

ICS 59.080.01; 61.020

**Sporttextilien –
Messung der Kompressions- und Materialeigenschaften (Druckverhalten);
Text English**

Sports Textiles –
Measurement of Compression and Material Properties (Pressure Properties); Text in English

Gesamtumfang 32 Seiten

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Foreword

This DIN SPEC has been developed according to the PAS procedure. The development of a DIN SPEC according to the PAS procedure is carried out in DIN SPEC (PAS)-consortiums and does not require the participation of all stakeholders.

This document has been developed and adopted by the initiators and authors named below:

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At present, there are no standards covering this topic in the body of German Standards.

DIN SPEC (PAS)s are not part of the body of German Standards.

A draft of this DIN SPEC (PAS) has not been published.

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Introduction

The aim of the document is to describe a suitable and independent method for:

- a) the determination of the compression properties of sports clothing;
- b) the determination of essential usage-relevant parameters of the materials used;
- c) the objective comparability and verifiability of product properties.

The market for compressive sportswear has become increasingly important in recent years and there are no generally accepted guidelines or procedures for sports textiles. This applies both to the test method and to the amount of compression that is applied along the body and/or limbs.

So far, compression properties of sporting goods have been tested to a great extent comparable to medical compression textiles according to DIN 58133 or RAL-GZ 387. Both standards serve to test medical devices (stockings, arm sleeves) used by patients suffering from for example venous diseases or lymphedema.

However, essentials mentioned in the standards deal with garments for legs and arms exclusively and are not applicable to sports textiles or even contradict the desired properties; listed requirements are not relevant. Furthermore, other useful and important material parameters are not taken into account, especially for the sports sector.

The lack of an independent and objective method for testing the compression and material properties of sports textiles makes it impossible to compare and/or agree technical and advertising statements as well as qualities and usage properties.

1 Scope

This DIN SPEC specifies a test method for determining the compression properties of compressive sports clothing that builds up a defined pressure on the leg, arm, torso and panty part such as for example leg socks and stockings, arm sleeves, pants and shirts. The test method serves to determine parameters, for example compression, residual pressure, stiffness and wear-out effect relevant to use of the materials used and ensures the objective comparability and verifiability of the product properties.

This DIN SPEC can also be used for other non-medical compression garments such as shape wear.

This specification does not cover any kind of compressive garment for medical use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DIN EN ISO 139:2011-10, *Textiles — Standard atmospheres for conditioning and testing*
(ISO 139:2005 + Amd.1:2011); German version EN ISO 139:2005 + A1:2011

DIN EN ISO 6330:2013-02, *Textiles — Domestic washing and drying procedures for textile testing*
(ISO 6330:2012); German version EN ISO 6330:2012

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

DIN and DKE maintain terminological databases for use in standardization at the following addresses:

- DIN-TERMinologieportal: available at <https://www.din.de/go/din-term>
- DKE-IEV: available at <http://www.dke.de/DKE-IEV>

3.1 extensibility

change in size of a test specimen in the longitudinal or transverse direction when stretched, expressed as a percentage ratio to the corresponding measurements when in a non-stretched condition

[SOURCE: DIN 58133:2008-07, 3.1, modified — Term and definition was translated into English.]

3.2 pressure profile

representation of the compression exerted by the garment along its length

[SOURCE: DIN 58133:2008-07, 3.2, modified — Term and definition was translated into English.]

3.3 compression

pressure exerted on the leg, arm or torso by a compression garment expressed in kPa or mmHg

[SOURCE: DIN 58133:2008-07, 3.10, modified — Term and definition was translated into English; arm or torso and the expression in kPa or mmHg was added.]

3.4**compression categories**

compression ranges in which compression garment is manufactured at each measuring point

3.5**measuring point**

position on the body where the pressure value is measured

3.6**reference point**

lowest (most distal) measuring point that is used as 100 %-basis for calculating the residual pressure

3.7**compression garment**

garment that exerts defined compression on leg and/or arm and/or torso

3.8**practical elongation**

elongation of the garment in the circumferential direction on an appropriately sized leg, arm or body, expressed as a percentage ratio based on the circumference of the garment in a non-stretched condition

[SOURCE: DIN 58133:2008-07, 3.14, modified — Term and definition was translated into English; definition was extended to arm and body.]

3.9**residual pressure**

pressure exerted by the garment at a point, expressed as a percentage based on the pressure at the reference point

[SOURCE: DIN 58133:2008-07, 3.15, modified — Term and definition was translated into English; definition was extended to garment.]

3.10**garment size**

given circumferences and lengths of the test specimen defined by the manufacturer

3.11**stiffness**

change in compression in kPa or mmHg at a specific measuring point with an increase in the circumference by 5 %

[SOURCE: DIN 58133:2008-07, 3.6, modified — Term and definition was translated into English; definition was extended to garment, circumference was changed from 1 cm to 5 %.]

3.12**wear-out effect**

pressure loss caused by overstretch by 5 % in kPa or mmHg, expressed as percentage based on the pressure before overstretching

3.13**material fatigue over time**

pressure change over time under stretched condition in kPa or mmHg and expressed as percentage based on the first measurement in the respective test series

4 Requirements

4.1 Measuring points

4.1.1 Leg

The measuring points, girth and lengths for legs including panty part are shown in Figure 1, the respective descriptions are listed in Table 1.

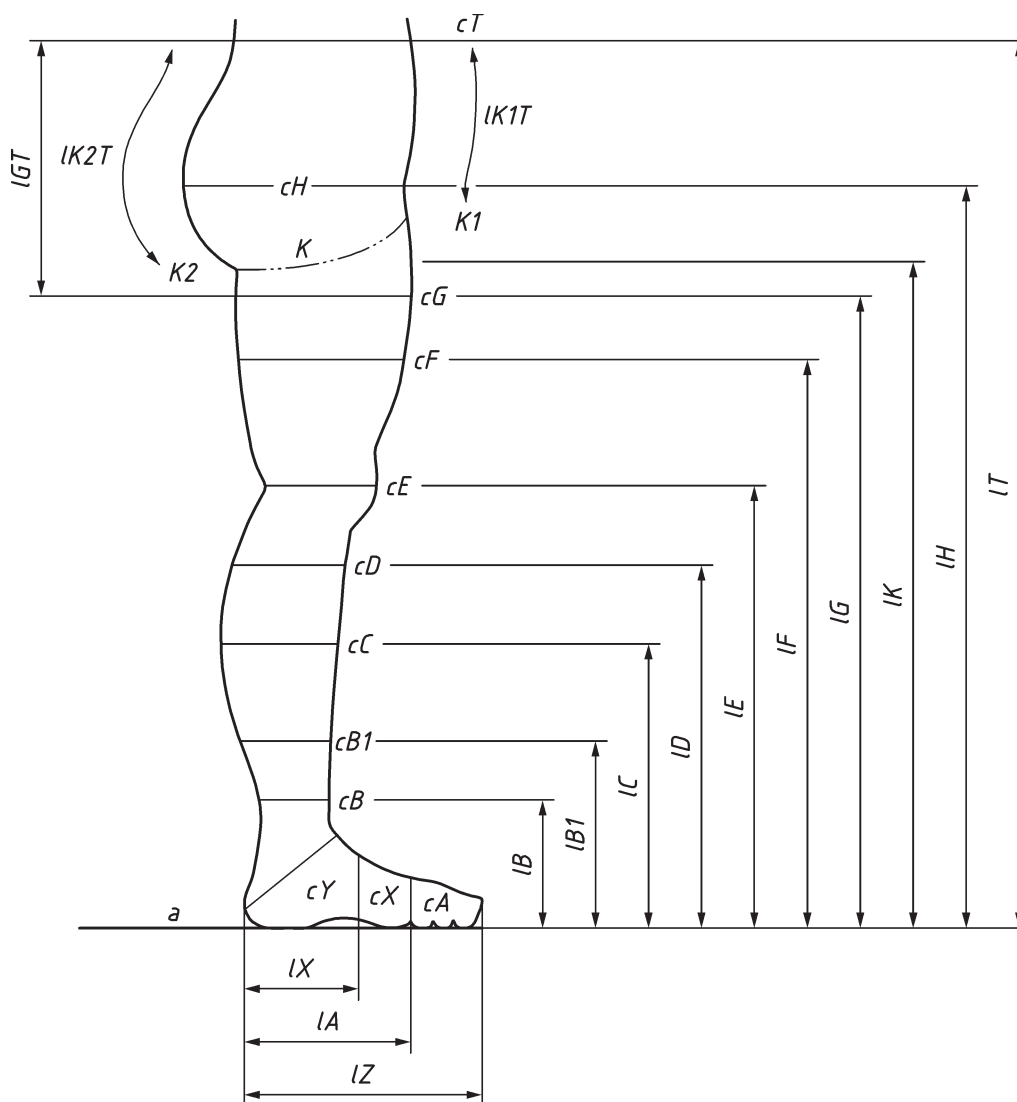


Figure 1 — Leg measuring points, lengths and girths

Table 1 — Leg measuring points, lengths and girths

Measuring point	Description	Girth code	Description	Length code	Description
a	sole of the foot at the heel/ground	–	–	–	–
A	forefoot at the implantation of the toes	cA	girth measured at A	lA	distance measured from the most prominent part of the heel to A (foot length without toe)
B	ankle at the point of its minimum girth	cB	girth measured at B	lB	distance measured from a to B
B1	point a at which the Achilles tendon changes into calf muscles	cB1	girth measured at B1	lB1	distance measured from a to B1
C	calf at its maximum girth	cC	girth measured at C	lC	distance measured from a to C
D	just below the tibial tuberosity	cD	girth measured at D	lD	distance measured from a to D
E	centre of the patella and over the back of the knee	cE	girth measured at E	lE	distance measured from a to E
F	between K and E	cF	girth measured at F	lF	distance measured from a to F
G	5 cm below K with the patient in upright position	cG	girth measured at G	lG	distance measured from a to G
H	greatest lateral trochanteric projections of the buttock	cH	girth measured at H	lH	distance measured from a to H
K	centre point of the crotch	–	–	lK	distance measured from a to K
K1	level at the pubic symphysis	–	–	–	–
K2	level at the infra-gluteal fold	–	–	–	–
T	natural waistline	cT	girth measured at T	lT	distance measured from a to T
				lGT	distance measured from G to T
				lK1T	distance measured from K1 to T
				lK2 T	distance measured from K2 to T
X	middle of the foot	cX	girth measured at X	lX	distance measured from the most prominent part of the heel to X
Y	instep	cY	girth at Y, measured with the foot in maximum dorsal flexion	–	–
Z	tip of toe			lZ	horizontal distance between the perpendiculars in contact with the end of the most prominent toe and the most prominent part of the heel (total foot length)

[SOURCE: DIN V ENV 12718:2001-12, Table 2, Table 3 and Table 4 summarized]

4.1.2 Torso

The measuring points, girth and lengths for the torso, both female and male, are shown in Figure 2, the respective descriptions are listed in Table 2.

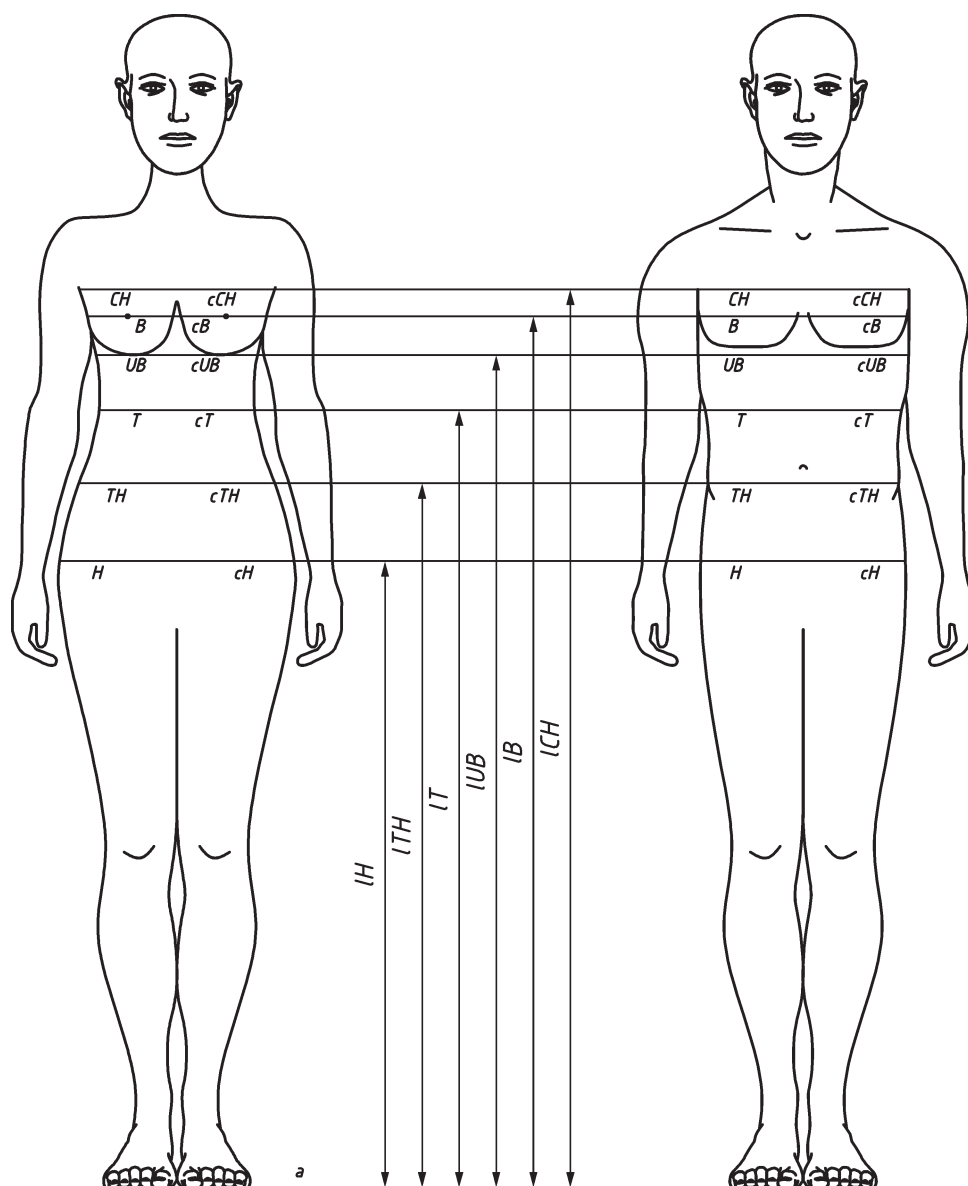


Figure 2 — Torso measuring points, lengths and girths (details and descriptions see Table 2)

Table 2 — Torso measuring points, girth and length codes

Measuring point	Description	Girth code	Description	Length code	Description
CH	chest — point on the union of the third and fourth sternbrae, in the midsagittal plane	cCH	horizontal girth of torso measured at axilla	ICH	vertical distance from armpit back fold point to the ground
B	bust — most anterior point of the bust when wearing a bra	cB	horizontal girth measured at bust point level	IB	vertical distance from the bust point to the ground