

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS T 8108 : 2020

(JSAA/JSA)

Occupational footwear

ICS 13.340.50

Reference number : JIS T 8108 : 2020 (E)

 **Documents**
Document Sharing Hub

Date of Establishment: 2020-03-25

Date of Public Notice in Official Gazette: 2020-03-25

Investigated by: Japanese Industrial Standards Committee
Standards Board for ISO area
Technical Committee on Safety

JIS T 8108:2020, First English edition published in 2021-06

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2021

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Classification	4
5 Basic performance	6
5.1 General	6
5.2 Design	7
5.3 Product performance	7
5.4 Upper	11
5.5 Outsole	12
6 Additional requirements	13
6.1 General	13
6.2 Product performance	13
6.3 Additional requirements for upper	14
6.4 Additional requirements for outsole	14
7 Marking	14
8 Instruction manual	15
8.1 General	15
8.2 Electrical insulating properties	15
8.3 Insock	16
Annex A (normative) Hybrid occupational footwear	17
Annex JA (informative) Methods for selecting occupational footwear suitable for work type	18
Annex JB (informative) Names of parts of occupational footwear	20
Annex JC (informative) Comparison table between JIS and corresponding International Standard	23

Foreword

This Japanese Industrial Standard has been established by the Minister of Health, Labour and Welfare and the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal for establishment of Japanese Industrial Standard submitted by Japan Safety Appliances Association (JSAA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act.

This **JIS** document is protected by the Copyright Act.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Ministers and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, published patent application or utility model rights.

Occupational footwear

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 20347:2012**, Edition 2, with some modifications of the technical contents of part of performance requirements so as to suit for use and management method of occupational footwear in Japan.

The dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JC. Annex JA and Annex JB are unique to **JIS** and not given in the corresponding International Standards.

1 Scope

This Standard specifies the requirements for occupational footwear that is used to protect the foot of the wearers in the workplaces of manufacturing industry, construction industry, freight industry, forest industry, fishery industry, etc. and not exposed to any mechanical risks (impact or compression). The basic rule of occupational footwear specified in this Standard is suitable for the type of any of the following work applications specified in Table 2: penetration resistant work, slip resistant work, cut resistant work, electrical insulating work, and heat resistant work.

NOTE The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 20347:2012 *Personal protective equipment—Occupational footwear (MOD)*

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS S 5037 *Sizing system for shoes*

JIS T 8010 *Testing method for withstand voltage of personal protective equipment and insulating devices*

JIS T 8107 *Test methods for protective and occupational footwear*

NOTE Corresponding International Standard: ISO 20344 *Personal protective equipment—Test methods for footwear*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1

occupational footwear

footwear incorporating protective features to protect the wearer from injuries which could arise through accidents

The occupational footwear shall be used only in the application not necessitating the protection performance of the toe region because it is not equipped with a protective toecap fitted to the toe region of the protective footwear.

3.2

leather

hide or skin tanned to be imputrescible

3.3

leather split

flesh or middle part of a hide or skin, obtained by splitting a thick leather, which is tanned to be imputrescible

3.4

rubber

vulcanized elastomers

3.5

polymeric materials

large molecules composed of repeating structural units (monomers) typically connected by chemical bond among Class II occupational footwear

Example Polyurethane (PU) or polyvinylchloride (PVC).

3.6

upper

generic term for the parts that wrap around the foot above the outsole of the shoe

The term is sometimes used synonymously with upper leather.

3.7

insole

non-removable component used to form the base of the shoe to which the upper is usually attached during lasting

3.8

insock

removable or non-removable footwear component used to cover part or all of the insole

“Non-removable” means that the insock cannot be removed without being damaged.

3.9

lining

material covering the inner surface of the upper

The wearer's foot is in direct contact with the lining. Backing materials such as knitted fabric, stocking, etc. used in Class II footwear is not considered as lining in this Standard.

3.10

vamp lining

material covering the inner surface of the forepart of the upper

3.11

quarter lining

material covering the inner surface of the quarters of the upper

3.12

outsole

part of the sole of the shoe that touches the floor, including seat region

3.13

midsole

intermediate component, not in direct contact with the floor, in a multi-layered component at the bottom of the shoes

An outsole combined with a midsole is called a shoe sole in this Standard.

3.14

cleat

protruding part of the outer surface of the sole for the purpose of slip-resistant

3.15

penetration-resistant insert

footwear component placed in the sole complex in order to provide protection against penetration

3.16

toe puff

material used in the toe region of the occupational footwear for the purpose of retaining the shape of the toe region

3.17

feather line

line connecting upper of shoe and joint part of outsole in whole circumference of shoe

3.18

electrical insulating properties

property of footwear which protects the wearer against electrical shocks by preventing the passage of dangerous current through the body via the feet if the material used in the upper and the outsole of the shoe falls under the provisions of this Standard and the sole of the shoe comes into contact with the charging part

3.19

fuel oil

aliphatic hydrocarbon constituent of petroleum

3.20

hybrid occupational footwear

shoe of which the upper uses material different from the material which extends the upper in Class II occupational footwear

See Figure A.1.

3.21

cut through

cut length exceeding 10 mm in the protective material surface nearest to the body side of the wearer in the cutting test of the protective materials

The definition above means as follows: when the specimen is a single-layered or multi-layered material constituting a final product, e.g. cut resistance occupational footwear, a saw chain in motion is brought into contact with the outside surface of the specimen viewed from the wearer's body. When the saw chain decelerates and finally stops while cutting the specimen's layer(s), a cut exceeding 10 mm in length is generated on the face opposite to the face in contact with the saw chain (see **JIS T 8125-1**).

NOTE The names of parts of the occupational footwear are given in Annex JB.

4 Classification

Occupational footwear shall be classified in accordance with Table 1, Table 2 and Table 3.

Table 1 Classification according to material class

Material class	Content	Symbol
Class I	Footwear made from leather for upper and from other materials for outsole	CI
Class II	All-rubber (i.e. entirely vulcanized) or all-polymeric (i.e. entirely moulded) footwear	CII

Table 2 Classification according to work application

Work application		Content	Symbol
For penetration resistant work		Footwear with penetration resistance satisfying specified values in this Standard	P
For slip resistant work	Slip resistance Class 1	Footwear with dynamic friction coefficient satisfying specified values for slip resistance Class 1	F1
	Slip resistance Class 2	Footwear with dynamic friction coefficient satisfying specified values for slip resistance Class 2	F2
For cut resistant work		Footwear which does not produce a cut through in cut resistance test	C
For electrical insulating work	For 600 V AC or under	Footwear which satisfies specified insulation value for 600 V AC or under in electrical performance test	I-600
	For 3 500 V AC or under	Footwear which satisfies specified insulation value for 3 500 V AC or under in electrical performance test	I-3500
	For 7 000 V AC or under	Footwear which satisfies specified insulation value for 7 000 V AC or under in electrical performance test	I-7000
For heat resistant work	For high-temperature thermal conductivity work	High-temperature thermal conductivity Class 1	HI1
		High-temperature thermal conductivity Class 2	HI2
	For low-temperature thermal conductivity work	Low-temperature thermal conductivity Class 1	CI1
		Low-temperature thermal conductivity Class 2	CI2

Table 3 Classification by additional requirements

Additional requirement	Symbol
Absorption of impact energy in seat region	E
Water resistance	W
Resistance to hot contact on outsole	H
Resistance to fuel oil on outsole	BO
Resistance to fuel oil on upper	UO
NOTE Methods for selecting occupational footwear suitable for work type are given in Annex JA (informative).	

5 Basic performance

5.1 General

Occupational footwear shall satisfy at least one performance requirement among penetration resistance, slip resistance, cut resistance, electrical insulating properties and heat-resistant conductivity. These requirements can be selected according to application.

The basic performance of occupational footwear shall be in accordance with Table 4.

Table 4 Basic performance of occupational footwear

Requirement		Subclause	Classification	
			Class I	Class II
Design	General	5.2.1	◎	◎
	Size	5.2.2	◎	◎
Whole footwear	Sole performance:	5.3.1		
	— Construction	5.3.1.1	◎	
	— Upper/outsole bond strength	5.3.1.2	◎	
	Penetration resistance	5.3.2	△	△
	Slip resistance	5.3.3	△	△
	Cut resistance	5.3.4	△	△
	Electrical insulating properties	5.3.5	△	△
	Heat-resistant conductivity	High-temperature thermal conductivity on sole	△	△
		Low-temperature thermal conductivity on sole	△	△
	Wearability	5.3.7	◎	◎
	Leakproofness	5.3.8		◎
Upper	Thickness	5.4.1	◎	◎
	Tensile properties	5.4.2		◎
	Hydrolysis	5.4.3		◎
	Grain crack	5.4.4	◎	
	Ageing resistance	5.4.5		◎
Outsole	Cleat	5.5.1	◎	◎
	Thickness and cleat height	5.5.2	◎	◎
	Tear strength	5.5.3	◎	
	Tensile properties	5.5.4	◎	◎
	Hydrolysis	5.5.5	◎	◎
	Ageing resistance	5.5.6	◎	◎
- The applicability of a requirement to a particular classification is indicated by “◎” or “△”. “◎” means the requirement shall be met. - In some cases the requirement relates only to particular materials within the classification, e.g. hydrolysis property of upper and outsole made of polyurethane. This does not mean that other materials are precluded from use. “△” means at least one of the requirements shall be met. NOTE 1 The absence of “◎” and “△” indicates that there is no requirement. NOTE 2 Methods for selecting occupational footwear suitable for work type are given in Annex JA (informative).				

5.2 Design

5.2.1 General

Footwear shall conform to one of the designs given in Figure 1.

Design E can be a knee-height boot (Design D) equipped with a thin impermeable material as indicated by “a” which extends the upper and which can be cut to adapt the boot to the wearer.

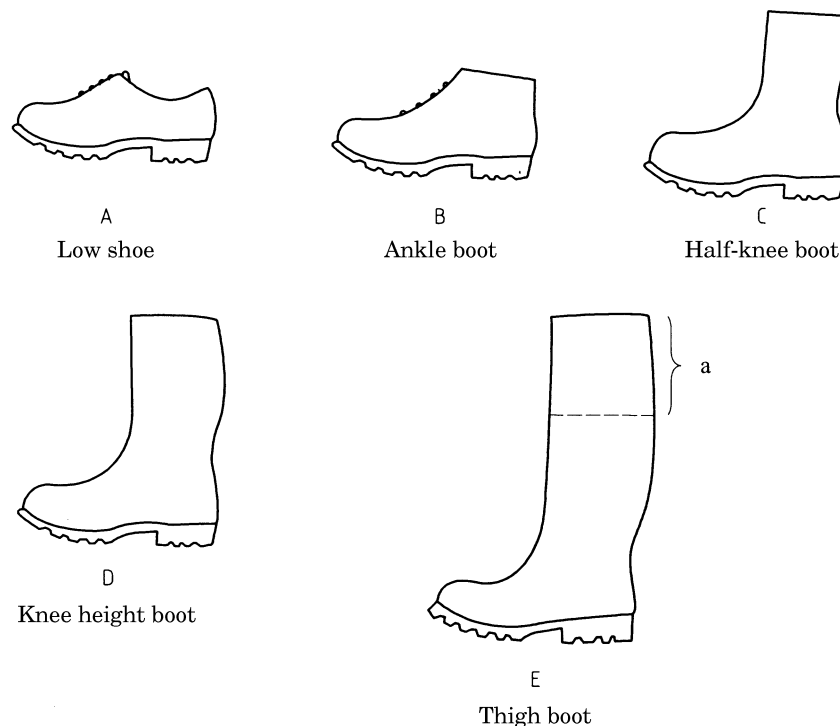


Figure 1 Designs of occupational footwear

5.2.2 Size

Occupational footwear sizes shall be in accordance with JIS S 5037.

5.3 Product performance

5.3.1 Outsole performance

5.3.1.1 Construction

When an insole is used, it shall not be possible to remove it without damaging the footwear. If there is no insole, a permanently attached insock shall be present.

5.3.1.2 Upper/outsole bond strength

When occupational footwear other than with a stitched sole is tested in accordance with the method described in **JIS T 8107, 5.1**, the upper/outsole bond strength shall be not less than 250 N. Both left and right shoes shall be tested and shall satisfy the above specified value.

In the case where the shoe sole is multi-layered, the bond strength of the upper and the midsole in contact with the upper shall be tested.

5.3.2 Penetration resistance

5.3.2.1 Construction of penetration-resistant insert

The penetration-resistant insert shall be built into the bottom of the shoe in such a manner that it cannot be removed without damaging the occupational footwear.

5.3.2.2 Corrosion resistance of metallic penetration-resistant inserts

When occupational footwear equipped with a metallic penetration-resistant insert is tested in accordance with **JIS T 8107, 5.7.3.1** and **5.7.3.2**, the metallic penetration-resistant insert shall exhibit no more than five areas of corrosion, none of which shall exceed 2.5 mm².

5.3.2.3 Flex resistance of penetration-resistant inserts

When penetration-resistant inserts in all types of occupational footwear are tested in accordance with **JIS T 8107, 5.7.3.3**, they shall show no visible signs of cracking or delamination after being subjected to 1×10^6 flex cycles.

5.3.2.4 Penetration resistance of metallic penetration-resistant inserts

When metallic penetration-resistant inserts are tested in accordance with **JIS T 8107, 5.7.1**, the force required to penetrate the sole unit shall be not less than 1 100 N.

5.3.2.5 Penetration resistance of non-metallic penetration-resistant inserts

When the penetration resistance of non-metallic penetration-resistant inserts is tested in accordance with **JIS T 8107, 5.7.2**, using a force of 1 100 N, the tip of the test nail shall not penetrate through the test piece. In order to achieve a “pass” result, the tip of the test nail shall not protrude from the test piece. This shall be checked by visual, cinematographic or electrical detection.

5.3.3 Slip resistance

5.3.3.1 General

Concerning the slip resistance of the occupational footwear, the dynamic friction coefficient shall be measured when the occupational footwear placed stationary on a horizontal plane is slid forward on a stainless steel floor coated with glycerine. The requirements are applicable to conventionally soled occupational footwear. They are not applicable to special-purpose occupational footwear containing spikes, metal studs or similar, nor to special-purpose occupational footwear to be used on soft ground (sand, sludge, etc.).

5.3.3.2 Slip resistance on stainless steel floor with glycerine

Occupational footwear resistant to slip on a stainless steel floor with glycerine, when tested in accordance with **JIS T 8107, 5.14**, shall fulfil the requirements of Table 5.