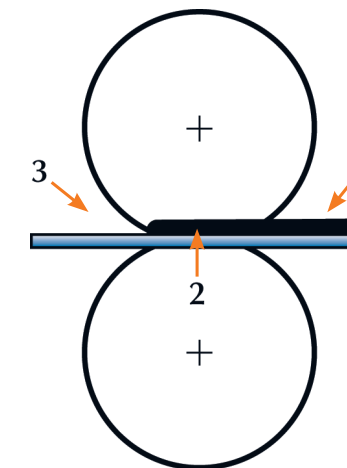
NCCM Mill Rolls are slightly compressible with a porous open surface. With the compressible, sponge-like characteristic, the rolls conform to the smallest variations in gauge thickness to maintain consistent tight contact across the strip. This tight contact helps assure exceptionally uniform wringing. Strips emerge drier from the rinse tank, and in some cases, users have found up to a 50 percent reduction in solution "carry through" compared with conventional rubber rolls. And the porous surface absorbs fluid to greatly reduce the chance of hydroplaning which can cause slippage.

## Oiling and de-oiling

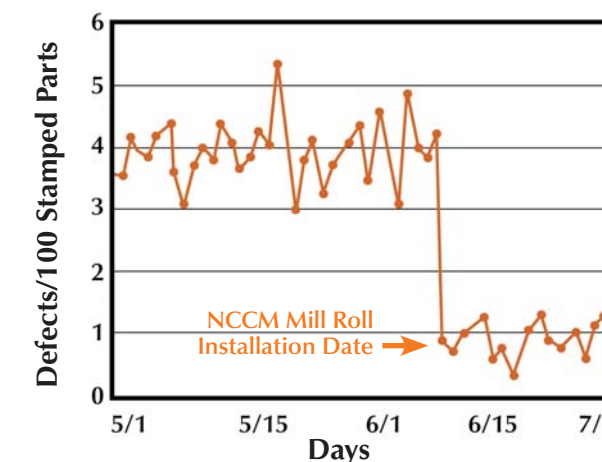
With tight contact, NCCM Mill Rolls meter and apply lubricants consistently and uniformly. And operators can remove excess protectant oils on incoming metal strip. This "de-oiling" helps reduce costs and improve capabilities in the caustic cleaner. For more information on oiling and de-oiling, please refer to the relevant NCCM application notes.

## Defects reduced

The results of NCCM Mill Rolls replacing rubber rolls in an automotive stamping operation are shown below. With the more effective wringing action of the NCCM rolls, defects were reduced from four per hundred stampings to approximately one per hundred.



1. Porous roll absorbs solution to relieve hydraulic pressure while maintaining tight contact with the metal strip.
2. Roll is compressed to near zero at the nip center, creating a seal which is restored with each revolution of the roll.
3. The porous surface reopens as compression decreases. The sponge-like action removes residual liquid from the strip.



# NCCM™ Mill Roll – CX Series For Aggressive Chemical Environments

NCCM Mill Rolls CX and CX-Plus are specially engineered to perform in aggressive chemical environments, such as electrolytic lines for tinning, chroming or galvanizing; or on pickling, caustic cleaning or coil coating lines.



## NCCM Mill Rolls CX Series

### Recommended Applications

- Wringer rolls in acidic & caustic environments
- Hold-down rolls
- Deflector rolls
- Steering rolls
- Pinch/feed rolls
- Submerger rolls

### Recommended Production Lines

- Electro plating lines
- Pickling lines
- Color coating lines
- Caustic washers

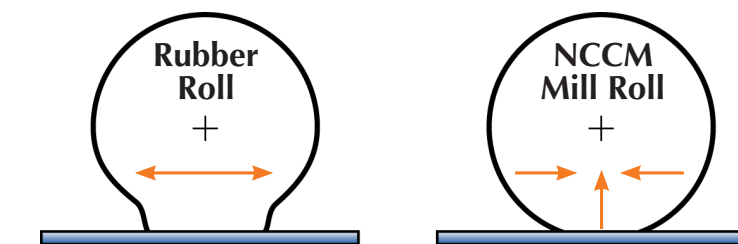
# Higher performance under pressure.

## NCCM Mill Rolls and conventional rubber rolls react differently at the same pressure levels.

Rubber rolls are essentially non-compressible, so the rubber bulges out on each side of the nip — as shown at right. This outward pressure causes tensile stresses that can enlarge cuts and gouges caused by metal slivers, strip splices, and production debris. After metal slivers stick into a rubber roll, the slivers will scratch the continuous metal strip causing surface defects. Splices and production debris can easily cut or gouge rubber rolls, resulting in increased "carry out" in wringing operations. Baths and rinses become contaminated as a result of this "carry out".

NCCM Mill Rolls with their void volume and non-woven porosity are slightly compressible. Under pressure, the roll increases in density at the nip. And as density increases, the material compresses inwardly, causing the roll to re-

sist cuts and gouges. This compressive stress allows cuts to heal themselves as the compressive forces push the sides of the cut closed. This means that NCCM rolls are less prone to damage, which keeps production lines moving, defects low, and productivity high.





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For more information,  
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