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HONSEL

HONSEL COILS

HONSEL COILS

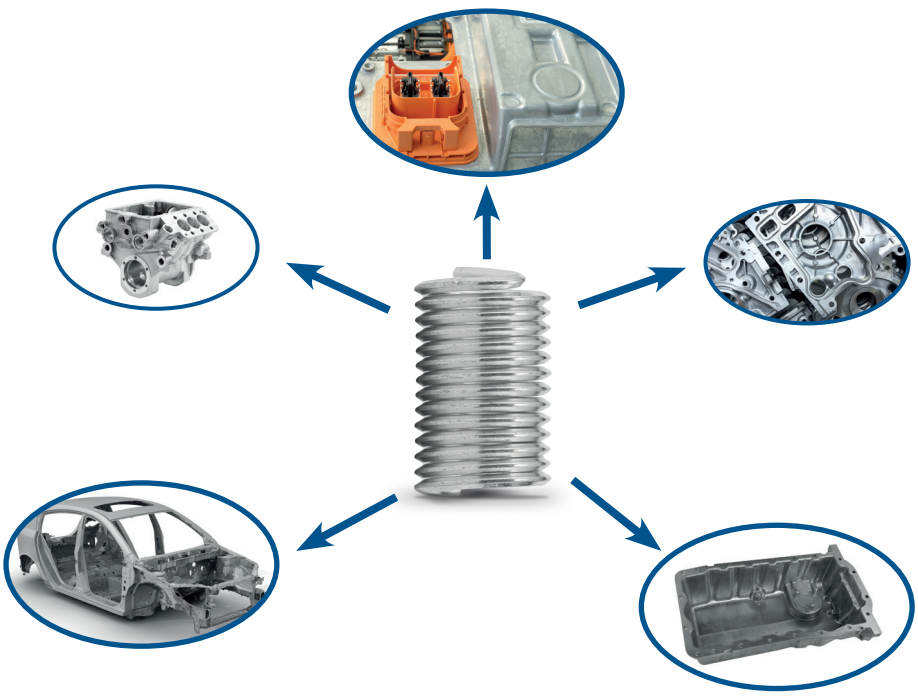
HONSEL COILS custom made

HONSEL COILS create high strength connections in weaker materials. Wire thread inserts have been tried and tested in practice for decades. The **HONSEL COILS** feature high wear resistance, low thread friction with tight tolerances, high surface quality and excellent corrosion and heat resistance.

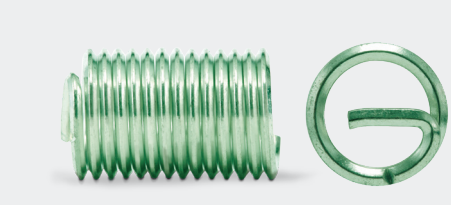
HONSEL COILS properties

- High surface quality
- High wear resistant
- Low thread friction
- Corrosion and temperature resistant
- High thread load capacity
- Cost savings
- Secure installation
- Screw locking performance

HONSEL COILS applications



- Electromobility
- Aluminum casting
- Magnesium casting
- Oil pan
- Exhaust manifold
- Cylinder block
- Battery frame
- Carrier
- Etc.



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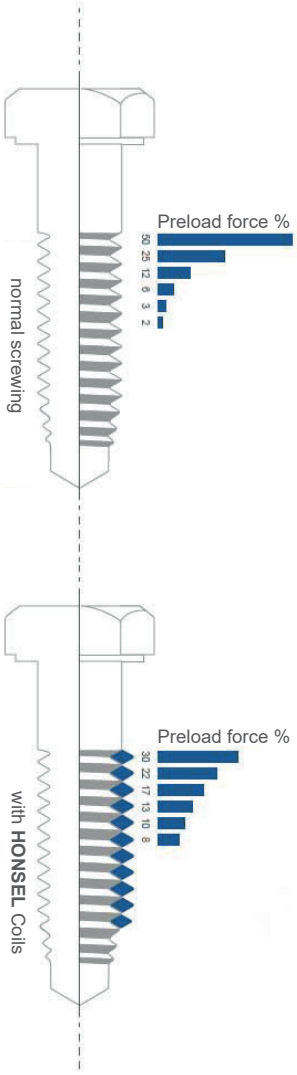

HONSEL COILS strength

HONSEL COILS are made of high-quality chrome-nickel steel. This material is the prerequisite for heavy-duty and wear-resistant threads with a low and constant thread friction.

HONSEL COILS capability

With conventional screw connections, the first three threads bear most oft the-load. **HONSEL COILS** solve this problem. The forces are distributed more evenly over the entire length of the screw which leads to a significantly more stable connection - especially with dynamically loaded applications.

HONSEL COILS reusability

Thanks to the high surface quality of the material, a wear-resistant and highly resilient thread with a very low and consistent friction is guaranteed. Compared to conventionally cut threads, the surface roughness is up to 85% lower and repeated fastener installation can have a higher and constant preload force with the same tightening torque. In addition, the yield point of high-strength screws can be targeted with significant more ease.

HONSEL COILS facts

Standard / specification*	according to DIN 8140-1
Material*	A2 (Material: 1.4301)
Thread Sizes*	Starting with M2. Regular and fine thread
Length*	1,0 - 3,0 xd_1
Surface condition*	Plain, tinned, colored

**Alternatives available upon request*

#onehonsel

From the high vertical range of manufacture in the production of fasteners, to projection, planning and individual design of the fastening, to the automated and process-monitored processing of the fasteners. Honsel can offer you everything from a hand.

HONSEL COILS

HONSEL COILS nominal length determination

Based on the application material and the screw property class, minimum length of the **HONSEL COILS** can be advised.

Application Material Strength	Nominal length for thread inserts l1 Property class of the fastener					
Rm N/mm²	4,8	5,8	8,8	10,9	12,9	14,9
bis 100	1,5 d	2,0 d	3,0 d	—	—	—
> 100 - 150	1,5 d	2,0 d	2,5 d	2,5 d	2,5 d	3,0 d
> 150 - 200	1,5 d	1,5 d	2,0 d	2,0 d	2,5 d	2,5 d
> 200 - 250	1,0 d	1,5 d	1,5 d	2,0 d	2,5 d	2,5 d
> 250 - 300	1,0 d	1,0 d	1,5 d	1,5 d	2,0 d	2,0 d
> 300 - 350	1,0 d	1,0 d	1,0 d	1,5 d	1,5 d	2,0 d
> 350 - 400	1,0 d	1,0 d	1,0 d	1,5 d	1,5 d	1,5 d
> 400	1,0 d	1,0 d	1,0 d	1,5 d	1,5 d	1,5 d

Values for determining the nominal length apply to aluminum and materials with a ratio $\frac{\text{Shear Stress}}{\text{Tensile Stress}} = 0{,}6 - 0{,}7$

Cast iron alloys sometimes have a $\frac{\text{Shear Stress}}{\text{tensile stress}} = 0{,}8 - 1{,}4$ *(source VDI 2230)*

Please note the following: The screw should be the weaker link in this connection. Tests on customer components could potentially support a lower nominal length than recommended. Custom lengths are also available.

The recommended values are designed for aluminum alloys with $T_{(max.)} = 300°C$ and magnesium alloys with $T_{(max.)} = 100°C$.

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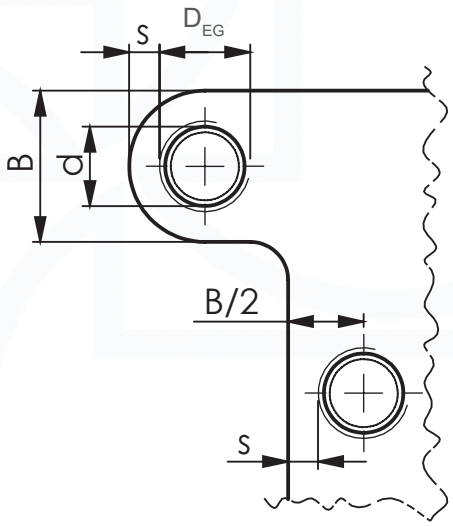
HONSEL COILS minimum wall thickness

Based on the major diameter of the **HONSEL COILS** receiving thread.

The minimum wall thickness is determined by the strength of the application material, the receiving thread major diameter, as well as the **HONSEL COILS** length.

The following formulas apply to **HONSEL COILS** with length of 1.5d installed into aluminum and general castings and wrought alloys

d = nominal diameter
D_{EG} = receiving thread major diameter
s = residual wall thickness
B = Min. material width



$B_{min} = 1{,}75 \times D_{EG}$

$S_{min} = 0{,}375 \times D_{EG}$

HONSEL COILS installation process

HONSEL COILS consist of a specially shaped and wound wire that can be assembled quickly and easily in just a few steps. The installation tab is removed after assembly.

1. Drilling

Drill the hole with diameter d2 corresponding to the specified thread size, manufacturing method and application material.

2. Cutting/shaping

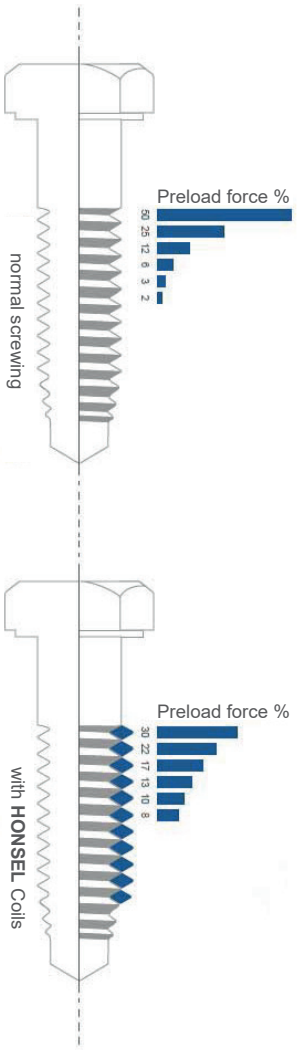
Generate receiving thread using the HONSEL thread tap. The receiving thread can be cut or formed. We recommend the use of lubricant during this process.

3. Assembly

The **HONSEL COILS** is positioned on the HONSEL installation spindle and screwed into the receiving thread until the specified depth is reached.

4. Breaking

In conclusion the installation tab is punched out at the break-off notch and removed.

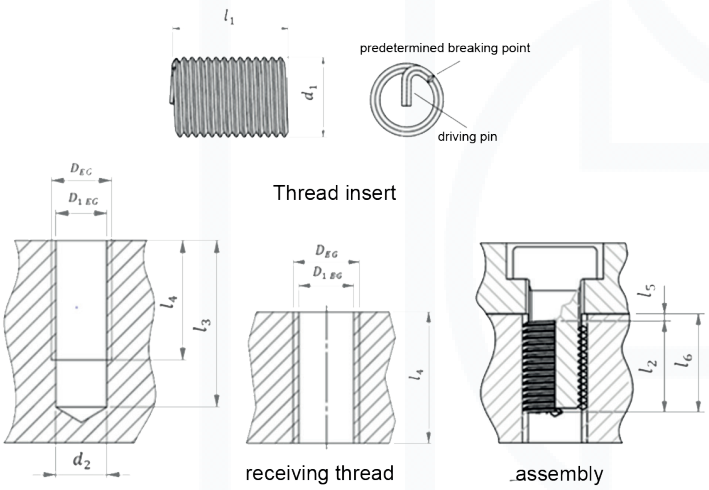


HONSEL COILS metric ISO standard and fine thread*

d	P	l1 x d	l1 mm	W	d1 min./max.	d2 cutting	d2 forming	l3 min.	receiving thread	D1 EG min./max.	D EG min.	l4 min.	l2	l6 max.	l5
M3	0,5	1 d	3,0	3,9	3,80 4,00	3,20	3,40	5,8	EG M3 6H mod.	3,11 3,22	3,65	3,0	2,5	2,9	0,1 bis 0,4
		1,5d	4,5	6,3				7,3				4,5	4,0	4,4	
		2 d	6,0	8,7				8,8				6,0	5,5	5,9	
		2,5d	7,5	11,1				10,3				7,5	7,0	7,4	
		3 d	9,0	13,5				11,8				9,0	8,5	8,9	
M4	0,7	1 d	4,0	3,7	5,15 5,35	4,20	4,60	7,8	EG M4 6H mod.	4,15 4,29	4,91	4,0	3,3	3,8	0,2 bis 0,5
		1,5d	6,0	6,1				9,8				6,0	5,3	5,8	
		2 d	8,0	8,4				11,8				8,0	7,3	7,8	
		2,5d	10,0	10,9				13,8				10,0	9,3	9,8	
		3 d	12,0	13,2				15,8				12,0	11,3	11,8	
M5	0,8	1 d	5,0	4,3	6,35 6,60	5,20	5,70	9,2	EG M5 6H mod.	5,17 5,33	6,04	5,0	4,2	4,8	0,2 bis 0,6
		1,5d	7,5	6,9				11,7				7,5	6,7	7,3	
		2 d	10,0	9,7				14,2				10,0	9,2	9,8	
		2,5d	12,5	12,3				16,7				12,5	11,7	12,3	
		3 d	15,0	14,8				19,2				15,0	14,2	14,8	
M6	1,0	1 d	6,0	4,2	7,60 7,85	6,30	6,80	11,1	EG M6 6H mod.	6,22 6,41	7,30	6,0	5,0	5,8	0,3 bis 0,8
		1,5d	9,0	6,9				14,1				9,0	8,0	8,8	
		2 d	12,0	9,6				17,1				12,0	11,0	11,8	
		2,5d	15,0	12,6				20,1				15,0	14,0	14,8	
		3 d	18,0	14,6				23,1				18,0	17,0	17,8	
M8	1,25	1 d	8,0	4,7	9,85 10,10	8,40	9,10	14,2	EG M8 6H mod.	8,27 8,48	9,62	8,0	6,75	7,65	0,3 bis 0,9
		1,5d	12,0	7,4				18,2				12,0	10,75	11,65	
		2 d	16,0	10,6				22,2				16,0	14,75	15,65	
		2,5d	20,0	13,5				26,2				20,0	18,75	19,65	
		3 d	24,0	16,4				30,2				24,0	22,75	23,65	
M10	1,5	1 d	10,0	5,0	12,10 12,50	10,50	11,30	17,3	EG M10 6H mod.	10,32 10,56	11,95	10,0	8,5	9,6	0,4 bis 1,1
		1,5d	15,0	8,1				22,3				15,0	13,5	14,6	
		2 d	20,0	11,2				27,3				20,0	18,5	19,6	
		2,5d	25,0	14,2				32,3				25,0	23,5	24,6	
		3 d	30,0	17,2				37,3				30,0	28,5	29,6	
M12	1,75	1 d	12,0	5,2	14,40 14,80	12,50	13,50	20,3	EG M12 6H mod.	12,38 12,64	14,27	12,0	10,25	11,55	0,4 bis 1,3
		1,5d	18,0	8,4				26,3				18,0	16,25	17,55	
		2 d	24,0	11,7				32,3				24,0	22,25	23,55	
		2,5d	30,0	14,7				38,3				30,0	28,25	29,55	
		3 d	36,0	18,0				44,3				36,0	34,25	35,55	
M12 x1,5	1,5	1 d	12,0	6,2	14,40 14,80	12,50	13,30	19,3	EG M12 x 1,5 6H mod.	12,32 12,56	13,95	12,0	10,5	11,6	0,4 bis 1,1
		1,5d	18,0	9,8				25,3				18,0	16,5	17,6	
		2 d	24,0	13,5				31,3				24,0	22,5	23,6	
		2,5d	30,0	17,1				37,3				30,0	28,5	29,6	
		3 d	36,0	20,8				43,3				36,0	34,5	35,6	
M14	2,0	1 d	14,0	5,6	16,80 17,20	14,50	15,70	23,3	EG M14 6H mod.	14,43 14,73	16,60	14,0	12,0	13,5	0,5 bis 1,5
		1,5d	21,0	8,8				30,3				21,0	19,0	20,5	
		2 d	28,0	12				37,3				28,0	26,0	27,5	
		2,5 d	35,0	15,2				44,3				35,0	33,0	34,5	
		3 d	42,0	18,3				51,3				42,0	40,0	41,5	
M14 x1,5	1,5	1 d	14,0	7,4	16,80 17,20	14,50	15,30	21,3	EG M14 x 1,5 6H mod.	14,38 14,56	15,95	14,0	12,5	13,6	0,4 bis 1,1
		1,5d	21,0	11,6				28,3				21,0	19,5	20,6	
		2 d	28,0	15,7				35,3				28,0	26,5	27,6	
		2,5d	35,0	19,9				42,3				35,0	33,5	34,6	
		3 d	42,0	24,0				49,3				42,0	40,5	41,6	
M16	2,0	1 d	16,0	6,5	19,00 19,40	16,50	17,70	25,3	EG M16 6H mod.	16,43 16,73	18,60	16,0	14,0	15,5	0,5 bis 1,5
		1,5d	24,0	10,1				33,3				24,0	22,0	23,5	
		2 d	32,0	13,8				41,3				32,0	30,0	31,5	
		2,5d	40,0	17,5				49,3				40,0	38,0	39,5	
M16 x1,5	1,5	1 d	16,0	8,7	19,00 19,40	16,50	17,30	23,3	EG M16 x 1,5 6H mod.	16,32 16,56	17,95	16,0	14,5	15,6	0,4 bis 1,1
		1,5d	24,0	13,4				31,3				24,0	22,5	23,6	
		2 d	32,0	18,1				39,3				32,0	30,5	31,6	
		2,5d	40,0	22,9				47,3				40,0	38,5	39,6	

HONSEL COILS metric ISO standard and fine thread*

The length of the thread inserts can only be measured when installed. For uninstalled thread inserts the measurable features are d_1 and W.



Receiving thread according to DIN 8140-2

d	= nominal thread diameter
d_1	= major diameter of the HONSEL COIL before installation
d_2	= receiving thread drill diameter (guide value) must be adjusted depending on the application and material
l_1	= nominal length of the HONSEL COIL before installation (cannot be measured in the delivered condition)
l_2	= length of HONSEL COIL when installed ($l_2 = l_1 - P$)
l_3	= minimum depth of core hole according to DIN 76 Part 1
l_4	= Minimum length of receiving thread for blind holes or minimum part thickness for thru holes ($l_4 = l_1 = l_2 + P$)
l_5	= distance between the HONSEL COIL and mating surface (l_5 = 0,25P to 0,75P) with l_4 defined as above
l_6	= maximum screw-in depth when installation tab is not removed ($l_6 = l_2 + l_5$ max.)
W	= number of rotations to reach full installation (the number of turns may deviate by -0.25P)
P	= thread pitch
D_{EG}	= major diameter of receiving thread
$D_{1\,EG}$	= minor diameter of receiving thread

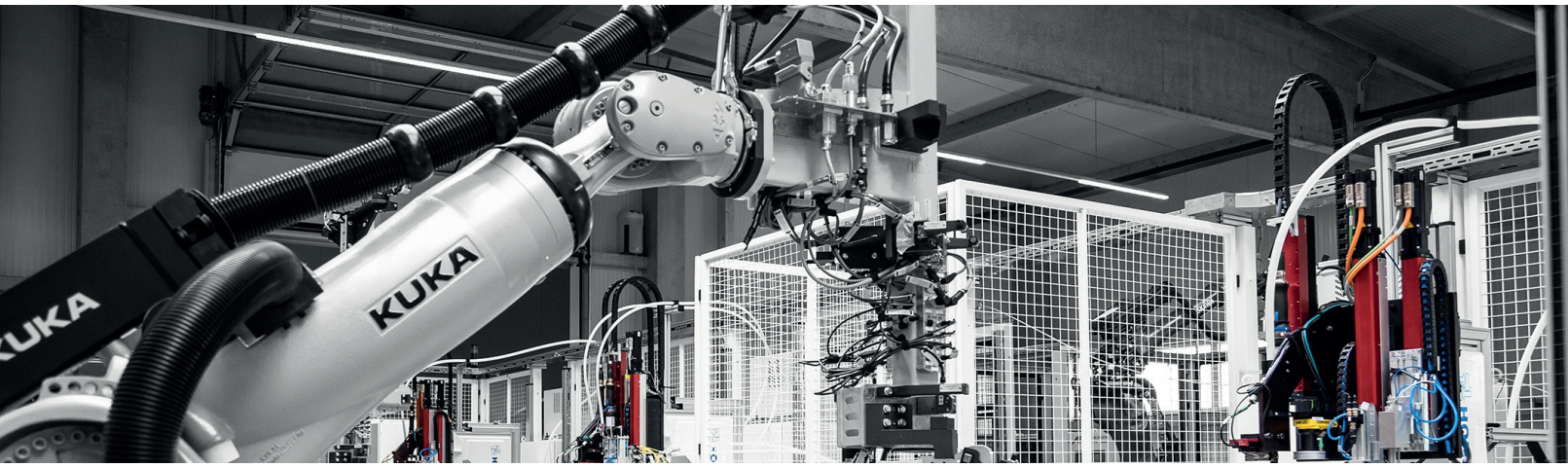
Please note:

- $D_{1\,EG}$ determines drill selection
- If a countersink cannot be avoided, then create and debur the countersunk at 90°. Countersink outer diameter = D_{EG} + 0,1 mm.
- If the HONSELCoil Plus thread inserts are used in automation, we recommend to add at least 1 x P to l_3 and l_4 each

All dimensions in mm. Technical changes reserved.

***Application-specific deviations on request.**

HONSEL COILS



HONSEL COILS

We offer a comprehensive range of installation tools for our **HONSEL COILS** wire thread inserts.
Both manual and CNC taps are available in all dimensions. Non-cutting manufacturing of receiving threads use thread formers which facilitates an efficient production method for many materials today. Our installation mandrels can be used in manual operation as well as automated assembly. In addition we offer suitable accessories such as limit plug gauges, tab breakers and removal tools.

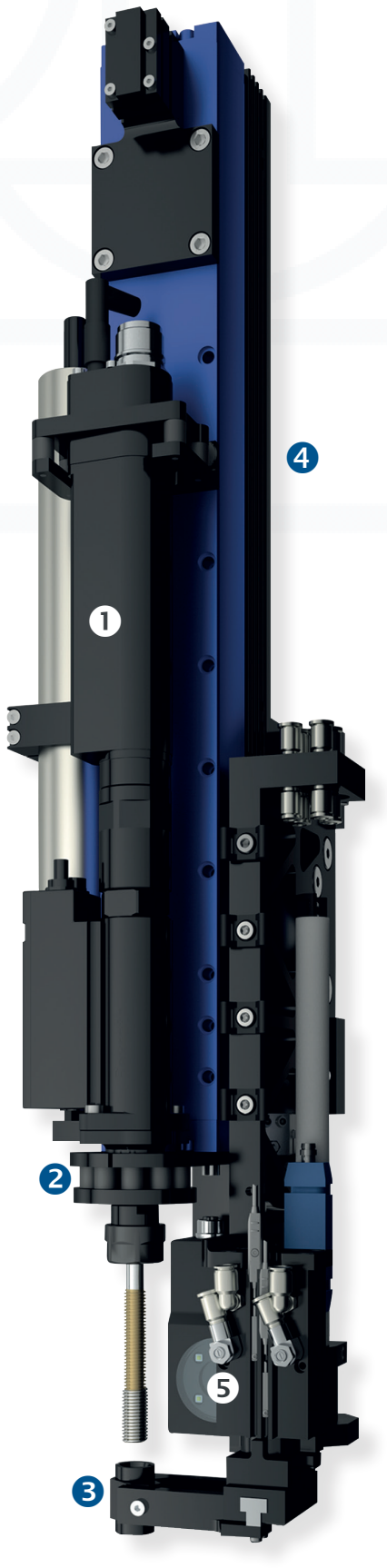
Whatever your preferred power source, manual, electrical or pneumatic, Honsel can provide the installation tool perfectly matched to the **HONSEL COILS** wire thread inserts.

HONSEL

HONSEL COIL screw system 2G

For automated and semi-automated processing of wire thread inserts. Due to the slim design, screw systems can be placed close to each other. This leads to more efficient use of existing production space and thus to greater cost-effectiveness. The electric linear motor is very fast at up to 3.2 m/s and alows cycle times to be optimized.

RIWO-System
The complete installation system from HONSEL „RIWO Coil 2G“: Feeding, installation technology and control Siemens S7 including 3D visualization.



❶ Bosch BG2 Screwdriver

Angle of rotation and torque-monitored screw technology with measuring device. Optional screwdriver technology from Desoutter and AtlasCopco. Other manufacturers available upon request.

❷ Floating screwdriver mount

Special mounting of the screwdriver with tolerance compensation.

❸ Integrated coil transfer with rotary gripper

Carefully matched gripping force and contour ensure process-reliable spin-on of the **HONSEL COILS**

❹ Linear motor

- Programmable electrical cantilever axis with repeatability (+/-0.05mm).
- Integrated position measuring system (+/-0.01 mm).
- The available force range remains constant during movement. Each assembly location can be programmed with a specific force that can be adjusted during travel.
- Speed up to 3.2 m/s for short cycle times.
- Feed stroke up to 500 mm.

❺ Camera

Spindle monitoring for higher output rates.

Technical data:	
Length:	700 mm
Width:	142 mm
Height:	190 mm
Weight:	22,5 kg
Ffeed stroke:	up to 500 mm
Installation position:	Flexible
Center distance:	min. 60 mm (with 2 screw systems)

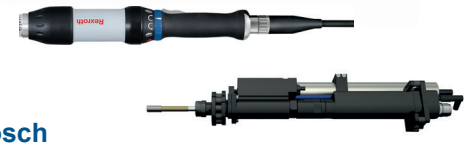
HONSEL COILS

HONSEL COILS tooling

Designed for optimal results

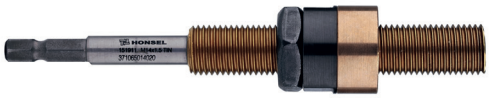
Thread former

- Reduced forming marks
- Optimal for installing **HONSEL COILS**
- Reduced abrasion of the coil coating during the installation process
- Special dimensions and tool integration upon customer request



Bosch

- Electric screwdriver
- Integrated transducer for torque and angle of rotation
- Torque and speed: product dependent



Installation spindle

- Long service life
- Optimum surface finish
- Metal hard stops for improved repeatability
- Special dimensions and tool integration upon customer request

Desoutter

- Electric screwdriver
- Integrated transducer for torque and angle of rotation
- Torque and speed: product dependent

Controller Desoutter

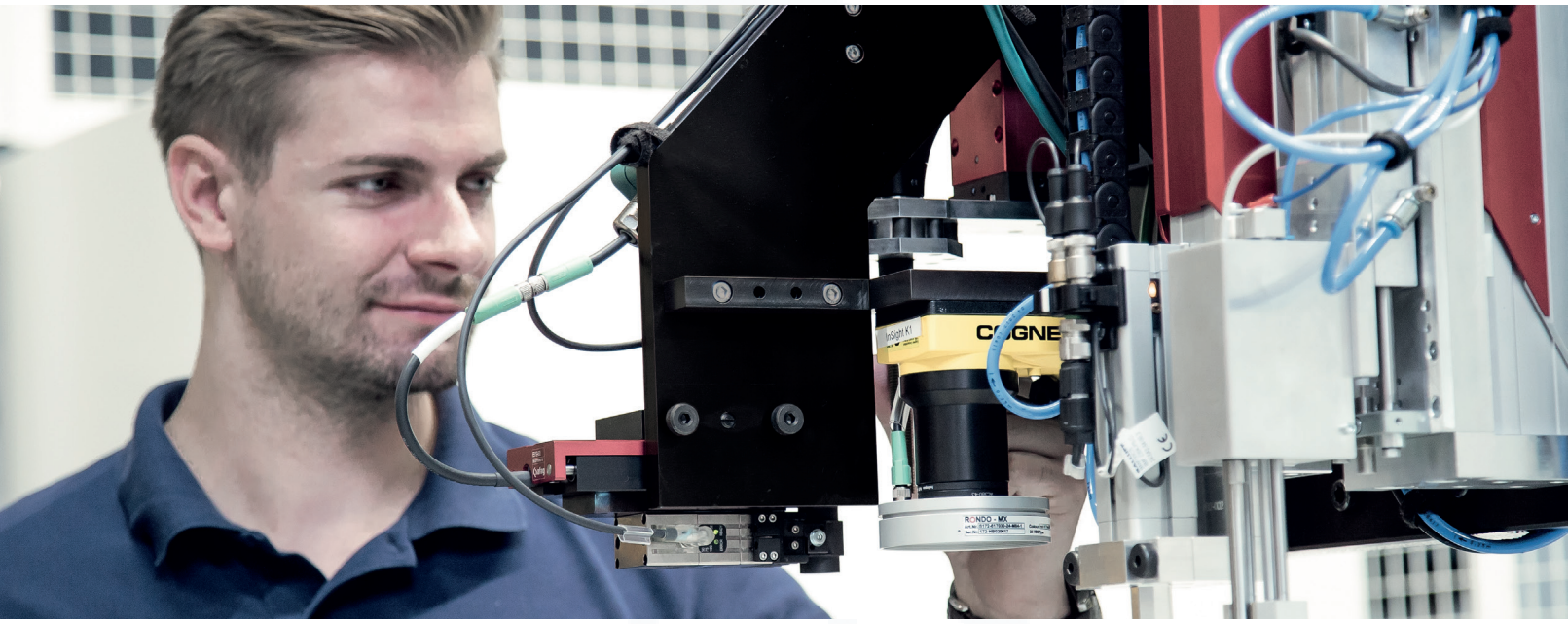
Controller Bosch

- Multi-control possible starting with two screwdrivers

removal spindle

Gage

Tab removal punch



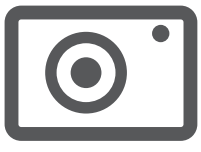
HONSELquality

From the first to the last part: Consistently error-free and good!

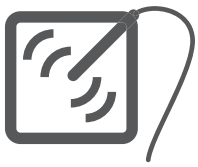
100% control and 0 ppm strategies, these are the issues that a company has to face today when it comes to defining quality assurance goals. HONSEL has made significant investments in this area over the years. A QA system has been developed that is exemplary focused on detailed process-monitoring. Of course, HONSEL is certified according to ISO 14001 and ISO/TS 16949. Another essential part of the HONSEL QA strategy is the use of optoelectronic testing machines. Even with large quantities, it can be guaranteed that all products that leave the facility are 100% tested. The company from Fröndenberg has a good reputation and we have every intention that this will remain so in the years to come – for sure.

HONSELQ-Gate

HONSEL Automation uses three different Q-Gate concepts for 100% control.



The VNG module has an optional camera-based Q-Gate. This recognizes via an optical evaluation whether a Blind rivet nut or bolt was set correctly.



The 2G coil screw system can be operated with two different Q-Gate variants:

Sensor-based: With evaluations using the DMSD 2G measurement curve.

Mechanical: With verification of the distance measurement and the use of a gauge

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