

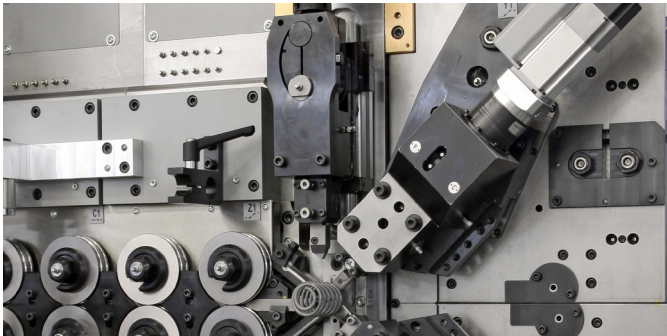
## CNC Spring Coiling Machines with Multi-Cut System, 3D Former and PTP Coiling Finger for the Production of Compression, Torsion and Extension Springs



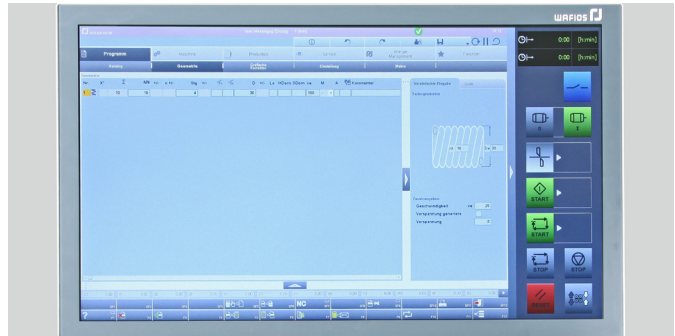
FUL 26+  
FUL 36+  
FUL 46–86

FUL 26+  
FUL 36+  
FUL 46–86

▼ PTP Coiling finger for initial tension control at the spring body



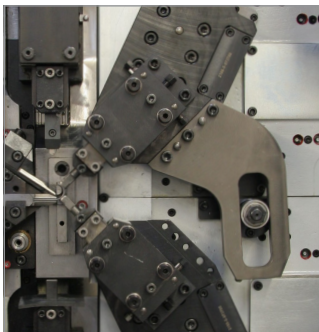
▼ WAFIOS Programming System WPS 3.2 EasyWay



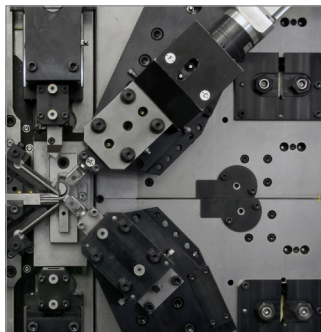
## Our Accomplishments for your Benefit

- **High output, high flexibility**
  - Configuration of machine ensures a fast production of springs due to a high infeed speed, excellent axis acceleration values and very short cutting times
  - Different types of cuts are available
  - Versatile equipment options
- **Future-oriented machine concept**
  - Latest drive and control technology
  - Modular machine structure and innovative tool solutions
- **Convenient programming system WPS 3.2 EasyWay increases machine availability**
  - Programming of geometries for simplified spring input
  - Manual settings can be saved with the spring program
- **High quality standards ensure zero-defect production**
  - Optical measuring of product with subsequent adjustment
  - Sorting by fast sorting chutes
  - *iQcontrol* function for in-process measurement and control
  - Further process monitoring features like e.g. slip control and color detection

▼ 2-Axes coiling device



▼ 4-Axes coiling device



## Design Features

### Machine structure

- High-precision roller feed
- Programmable vertical mandrel slide adjustment
- Programmable pitch, parallel and vertical to the spring axis
- Multi-cut system for straight/rotary and flying cut
- Individually programmable cutting speed
- Rigid spring-shaping device with 2-axes coiling unit and simple mechanical system for quick changeover from right- to left-hand coiled springs
- Two more CNC axes for convenient and simple changeover from right- to left-hand coiling at the push of a button
- Motor-adjustable coiling pin holder (PTP coiling finger) for the upper and lower slider
- Motor-adjustable torsion spring device (3D Former) for manufacturing torsion springs with tangentially bent spring legs (option for FUL 26+ - 86)
- Optimized cut now also available when using the guide plate and color detection
- Freely programmable cutting ellipse (Mult-E cut, option for FUL 36+, 46 and 56) for implementing different cutting angles, also: rotary cut even for small spring indexes

### Programming

- Simple, program-supported configuration of tools
- Convenient operation via touchscreen
- Sensors available for unmanned process monitoring
- Graphical spring correction

### 4speed – max. output rate for FUL 26+ and 36+

- Highest feed speed up to 600 m/min due to water-cooled drive technology
- Optimum wire feed towards connected machine due to enhanced wire guiding concept

# Universal, Powerful and Profitable – WAFIOS CNC Spring Coiling Machines

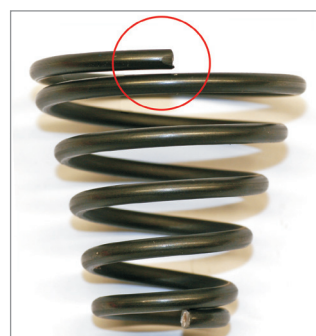
## New Definition of Productivity

Designed for the production of precise, close-tolerance compression and extension spring bodies with high output due to pioneering design features.

Fast, easy cut type changes using the new multi-cut system give users more flexibility and operating convenience.

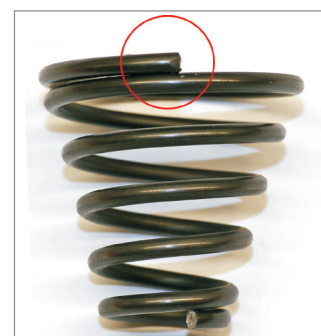
Set new standards of quality with the new motor-adjustable coiling pin holder (PTP coiling finger). Motor-adjustable torsion spring device (3D Former) for a universal production of the most different types of torsion springs.

Shorter set-up times thanks to fast, precise tool settings made with comprehensive CNC control technology.



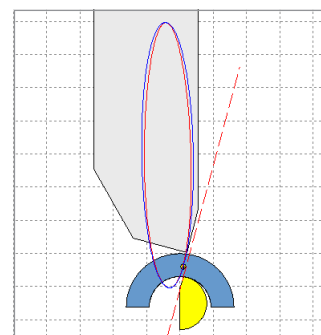
▲ Conical spring produced without motor-adjustable coiling pin holder (PTP coiling finger)

▼ Torsion spring with tangential bend (Motor-adjustable torsion spring device - 3D Former)



▲ Conical spring produced with motor-adjustable coiling pin holder (PTP coiling finger)

▼ Freely programmable cutting ellipse (Multi-E cut)



## Quality

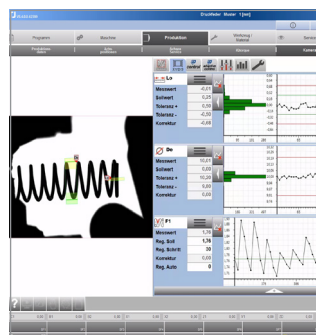
For more than 125 years, the name of WAFIOS has been synonymous with highest quality, safety standards, and technical innovations in the German machine manufacturing industry.

## Reliability

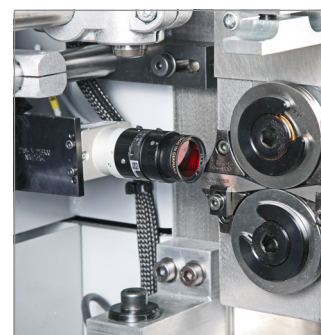
Strict quality controls, state-of-the-art production systems, and many years of experience guarantee that your investment is safe in our hands. Our global service network ensures high availability of WAFIOS machinery.

## Cost efficiency

High production output and a long service life will save money and shorten the amortization time of your investment.



▲ WAFIOS Programming System WPS 3.2 EasyWay with WVS and iQcontrol

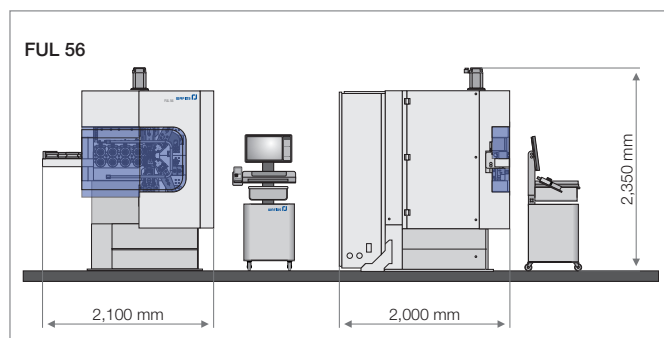


▲ WAFIOS Vision System (WVS)

Technical Data	FUL 16**	FUL 26+**	FUL 36+**	FUL 46	FUL 56	FUL 76	FUL 86	FUL 126	FUL 166
Wire Ø: [mm]	0.12 – 0.6 (Wm > 4)	0.2 – 1.6 (Wm > 4)	0.5 – 2.8 (Wm > 4)	0.9 – 4.0 (Wm > 4)	1.5 – 5.0 (Wm > 4)	2.1 – 7.0 (Wm > 4)	3.1 – 8.0 (Wm > 4)	5.1 – 12.0 (Wm > 5)	6.1 – 16.0 (Wm > 5)
R <sub>m</sub> : [N/mm <sup>2</sup> ]	2,600	2,300	2,300	2,000	2,000	2,000	2,000	2,000	2,000
Wire Ø: [mm]	0.12 – 0.8 (Wm > 6)	0.2 – 1.8 (Wm > 5)	0.5 – 3.0 (Wm > 4)	0.9 – 4.5 (Wm > 5)	1.5 – 5.5 (Wm > 5)	2.1 – 7.5 (Wm > 5)	3.1 – 9.0 (Wm > 5)	5.1 – 13.0 (Wm > 5)	6.1 – 17.0 (Wm > 5)
R <sub>m</sub> : [N/mm <sup>2</sup> ]	2,600	1,900	2,000	1,900	1,900	1,700	1,700	1,700	1,700
Wire Ø: [mm] 4speed		0.5 – 1.6 (Wm > 4)	1.0 – 2.8 (Wm > 4)						
R <sub>m</sub> : [N/mm <sup>2</sup> ]		2,300	2,000						
Feed roller pairs:	2 (option)	2	2	2	4	4	4	4	6
Outer spring Ø: [mm]	20	45	65	95	95	140	150	220	240
Max. Feed speed: Standard [m/min] 4speed [m/min]	240	240 600	220 500	175	150	130	130	90	70
Max. output: [springs/min] [rings/min]	1.500	600 1,100	500 800	350 700	300 600	250 400	160 250	140	50
Dimensions: [mm] (w×h×l)	900 × 1,700 × 900	1,200 × 1,850 × 1,650*	1,650 × 2,100 × 1,800*	1,900 × 2,350 × 2,000*	2,100 × 2,400 × 2,000*	4,000 × 2,500 × 2,670*	4,000 × 2,600 × 2,670*	4,600 × 2,700 × 3,500*	6,560 × 3,200 × 4,200*
Weight: Machine with switch cabinet	700	1,200	1,800	4,000	4,200	8,000	8,200	16,000	21,800

\* Length without control panel carriage

\*\* FUL 16, 26+, 36+, 166 see separate flyers



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Precision Machinery for Wire and Tube