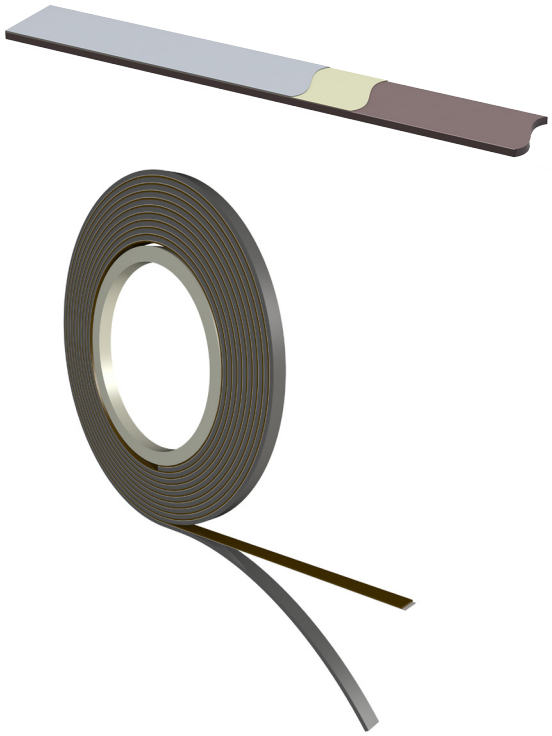
Counting

Controlling



LMS
Linear Magnetic Scale
Incremental / Absolute

- Linear applications
- Different scale materials available
- Different pole pitches

Features

- From low to very high accuracy producible on demand
- One or multiple track magnetization
- Different scale geometries
- Customizable for many applications
- No attrition from usage
- Resistant to dust, cooling lubricant emulsion, oil, etc.
- Wide range of selectable magnetic scale characteristics
- A variety of magnetic materials for several applications

Controlling movements with the LMS
Simple – precise – economic

BOGEN produces magnetic scales for a large variety of different applications. The Linear Magnetic Scale Incremental/Absolute can be written one track or multiple tracks. Using different accuracy classes, scales can be tailored to the customer´s special requirements. The scales can be used for many different solutions.

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Linear Magnetic Scale

Characteristics Linear Magnetic Scale

Accuracy class	± 3 µm, ± 10 µm, ± 20 µm, ± 40 µm, ± 100 µm
Material	Magnetic Tape: Elastomer filled with ferrite Carrier Tape: Stainless Steel
Width [mm]	5, 6, 8, 10, 20, 25 ±0.2 (others on request)
Thickness [mm]	0.5 to 1.66 (depending on scale setup)
Pole pitch [mm]	any pole pitches in 0.01 increments (e.g. 0.5 ; 1; 1.2; 2; 2.5; 2.54; 3; 3.2; 4; 5)
Magnetic flux density	Pole pitch Magnetic flux Distance 1 mm 20mT +10/-7 mT 0.4 mm 2 mm 30mT +10/-10 mT 0.7 mm 2.54 mm 30mT +10/-12 mT 0.8 mm 5 mm 30mT +10/-15 mT 1.4 mm
Operating temperature	-20°C to +100°C max.
Expansion coeffizient	~ 17 x 10-6/K
Minimum bending radius [mm]	65
Length on reel	25 m, 50 m (others on request)
Length in pieces	on request
End processing for pieces	Multiple hole combinations and angle cuts possible (on request)

Characteristics Adhesive Tape (optional)

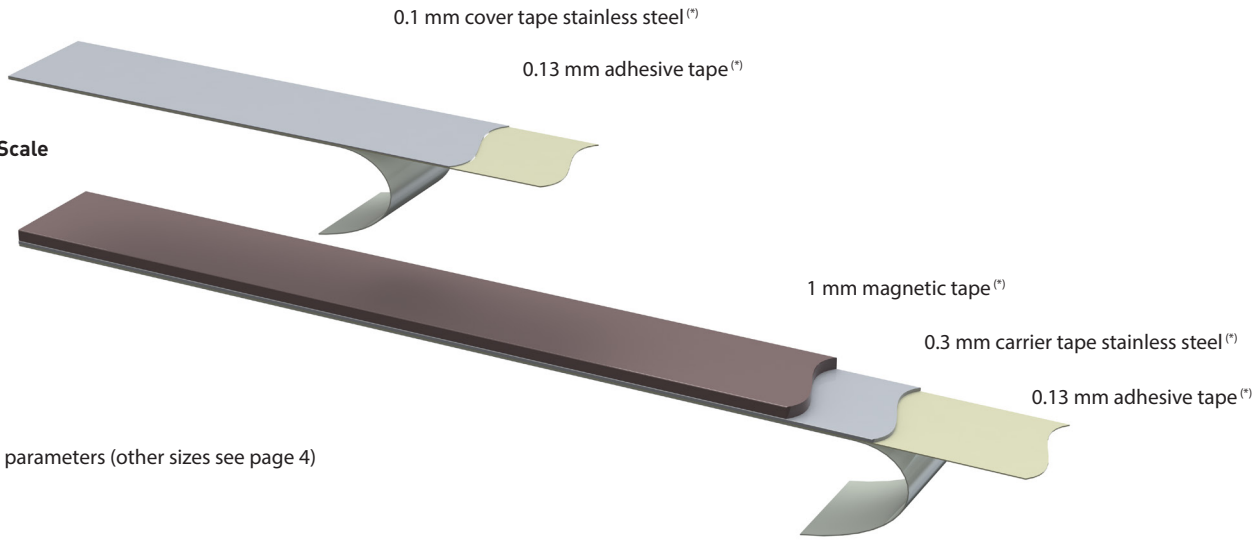
Material	Double sided acrylic adhesive tape
Width [mm}	4.5, 7, 9, 14, 19, 24 others on request
Thicknes [mm]	0.13

Characteriestics Cover Tape (separate accessory)

Material	Cover tape: Stainless steel, non magnetic Adhesive tape: Acrylic adhesive tape
Width [mm}	5 ± 0.2 8 ± 0.2 10 ± 0.2 20 ± 0.2
Thickness [mm]	0.23 total thickness (0.1 mm stainless steel tape + 0.13 mm adhesive tape)
Length on reel [m]	50

Dimension Magnetic Scale

Cover Tape (separate accessory)



(*) standard parameters (other sizes see page 4)

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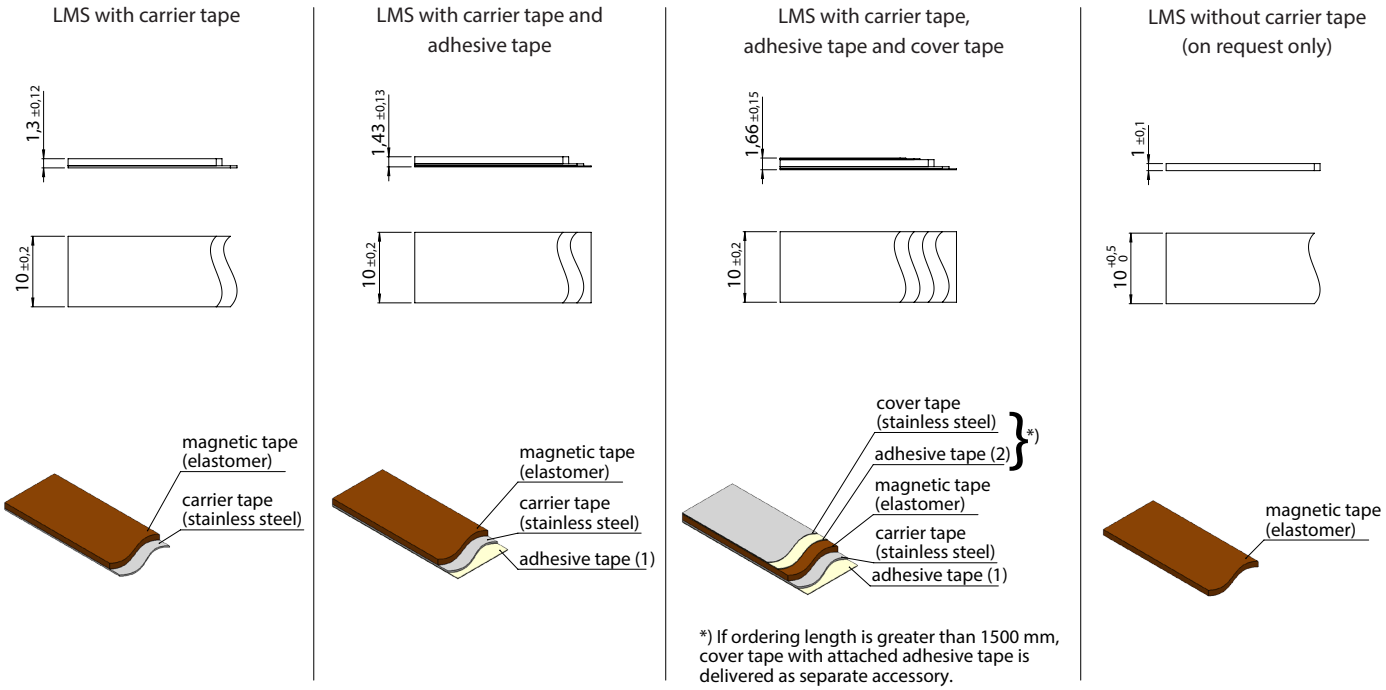
Scale Dimensions with Standard Layer Stackup



*) If ordering length is greater than 1500 mm, cover tape with attached adhesive tape is delivered as separate accessory.

Scale Dimensions with optional Layer Stackup *)

For individual scale setups following layer dimensions can be used

Magnetic tape	0.5 mm or **1.0 mm**
Carrier tape	0.1 mm or **0.3 mm**
Adhesive tape	**0.13 mm**, 0.212 mm or 0.050 mm
Cover tape	0.076mm, **0.1 mm,** 0.15mm

*) standard parameters are bold

Length

Linear magnetic scales cut in pieces or supplied on reel

Marking[1)]

The marking distance is 250 mm and builds up as follows:
accuracy class . pole pitch [µm] . year/week . reel no. . magnetic strip counter (optional)
e.g. A20.2000.1605.19 (marking every 250 mm)
A20.2000.1608.19.012 (marking one time per magnetic strip)

1) The magnetic strip counter indicates the number of remaining strips on the reel. The strip is marked only once per length.

Optional Accessory

- Extruded aluminum profile
- Scale applicator

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Order Code

Parameters

LMS	N	-	P	-	L	-	W	-	S	-	H	-	A	-	C	-	K	-	T

			Code	Explanation [1]
Parameters	**N**	**Number of Tracks**		one track
			2	two tracks
			...	number of tracks (up to nine)
	P	**Track Parameters** [2]	I ...	one incremental track and its pole pitch [3]
			I ... - Z	one incremental track and its pole pitch [3], one reference track
			I ... - I ...	two incremental tracks and their pole pitches [3]
	L	**Length**	L ...	piece, length in mm [4]
	W	**Width (mm)**	W5	5 mm
			W8	8 mm
			W8-10	8 mm Elastomer (only for P95-05 extrusion)
				10 mm stainless steel carrier tape (only for P95-05 extrusion)
			W10	10 mm
			W15	15 mm
			W20	20 mm
			W25	25 mm
	S	**Magnetic Track Height (mm)**		**track height corresponds to scale width**
			S ...	magnetic track height in mm
	H	**Scale Height (mm)**		**1 mm magnetic tape, 0.3 mm carrier tape**
			H1-0.1	1 mm magnetic tape, 0.1 mm carrier tape
			H0.5-0.3	0.5 mm magnetic tape, 0.3 mm carrier tape
			H0.5-0.1	0.5 mm magnetic tape, 0.1 mm carrier tape
	A	**Accuracy Class**	A3	± 3 µm/m (only delivered up to piece length 2300 mm)
			A10	± 10 µm/m (only delivered up to piece length 2300 mm)
			A20	± 20 µm/m
			A40	**± 40 µm/m**
			A100	± 100 µm/m
	C	**Cover**		**without cover tape**
			C	equipped with cover tape (only delivered up to piece length 1500 mm)
	K	**Adhesive Tape**		without adhesive tape
			K	**equipped with adhesive tape**
	T	**Text Imprint**		**with BOGEN text imprint**
			T0	without text imprint
			T2	with customer specific text imprint (on request)

[1] standard parameters are bold
[2] for absolute track and other options than listed please contact our sales team
[3] standard pole pitches: 0.5 mm, 1 mm, 2 mm, 2.54 mm, 5 mm
[4] length of nonius scale: measuring length + 5 mm non-magnetized scale at each end; measuring length = number of poles x pole pitch
all other scales: length = measuring length

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Ordering Example

LMS2-I1-Z-L2200-W10-A3-K	Linear magnetic scale, 2 tracks, one incremental track with pole pitch 1 mm, one reference track, length 2.200 mm, width 10 mm, width of scale encoded completely, height magnetic tape 1 mm and height carrier tape 0.3 mm, accuracy ± 3 µm/m, without cover tape, with adhesive tape, with standard text imprint
LMS-I10-L48000-W8-A100-K-T2	Linear magnetic scale, one track, incremental track with 10 mm pole pitch, length 48.000 mm, width 8 mm, width of scale encoded completely, height magnetic tape 1 mm and height carrier tape 0.3 mm, accuracy ± 100 µm/m, without cover tape, with adhesive tape, customer specific text imprint

Customization

Linear scales can be customized beyond these listed settings with different pole patterns including irregular patterns, different tracks and other options. Please contact BOGEN with your requests.

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