

Portable equipment for projecting extinguishing agents supplied by fire fighting pumps — Portable monitors

Part 2: Water nozzles

ICS 13.220.10

National foreword

This British Standard is the UK implementation of EN 15767-2:2009.

The UK participation in its preparation was entrusted to Technical Committee FSH/17/8, Hydrants, hoses and associated water delivery equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2009.

© BSI 2009

ISBN 978 0 580 61143 8

Amendments/corrigenda issued since publication

Date	Comments

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15767-2

June 2009

ICS 13.220.10

English Version

Portable equipment for projecting extinguishing agents supplied
by fire fighting pumps - Portable monitors - Part 2: Water
nozzles

Équipement portable de projection d'agents d'extinction
alimenté par des pompes à usage incendie - Lances-canon
portables - Partie 2 : Diffuseurs à eau

Tragbare Geräte zum Ausbringen von Löschmitteln, welche
mit Feuerlöschpumpen gefördert werden - Tragbare Werfer
- Teil 2: Wasserdüsen

This European Standard was approved by CEN on 23 April 2009.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Requirements	5
4.1 Mechanical characteristics.....	5
4.2 Materials	6
4.3 Flush	6
4.4 Hydraulic characteristics.....	7
4.5 Leak-tightness.....	8
5 Testing and verification	9
5.1 General.....	9
5.2 Jet spray angle measurement	9
5.3 Heat and frost test	9
5.4 Flushing.....	9
5.5 Flow and throw test.....	9
5.6 Leak-tightness test	10
6 Information for use	10
6.1 Instruction and maintenance handbook	10
6.2 Marking	11
Annex A (informative) Acceptance test on delivery	12
Annex B (normative) Datasheet for water nozzles	13
B.1 General.....	13
B.2 General data	13
B.3 Flow – pressure chart.....	13
B.4 Operational devices.....	16
B.5 Requirements.....	17
B.6 Optional extra data (no requirements)	17
B.7 Data certified by *	17
Annex C (informative) Example of completed datasheet for water nozzles	18
C.1 General data	18
C.2 Flow – pressure chart.....	18
C.3 Operational devices.....	20
C.4 Requirements.....	21
C.5 Optional extra data (no requirements)	21
C.6 Data certified by *	21
Bibliography	22

Foreword

This document (EN 15767-2:2009) has been prepared by Technical Committee CEN/TC 192 “Fire service equipment”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

EN 15767 consists of the following parts, under the general title *Portable equipment for projecting extinguishing agents supplied by fire fighting pumps — Portable monitors*:

Part 1: General requirements for portable monitor assemblies;

Part 2: Water nozzles;

Part 3: Foam devices¹⁾.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1) Under preparation.

1 Scope

1.1 In addition to the requirements given in EN 15767-1, this European Standard is applicable to water nozzles, including water with fire extinguishing additives. It specifies requirements for safety, performance, classification and designation, as well as test methods, instructions for use and maintenance and marking.

1.2 This European Standard is not applicable to water nozzles that are manufactured before its date of publication.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 15767-1:2009, *Portable equipment for projecting extinguishing agents supplied by fire fighting pumps — Portable monitors — Part 1: General requirements for portable monitor assemblies*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions of EN 15767-1:2009 and the following apply.

3.1

water nozzle

component, without shut-off function, connected to the outlet of the monitor that controls the water stream (shape and quantity)

NOTE Several types of water nozzles are described in 3.1.1, 3.1.2 and 3.1.3.

3.1.1

smooth bore water nozzle

nozzle providing a solid water stream

3.1.2

flat spray water nozzle

nozzle providing a flat spray water stream

3.1.3

combination water nozzle

nozzle with a adjustable pattern, corresponding to the following definitions

3.1.3.1

combination water nozzle – type 1

nozzle with adjustable pattern at variable flow

NOTE Changing the pattern changes the flow.

3.1.3.2

combination water nozzle – type 2

nozzle with adjustable pattern at constant flow

NOTE Changing the pattern does not change the flow.

3.1.3.3

combination water nozzle – type 3

nozzle with adjustable pattern at selectable, constant flow

NOTE Changing the pattern does not change the flow.

3.1.3.4

combination water nozzle – type 4 (automatic water nozzle)

nozzle with integrated pressure control device

NOTE Changing the pattern does not change the flow.

3.1.3.4.1

combination water nozzle – type 4.1

nozzle with adjustable pattern at constant pressure

3.1.3.4.2

combination water nozzle – type 4.2

nozzle with adjustable pattern and selectable flow at constant pressure

3.2

median pressure

p_m

for automatic water nozzle, average pressure of the pressure control range

3.3

jet

3.3.1

straight jet

jet having the maximum throw and mechanical effect

3.3.2

spray jet

any jet different to the straight jet

[EN 15182-1:2007]

3.4

flush

position allowing the water nozzle to clear debris

3.5

manufacturer's stated maximum flow

Q_{max}

flow under which the water nozzle can be operated safely and efficiently

4 Requirements

4.1 Mechanical characteristics

4.1.1 Mass

The water nozzle shall have a maximum mass as defined in Table 1.

Table 1 — Maximum mass

Q_{\max} l/min	Maximum mass of the water nozzle kg
< 2 000	4
2 000 - 4 000	8
4 000 – 8 000	12
> 8 000	20
NOTE The maximum mass does not apply to seawater-resistant nozzles.	

4.1.2 Operating and handling elements

The torques needed to move the operating elements shall not exceed the values given in Table 2 at pressures up to the nominal pressure.

Table 2 — Maximum torques

Type of operating element	Torque N·m
Lever	20
Valve handle	15
Rotating operating elements	15

4.1.3 Flow adjustment positions

The settings of the water nozzle equipped with selectable flowrate shall be easily identifiable by visual means.

4.1.4 Jet adjustment positions

The different jet positions of a nozzle equipped with adjustable jet positions shall be clearly marked.

4.2 Materials

The materials used shall be selected in such a way that all the requirements in Clause 4 are met, subject to the tests defined in Clause 5.

The water nozzle shall pass the heat and frost tests defined in 5.3.

4.3 Flush

4.3.1 The combination nozzle with Q_{\max} less than 2 000 l/min, when tested in accordance with 5.4, shall be able to clear or flush a steel ball of 6,35 mm diameter without shutting off the nozzle.

NOTE This should be accomplished either through the full open nozzle position or through a flush feature of the nozzle. In nozzles with flowrate over 2 000 l, blockage due to debris is not likely because of the larger opening of the nozzle.

4.3.2 Water nozzles equipped with a flush feature shall have a mechanical and/or visual device to indicate to the user when the flush feature is being engaged.

4.4 Hydraulic characteristics

4.4.1 Pressures

The following pressures, measured at the nozzle inlet, shall be used for the determination of the hydraulic characteristics:

reference pressure: $p_R = 6 \text{ bar} \pm 0,1 \text{ bar}$;

median pressure for automatic water nozzle: p_m ;

nominal pressure: $p_N = 16 \text{ bar}$;

test pressure: $p_t = 25,5 \text{ bar}$.

4.4.2 Flowrates

All flowrates indicated on the nozzle shall be measured at straight jet and at the maximum spray angle position at the reference pressure p_R .

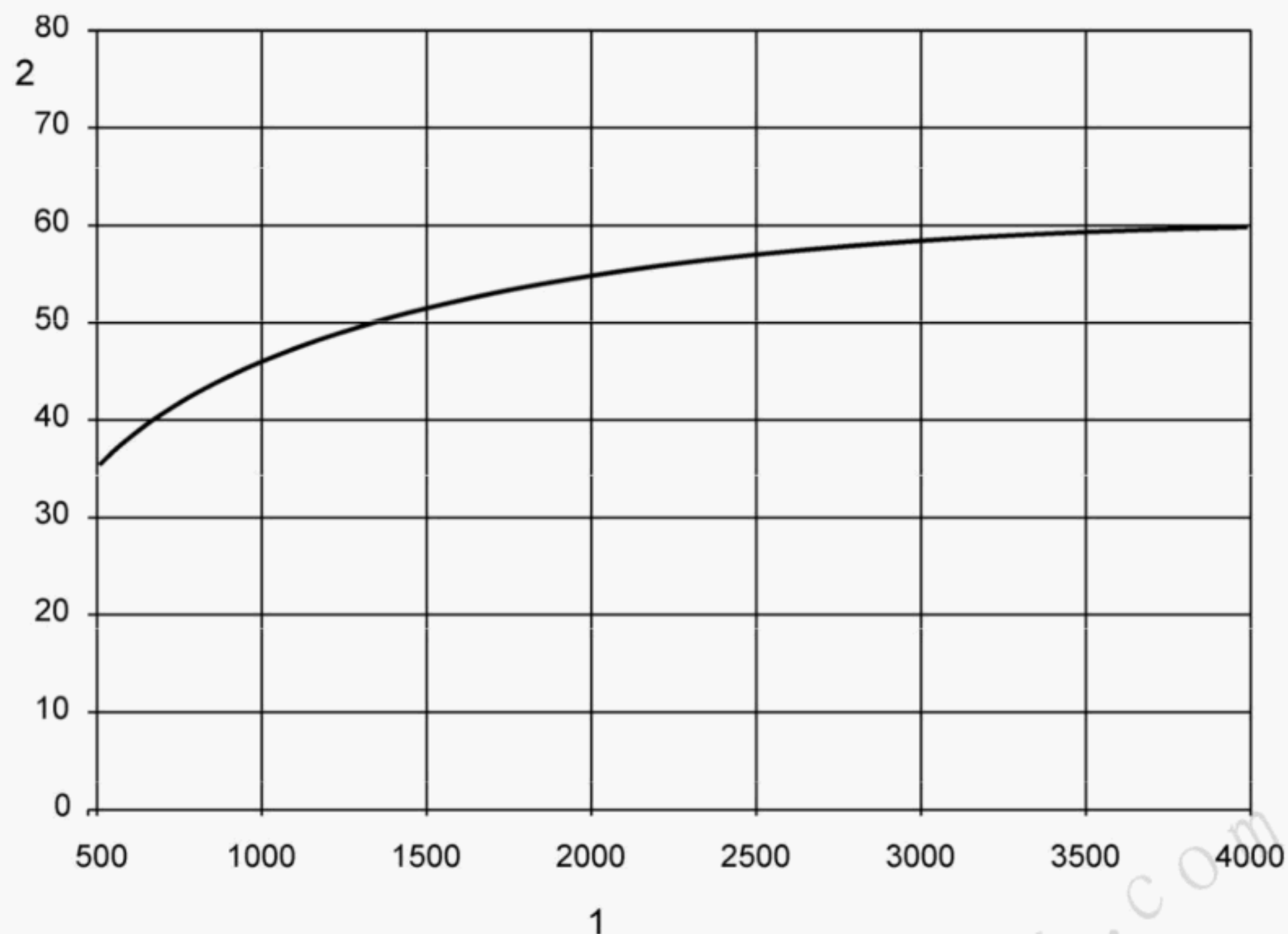
The flowrates measured at the reference pressure p_R shall not deviate by more than $- 0/+ 10 \%$ of the flowrate setting of the nozzle.

NOTE The deviation should also apply when the shape of the stream is altered.

4.4.3 Effective throw

The water nozzle shall achieve, for each flowrate position above 500 l/min, a minimum effective throw d_{eff} as shown in Figure 1, when set to a straight jet at the reference pressure.

For water nozzles above 4 000 l/min, the minimum effective throw shall be at least 60 metres.



Key

- 1 Flowrate Q in litres per minute
- 2 Effective throw d_{eff} in metres

Figure 1 — Effective throw

4.4.4 Spray jet

The spray jet shall have a spray angle of at least 100°.

4.4.5 Automatic water nozzles

For automatic water nozzles, the regulation range (pressure at the beginning of the range and pressure at the end of the range) shall be stated in the documentation accompanying the product, from which the median pressure is calculated.

The flow should be set at both the minimum and maximum flow and the pressure for each shall be read.

This pressure shall not deviate from the median pressure by more than 30 %.

4.5 Leak-tightness

The nozzle shall show no leakage during 1 min at the reference pressure $p_R = 6$ bar.

NOTE No leakage means no visible weeping or drop formation from the body of the nozzle.

5 Testing and verification

5.1 General

All tests shall be done with water only.

Unless otherwise specified, tests shall be carried out at the reference pressure p_R , in the following order.

NOTE Guidance for acceptance tests on delivery is given in Annex A.

5.2 Jet spray angle measurement

Arrange the water nozzle on a fixed support in a horizontal position 1,5 m above the ground, in a zone where the wind speed is lower than 2 m/s.

Arrange a rule perpendicular to the flow at a distance of 1 m. This rule shall be marked in order to determine the spray angle.

5.3 Heat and frost test

5.3.1 Sensitivity to heat

It shall be possible to use the water nozzle without restricting its function after it has been stored for 24 h at $(55 \pm 2) ^\circ\text{C}$.

NOTE Hand protection should be used when carrying out this test.

5.3.2 Sensitivity to frost

The water nozzle shall be disconnected following operation for 1 min at the reference pressure p_R . It shall then be drained for 1 min and stored at a temperature of $(- 15 \pm 2) ^\circ\text{C}$ for 30 min. Following this, it shall still be possible to move the operating elements manually.

NOTE Hand protection is recommended.

5.4 Flushing

The combination nozzle shall be held in the vertical position, discharge end down.

The steel ball shall pass through the nozzle.

5.5 Flow and throw test

The effective throw shall be measured under the following conditions, in accordance with Figure 2:

effective throw (in metre): furthest droplets - 10 % = $d_{\text{eff}} = 0,9 d_{\text{max}}$;

pressure at the inlet of the nozzle: $p_R = 6 \text{ bar}$;

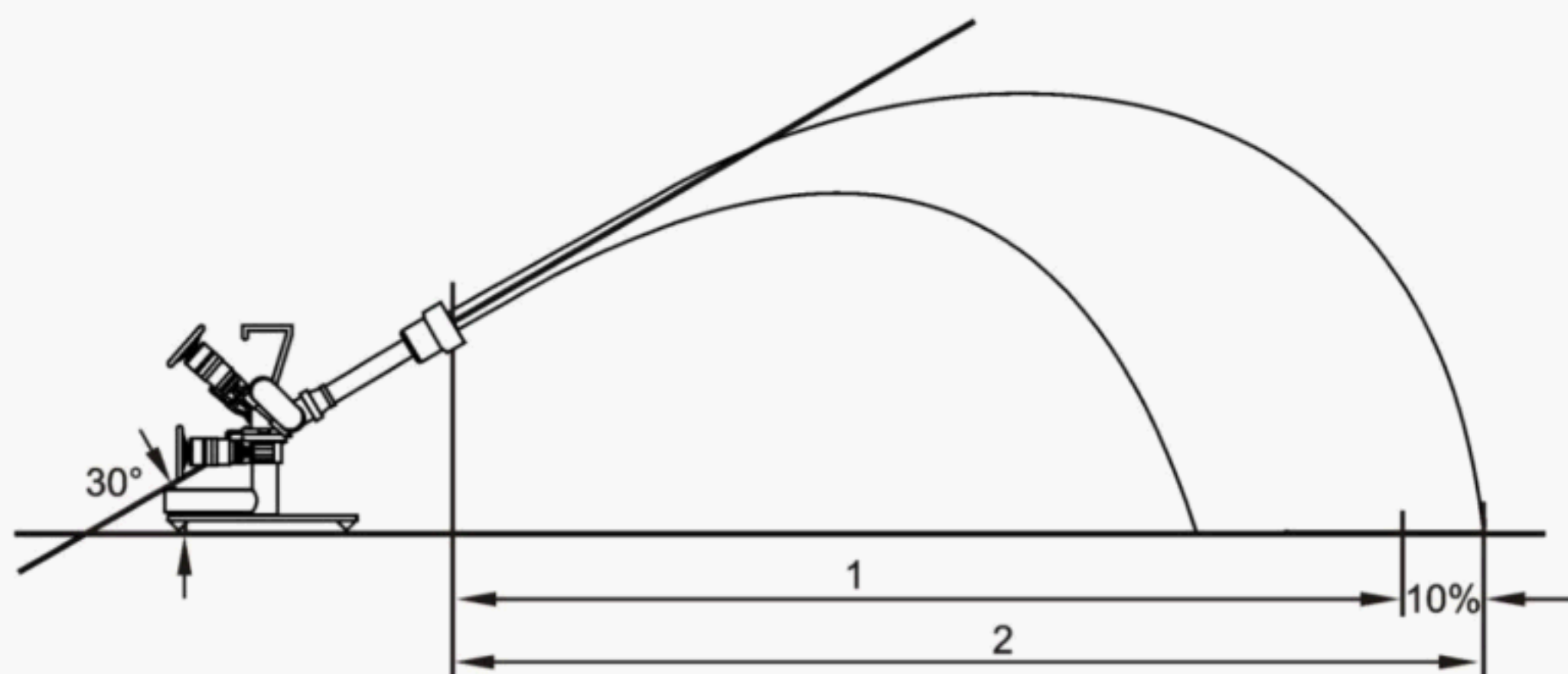
inclination: $(30 \pm 0,5)^\circ$;

height: the outlet of the nozzle shall be no more than 1 m from the ground;

maximum wind speed: 2 m/s (Beaufort scale 3).

The measurement shall be carried out when the system is stabilised.

The maximum effective throw shall be given in the instruction handbook.



Key

- 1 Effective throw (d_{eff})
- 2 Maximum throw (d_{max})

Figure 2 — Measurement of the effective throw

5.6 Leak-tightness test

The leak test shall be conducted in accordance with 4.5.

6 Information for use

6.1 Instruction and maintenance handbook

6.1.1 General

Each water nozzle shall be delivered with an instruction and maintenance handbook.

NOTE 1 These instructions may be combined with those for the portable monitor body.

NOTE 2 This handbook should be made available, if required by the user, in a digital format.

6.1.2 Instruction handbook

The instruction handbook shall contain at least the following information:

name and/or logo and contact details of manufacturer;

data sheet according to Annex B (see also an example of a complete data sheet in Annex C);

product warnings;

general information for use.

6.1.3 Maintenance handbook

The maintenance handbook shall at least contain:

- maintenance instructions;
- sectional or exploded diagram;
- spare parts list cross-referenced to diagram.

6.2 Marking

Water nozzles shall be permanently marked with at least the following information:

- identification of the manufacturer;
- serial or batch number and/or year of manufacture;
- reference to this standard;
- type of water nozzle;
- type of spray;
- Q_{\max} ;
- P_N ;
- p_M (for type 4 nozzles);
- jet adjustment directions or positions, where applicable;
- flush position, where applicable;
- various flow positions, where applicable.

Annex A

(informative)

Acceptance test on delivery

Acceptance tests based on the safety and performance requirements of this part of this European Standard may be undertaken on delivery by the customer, by an independent or national testing organisation or by any other third party of the customers' choice and the results of the tests recorded.

The inspection may include:

- examination of all of the test results and the conformity documentation;

- confirmation that the water nozzle specification has been met by visual and functional inspection or test;

- confirmation that the required water nozzle documentation, as specified in the standard, is available;

- confirmation that the performance and specification of the water nozzle meet the requirements of the standard.

标准分享网 www.bzfxw.com

Annex B (normative)

Datasheet for water nozzles

B.1 General

NOTE 1 The symbol * means "where applicable" in the whole datasheet.

NOTE 2 The actual test results can be entered in the data sheet, when these exceed the minimum requirements given in this Standard.

Information shall be provided describing the equipment and method used for flow measurement.

B.2 General data

Manufacturer	
Model	
Type according to EN 15767-2, 3.1.3	
Maximum flowrate (l/min) Q_{\max}	
Flowrate settings*	
Type of spray*	

B.3 Flow – pressure chart

In the charts (see Figures B.3 and B.4), the cone spray types shall be represented by the symbols (or combinations of the symbols) as shown in Figure B.1, where applicable, and the throw shall be represented by the symbols as shown in Figure B.2.



Key

- 1 hollow cone spray
- 2 full cone spray
- 3 hollow/full cone spray alternatively
- 4 hollow cone spray combined with narrow spray jet
- 5 hollow cone spray combined with full jet

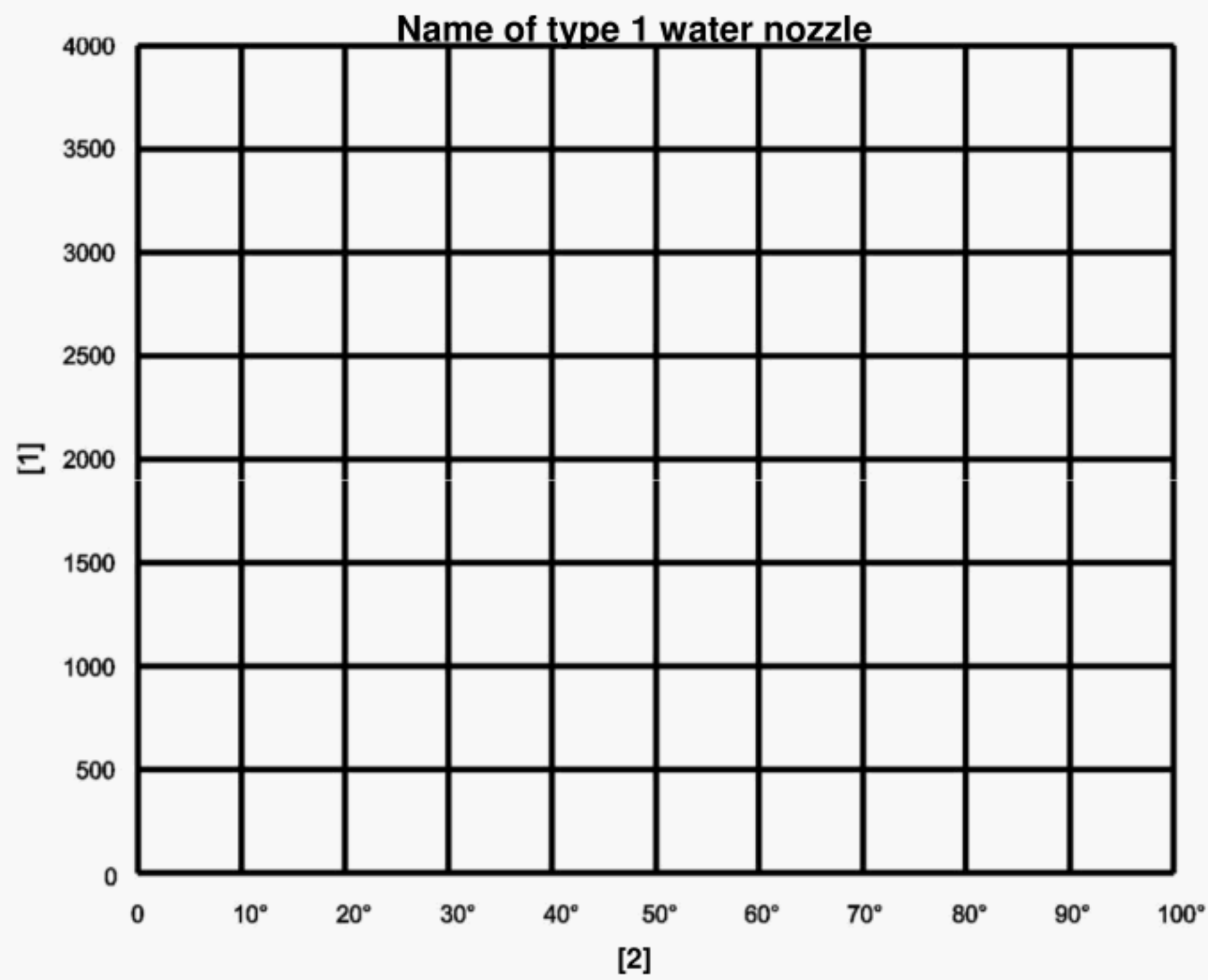
Figure B.1 — Symbols for spray types



Key

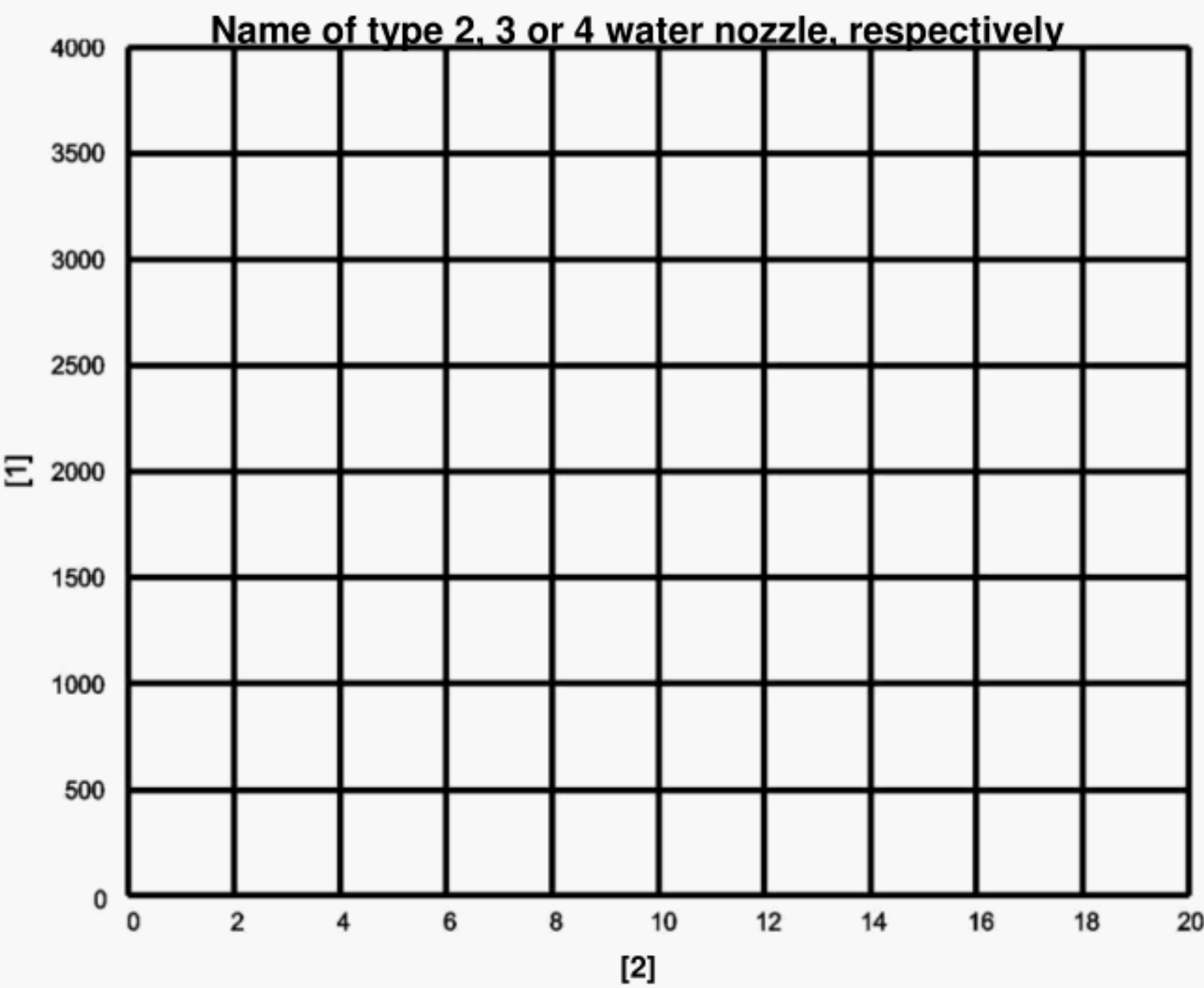
- 1 Full Jet: Throw [m] (using a straight line)
 - 2 Maximum Spray Jet: Throw [m] (using a dotted line)
- NN throw (metres)

Figure B.2 — Symbols for throw at spray types



- Key**
- 1 Flow [l/min]
 - 2 Angle of rotation [degrees]

Figure B.3 — Flow chart template for type 1 water nozzle at p_R , as specified in EN 15767-2



Key

- 1 Flow [l/min]
- 2 Pressure [bar]

Figure B.4 — Pressure chart template for water nozzles as specified in EN 15767-2, types 2, 3 and 4 and at minimum and maximum flow settings*

B.4 Operational devices

Fitting system	
Jet / spray system*	
Flow adjustment system*	

B.5 Requirements

Number of the relevant clause of this part of this Standard	Item		Minimum required	Test result
4.1.1	Maximum mass (kg)			
4.1.2	Maximum torques (N·m)	Rotating elements		
		Valve handle		
		Lever		
4.2	Sensitivity to heat (°C)			
	Sensitivity to frost (°C)			
4.3	Non-obstruction test* (mm)			
4.4.3	Effective throw (m)			
4.4.4	Maximum spray jet*: angle			

B.6 Optional extra data (no requirements)

Ageing test	UV test	
	Ozone test	
	Corrosion test	

B.7 Data certified by *

Annex C
(informative)

Example of completed datasheet for water nozzles

NOTE 1 The symbol * means "where applicable" in the whole datasheet.

C.1 General data

Manufacturer	FED
Model	Nozzle-flow
Type according to	
EN 15767-2 3.1.3	EN 15767-2, combination water nozzle type 2
Maximum flowrate (l/min) Q_{max}	3 000 l/min
Flowrate settings*	None
Type of spray*	Full cone

C.2 Flow – pressure chart

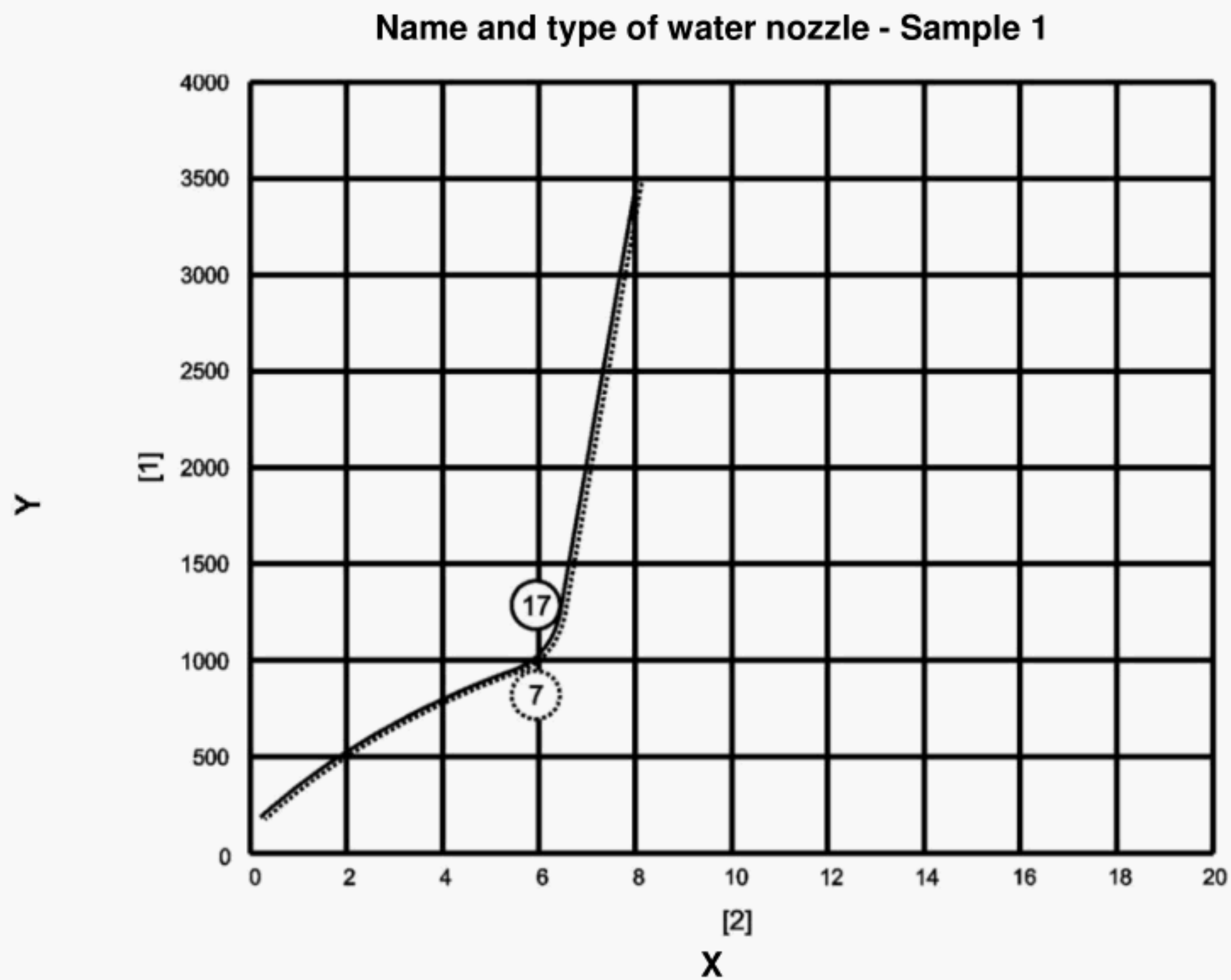
In the charts (see Figures C.2 and C.3), the cone spray types shall be represented by the symbols (or combinations of the symbols) as shown in Figure C.1, where applicable.



Key

- 1 hollow cone spray
- 2 full cone spray
- 3 hollow/full cone spray alternatively
- 4 hollow cone spray combined with narrow spray jet
- 5 hollow cone spray combined with full jet

Figure C.1 — Symbols for spray types



Key

X Pressure [bar]
Y Flow [l/min]

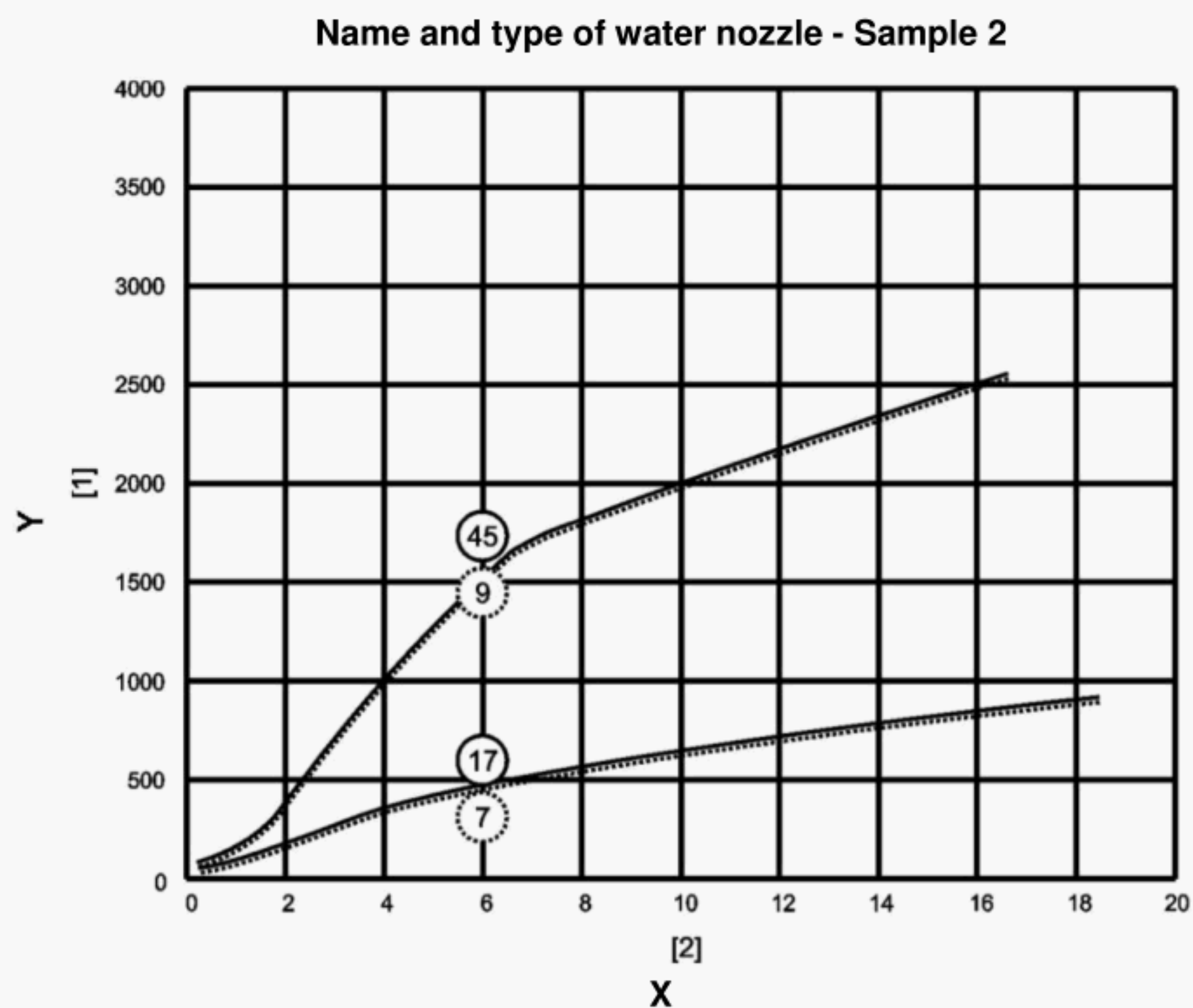


Full Jet: Throw [m] (using a straight line)



Maximum Spray Jet: Throw [m] (using a dotted line)

Figure C.2 — Pressure chart template (sample 1) for type 4 water nozzle, as specified in EN 15767-2



Key

X Pressure [bar]
Y Flow [l/min]



-  Full Jet: Throw [m] (using a straight line)
-  Maximum Spray Jet: Throw [m] (using a dotted line)

Figure C.3 — Pressure chart template (sample 2) for water nozzles as specified in EN 15767-2, type 2 at minimum and maximum flow settings

C.3 Operational devices

Fitting system	Swivelling 2 ½ BSP thread (male, according to EN ISO 228-1 [1] and -2 [2])
Jet / spray system*	Rotating elements
Flow adjustment system*	No

C.4 Requirements

Number of the relevant clause of this part of this			required	Test result
	Item		Minimum	
Standard 4.1.1	Maximum mass (kg)			
			< 4,0	3,5
		Rotating elements	15	12
4.1.2	Maximum torques (N·m)	Valve handle	15	10
		Lever	20	16
4.2	Sensitivity to heat (°C)		≥ + 55	60
	Sensitivity to frost (°C)		≤ - 15	- 15
4.3	Non-obstruction test* (mm)		-	-
4.4.3	Effective throw (m)		> 58	60
4.4.4	Maximum spray jet*: angle		> 100	110

C.5 Optional extra data (no requirements)		
	UV test	

Ageing test

Ozone test

Corrosion test

C.6 Data certified by *

Bibliography

- [1] EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*
- [2] EN ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges (ISO 228-2:1987)*
- [3] EN 15182-1:2007, *Hand-held branchpipes for fire service use — Part 1: Common requirements*

BSI - British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001 Email: orders@bsigroup.com You may also buy directly using a debit/credit card from the BSI Shop on the Website <http://www.bsigroup.com/shop>

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact Information Centre. Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048 Email: info@bsigroup.com

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001 Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at <http://www.bsigroup.com/BSOL>

Further information about BSI is available on the BSI website at <http://www.bsigroup.com>.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

Details and advice can be obtained from the Copyright and Licensing Manager. Tel: +44 (0)20 8996 7070 Email: copyright@bsigroup.com