BRITISH STANDARD

BS EN
12560-1:2001

Flanges and their joints — Gaskets for Class-designated flanges —

Part 1: Non-metallic flat gaskets with or without inserts

The European Standard EN 12560-1:2001 has the status of a British Standard

ICS 23.040.80

National foreword

This British Standard is the official English language version of EN 12560-1:2001. It supersedes BS 7076-1:1989 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PSE/2, Jointing material and compounds, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 March 2001

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 17 and a back cover.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12560-1

January 2001

ICS 23.040.80

English version

Flanges and their joints — Gaskets for Class-designated flanges — Part 1: Non-metallic flat gaskets with or without inserts

Brides et leurs assemblages — Joints pour les brides désignées Class — Partie 1: Joints plats non métalliques avec ou sans insert

Flansche und ihre Verbindungen — Dichtungen für Flansche mit Class-Bezeichnung — Teil 1: Flachdichtungen aus nichtmetallischem Werkstoff mit oder ohne Einlagen

This European Standard was approved by CEN on 28 December 2000.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 12560-1:2001 E

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 74, Flanges and their joints, the Secretariat of which is held by DIN.

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 July 2001, and conflicting national standards shall be withdrawn at the latest by July 2001.

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

The annex A is informative and contains “A-deviations”.

Introduction

EN 12560 consists of seven parts:

Part 1: Non-metallic flat gaskets with or without inserts.

Part 2: Spiral wound gaskets for use with steel flanges.

Part 3: Non-metallic PTFE envelope gaskets.

Part 4: Corrugated, flat or grooved metallic and filled metallic gaskets for use with steel flanges.

Part 5: Metallic ring-joint gaskets for use with steel flanges.

Part 6: Kammprofile gaskets for use with steel flanges.

Part 7: Covered metal jacketed gaskets for use with steel flanges.

The terminology and definitions in this standard are in accordance with those given in ISO standards.

WARNING: Gaskets made to this standard may contain asbestos. Materials containing asbestos may be subject to legislation that requires precautions to be taken when handling them to ensure that they do not constitute a hazard to health (see annex A). Attention is drawn to the relevant EC directives.

1 Scope

This European Standard specifies the dimensions, types, designation and marking of non-metallic flat gaskets, with or without insertion, for use with flanges in accordance with prEN 1759-1:2000, prEN 1759-3:1994 and prEN 1759-4:1994, for Class designations Class 150, Class 300, Class 600 and Class 900 for nominal sizes DN 15 to DN 600.

NOTE: Dimensions of other types of gaskets for use with flanges complying with prEN 1759-1:2000, prEN 1759-3:1994 and prEN 1759-4:1997 are given in prEN 12560-2:2000, prEN 12560-3:2000, prEN 12560-4:2000,prEN 12560-5:2000, prEN 12560-6:2000 and prEN 12560-7:2000.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

prEN 1759-1:2000
Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 1: Steel flanges, nominal pipe sizes NPS ½ to NPS 24.

prEN 1759-3:1994
Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 3: Copper alloy and composite flanges.

prEN 1759-4:1997
Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, Class designated — Part 4: Aluminium alloy flanges.

EN ISO 6708
Pipework components — Definition and selection of DN (nominal size) (ISO 6708:1995).

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1
DN

see EN ISO 6708

3.2
NPS

see prEN 1759-3:1994

3.3
Class

see prEN 1759-3:1994

4 Designations

4.1 Range of Class designations

Gaskets shall be designated as suitable for use with one or more of the following Class designations of flange:

- Class 150;
- Class 300;
- Class 600;
- Class 900.

4.2 Range of gasket sizes

Gasket nominal sizes shall be designated in accordance with the ranges specified in Tables 1, 2 and 3.

4.3 Gasket types

Gasket types as defined in clause 6 and illustrated in Figures 1 and 2 shall be designated as:

- Type FF;
- Type IBC;
- Type TG;
- Type SR.

4.4 Information to be supplied by the purchaser

The following information shall be supplied by the purchaser when ordering gaskets:

a) the number and part of this European Standard, i.e. EN 12560-1;

b) gasket type designation (see 4.3);

c) nominal size (see Tables 2 or 3, as appropriate);

d) Class designation (see Tables 2 or 3, as appropriate);

e) thickness (see 8.1);

f) material(s) (see clause 5).

Additional information that should be supplied by the purchaser:

g) expected operating conditions for which the gasket will be used and whether the gasket is required for use with water intended for human consumption (see clause 5).

NOTE: Before ordering a gasket it is recommended that the selection of the gasket type, material and thickness should be made in consultation with the gasket supplier. The selection of gasket material type and thickness should take into account the fluid, the operating conditions, the properties of the gasket material, the type and surface finish of the flange facing and the flange bolt loading.

EXAMPLE: A gasket according to EN 12560-1, full face type (type FF), of nominal size DN 100, Class 150, 2 mm thickness in expanded graphite, shall be designated as follows:

Gasket EN 12560-1 — FF — DN 100 — Class 150 — 2 mm — expanded graphite.

5 Gasket designs and materials

Gaskets shall be manufactured in a single material or combination of materials and shall be one of the following designs:

a) single flat sheet; or

b) laminated ply; or

c) moulded.

NOTE 1: The selection of the gasket material should take into account the fluid, the operating conditions, the properties of the gasket material, the type and surface finish of the flange facing and the flange bolt loading. It is recommended that selection of gaskets for any particular application is made in consultation with the gasket supplier (see 4.4).

Where gaskets come, or are likely to come, into contact with water intended for human consumption, the materials shall comply with relevant national regulations.

NOTE 2: The purchaser should indicate on the enquiry and/or order if gaskets are to be used with water intended for human consumption (see 4.4). It should be noted that the national regulations of both the country of origin and the country of use may be considered relevant.

6 Gasket types

Gaskets shall be one of the following types:

a) Full face type gasket (designation: type FF) for use with type A (flat face) or type B (raised face) flange facings [see Figures 1 a) and 2 a)];

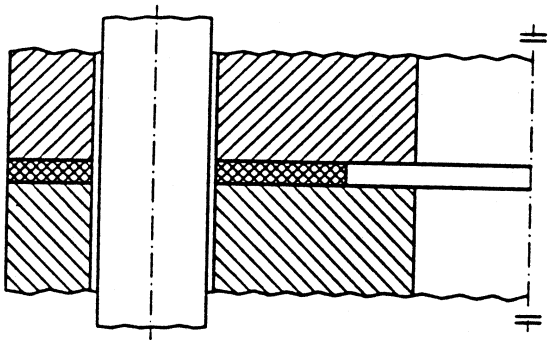
b) Inside bolt circle type gasket (designation: type IBC) for use with type A (flat face) or type B (raised face) flange facings [see Figures 1 b), 2 b), 2 c) and 2 d)];

c) Tongue and groove type gasket (designation: type TG) for use with type C/D (tongue/groove) flange facings [see Figures 1 c) and 2 b), 2 c) and 2 d)];

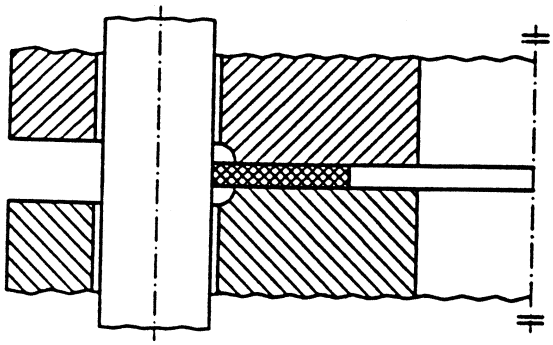
d) Spigot and recess type gasket (designation type SR), for use with type E/F (spigot/recess) flange facings [see Figures 1 d); 2 b), 2 c) and 2 d)];

NOTE 1: The types of flange facings are specified in prEN 1759-1:2000, prEN 1759-3:1994 and prEN 1759-4:1997 and for information, the facings are shown in Figure 3.

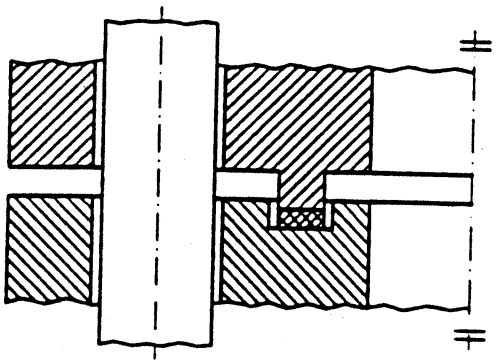
NOTE 2: The selection of gasket type should take into account the fluid, the operating conditions, the properties of the gasket material, the type and surface finish of the flange facing and the flange bolt loading. It is recommended that selection of gasket type for any particular application is made in consultation with the gasket supplier (see 4.4).



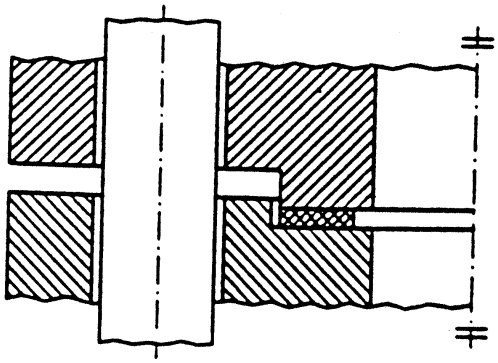
a) Type A flange facings with Type FF gasket



b) Type B flange facings with Type IBC gasket

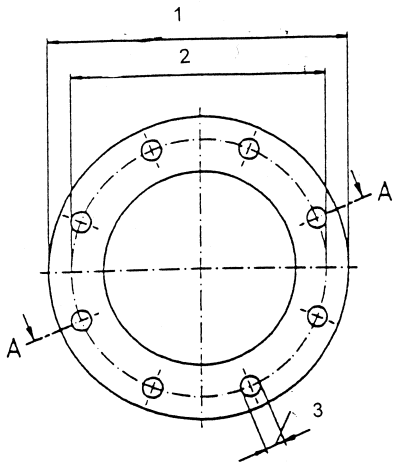


c) Type C/D flange facings with Type TG gasket



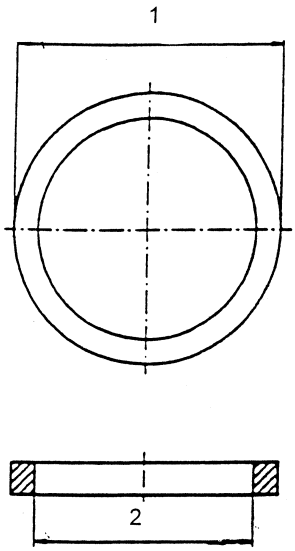
d) Type E/F flange facings with Type SR gasket

Figure 1 — Types of flange facings with gaskets



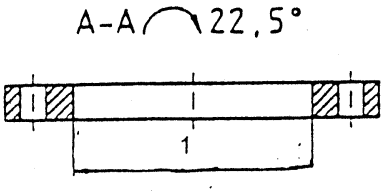
This figure illustrates the arrangement but not necessarily the correct number of bolt holes. Refer to the relevant table for the actual number of bolt holes.

Key
1 Outside diameter
2 Bolt circle diameter
3 Hole diameter



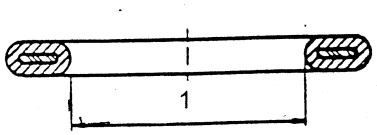
Key
1 Outside diameter
2 Inside diameter

b) Type IBC gasket (for type A and type B flange facings). Type TG gasket (for type C/D flange facings). Type SR gasket (for type E/F flange facings).



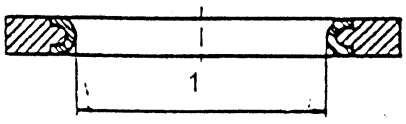
Key
1 Inside diameter

a) Type FF gasket (for types A and B flange facings)



Key
1 Inside diameter

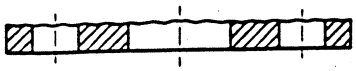
c) Typical rubber gasket with fabric insertion



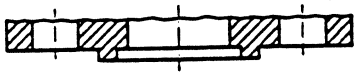
Key
1 Inside diameter

d) Typical rubber gasket with metallic insertion

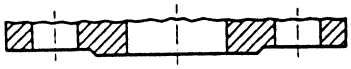
Figure 2 — Gasket dimensions



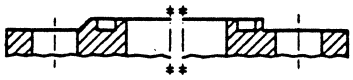
Type A — Flat face



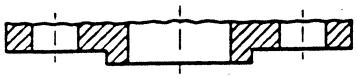
Type C — Tongue



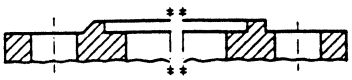
Type B — Raised face



Type D — Groove



Type E — Spigot



Type F — Recess

Figure 3 — Flange facing types

7 Range of nominal sizes

The ranges of nominal sizes of gaskets for the various Class designations shall be as given in Table 1 for the different gasket types.

Table 1 — Range of gasket nominal sizes

Class	For dimensions refer to table number	Gasket type[a]			
		Type FF	Type IBC	Type TG	Type SR
		DN range			
150	2	15 to 600	15 to 600	-	-
300	3	-	15 to 600	15 to 600	15 to 600
600	3	-	15 to 600	15 to 600	15 to 600
900	3	-	15 to 600	15 to 600	15 to 600

[a] See clause 6.

8 Dimensions

8.1 Thickness

NOTE: The selection of gasket thickness should take into account the fluid, the operating conditions, the properties of the gasket material, the type and surface finish of the flange facing and the flange bolt loading. It is recommended that selection of gasket thickness for any particular application is made in consultation with the gasket supplier (see 4.4).

8.2 Diameters

The diameters of Class 150 designated gaskets shall be as given in Table 2. The diameters of Class 300, 600 and 900 gaskets shall be as given in Table 3.

In the case of gaskets with an inner metallic insertion, the gasket inside diameter shall be to the inside of the insertion [see Figure 2 d)].

Table 2 — Dimensions of gaskets for Class designation 150 flanges

Nominal size		Gasket inside diameter	Type IBC gasket outside diameter	Type FF gasket				
				Outside diameter	Holes			Bolt circle diameter
					Number	Diameter[b]		
DN	NPS[a]	mm	mm	mm		mm	in	mm
15	½	22	47,5	89	4	15,9	⅝	60,3
20	¾	27	57,0	98	4	15,9	⅝	69,8
25	1	34	66,5	108	4	15,9	⅝	79,4
32	1¼	43	76,0	117	4	15,9	⅝	88,9
40	1½	49	85,5	127	4	15,9	⅝	98,4
50	2	61	104,5	152	4	19,0	¾	120,6
65	2½	73	124,0	178	4	19,0	¾	139,7
80	3	89	136,5	190	4	19,0	¾	152,4
100	4	115	174,5	229	8	19,0	¾	190,5
125	5	141	196,5	254	8	22,2	⅞	215,9
150	6	169	222,0	279	8	22,2	⅞	241,3
200	8	220	279,0	343	8	22,2	⅞	298,4
250	10	273	339,5	406	12	25,4	1	362,0
300	12	324	409,5	483	12	25,4	1	431,8
350	14	356	450,5	533	12	28,6	1⅛	476,2
400	16	407	514,0	597	16	28,6	1⅛	539,8
450	18	458	549,0	635	16	31,8	1¼	577,8
500	20	508	606,5	698	20	31,8	1¼	635,0
600	24	610	717,5	813	20	34,9	1⅜	749,3

[a] For information only.

[b] Either the metric or imperial dimension is permitted.

Table 3 — Dimensions of gaskets for Class 300, 600 and 900 flanges

Nominal size		Gasket inside diameter[a]	Type IBC gasket outside diameter			Type SR gasket outside diameter	Type TG gasket	
			Class 300	Class 600	Class 900		Inside diameter	Outside diameter
DN	NPS[b]	mm	mm	mm	mm	mm	mm	mm
15	½	22	54,0	54,0	63,5	35,0	25,5	35,0
20	¾	27	66,5	66,5	69,5	43,0	33,5	43,0
25	1	34	73,0	73,0	79,0	51,0	38,0	51,0
32	1¼	43	82,5	82,5	89,0	64,0	47,5	64,0
40	1½	49	95,0	95,0	98,0	73,0	54,0	73,0
50	2	61	111,0	111,0	142,5	92,0	73,0	92,0
65	2½	73	130,0	130,0	165,0	105,0	85,5	105,0
80	3	89	149,0	149,0	168,0	127,0	108,0	127,0
100	4	115	181,0	193,5	206,0	157,0	132,0	157,0
125	5	141	216,0	241,0	247,5	186,0	160,5	186,0
150	6	169	251,0	266,5	289,0	216,0	190,5	216,0
200	8	220	308,0	320,5	358,5	270,0	238,0	270,0
250	10	273	362,0	400,0	435,0	324,0	286,0	324,0
300	12	324	422,0	457,0	498,5	381,0	343,0	381,0
350	14	356	485,5	492,0	520,5	413,0	374,5	413,0
400	16	407	539,5	565,0	574,5	470,0	425,5	470,0
450	18	458	597,0	612,5	638,0	533,0	489,0	533,0
500	20	508	654,0	682,5	698,5	584,0	533,5	584,0
600	24	610	774,5	790,5	838,0	692,0	641,5	692,0

[a] Except for tongue and groove gaskets.
[b] For information only.

8.3 Tolerances

The following tolerances shall apply throughout this standard:

Centre to centre of adjacent bolt holes:		±0,76 mm
Bolt circle diameter:		±1,52 mm
Outside diameter:	DN 300 and below	$^{0}_{-1,52}$ mm
	DN 350 and above	$^{0}_{-3,05}$ mm
Inside diameter:	DN 300 and below	±1,52 mm
	DN 350 and above	±3,05 mm

9 Marking

Gaskets shall be marked either individually or on the packaging containing the gaskets or, by agreement between supplier and purchaser on the packaging of each individual gasket with the following information:

a) the number and part of this European Standard, i.e. EN 12560-1;

b) gasket type designation, i.e. type IBC;

c) the nominal size e.g. DN 100;

d) thickness e.g. 2 mm;

e) material(s) e.g. expanded graphite;

f) manufacturer's name or trademark, e.g. AAA/BBB.

EXAMPLE 1:

EN 12560-1 — Type IBC — DN 100 — 2 mm — expanded graphite — AAA/BBB.

NOTE: The Class designation or range of Class designation for which the gasket may be suitable may also be included on the marking.

EXAMPLE 2:

EN 12560-1 — Type IBC — DN 100 — 2 mm — expanded graphite — AAA/BBB — Class 150/Class 600.

Annex A
(informative)

A-deviations

This European Standard is mandated under the Council Directive on the approximation of the laws of the Member States concerning pressure equipment.

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/CENELEC member.

NOTE: (from CEN/CENELEC IR Part 2, 3.1.9): Where standards fall under EC Directives, it is the view of the commission of the European Communities (OJ No G 59, 9.3.1982) that the effect of the decision of the Court of Justice in case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted except under the safeguard procedure provided for in the relevant Directive.

A-deviations in an EFTA country are **valid instead** of the relevant provisions of the European Standard in that country until they have been removed.

With reference to clause 5, Gasket designs and material:

Denmark

Bekendtgørelse om asbest

(Nr. 660 af 24. juni 1986)

Bekendtgørelse om ændring af bekendtgørelse om asbest

(Nr. 139 af 23. marts 1987)

(Nr. 984 af 11. december 1992)

According to this order, the use of asbestos and material containing asbestos is prohibited in Denmark.

Austria

Order on the use of asbestos (BGBI. Nr 324/1990 Asbestverordnung)

According to this ordinance the use of gasket materials containing asbestos is prohibited in Austria.

Czech Republic

Decree No. 76/1990 Coll. Health Regulations of the Ministry of Health and Social Affairs of CSR — Head of Public Health of CSR dated 27 February 1990 which amends the guidelines of the Ministry of Health of CSR — Head of Public Health of CSR No. 64/1984 Coll. Health Regulations concerning health principles for work with chemical carcinogens.

Commencement of production of materials containing asbestos shall be authorized by Head of Public Health of the Czech Republic. Products and materials containing asbestos may be used only where absolutely necessary and only for such technical and fire prevention purposes where no other suitable materials can be used.

France

Décret no 96-1132 du 24 décembre 1996 modifiant le décret n° 96-98 du 7 février 1996 relatif à la protection des travailleurs contre risques liés à l'inhalation de poussières d'amiante.

Décret no 96-4433 du 24 décembre 1996 relatif à l'interdiction de l'amiante, pris en application du code du travail et du code de la consommation.

According to these regulations, within the scope of industrial safety the fabrication, manufacture, sale, import and merchandising of products containing asbestos is forbidden on the French market from 1st January 1997.

Germany

Verordnung zur Novellierung der Gefahrstoffverordnung, zur Aufhebung der Gefährlichkeitsmerkmale-verordnung und zur Änderung der ersten Verordnung zum Sprengstoffgesetz vom 26.10.1993 er-schienen im Bundesgesetzblatt, Jahrgang 1993, Teil 1, Nummer 57, Seite 1782 und Verordnung über die Neuordnung und Ergänzung der Verbote und Beschränkungen des Herstellens, Inverkehrbringens und Verwendens gefährlicher Stoffe, Zubereitungen und Erzeugnisse nach Paragraph 17 des Chemi-kaliengesetzes vom 14. Oktober 1993, Bundesgesetzblatt Jahrgang 1993, Teil 1, Seite 1720.

According to this ordinance the use of gasket material containing asbestos is prohibited in Germany.

Italy

Law 1992-03-27 N.257 concerning "Rules regarding the stop of use of asbestos".

Netherlands

Asbestbesluit Arbeidsomstandighedenwet (Staatsblad 1993, 136).

According to Dutch legislation, the use of asbestos and asbestos containing products is prohibited in the Netherlands.

Norway

Forskrifter til arbeidsmiljøloven fastsatt av Kommunaldepartementet 16.August 1991 "Asbest" (best. nr 235).

According to these regulations the use of asbestos and materials containing asbestos is prohibited in Norway.

Switzerland

Verordnung über umweltgefährdende Stoffe (Stoffverordnung, StoV) vom 1986-06-09, Stand 1994-01-01, Änderung 1994-01-26, SR 814.013.

Sweden

Ordinance AFS 1992:2 "Asbest" of the National Board of Occupational Safety and Health.

According to this ordinance the use of asbestos and material containing asbestos is prohibited.

UK

Asbestos products (Safety) Regulations 1985.

Control of Asbestos at Work Regulations 1987 (as amended).

Asbestos (Prohibitions) Regulations 1992.

According to these regulations provisions covering work activities involving exposure to asbestos and the labelling of products containing asbestos apply in the UK.

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389 Chiswick High Road
London
W4 4AL