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MANUFACTURING SOLUTION FROM COIL STOCK

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BLM GROUP

COIL STOCK

Manufacturing solution from

Processing from coil brings many benefits: Reduces the cost of purchasing raw material, reduces spaces required for storage, reduces amount of material waste, eliminates separate operations and eliminates work in process inventory.

Copper coils are commonly used in automotive and residential air conditioners. Our coiled tube processing solution provides an automated system that feeds from a coil, straightens, end forms (up to 6 stations), orients, bends, and unloads in a controlled manner.

These systems are characterized by high flexibility:

- select from among the various processing steps mentioned above, the user can add or remove operations at will.
- machine configuration: select the machine best suited for performing each operation.



1. Power feed coil reel



2. Tube straightening



3. Cutting can be performed by 3 different methods: orbital groove then fracture, orbital cut off (cleaner), or saw blade (faster)



4. End Forming



5. There are multiple types of bending available. Compression bending (extremely fast), to make 'elbows' and 'S' and bends near end forms. Draw bending - left or right or variable radius ends. And now including mandrel bending

4-RUNNER

From coil without mandrel



4-RUNNER is a BLM solution for processes that start from coil, straightens, end forms, and performs non-mandrel bends.

4-RUNNER, besides cutting and forming operations, bending can be done with fixed or variable radius in or out of plane depending on the design requirements. The capability of combining both draw bending and compression bending technologies on multiple radii guarantees maximum flexibility and efficiency.



3-RUNNER

From coil with mandrel



3 RUNNER and **SMART** are BLM solutions for a process that begins from the coil and requires mandrel bending. They are mainly used in the vehicle heating and air conditioning applications, where bending requirements (average radius, tube diameter and wall thickness) are more stringent and high cosmetics are required.

Thanks to the optimization of material utilization and the simultaneous sequence of operations this system provides a complete, cost effective, and high throughput solution.



4-RUNNER

From coil without mandrel

4-RUNNER is a complete production process that begins from coil with straightening, end forming (up to 6 processing stages), positioning, rolling, bending, cutting, and controlled unloading of the finished part. An unquestioned benefit of this combined processing center is that it can be configured to operate with various modules; for performing just basic processing operations instead of the complete production process from straightening to unloading of the “cut - bent - formed” part.

BENEFITS
Maximum output with just-in-time operation
Minimization of the amount of waste material when working from the reel



Feeding from motorized reel de-coiler.
The tube is straightened by a set of driven rollers.

With the **4-RUNNER** in a single automated sequence you can bend a tube both right hand and left hand, in either fixed or variable radius bends, in plane or any at 3D angle. The possibility of combining different bending technologies such as compression bending and draw bending with different bending radii on the same part offers maximum flexibility, productivity and accuracy.

Different cutting devices can be used depending upon the component requirements: internal orbital cutter, external orbital cutter, or sawblade.

The multi-station end-forming unit can be configured with four or six ram forming stations or four ram forming stations and one rotary station.

The CNC controlled, integrated unloading device automatically unloads the finished components in a neat and controlled manner.

3-RUNNER & SMART

From coil with mandrel

3-RUNNER is a machine that straightens, cuts, shapes and unloads.
SMART is a tube bender with an integrated loading feeder.
Both CNC machines are controlled from one central control point.
This eliminates the need to make corrections on two separate machines.

The bending head then performs part unloading.

SMART is an all-electric tube bender with visual 3D graphics software (VGP3D), capable of bending left and right hand bends, with multiple radii or variable radius, and with a mandrel.

The automatic unloading device, integrated with the machine's cycle, is numerically controlled which makes it possible to unload a single tube into the tube bender.



BENEFITS

- High throughput for operating in a just-in-time system
- Minimal waste material when working from the reel

The coil is fed by a driven power reel. The tube is straightened with multiple roller wheels.

Cut off is performed by various available cutting tools depending on the application: internal or external orbital cutting or blade cutting.

The end forming module can be configured with 4 or 6 ram forming stages or with 4 ram stages and 1 rotating stage.

3-RUNNER

3 operations
on 1 machine



3-RUNNER is a complete processing center that begins from coil, straightens, cuts and bends in a fully automatic cycle, with discharge of the finished part, ready for assembly and/or further processing. Of course, control of the integrated bending operations makes it possible to save cycle time, by eliminating loading and unloading operations, which also improves the quality and repeatability of bending operations.

It is particularly suited for those who process tube for the vehicle or residential HVAC industries.



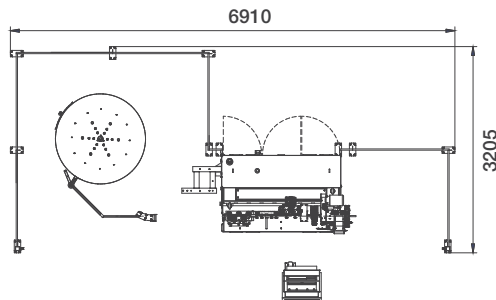
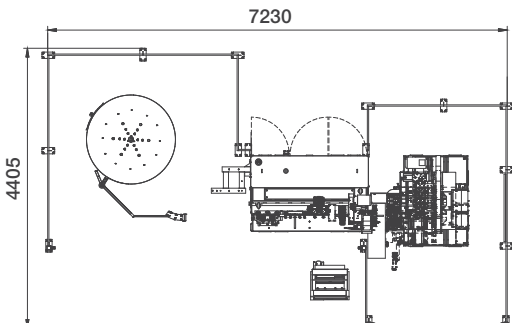
3-RUNNER

Technical specifications

Bending capacity for round tubes	Al: 25.4 x 1.5 mm - Cu: 25.4 x 1.5 mm Steel (R= 37 Kg/mm²): 14 x 1 mm - Stainless: 12 x 1 mm
Controlled axes	nr. 3+4+1
X axis accuracy	± 0,05 mm
Max bore through tube guides	26 mm
Max. installed power	12 kW (16 kW with accessories)
Average power consumption	4 kW
Noise level	65 dB(A)
Machine weight without end-forming module	1.250 kg
End forming module weight	1.500 kg
Machine dimensions without end forming module	3430 x 1270 x 1900 mm (135" x 70" x 75") (without the safty/control zone)
End forming module dimensions	1550 x 1450 x 1400 mm (62" x 48" x 56")



Numerical control: SIEMENS SIMOTION for control of continuous motion interpolation. **Operator's interface:** programming of forming and bending cycle parameters. Industrial IPC427D PC with INTEL CORE I7--3517UE processor, 4GB RAM, 80 GB permanent hard disk for saving programs and tools. 7 ULTIMATE operating system. **Connections:** 2xEthernet, 4xUSB 3.0, 1xRS232, Siemens IFP 1900 operator's panel, Touch screen (color 19" monitor 16/9 LED display). SIEMENS MCP483 panel with buttons. Serial tele-service (requires Internet connection of machine). **Digital inputs:** SIEMENS SINAMICS with DRIVE-CLIQ digital interface integrated with all components of the system, including motors and relays. Brushless electrical motors with position feedback by means of absolute inverters. **Options:** ink marking system, 4R-MEASURE measuring system for verification in the process of the maximum size of the forming folder.



☞ Features, weights, dimensions, capacities and specifications of the machines are non binding and may be subject to change without notice. Pictures are for demonstration purpose only.

ENDFORMING

tube bending
lasertube cutting system
sawing, deburring and washing
cutting and end machining
combination sheet and tube laser cutting
handling
manufacturing cell
process control software



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