

## Steel strap packaging

### Coil winding

Signode strapping is produced in two basic coil windings:

### Mill wound

The strapping is oscillated uniformly and tightly across the 2-1/2" (63.5mm) width of the coil.

### Ribbon wound

Each layer is wound directly over the one below it so that the width of the strapping is the width of the coil.

Mill wound



Ribbon wound

### Coil sizes

**Inside diameter:** 16" (406.4mm)

**Outside diameter:** Mill wound coils measure 23" (584.2mm). Ribbon wound coils vary from 23-1/2" to 27" (596.9mm to 685.8mm) depending on strap size.

## Standard multi-coil skids

Twelve mill wound coils make up a standard skid. The number of ribbon wound coils will vary with strapping width.



Ribbon wound skid

Mill wound skid



### Anchor strapping

The standard or stocked version of punched strapping comes in two sizes:

3/4" x 0.017" (19.0 x 0.43mm)  
Apex Plus with in-line 0.145" (3.5mm) holes on 3/4" (19.0mm) centers and a strap strength of 1,255 lbs. (5 583 N).

1-1/4" x 0.029" (31.8 x 0.74mm)  
Magnus with staggered 0.240" (6.1mm) holes on 1-1/2" (38.1 mm) centers and a strap strength of 4,020 lbs. (17 881 N).

## Standard strap finishes

Signode produces three different steel strapping finishes. Each is tailored to the requirements of particular tensioning methods, sealing devices and packaging applications.

### Painted

Painted strapping is coated to offer corrosion resistance. Available in a wide range of Magnus strapping sizes, it is used in crimp-type seal systems to produce high joint strength.

### Painted and waxed

Painted and waxed strapping also provides corrosion resistance. Available in all Apex Plus and Magnus strap sizes, it can be used in notch or crimp-type seal systems. Its primary advantage is improved tension transmission around load corners.

Waxed strapping is required for feedwheel-type tensioners.

### Zinc painted and waxed

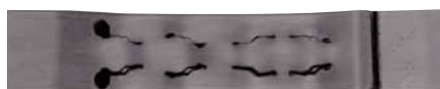
Zinc finish strapping is waxed and has a zinc enriched coating to provide outstanding resistance to rust. Available in a variety of Apex Plus and Magnus sizes, it has the same improved tension transmission characteristics as the painted and waxed strapping. Zinc finish protects where it is needed most—at points of surface damage and scratches.

## Sealless joint types

Sealless joints can be made with Signode manual or pneumatic combination tools. Using interlocking keys, the sealless joints provide static joint strength equal to that of notch-type joints. The reverse lock sealless joint features one reversed interlocking key for added security in impact conditions.



Three key sealless joint



Four key, reverse lock, sealless joint

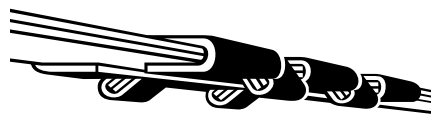
## Basic seal joint types

### Notch joint

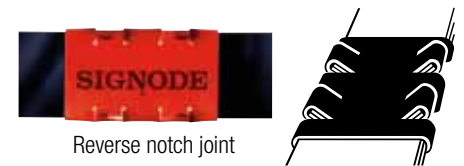
One way to lock strap ends is to cut, or "notch" the seal and the strapping it joins to form tabs at the edges. These tabs are bent down (down notch joint) or bent up (reverse notch joint). The strength of the notch joint comes from the mechanical interlock between the seal and strapping. Notch joints are typically used on waxed strapping in packaging and unitizing applications.



Down notch joint



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Reverse notch joint

### Crimp joint

Another way to seal the ends of strapping is to press or "crimp" undulations into the seal and strapping ends. The strength of the crimp joint comes from the deformed seal creating high frictional forces. Crimp joints produce high static and dynamic joint strengths and are used on applications like carloading in which the strapped load is subject to severe impact.



Crimp joint



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# Steel Strapping

## For uncompromising quality and packaging effectiveness

Consistent high quality makes Signode steel strapping the first choice among packaging professionals worldwide. Purchasing professionals also prefer Signode strapping because it's made to the most exacting tolerances, so it goes further and stretches their strapping dollars.

## Types, sizes and finishes for all demanding applications

Signode offers two basic types of steel strapping: Apex, Apex Plus and Magnus. Each is specially formulated to meet the demands of a particular range of applications. And for each strapping type, there is a selection of sizes and finishes which matches the specific requirements of those applications.

### Apex™ and Apex Plus™ strapping

A cold-rolled, low carbon steel strapping. Manufactured with superior edge conditioning and coating.

### Magnus® strapping

A cold-rolled, medium carbon steel strapping. Heat-treated with a Signode process that combines fine surface and controlled physical properties with high strength and excellent shock resistance.

### Steel strapping

The particular type of strapping best suited to a specific application generally depends on three factors: 1) the strapping's function or purpose, 2) the package characteristics and 3) shipping or handling considerations.

In a specific application, strapping may perform one or more of the following functions: package reinforcement, carton closure, securement, unitization, baling, bundling, bracing, palletization, compression retention and pilferage reduction.

Package characteristics that influence strap selection are: weight, stability, rigidity, integrity and sharpness of the edges (sharp edges may demand heavier strapping or corner protection).

Shipping considerations that affect the choice of strapping include: how far the package is shipped; how it's handled by both the shipper and receiver; and where and how it's stored.

Together, these various factors tend to narrow the choice to a particular set of strap characteristics. In simple applications, the choice may be obvious. In more complex applications,

### Apex™ strapping

Strap Size				Part Number	Average Strength*		Yield		Coil Winding	Coils Per Pallet	Coil Weight lbs	Strap Finish
Width		Thickness			lbs	N	ft/lb	M/kg				
inch	mm	inch	mm									
1/2	12.7	.015	0.38	085007	870	3 870	39.3	26.4	Mill	12	105	Painted & Waxed
1/2	12.7	.020	0.51	085009	1,170	5 200	29.4	19.8	Mill	12	105	Painted & Waxed
1/2	12.7	.023	0.58	085200	1,300	5 780	25.6	17.2	Mill	12	105	Painted & Waxed
5/8	15.9	.020	0.51	085203	1,460	6 490	23.6	15.9	Mill	12	105	Painted & Waxed
5/8	15.9	.023	0.58	085204	1,670	7 430	20.5	13.8	Mill	12	105	Painted & Waxed
3/4	19.0	.020	0.51	085206	1,750	7 780	19.6	13.2	Mill	12	105	Painted & Waxed
3/4	19.0	.023	0.58	085207	1,950	8 670	17.1	11.5	Mill	12	105	Painted & Waxed

### Apex Plus™ strapping

Strap Size				Part Number	Average Strength*		Yield		Coil Winding	Coils Per Pallet	Coil Weight lbs	Strap Finish
Width		Thickness			lbs	N	ft/lb	M/kg				
inch	mm	inch	mm									
3/8	9.5	.017	0.43	2X1502	975	4 340	46.1	31.0	Mill	12	105	Painted & Waxed
1/2	12.7	.017*	0.43	2X1504	1,275	5 670	34.6	23.3	Mill	12	105	Painted & Waxed
1/2	12.7	.020	0.51	2X1270	1,475	6 560	29.4	19.7	Mill	12	105	Painted & Waxed
1/2	12.7	.020	0.51	2X1174	1,475	6 560	29.4	19.7	Mill	12	105	Zinc
5/8	15.9	.017*	0.43	2X1505	1,625	7 230	27.7	18.6	Mill	12	105	Painted & Waxed
5/8	15.9	.020	0.51	2X1253	1,825	8 120	23.6	15.8	Mill	12	105	Painted & Waxed
3/4	19.0	.017*	0.43	2X1506	1,900	8 450	23.1	15.5	Mill	12	105	Painted & Waxed
3/4	19.0	.020	0.51	2X1509	2,150	9 560	19.6	13.1	Mill	12	105	Painted & Waxed
3/4	19.0	.023	0.58	2X1551	2,500	11,120	17.1	11.5	Mill	12	105	Painted & Waxed

### Magnus® strapping

Strap Size				Part Number	Average Strength*		Yield		Coil Winding	Coils Per Pallet	Coil Weight lbs	Strap Finish
Width		Thickness			lbs	N	ft/lb	M/kg				
inch	mm	inch	mm									
1/2	12.7	.020	0.51	085604	1,525	6 780	29.4	19.7	Mill	12	105	Painted & Waxed
		.020	0.51	075955	1,525	6 780	29.4	19.7	Mill	12	105	Zinc
5/8	15.9	.020*	0.51	085644	1,900	8 450	23.6	15.8	Mill	12	105	Painted & Waxed
		.020*	0.51	076061	1,900	8 450	23.6	15.8	Mill	12	105	Zinc
		.023	0.58	088432	2,175	9 670	20.5	13.7	Mill	12	105	Painted & Waxed
3/4	19.0	.020	0.51	089397	2,250	10 010	19.6	13.1	Mill	12	105	Painted & Waxed
		.023	0.58	089370	2,600	11 560	17.1	11.5	Mill	12	105	Painted & Waxed
		.025*	0.64	085684	2,800	12 450	15.7	10.5	Mill	12	105	Painted & Waxed
		.025*	0.64	085680	2,800	12 450	15.7	10.5	Ribbon	32	75	Painted & Waxed
		.025	0.64	076310	2,800	12 450	15.7	10.5	Mill	12	105	Zinc
		.029	0.74	2X1424	3,400	15 125	13.5	9.1	Mill	12	105	Painted & Waxed
		.029	0.74	2X1295	3,400	15 125	13.5	9.1	Ribbon	32	75	Painted & Waxed
1-1/4	31.8	.025	0.64	089367	4,650	20 680	9.4	6.3	Ribbon	20	105	Painted & Waxed
		.029	0.74	2X1268	5,400	24 020	8.1	5.5	Ribbon	20	105	Painted & Waxed
		.029	0.74	2X1296	5,400	24 020	8.1	5.5	Ribbon	20	105	Zinc
		.044	1.12	2X1438	7,900	35 140	5.3	3.5	Ribbon	20	105	Painted & Waxed
2	50.8	.044	1.12	2X1439	12,500	55 600	3.3	2.2	Ribbon	15	120	Painted & Waxed

### Anchor strapping — Apex Plus

3/4	19.0	.017*	0.43	2X1518	1,255	5 583	20.1	13.6	Mill	12	105	Painted & Waxed
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### Anchor strapping — Magnus

1-1/4	31.8	.029	0.74	072823	4,020	19 130	7.6	3.4	Ribbon	20	110	Painted & Waxed
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\* 300 ft. demonstration coils are available for these sizes.

\* Strap break strengths are listed as averages. Always use American Society for Testing Materials (ASTM D-3950) minimum break strengths for package design/safety factor purposes. For proper strap selection, contact your Signode sales representative.

your sales representative can help you determine your strapping requirements,

such as width, thickness, finish, type of steel and tensile strength.