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& Coil Handling

The Compact Coil System: Less is More on the Shop Floor



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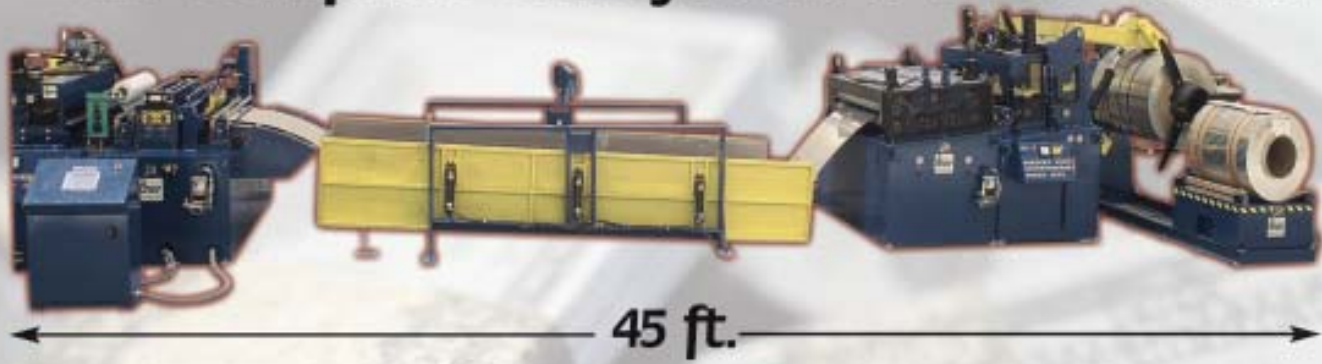
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When Floor Space = Money The Compact Coil System is the Solution



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Compact Coil Lines or Space Saver Systems have been very popular in Europe for many years. Until recently the implementation of Compact Coil lines by American Companies has been somewhat limited. However, the latest concept sweeping the US press feed market segment is the "Compact System" approach to processing material. Everyone today is focused on the high value of press room real estate. The demand for shorter changeover times, limited production runs, along with the requirement to add additional production to existing plant layouts, has also led to the increased popularity of the Space Saving Compact Coil Line.

The Compact Coil Line Principle

The Compact Coil Line principle revolves around combining the three functions of coil payout, flattening and feeding of the material. This is typically achieved utilizing several configurations, a straightener/feeder unit along with a motorized uncoiler; a straightener/feeder unit along with a powered coil cradle; or a servo feed/pull through straightener and motorized uncoiler.

The key to a successful compact system approach is an understanding of what the application requires. Key factors which need to be addressed are:

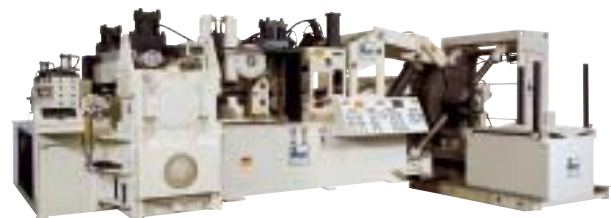
- Will the system be running piloted tools?**
- Are there any surface critical material applications?**
- What are the minimum and maximum feed lengths?**
- Are there a lot of partial coil operations?**
- Does system require top and bottom payoff capability?**
- What level of automation is desired?**

All of these application requirements need to be considered for the equipment supplier to manufacture a compact system that the end user will be satisfied with and will more importantly allow them to process the jobs in which they purchased the equipment for in the first place.

The following are examples of compact systems based on individual customer requirements to save floor space.

Thick High Strength Steel (HSS) Application:

One of the first companies to recognize the advantages of the Compact Coil Line was Raybestos Power Train, located in Sullivan, Indiana. Raybestos manufactures clutches and brake disks for most types of vehicles, including the off road super trucks. The critical requirement in the processing of material for Raybestos was equipment that provided ultimate versatility in a limited floor space.



60" x .500" x 40,000 lb. space saving system

The press feed system needed the capacity to handle materials from .048” through .250” thickness up to 60” wide, with the ability to process .500” thick material up to a width of 30”. A key consideration in the selection of equipment was the wide variety of coils with yield strengths ranging from a low of 60,000 psi to a high of 120,000 psi.

Flat material free from scratches or markings, needed to be fed into a compound die to manufacture their parts. The solution was a Compact CWP Space Saving Coil Line manufactured by Formtek Maine.

To eliminate the potential of material wraps sliding on each other, a synchronized dual axis control platform was utilized. During the acceleration portion of the feed progression, the uncoiler is powered as a follower to the straightener/feeder. As the straightener/feeder unit starts to decelerate into position, the second axis follower transforms into a constant tension back drive. To efficiently process the wide variety of materials, at the tensions required for those materials, the material thickness and width is programmed into the control. This allows the uncoiling to be synchronized to the feeding. A sensor determines the O.D. of the coil. Utilizing this data along with the position information from the straightener/feeder controller, the coil mass, acceleration required and ideal back tension during deceleration are automatically calculated and implemented for a smooth efficient operation.

Conversion From Plain Steel To High Strength Steel (HSS)

As automotive companies strive to lower material part weight without reducing the load carrying capacity of the parts, HSS is being required on a larger number of items.

One supplier of roll formed parts was faced with the loss of work unless he could convert his processing to handle HSS steel. “My existing coil handling equipment could not safely handle the new HSS materials and I didn’t have the room to put in a conventional Coil Line.”

“I needed a compact Coil Line and I needed it quickly.” The answer was a Rowe Space Manager Compact Coil Line, manufactured by Formtek Maine.

To fit in the available space and meet coil reel requirements, the coil reel is loaded from the backside of the line.



Some suppliers import their compact coil lines, so waiting for a system to be custom built and delivered from overseas was not an option. “Rowe Engineering converted their standard Space Manager to meet



my floor space requirements and shipped the system in less than four weeks”, the customer stated.

Progressive Die Application

When National Industrial Concepts (NIC) was considering adding coil handling equipment and a new E2-200-96 Minster Press within their facility, several factors played an important roll in their decision. They required the ability to payoff the top and the bottom of the coil, the ability to process material with progressive dies, and they wanted thread-up assistance with an automated control platform. Another request was to purchase equipment, which was manufactured in the USA, with local support and service.

CWP supplied a compact coil system with a motorized reel, that utilized a dual operation mode to allow the coils to payoff the top or the bottom. The coil car is supplied with power thread-up assist rolls to be utilized when threading up material which will pay off the bottom. This feature allows the lead edge of the strip to be forced straight up into the guide chute on the entry end of the straightener/feeder for hands free thread-up. The straightener/feeder unit is also supplied with pneumatic roll release to allow the upper feed and straightening rolls to open and allow the pilots to register the material into position.



CWP Compact Coil System features ability to payoff the top or bottom of the coil

All of these features combined provided a compact press feed system which was easy to thread-up and operate.

NIC provides sheet metal fabrication, assemblies and global sourcing services to customers who have low to mid volume production requirements. NIC customers receive short lead time deliveries at prices that compete worldwide. “The addition of the E2-200 Minster Press with the CWP compact coil line expands the range of products we are able to provide to our diversified customer base” states Paul Vaughn, Vice President of NIC.

Cut to Length Application:

Blount Canada LTD, a division of Oregon Cutting Systems, located in Guelph Ontario approached Formtek Maine with the requirement to process high yield, heavy material in a very limited floor space arrangement.

They had purchased three ROWE compact units years earlier and wanted a new version of compact system that would allow for easier coil loading capabilities. The system would have to

be installed in a section of their facility which only had an overhead crane capable of picking the coils 35" off the ground to be loaded into the CTL systems. The system needed to be interfaced with their download communication requirements as well.



One of the three Compact Coil Systems previously purchased by Blount

The new system, which was required to handle 40" x .437" x 30,000lbs with a material yield of 60,000psi, was built with a coil cradle entry section designed to payoff the bottom of the coil in place of the older ROWE units which paid material off the top through an overhead loop chute arrangement. This new design allows for a back load of the coils directly into the cradle section of the system. A heavy duty hydraulic debender unit accepts the lead edge of the coil and breaks it for easy thread-up into the straightener/feeder unit.



Compact Coil System allows for back load of coils directly into the cradle section

The straightener/feeder unit is set up with ethernet communication to allow the system to accept a remote feed length down load. Upon the receipt of the feed length the system powers up and processes the desired length. Once the hydraulic bow tie shear strokes to cut the part off, it feeds onto a part staging table and awaits pick-up by a remote controlled staging car. The car takes the blank and delivers it to a laser cutting machine in an Amada system for cutting of chain saw bars.

Partial Coil Operation:

When approached to supply a compact system to handle 24" x .250" x 10,000lbs in an environment which would be processing partial coils CWP supplied a compact system to satisfy the customer requirements. The CWP system utilized a motorized uncoiler with photo eye loop control to allow the slack material to develop directly below the uncoiler spindle. Both primary and secondary hold down arms were provided with powered rider rolls for thread-up and to allow for rewinding the slack material during partial coil operation.



24" x .250" x 10,000 lb. Compact Coil System with touch screen interface

A touch screen interface allowed for all of the system programming, thread-up manual, maintenance manual and complete system diagnostics.

Economical Blanking System:

When a customer requested CWP to supply a complete feed system to blank material which was 9" wide x .250" thick and fit the entire system into 13' of floor space, CWP supplied a compact system to meet the requirements.

A 12" straightener/feeder unit with 2.75" diameter rolls was supplied to process the required feed lengths. A complete threader peeler system with hold down arm, powered rider roll, breaker bar, peeler table and peeler blade allow for thread-up of the system. The stock reel features manual expansion and photo eyes to control the slack material under the spindle of the uncoiler.



The most economical compact system is the servo feed with pull through straightener and motorized uncoiler configuration. This system allows slack material to be gathered directly under the uncoiler spindle with the use of a loop control device. The pull through straightener is adjusted based on the material thickness to remove the coil set prior to the material reaching the servo roll feed. The servo feed unit is programmed for the required feed length and speed settings for the job being processed.

This type of compact system does not allow the straightener rolls to be opened during operation so it is designed for applications which do not require pilot release to register the material into position.

CoilMate/Dickerman System

Coilmate/Dickerman a division of Formtek Maine was asked to provide an affordable compact system for a straight blanking application without any pilot registration and fit it within 13' of floor space. A 6,000 lb. motorized uncoiler with a proximity loop control was supplied along with a SMX18 and a SM-5 pull through straightener to meet the customers application requirements and budget constraints.



As a further example of how popular the compact system has become, Formtek Maine is currently manufacturing four complete compact systems for different customers:

ITW Drawform of Zeeland, MI required a system to process 12" x .156" material and had 13' of floor space available for the complete system installation. CWP is supplying a SMXSE12 CSF combination straightener/feeder unit with pilot release head design, handwheel adjustable edge guides, peeler table, peeler blade, matte chrome feed rolls and a transformer for 480 volt operation. A 4RM-18 motorized stock reel is being supplied with 8,000lb coil capacity, 13"-21" expansion range, hold down arm, powered rider roll, 72" O.D. capacity and paddle loop control.

ITW will use this system to process tightly toleranced deep drawn metal stampings for customers located around the world. They supply automotive, door lock hardware, plumbing, communication and fire protection industries all from their state of the art 200,000 ft² Zeeland, MI facility.

Titan Wheel Rolling Along with Compact System

Titan Wheel International, located in Quincy, IL, has over 100 years in the off-highway wheel manufacturing business. They supply four major product groups: Agricultural Equipment, Consumer Products, Earth Moving/Construction Equipment and Military Components. Titan Wheel requested a system to process 18" x .250" material with the ability for easy access to clean the rolls and easy access to change pass line height between jobs. CWP is supplying a SMX SFAC 9-20 straightener/feeder unit with powered passline adjustment with clamp to press feature, handwheel adjustable edge guides (entry & exit), matte chrome feed rolls, smooth chrome straightening rolls, powered high lift head design, peeler table, peeler blade and a transformer for 480 volt operation. A 5RM-24 motorized stock reel is being supplied with 15,000lb coil capacity, heavy duty brake, positioning scale, 72" O.D. capacity, hydraulic expansion, hold down arm, powered rider roll, secondary hold down arm, electric eye loop control and a 15,000lb coil loading car.

Compact System on the Beam

Steel of West Virginia located in Huntington, WV required a compact system to process 8" x .179" x 8,000lb material with yield strengths up to 70,000psi. They wanted the ability to process partial coils within a limited the amount of floor space. CWP is supplying an SMX12HDCSF combination straightener/feeder with adjustable height cabinet, automatic lubrication, dial indicators, peeler table, peeler blade and tie brackets between straightener/feeder and the uncoiler. A 4RDM-18 motorized double reel is being supplied with 8,000lb capacity per spindle, 72" O.D. capacity, hydraulic expansion, powered indexing, hold down arms, powered rider rolls, fail safe brakes and coil arm spacers. The use of the double reel will allow for reduced coil change over time when processing partial coils. While the run spindle is processing material the load spindle can have the next coil loaded and secured in position with the hold down arm so the retaining bands on the coil can be cut. Once the run coil has completed its process the hold down arm is lowered and the material is backed up to the hold down wheel. The reel is then power indexed to bring the staged coil into position and the system is threaded-up and ready to go into automatic mode again.

Steel of West Virginia will use the system to produce end plates that are welded onto the ends of I-beams. These I-beams are then used as cross members, or floor supports, in truck trailer vans and truck bodies.

Compact System for Outdoor Products Manufacturer

A leading Outdoor Products manufacturer in GA has another compact system on order to process 24" x .156" x 10,000lb material. CWP is supplying an SMX24DSF11 straightener/feeder unit with powered height and clamp feature, high speed pneumatics, automatic lubrication, entry and exit handwheel adjustable edge guides, 12 digit alpha numeric display and a powered telescoping stock support assembly. A C10024 coil cradle is being supplied with overhead loop chute, pivot guide chute and front load design.



Twelve similar CWP systems are installed in this facility. The equipment will be utilized to produce outdoor products such as lawn mowers and snow blowers.

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