TECHNICAL SPECIFICATION

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Footwear — Sizing — Conversion of sizing systems

Chaussures — Pointures — Conversion des systèmes de pointures

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Foreword

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The committee responsible for this document is ISO/TC 137, *Footwear sizing designations and marking systems*.

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Footwear — Sizing — Conversion of sizing systems

1 Scope

This Technical Specification comprises three shoe size conversion tables covering the major shoe sizing systems (Mondopoint, European and United Kingdom, as well as China, Japan and United States). The tables are based on measurement of foot length, this being the logical starting point for any shoe size marking system. The tables contain the following information:

Table 1 — Adults' technical shoe size conversion;

Table 2 — Adults' recommended shoe size marking (simplified);

Table 3 — Children's size conversion.

Explanatory notes are given in Clause 3.

NOTE It is acknowledged that, due to the different ways in which each system has been developed and interpreted over many years without being formalized into any national or International Standards (other than ISO 9407), there is no exact solution to the problem of accurate shoe size conversions. Tables 1 and 2 offer a good compromise solution which will, if adopted, benefit the consumer.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9407, *Shoe sizes — Mondopoint system of sizing and marking*

ISO/TS 19408, *Footwear — Sizing — Vocabulary and terminology*

3 Explanatory notes

3.1 General

There are three main sizing systems (Mondopoint, European and UK). As there are fundamental differences between them, they have been aligned to a common denominator: foot length. Foot length is deemed to be the key reference point when fitting footwear. Customers' foot length can be readily measured and shoes marked with a designation that indicates the appropriate shoe size that will accommodate their foot length. Customers expect to buy the same size of footwear irrespective of the footwear type or style.

NOTE To check that size marking is correct requires a practical fit assessment of footwear whereby subjects having appropriate foot lengths for the marked size don the footwear and the available toe allowance is assessed for satisfactory fit. Some allowance for foot width may also have to be made. This Technical Specification, however, does not attempt to assess the overall fitting properties of footwear i.e. it does not cover width, volume, toe depth, etc.

3.2 Table 1 — Adults' technical shoe size conversion

a) The Mondopoint system is defined in ISO 9407 and is based on foot length. The size grading intervals used with Mondopoint are given in DIN 66074-2:1975 as 5 mm (Range 1) or 7,5 mm (Range 2), both starting at zero. In practice, 10 mm intervals are commonly referred to as whole sizes and 5 mm intervals as half sizes. Intervals of 7,5 mm are used mainly for specialized footwear. China and Japan

use the Mondopoint system for length designation; Japan sometimes expresses size in centimetres rather than millimetres.

NOTE 1 Some footwear is marked with a 'CM' or CMS' size marking; this usually indicates a Mondopoint size in centimetres rather than millimetres though sometimes appears to indicate last length.

b) The European system (EUR) (previously known as Paris Points, French or Continental) is based on a size grading interval of 6,67 mm, starting at zero. This system may be interpreted as being based on last length or foot length depending on the country of origin, resulting in differences in shoe size markings (see Note 2).

c) The United Kingdom system (UK) is based on a size grading interval of 8,47 mm, starting at 101,6 mm (4 inches or equivalent to 12 size grading intervals). The first 13 sizes are referred to as children's sizes; the scale then re-starts at size 1 for larger sizes. This system was originally developed with regard to shoe or last length but subsequently redefined in terms of foot length.

d) The United States system (US) is based on a size grading interval of 8,47 mm, starting at 99,5 mm (3 $\frac{11}{12}$ inches). The first 13 sizes are referred to as children's sizes; the scale then re-starts at size 1 for larger sizes. In practice, however, the US system corresponds directly to the UK system but with the addition of an arbitrary off-set of one size difference for men's footwear and usually two sizes difference for women's footwear.

Table 1 gives precise conversion data utilizing mathematical relationships between the different scales based on an understanding of how the systems are generally implemented in practice.

A UK adult size is calculated from the foot length as:

$$\frac{l_f + (2 \times 8{,}47)}{8{,}47} - 25$$

where

l_f is foot length.

25 ≡ 12 sizes plus 13 children sizes, and 12 sizes ≡ 101,6 mm or 4 inches.

An EUR size is calculated from foot length as:

$$\frac{l_f + (2 \times 6{,}67)}{6{,}67}$$

In both cases the difference between foot length and shoe or last length is taken as being empirically equivalent to two sizes (two UK sizes or two EUR sizes respectively).

NOTE 2 An alternative approach to the European system, which is in use but not adopted here, is based on a 5 % difference between foot length and last length as opposed to a two grade interval difference. The two approaches give very similar size conversions to the Mondopoint and UK systems for sizes 38 to 46, but differ by approximately half a European size at the smallest and largest sizes.

Column 1 gives the exact foot length values for EUR and UK whole and half sizes, plus Mondopoint standard values (Ranges 1 and 2) where no EUR or UK foot length value lies within ± 0,5 mm. Columns 6 and 7 are for information only and indicate the approximate range of effective last lengths that might be associated with each foot length. The actual last length will usually be greater than the effective last length due to toe shape/fashion design (see ISO/TS 19408).

NOTE 3 Some customers might be surprised to see the EUR/UK size conversions given here and believe that the EUR size markings should be increased by half a size against the UK scale. For example, Table 2 shows 4 UK ≡ 36,5 EUR and 8 UK ≡ 41,5 EUR, while footwear is often labelled 4 UK/37 EUR and 8 UK/42 EUR. However, Tables 1 and 2 are considered more technically correct.

3.3 Table 2 — Adults' recommended shoe size marking (simplified)

To simplify Table 1 for the practical requirement of shoe labelling, while retaining the highest degree of accuracy with respect to foot length, requires a knowledge of which system was used to manufacture and grade the footwear.

Table 2 therefore gives the most accurate size conversions possible based on each of the three main sizing systems (Mondopoint, EUR or UK). It should be noted however, that even in this table, approximate size conversions have had to be used because the fundamental difference in size grading interval means that exact size conversions cannot be given to whole or half sizes. It is suggested that shoe labels might also reflect this information, for example, by use of bold font to indicate the size grading system used to manufacture the footwear, with the converted sizes following in plain font:

Women's	**Mondo**	EUR	UK	US
	240	38	5,5	7,5

Men's	**EUR**	Mondo	UK	US
	41	260	7,5	8,5

NOTE As a general rule, it is desirable to mark a shoe size down slightly as oppose to up so that it will encourage wearers to try a slightly generous fitting shoe rather than slightly tight fitting shoe. This will tend to benefit foot comfort and health. However, in practice, the wearer will chose whichever size suits their personal preference.

3.4 Table 3 — Children's recommended shoe size marking

Shoe size and typical effective last length are based on foot length plus a toe allowance of 8 % of foot length.

The US system is based on the UK system but with the addition of an arbitrary offset of usually half a size difference for children's footwear.

4 Conversion tables

Table 1 — Adults' technical shoe size conversion

Foot length (mm) [a]	Mondopoint, China and Japan		EUR	UK	Typical effective last length range (mm) [b c]	
	Range 1 (5 mm)	Range 2 (7,5 mm)	(6,67 mm) [d]	(8,47 mm) [d]		
210,0	210					
211,7				2	219	231
213,4			34		220	232
215,0	215				222	234
215,9				2,5	223	237
216,8			34,5		224	236
217,5		217,5			225	237
220,1	220		35		227	239
220,2				3	227	239
223,4			35,5		230	242
224,4				3,5	231	243
225,0	225	225			232	244
226,8			36		234	246
228,7				4	236	248
230,1	230		36,5		237	249
232,5		232,5			240	252
232,9				4,5	240	252
233,5			37		240	252
235,0	235				242	254
236,8			37,5		244	256
237,1				5	244	256
240,1	240	240	38		247	259
241,4				5,5	248	260
243,5			38,5		250	262
245,0	245				252	264
245,6				6	253	265
246,8			39		254	266
247,5		247,5			255	267

NOTE See Clause 3 for further explanation.

[a] Footwear is generally expected to accommodate a range of foot lengths equal to $l_f \pm \frac{i_{sg}}{2}$ where l_f is foot length and i_{sg} is size grading interval (see 3.2). Grade intervals are given in 3.2 a), b), c) and d).

[b] Effective last length as defined in ISO/TS 19408.

[c] Specialized footwear might fall outside this range.

[d] Size grading interval for whole sizes.

Table 1 *(continued)*

Foot length (mm) [a]	Mondopoint, China and Japan		EUR	UK	Typical effective last length range (mm) [b c]	
	Range 1 (5 mm)	Range 2 (7,5 mm)	(6,67 mm) [d]	(8,47 mm) [d]		
249,8	250			6,5	257	269
250,1			39,5		257	269
253,5			40		260	272
254,1				7	261	273
255,0	255	255			262	274
256,8			40,5		264	276
258,3				7,5	265	276
260,1	260		41		267	279
262,5		262,5		8	270	282
263,5			41,5		270	282
265,0	265				272	284
266,8			42	8,5	274	286
270,1	270	270	42,5		277	289
271,0				9	278	290
273,5			43		280	292
275,2	275			9,5	282	294
276,8			43,5		284	296
277,5		277,5			285	297
279,5				10	286	298
280,1	280		44		287	299
283,5			44,5		290	302
283,7				10,5	291	303
285,0	285	285			292	304
286,8			45		294	306
287,9				11	295	307
290,1	290		45,5		297	309
292,2		292,5		11,5	299	311
293,5			46		300	312
295,0	295				302	314
296,4				12	303	315
296,8			46,5		304	316
300,2	300	300	47		307	319

NOTE See Clause 3 for further explanation.

[a] Footwear is generally expected to accommodate a range of foot lengths equal to $l_f \pm \frac{i_{sg}}{2}$ where l_f is foot length and i_{sg} is size grading interval (see 3.2). Grade intervals are given in 3.2 a), b), c) and d).

[b] Effective last length as defined in ISO/TS 19408.

[c] Specialized footwear might fall outside this range.

[d] Size grading interval for whole sizes.