



**DE**

## **Einbau- und Wartungsanleitung**

Ein- und zweiflügelige Stahltüren (OD-Türen, H3G, H16G, HS75, H16S1)

**DEUTSCH ..... 3**



..... **8**

---

Weitergabe sowie Vervielfältigung dieses Dokuments, Verwertung und Mitteilung seines Inhalts sind verboten, soweit nicht ausdrücklich gestattet. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patent-, Gebrauchsmuster- oder Geschmacksmustereintragung vorbehalten. Änderungen vorbehalten.

# Inhaltsverzeichnis

- 1 Zu dieser Anleitung..... 3**
- 1.1 Verwendete Warnhinweise..... 3
- 1.2 Verwendete Symbole..... 3
- 2 Sicherheitshinweise ..... 4**
- 3 Informationen zu den Türeigenschaften..... 4**
- 3.1 Feuerschutz- und Rauchschutztüren.....4
- 3.2 Schallschutztüren ..... 6
- 3.3 Einbruchschutztüren ..... 6
- 3.4 Funktionstüren ..... 6
- 3.5 Feuerschutz und Außenanwendung ..... 6
- 4 Montage..... 6**
- 4.1 Vor der Montage ..... 6
- 4.2 Maße ..... 6
- 4.3 Bei der Montage ..... 6
- 4.4 Hinweise zum Bildteil..... 6
- 5 Wartung und Pflege ..... 7**
- 5.1 Jährliche Wartungsarbeiten ..... 7
- 5.2 Erforderliche Oberflächenbehandlung für Elemente mit Standardgrundierung..... 7
- 5.3 Reinigung..... 7
- 5.4 Pflege von Edelstahlbauteilen..... 7
- 6 Etikettierung und Kennzeichnung ..... 7**
- 7 Allgemeines ..... 7**
- 8 Leistungserklärung..... 7**



..... 8

Sehr geehrte Kundin, sehr geehrter Kunde,  
wir freuen uns darüber, dass Sie sich für ein Produkt aus  
unserem Hause entschieden haben.

## 1 Zu dieser Anleitung

Bitte lesen und beachten Sie diese Anleitung. Sie gibt Ihnen wichtige Informationen zu Einbau, Wartung und Pflege Ihrer Stahltür und ist ein wichtiges Dokument für die Bauakte. Sprechen Sie mit unserem Kundendienst, wenn Sie nach dem Durcharbeiten dieser Anleitung noch Fragen haben.

### 1.1 Verwendete Warnhinweise

Das allgemeine Warnsymbol kennzeichnet eine Gefahr, die zu **Verletzungen** oder **zum Tod** führen kann. Im Textteil wird das allgemeine Warnsymbol in Verbindung mit den nachfolgend beschriebenen Warnstufen verwendet. Im Bildteil verweist eine zusätzlich Angabe auf die Erläuterungen im Textteil.

**GEFAHR**

Kennzeichnet eine Gefahr, die unmittelbar zum Tod oder zu schweren Verletzungen führt.

### 1.2 Verwendete Symbole



Feuerschutz



Rauchschutz



Sicherheitstür



Schallschutz



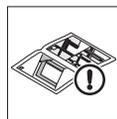
Funktionstür



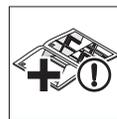
Wichtiger Hinweis



Siehe Textteil



Siehe Bildteil



Siehe Einbauanleitung im Zubehörpaket



Als Zubehör zu bestellen



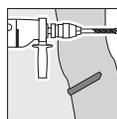
Korrektes Vorgehen



Unzulässiges Vorgehen (Vorgehensweise)



Schweißen



Bohren



Elektrischer Türöffner



Einbruchgefahr auf Öffnungsseite



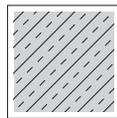
Einbruchgefahr auf Schließseite



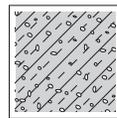
Fluchtweg



Holz



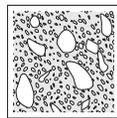
Mauerwerk / Beton



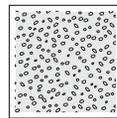
Porenbeton



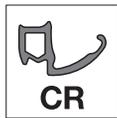
Gips



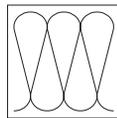
Beton



Mörtel



Zargendichtung CR  
T60 / E<sub>2</sub> 60 / HBS60  
T90 / E<sub>2</sub> 90 / HBS90  
T120 / E<sub>2</sub> 120 / HBS120  
T30 / E<sub>2</sub> 30 mit Mineralwollhinterfüllung



Dämmstoff A  
(EN 13501-1)

## 2 Sicherheitshinweise

 **GEFAHR**

**Lebensgefahr beim Einbau der Stahltür**

Beim Einbau kann die Tür oder der Türrahmen umfallen und dabei Personen erschlagen.

- ▶ Sichern Sie Tür und Zarge vor und während der Montagearbeit gegen Umfallen.

- Setzen Sie nur qualifiziertes und unterwiesenes Personal für Montage und Wartung ein.
- Lassen Sie Elektroarbeiten nur von ausgebildeten Fachkräften durchführen.
- Führen Sie keine Veränderungen durch An- und Umbauten durch, die die Sicherheit beeinträchtigen können.
- Schließen Sie die Gefahr durch Feuer, Gas, Staub, Dampf, Rauch, Brand und Explosion bei Schweiß, Brenn- und Schleifarbeiten aus.
- Vermeiden Sie, dass bei Schweißarbeiten aufschäumende Baustoffe durch Wärmeeintrag reagieren und dadurch ihre Wirkung verlieren.

## 3 Informationen zu den Türeigenschaften

Beachten Sie, dass die Tür einzelne Eigenschaften, eine Kombination aus den Eigenschaften Feuerschutz, Rauchschutz, Schallschutz und Einbruchschutz erfüllen kann oder eine Funktionstür sein kann.

### 3.1 Feuerschutz- und Rauchschutztüren

- Die jeweilige Zulassung können Sie unter [www.hoermann.de/dokumentation/zulassungsbescheide-fuer-feuerschutzabschluesse/](http://www.hoermann.de/dokumentation/zulassungsbescheide-fuer-feuerschutzabschluesse/) einsehen. Die Zulassung muss an der Verwendungsstelle vorliegen.
- Die angegebenen Informationen sind Mindestanforderungen für den Einbau in Deutschland. Bei Einbau in anderen Ländern gelten die jeweiligen nationalen Zulassungen, wobei die Materialkennwerte mindestens der DIN zugrunde gelegt werden müssen.
- Beachten Sie die DIN 18093 (Einbau von Feuerschutztüren) und die DIN 18100 (Wandöffnungen für Türen) bzw. die länderspezifischen Vorschriften.

- Der Hersteller kann in Einzelfällen nach § 22 und § 23 der Musterbauordnung eine Übereinstimmungserklärung ausstellen.
- **Der Betreiber ist für den einwandfreien Zustand der Tür verantwortlich.**
- In Deutschland dürfen Federbänder an Türen und Klappen mit folgenden Eigenschaften **nicht** verwendet werden:
  - Flügelgewicht > 80 kg
  - Verglasung
  - Einbau in Montagewände (Ausnahme: Maße < 1000 × 1000 mm)
  - Kombination als Rauchschutztüren nach DIN 18095
  - 2-flügelig
- Außerhalb Deutschlands können andere Vorschriften gelten, allerdings empfehlen wir die Einhaltung der deutschen Vorgaben.
- Verwenden Sie Beschläge, Schlösser, Schließmittel und Elektroanbauteile nur, wenn sie Bestandteil der Türzulassung sind oder eine Freigabe des Herstellers vorliegt.
- Bauen Sie 3-seitig gefälzte Türen ohne unteren Schachtabschluss, in Schächten auf unterstem Bodenniveau ein.
- Gipskartonwände und Wanddicken: siehe Tab. 1:
- Zulässige Wände und Wanddicken: siehe Tab. 2:
- Hinterfüllen Sie die Zarge mit mineralischem Mörtel auf Zementbasis, z.B. LM21 von Sakret, wenn es in der Einbausituation nicht anders beschrieben wird. Spreizen Sie U-Zargen und Eckzargen (mit und ohne Gegenzargen) vor dem Hinterfüllen ab, damit sie sich durch den Druck des Mörtels nicht verbiegen.
- **Rauchschutz:**
  - Verwenden Sie Bodendichtungen und Dichtungskeile (siehe Bildteil Punkt 10.6 und 11).
  - Versiegeln Sie den Zargenanschluss zu den angrenzenden Bauteilen beidseits und lückenlos dauerelastisch, wenn die Zarge nicht mit Mörtel hinterfüllt ist.
  - Verwenden Sie einen Schließzylinder.
- Setzen Sie Verglasungen von Feuerschutztüren keiner direkten Sonnenstrahlung aus.

Tab. 1: Zulässige F90A Montagewände mit Mindestwanddicken für Feuerschutz- und Rauchschutztüren, Höhe ≤ 5000 mm

Prüfzeugnis-Nr.	Wand	H3 OD H_30 OD	H3-1G H_30 D1	<sup>1)</sup> H3-2 VM H_30 D2	H16 S1 H_90 E1
P-3310/563/07-MPA BS	Knauf W 112	≥ 100 mm	≥ 100 mm	≥ 100 mm	≥ 125 mm
P-3391/170/08-MPA BS	Knauf W 131	≥ 116 mm	—	—	≥ 177 mm
P-3310/563/07-MPA BS	Knauf W 132	≥ 100 mm	—	—	—
P-3202/2028-MPA BS	RiGips W 352/W 353	≥ 100 mm	≥ 100 mm	≥ 100 mm	≥ 150 mm
P-3956/1013-MPA BS	RiGips 3.40.01ff./3.41.01ff.	≥ 100 mm	≥ 100 mm	≥ 100 mm	—
P-3014/1393-MPA BS	RiGips 3.60.20	≥ 100 mm	≥ 100 mm	≥ 100 mm	≥ 125 mm
P-3020/0109-MPA BS	RiGips 6.70.10	≥ 165 mm	—	—	≥ 165 mm
P-SAC-02/III-681	LaFarge L11 – L14	≥ 100 mm	≥ 100 mm	≥ 100 mm	—
P-MPA-E-98-005	LaFarge L15	≥ 100 mm	—	—	≥ 125 mm
P-3515/0519-MPA BS	LaFarge L16	≥ 150 mm	—	—	≥ 150 mm
P-3391/0890-MPA BS	LaFarge L18	—	—	—	≥ 161 mm
P-MPA-E-99-047	Promat 450.81	≥ 140 mm	—	—	≥ 140 mm
P-11-003478-PR01	B + M W 50/100 – W 100/150	≥ 100 mm	—	—	—
P-3854/1372-MPA BS	Fermacell 1 S 31/3.1	≥ 95 mm	≥ 95 mm	≥ 95 mm	—

1) max. 2750 × 2750 mm

Tab. 2: Zulässige Wände und Mindestwanddicken für Feuerschutz- und Rauchschutztüren (mm) siehe 4.2

Wand	H3-1 OD H_30-1 OD		H3-2 OD H_30-2 OD		H3-1 G H_30 D1	H3-2 VM H_30 D2	H16-1 G H_90 D1	H16-2 G H_90 F-2	H16-S1 H_90 E-1	H16-1 OD H_90-1 OD		H16-2 OD H_90-2 OD
	<sup>1)</sup> k ≤ 2500 100	<sup>2)</sup> k > 2500 140	<sup>1)</sup> k ≤ 2500 100	<sup>2)</sup> k > 2500 140						—	—	
Beton DIN 1045-1, Festigkeit ≥ C12/15	<sup>1)</sup> k ≤ 2500 100	<sup>2)</sup> k > 2500 140	<sup>1)</sup> k ≤ 2500 100	<sup>2)</sup> k > 2500 140	140	140	140	140	120	—	—	—
Mauerwerk DIN 1053-1, Steinfestigkeit ≥ 12, Mörtelgruppe ≥ 2	<sup>1)</sup> k ≤ 2500 115	k > 2500	<sup>1)</sup> k ≤ 2500 115	<sup>2)</sup> k > 2500 175	175	175	240	240	175	e ≤ 625 k ≤ 750	e > 625 k > 750	—
Porenbeton-Block oder Plansteine, DIN 4165-3, Festigkeitsklasse ≥ 4, Porenbetonplatten nach allgemeiner bauaufsichtlicher Zulassung, Festigkeitsklasse ≥ 4.4	k ≤ 2500 150		k ≤ 2500 150		175	175	200	200	175	—	—	200
Montagewand F90-A nach ABP, Bild 9D beachten, max. Höhe 5000 mm	<sup>3)</sup> —		<sup>3)</sup> —		<sup>3)</sup> —	<sup>3)</sup> —	—	—	<sup>3)</sup> —	—	—	—
Montagewand F90-A DIN 4102-4/Tab. 48, Bild 9D beachten, max. Höhe 5000 mm	e ≤ 1320 100		e ≤ 2500 100		—	e ≤ 2750 und k ≤ 2750	—	—	—	—	—	—
Montagewand F90-B DIN 4102-4/Tab. 49, Bild 9D beachten, max. Höhe 5000 mm	e ≤ 1250 und k ≤ 2500 <sup>4)</sup> 100 / <sup>5)</sup> 130		e ≤ 2500 und k ≤ 2500 <sup>4)</sup> 100 / <sup>5)</sup> 130		—	—	—	—	—	—	—	—
Montagewand F30-B	e ≤ 1125 und k ≤ 2125 185		—		—	—	—	—	—	—	—	—
Gips-Wandbauplatten VG Orth, P-SAC 02 / III-468, Bild 9/E1 beachten	—		—		—	—	—	—	—	—	—	—
Mindestwanddicken	100		100		100	100	—	—	125	—	—	125

1) ohne Oberteil

2) mit Oberteil

3) siehe Tab. 1:

4) zweischalige Zarge

5) Dryfix

### 3.2 Schallschutztüren

- Die gesamte Schalldämmung ist von den umgebenden Bauteilen abhängig. Die resultierende Schalldämmung von Wand und Tür müssen Sie gesondert nachweisen, da sie nicht aus dem bewerteten Schalldämmmaß  $R_w$  bzw.  $R$  der Tür allein abgeleitet werden kann.
- Achten Sie auf vollständig anliegende Dichtung(en).
- Der Boden muss glatt sein, damit die vollständige Dichtfunktion der Bodendichtung gewährleistet ist.
- Trennen Sie den Estrich im Schwellenbereich.
- Verwenden Sie Dichtungskeile und Bodendichtung (siehe Bildteil Punkt 10.6 und 11).
- Verwenden Sie einen Schließzylinder.
- Hinterfüllen Sie die Zarge vollständig mit Mörtel.
- Verkleben Sie die auf Gehrung geschnittenen Ecken der Zargendichtung z.B. mit Köratan UC 41.

### 3.3 Einbruchschutztüren

- Die Tür erfüllt ihre Einbruchschutzeigenschaften nur, wenn der Riegel komplett vorgeschlossen und der Schlüssel abgezogen ist.
- Sichern Sie die Türblätter an RC4/B Türen und an allen 2-flügeligen WK-Türen an den Bändern mit je zwei Schrauben (siehe Bildteil Punkt 8.4b und 10.2).
- Verwenden Sie nur Eckzargen, Eckzargen mit Gegenzarge und U-Zargen.
- Hinterfütern Sie an RC2/N Türen die Zarge im Bereich der Verriegelungspunkte, Bänder und Sicherungsbolzen druckfest.
- Hinterfütern Sie an RC3/A und RC4/B Türen die Zarge umlaufend druckfest.
- Montieren Sie an Türen mit Gläsern den Glashalterahmen mit Sicherungsglaschen auf der Angriffsseite.
- Montieren Sie die Hinterklotzung bei Austausch der oberen Verglasung wie vor der Montage.
- Messen Sie bei 2-flügeligen Türen die unteren Spaltmaße von der Bodenmulde.
- Erschweren Sie bei Antipaniktüren den Eingriff mit Draht z.B. durch geringe Bodenluft oder Verwendung einer Flachrundschwelle.
- Füllen Sie die Zargen von RC2 Türen kpl. mit Mörtel aus, wenn sie in F90A Montagewände eingebaut werden.

### 3.3.1 Mindestanforderungen an einbruchhemmende Türen

Widerstandsklasse nach DIN EN V 1627 / DIN EN 1627 / VDS	RC2 / N	RC3 / A	RC4 / B
Mauerwerk DIN 1053 Teil 1 (mm)	115	115	240
Stahlbeton, mind. C12/15 (mm)	100	120	140
Porenbetonsteine Klasse 4 (mm)	175, 115 <sup>1)</sup>	300	-
Porenbetonplatten Klasse 4 (mm)	150	-	-
Montagewand F90 A	✓	-	-
Profilzylinder nach DIN 18252 <sup>3)</sup>	P2BS	P2BS	P3BS
Profilzylinder <sup>2)</sup> 3) 4)	Klasse A	Klasse A	Klasse B
Schutzbeschlag nach DIN 18257 <sup>3)</sup>	ES1 (ZA)	ES2 (ZA)	ES3 (ZA)
Schutzbeschlag <sup>2)</sup> 3)	Klasse A	Klasse A	Klasse B
Gläser EN 356 (Feuerschutz)	P4A	P6B/P7B	-

1) nur 1-Flügler, wir empfehlen Wanddicken ab 150 mm  
 2) für VdS anerkannte Türen  
 3) Schutzbeschlag oder Profilzylinder muss mit Ziehschutz (ZA) ausgeführt sein.  
 4) nicht zwingend im Lieferumfang enthalten

### 3.4 Funktionstüren

Die Zargen müssen nicht zwingend hinterfüllt werden.

### 3.5 Feuerschutz und Außenanwendung

Feuerschutz und Außenanwendung bedarf einer eigenen Zulassung. Beachten Sie die separate Einbauanleitung Art- Nr. 479166.

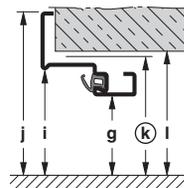
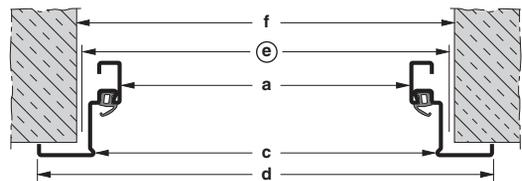
## 4 Montage

### 4.1 Vor der Montage

Klären Sie vor der Montage folgende Fragen:

- Welche Eigenschaften hat die Tür?
- Ist die Wandbauart zum Einbau der Tür geeignet?
- Ist die Höhenlage des Bodens bekannt (Meterriss?)
- In welche Richtung soll die Tür öffnen?
- Sind Bauvorschriften zu beachten?
- Muss die Wand im Bereich der Mauerschuttkästen ausgestemmt werden?

### 4.2 Maße



$$\begin{aligned}
 a &= e - 82 & g &= k - 42 \\
 c &= e - 36 & i &= k - 19 \\
 d &= e + 64 & j &= k + 31 \\
 f &= e + 10 & l &= k + 5
 \end{aligned}$$

Abb. 1: Maße

- a/g lichte Öffnungsweite / -höhe
- c/i lichte Falzbreite / -höhe
- d/j Zargenaußenmaßbreite / -höhe
- e/k Baurichtmaßbreite / -höhe
- f/l lichte Rohbaumaßbreite / -höhe EN 12519

### 4.3 Bei der Montage

- Beachten Sie die Einbauhinweise in den Zubehörpaketen.
- Verwenden Sie Montageteile, wenn sie mitgeliefert werden, z.B. Dübellaschen, Dübel oder Schrauben.
- Verwenden Sie die unter Punkt 8 angegebenen Dübel und beachten Sie die Montagehinweise in der Dübelzulassung, siehe Internetseiten der Dübelhersteller.
- Beachten Sie, dass bei Zargen ohne Bodeneinstand der untere Montagewinkel vor der Montage entfernt werden muss.

### 4.4 Hinweise zum Bildteil

siehe Punkt	Beschreibung
8	Einbausituationen und Zargenformen
8.1a	Stumpf
8.1b	Dünnfalz
8.1c	Dickfalz
8.2a / 8.2b	Anzahl der Befestigungspunkte
8.2c	Einbauablauf
8.3a	Ausbau der Standardtür

siehe Punkt	Beschreibung
8.3b	Ausbau der Sicherheitstür
8.4	Zusammenbau der Eckzarge
8.5	Bodenmulde und Montagewinkel
8.6	Befestigungsteile
8.7	Minimaler Randabstand und Spreizrichtung Dübel
8.8	Einbau Schattennutprofile
8.9	Leerrohre in der Zarge
8.10	Einsetzbare E – Öffner
8.11	Mauerschutzkästen in GKF – Wände
8.12	Aufbau GKF-Wände
9.0	Einbausituationen
10.1a	Einbau mit Standardbändern
10.1b	Einbau mit 3D-Bändern
10.2	Einbau der Sicherheitstür
10.3	Einstellen der Luftspalte
10.4	Entfernen der Bodenwinkel bei Zargen ohne Bodeneinstand
10.5	Einbau der Gegenzarge
10.6	Dichtungskeile mit Silikon befestigen
10.7	Einbau der Zargendichtung
10.8	Schließblech abfeilen
10.9	Anheben der Tür
10.10	Spannen des Federbandes Umbau Glasrahmen
10.11	Umbau des Lüftungsgitters
10.12	Umbau Glasrahmen
10.13	Dämmschichtbildner bei Feuer- und Rauchschutz
10.14	Dämmschichtbildner an Sicherungsbolzen
10.15	Kennzeichnung großer Glasflächen
10.16	Paniktüren und WK3 / A
10.17	Einbau Blockschloss bei Mehrfachverriegelung
11	Bodendichtungen
12	Türschließer
13.1	Schlüssel bei Paniktüren abziehen
13.2	Fehlbedienung des Schlosses vermeiden

## 5 Wartung und Pflege

### 5.1 Jährliche Wartungsarbeiten

- ▶ Kontrollieren Sie Türblatt, Zarge und Befestigung auf mechanische und korrosive Schäden.
- ▶ Kontrollieren Sie die Funktion des Schlosses und fetten Sie ggf. die Falle.
- ▶ Schmieren Sie Bolzenschlösser mit Teflonspray.
- ▶ Kontrollieren Sie die Befestigung der Anbauteile, wie z.B. Drücker, Schloss, Türschließer, Bänder usw.
- ▶ Fetten Sie Bandbolzen und Lagerringe.
- ▶ Kontrollieren Sie die Spaltmaße.
- ▶ Kontrollieren Sie die Sichtbarkeit der Kennzeichnung.



**GEFAHR**

#### **Lebensgefahr durch abgelöste Dämmschichtbildner**

Durch abgelöste Dämmschichtbildner verliert der Feuerschutzabschluss seine Funktion.

- ▶ Ersetzen Sie abgelöste Dämmschichtbildner, siehe Bildteil Punkt 10.13.

- ▶ Tauschen Sie defekte Teile aus.
- ▶ Verwenden Sie nur Original-Ersatzteile des Herstellers.

Wenn Sie Mängel feststellen, die Sie nicht selbst beheben können, beauftragen Sie eine Fachfirma.

## 5.2 Erforderliche Oberflächenbehandlung für Elemente mit Standardgrundierung

Die Oberfläche von Türblatt und Zarge besteht aus einer Pulvergrundbeschichtung auf Epoxidharz Polyester Basis.

1. Entfernen Sie die Dichtung(en).
2. Schleifen Sie, bis auf die Dämmschichtbildner alle zu lackierenden Oberflächen an.
3. Reinigen Sie die Oberflächen gründlich.
4. Verwenden Sie für die Endbehandlung von Türblatt, Zarge und Dämmschichtbildner folgenden Beschichtungsaufbau:
  - Grundbeschichtung 2K Epoxi Haftgrund und Endbeschichtung mit geeigneten handelsüblichen Bautenlacken oder
  - Grund- und Schlussbeschichtung mit 2K PUR Lack.
 Verwenden Sie bei direkter Sonneneinstrahlung keine dunklen Anstriche. Beachten Sie das BFS Merkblatt Nr. 24 sowie die Verarbeitungshinweise der Lackhersteller und fertigen Sie eine Haftprobe an. Nehmen Sie die Endbehandlung innerhalb von drei Monaten nach Montage vor, um Korrosionsschäden zu vermeiden.
5. Bringen Sie die Dichtung(en) nach dem Trocknen der Farbe wieder an.

## 5.3 Reinigung

- ▶ Reinigen Sie die Oberflächen mit klarem Wasser oder handelsüblichem Lackreiniger.

## 5.4 Pflege von Edelstahlbauteilen

- ▶ Reinigen und pflegen Sie regelmäßig Bauteile aus Edelstahl mit der bei Hörmann erhältlichen Edel Glanz Edeldahlpflege und tragen Sie diese mit einem weichen Tuch auf.

## 6 Etikettierung und Kennzeichnung

Das Etikett der **Türtypen D65-1, D65-2, D65-1 OD, D65-2 OD** ist auf Grundlage der Verordnung (EU) Nr. 305/2011 mit dem CE-Konformitätskennzeichen versehen. Die herangezogene und angewandte harmonisierte europäische Produktnorm ist EN 14351-1:2006 + A1:2010 „Fenster und Türen – Produktnorm, Leistungseigenschaften – Teil 1: Fenster und Außentüren ohne Eigenschaften bezüglich Feuerschutz und/oder Rauchdichtheit.“ Die Nummer der zugehörigen CE-Kennzeichnung bzw. Leistungserklärung ist im Falzbereich der Tür auf dem oben genannten Etikett zwischen dem Herstellerlogo und dem CE-Konformitätskennzeichen angegeben.

Türen, auf deren Etikett kein CE-Konformitätskennzeichen abgebildet ist, fallen nicht in den Anwendungsbereich der oben genannten harmonisierten europäischen Produktnorm und dürfen daher nicht über eine CE-Kennzeichnung bzw. Leistungserklärung verfügen.

## 7 Allgemeines

Die Inbetriebnahme der Tür ist so lange untersagt, bis festgestellt wurde, dass sie nach unseren Vorgaben montiert und auf ihre ordnungsgemäße Funktion überprüft wurde. Bei einer Veränderung des Produkts verliert die Leistungserklärung ihre Gültigkeit.

## 8 Leistungserklärung

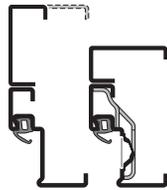
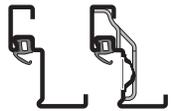
Leistungserklärung siehe Punkt **8.3:**  
[www.hoermann.com/dop](http://www.hoermann.com/dop)



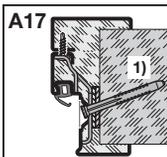
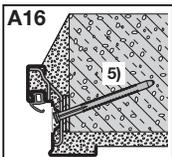
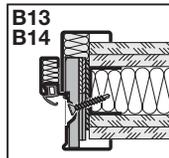
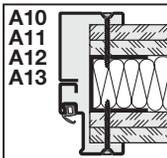
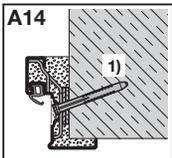
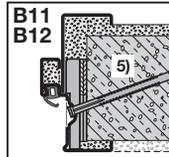
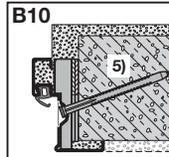
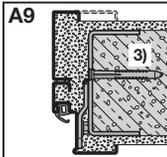
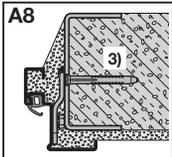
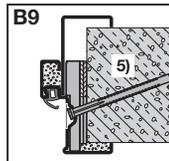
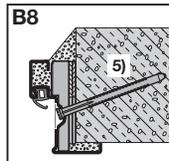
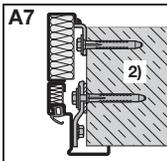
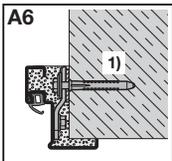
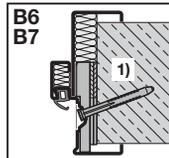
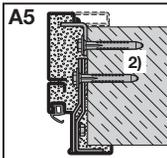
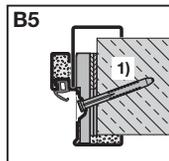
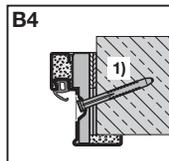
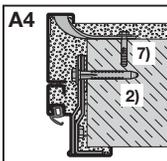
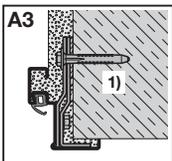
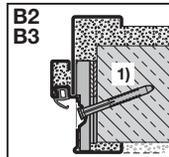
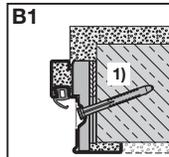
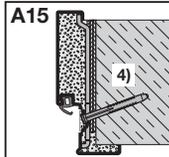
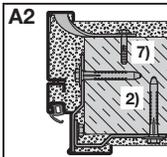
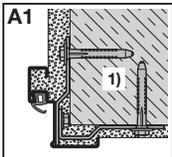
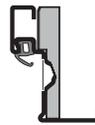
4.3/4.4



A



B



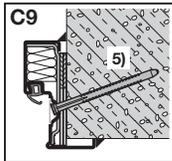
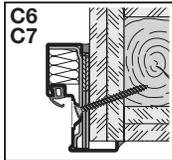
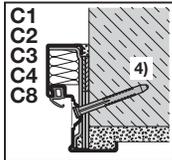
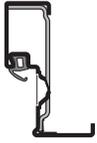
8

4.3/4.4

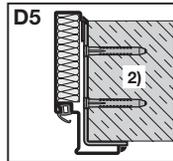
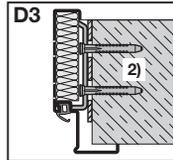
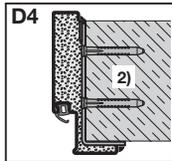
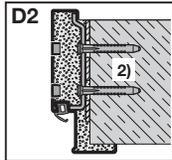
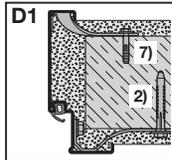
9



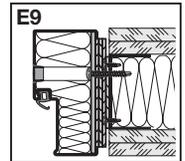
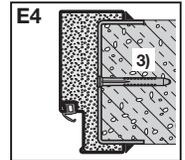
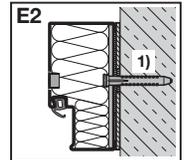
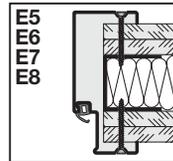
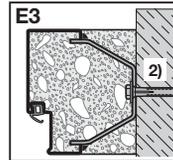
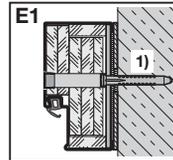
C



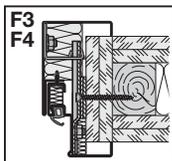
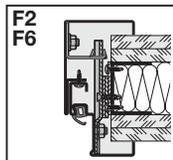
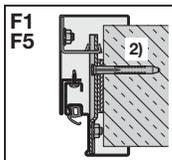
D



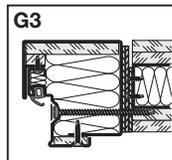
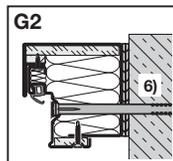
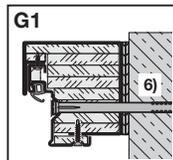
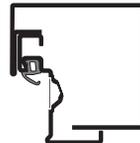
E



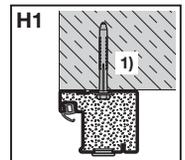
F



G



H



1) Fischer: FUR 10 x 80/100

Fischer: SXS 10 x 80/100  
 Hilti: HRD 10 x 80/100  
 MEA: MFR 10 x 80/100  
 Würth: W-UR 10 x 80/100

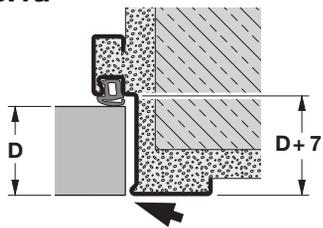


2) Fischer: FUR 10 x 80/100/115  
 Fischer: SXS 10 x 80/100/120  
 Hilti: HRD 10 x 80/100  
 MEA: MFR 10 x 80/100/115  
 Würth: W-UR 10 x 80/100/115

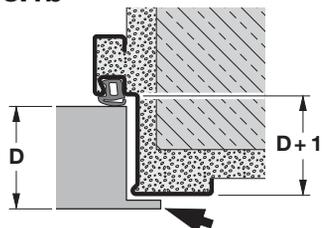
3) Fischer: FUR 10 x 80/100/115  
 Fischer: SXS 10 x 80/100/120  
 Hilti: HRD 10 x 80/100  
 MEA: MFR 10 x 80/100/115  
 Würth: W-UR 10 x 80/100/115

4) Fischer: FUR 10 x 100  
 5) Fischer: FUR 10 x 160  
 6) Fischer: FUR 10 x 200  
 7) 8 x 40

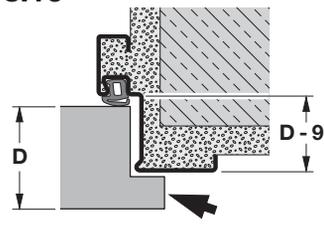
8.1a



8.1b

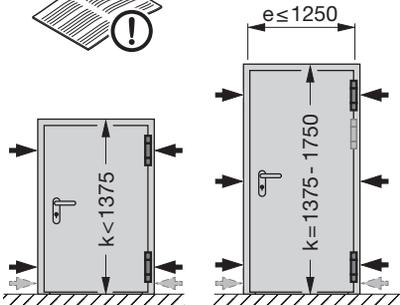


8.1c



8.2a

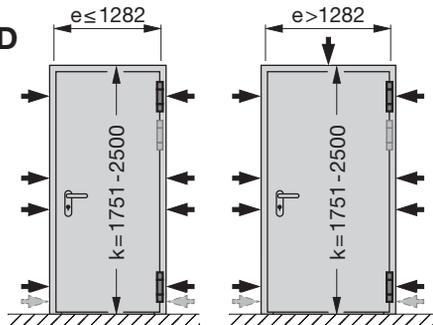
4.2/4.3



H16-S1

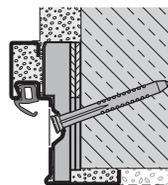
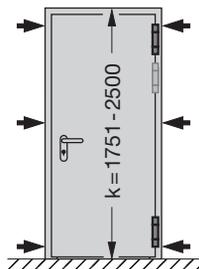
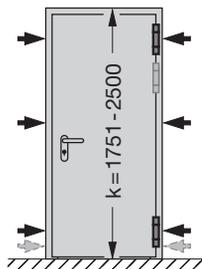
H16-1 OD

HS75



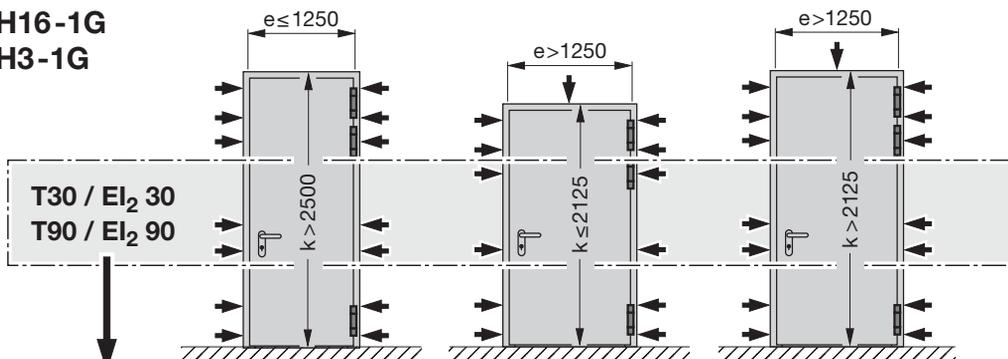
D65-1 OD

H3-1 OD



H16-1G

H3-1G



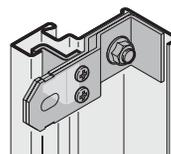
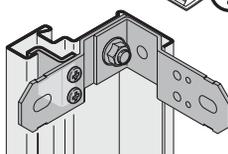
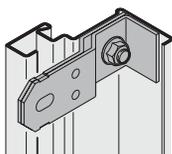
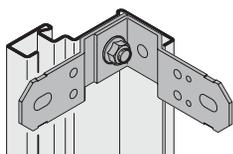
T30 / EI<sub>2</sub> 30

T90 / EI<sub>2</sub> 90



8.6a

8.6b

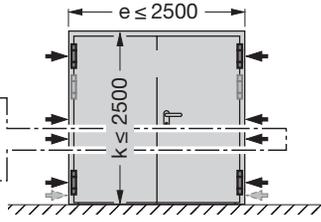


8.2b

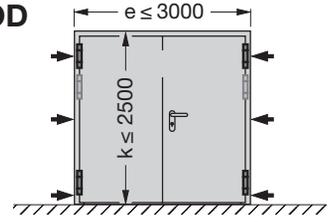
4.2/4.3



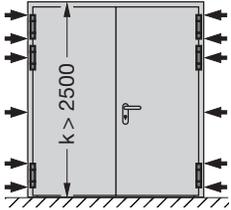
H16-2 OD  
H\_16-2 OD



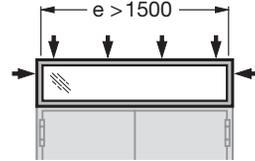
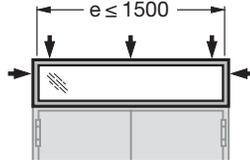
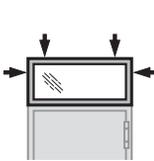
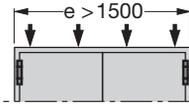
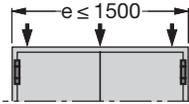
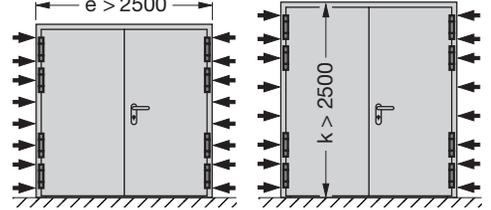
D65-2 OD



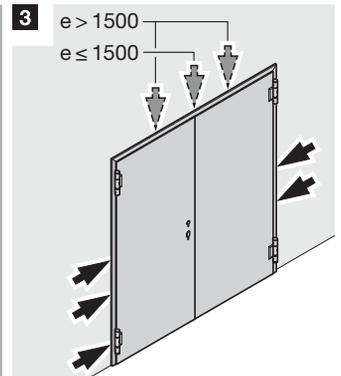
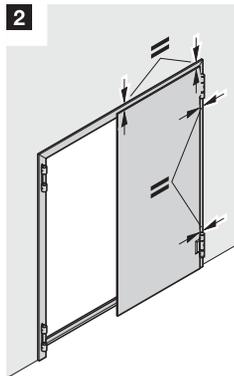
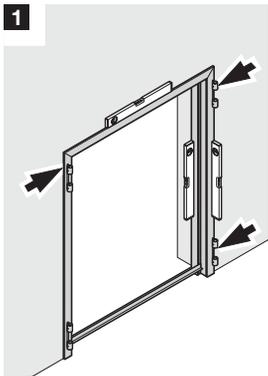
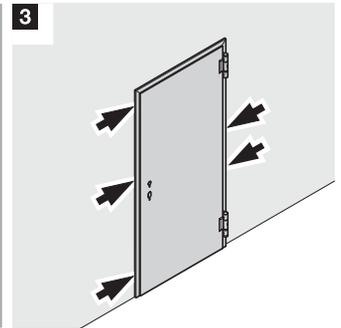
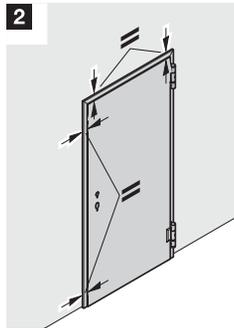
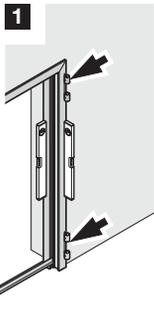
H3-2 VM



H16-2 G  
H\_90 F2



8.2c

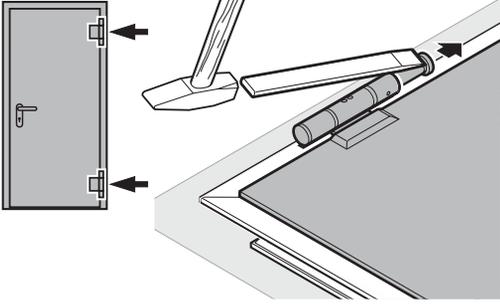


8.3a

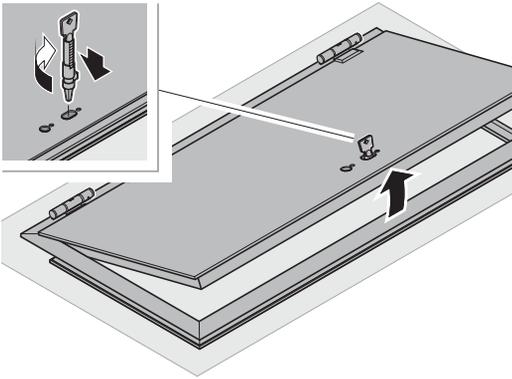
4.3



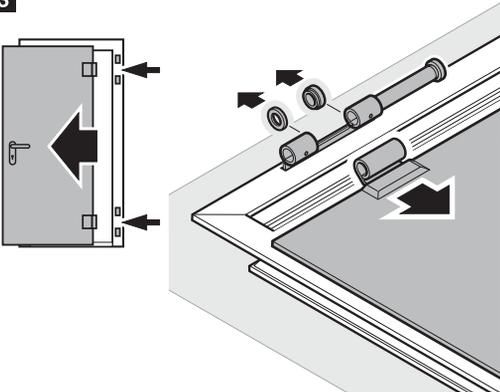
1



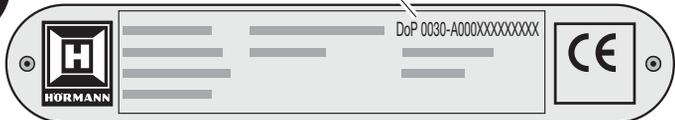
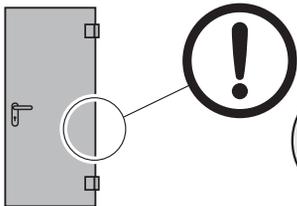
2



3



4

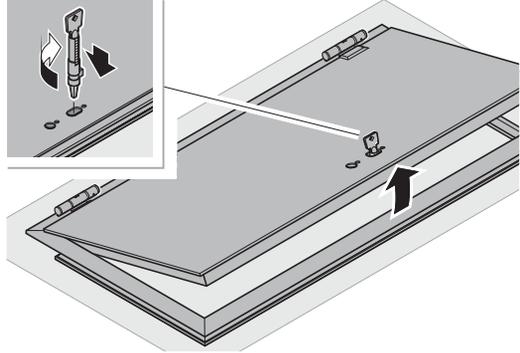


8.3b

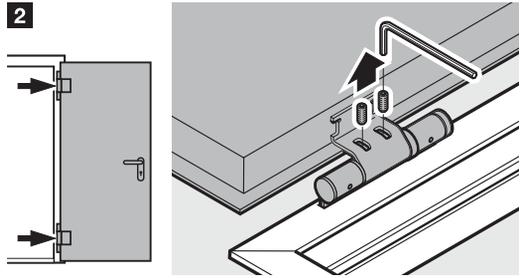
3.3/4.3



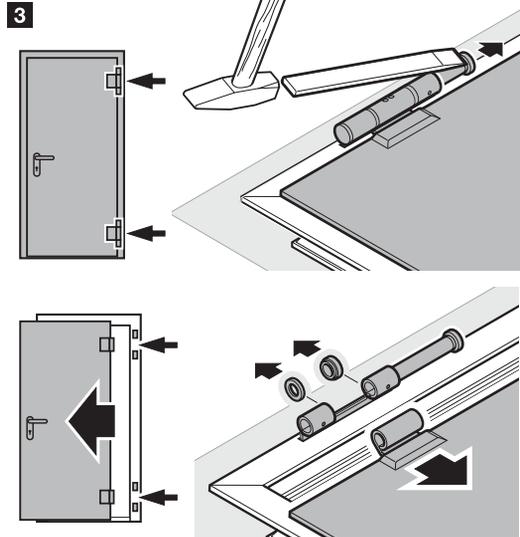
1

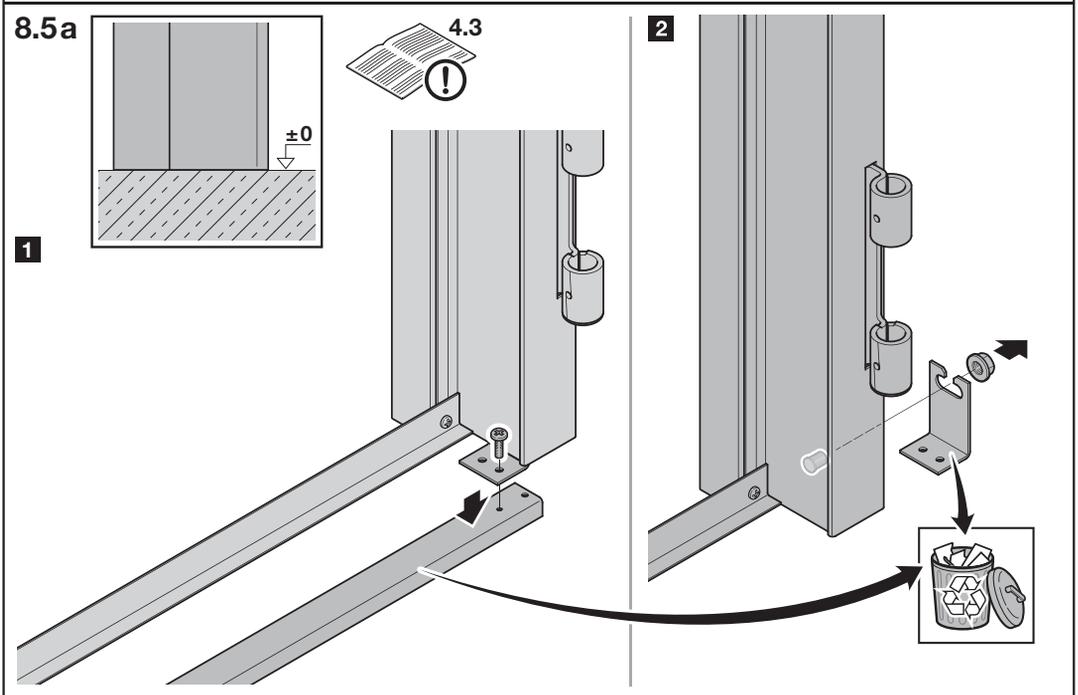
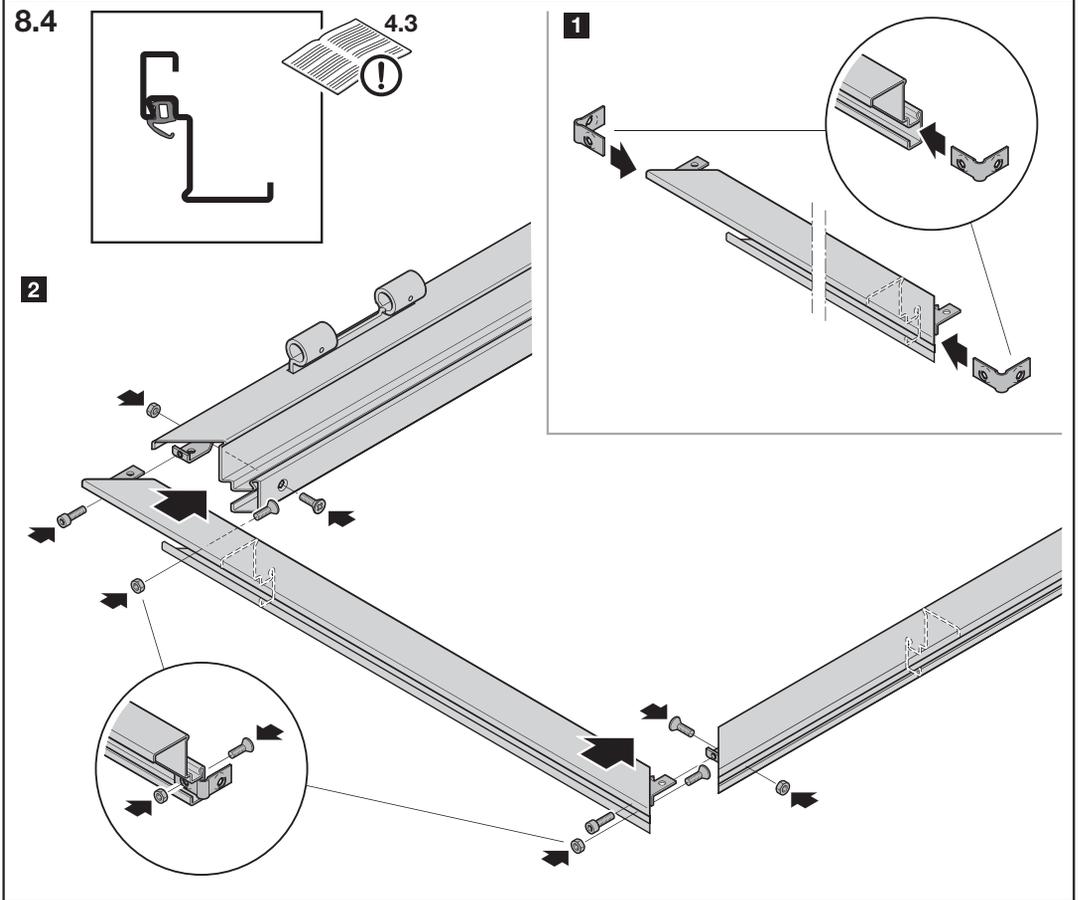


2



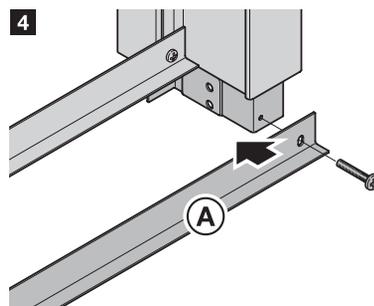
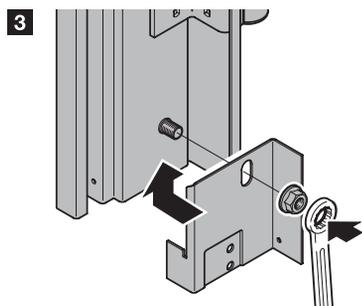
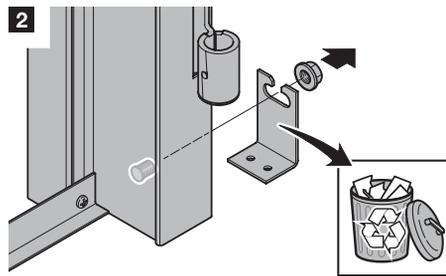
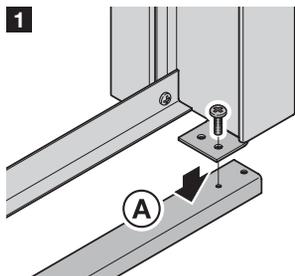
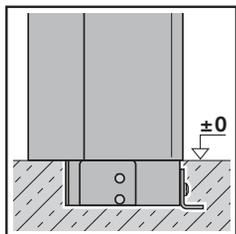
3





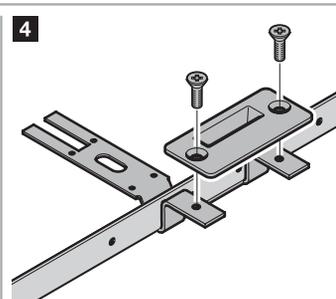
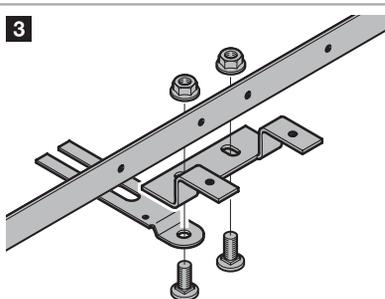
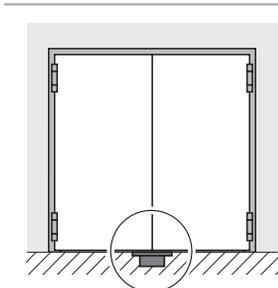
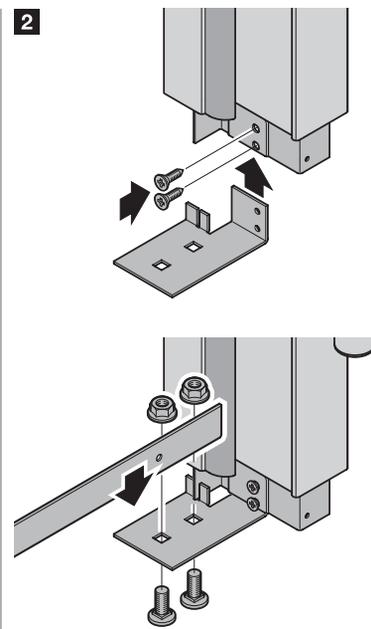
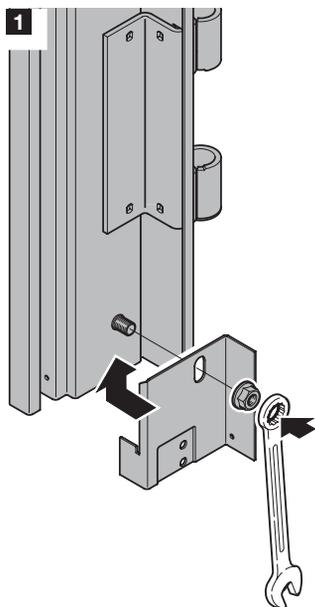
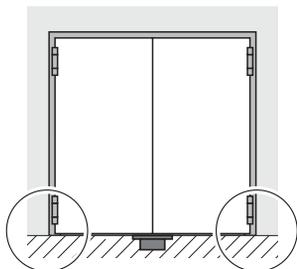
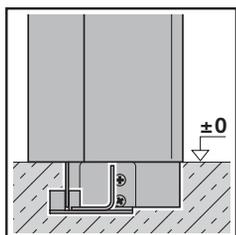
8.5b

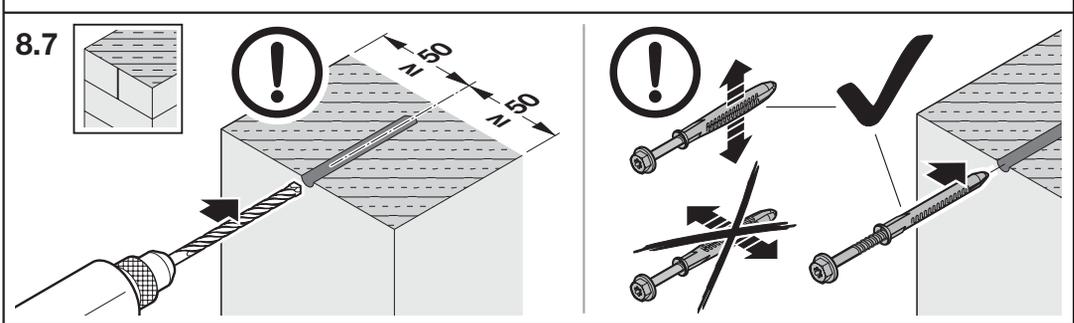
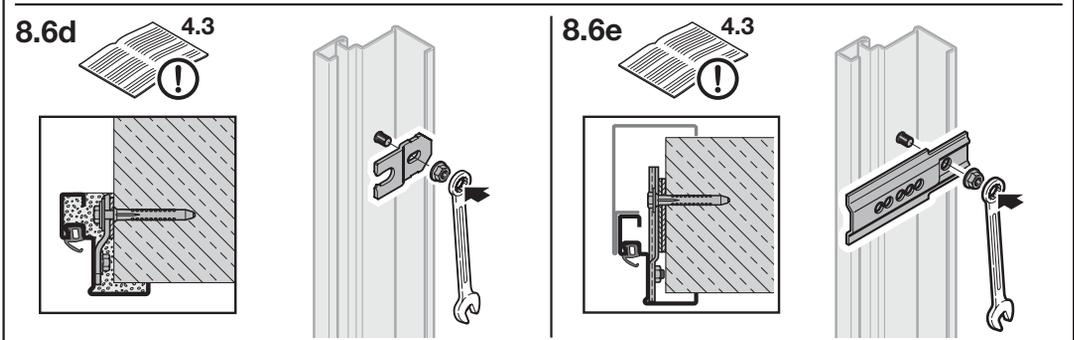
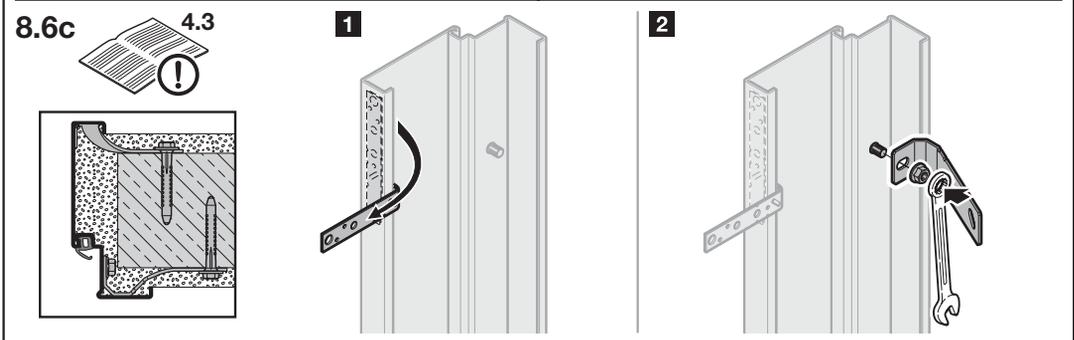
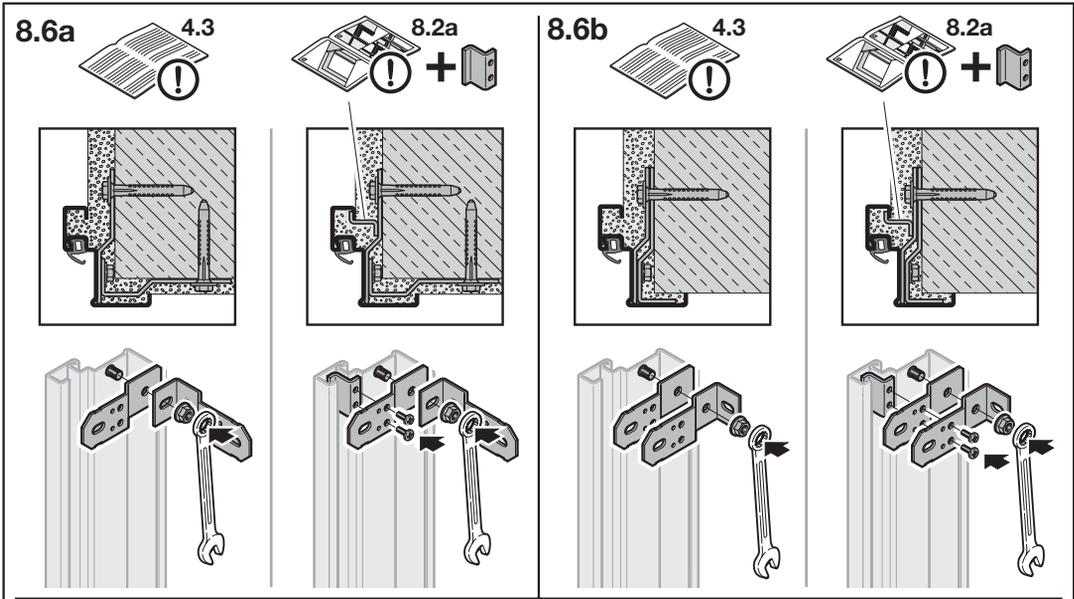
4.3

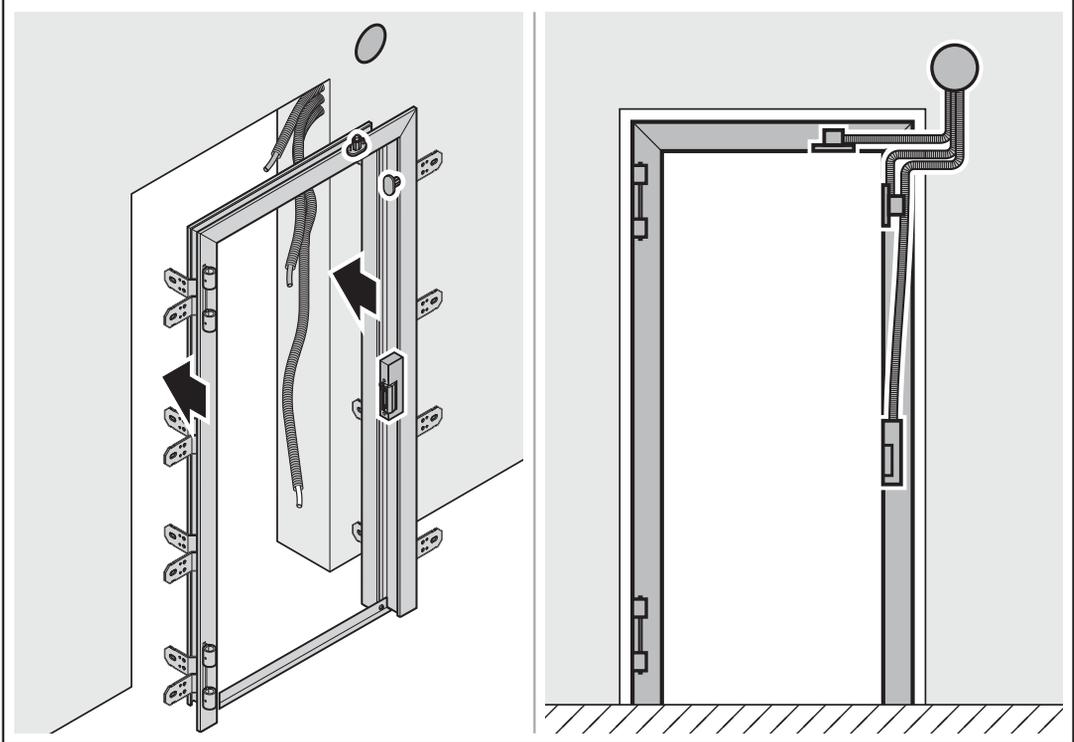
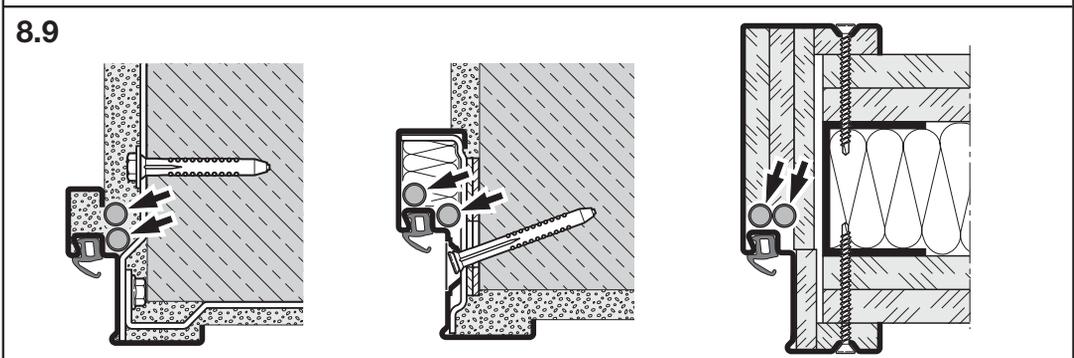
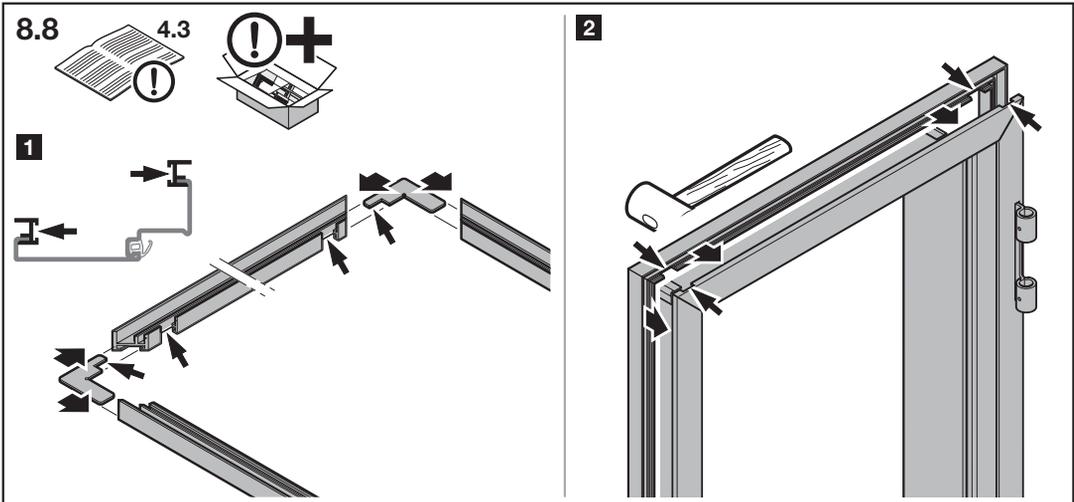


8.5c

4.3







8.10



AC  
~

DC  
≡



I.S.T. Systems

FT200/FT201

x

x

x

x

142 UF

x

x

x

x

x

x

effeff

143

x

x

x (79/2)

x

x

x

x

14/34

x

x

x

x

Dorma

447/Basic

x

x

x

x

Lucky Basic

x

x

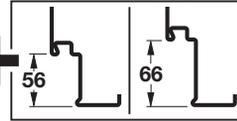
x

x

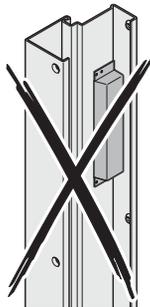
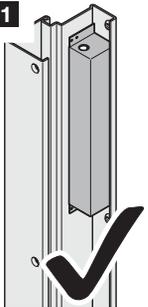
8.11



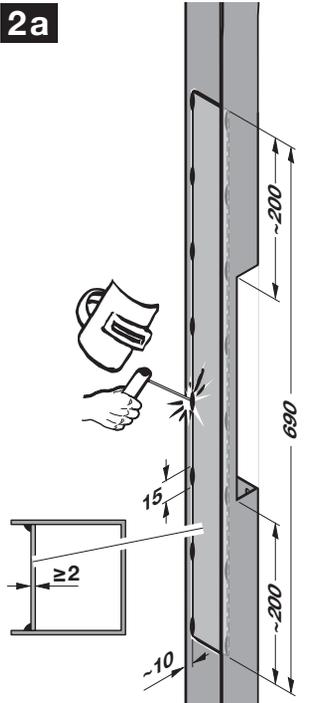
8.12



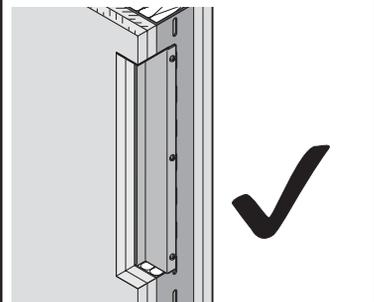
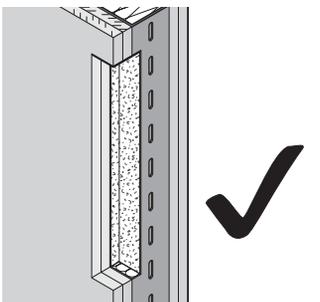
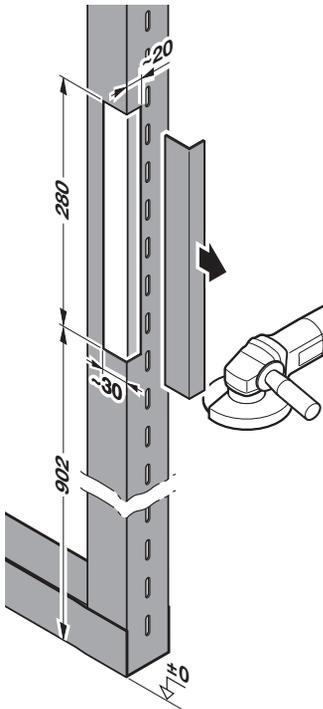
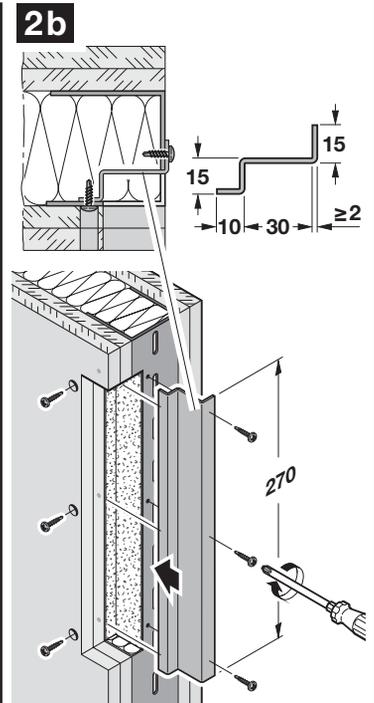
1



2a



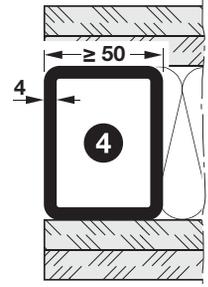
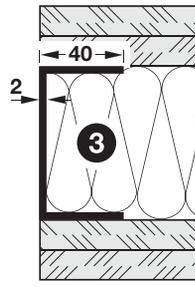
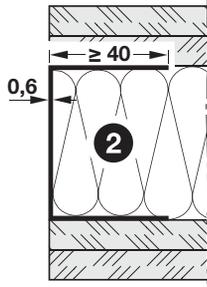
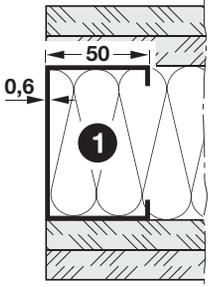
2b



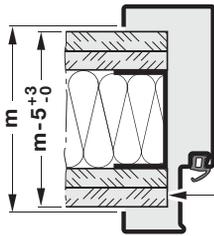
8.12

4.2

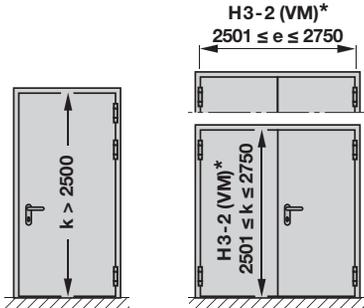
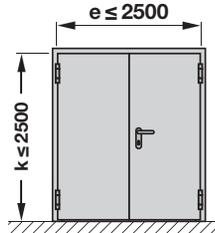
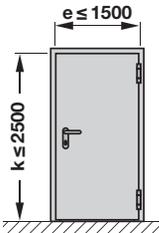
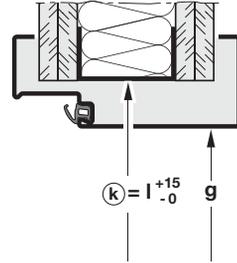
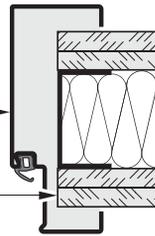
8.10



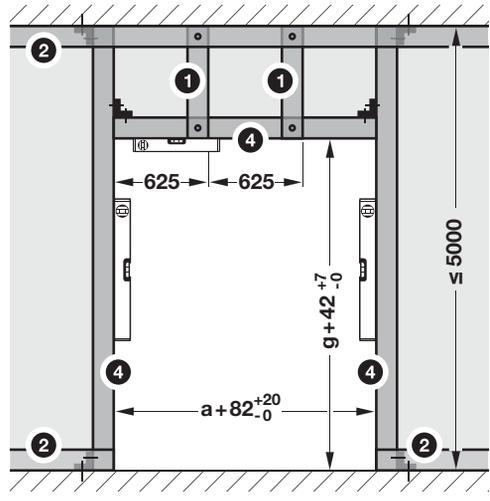
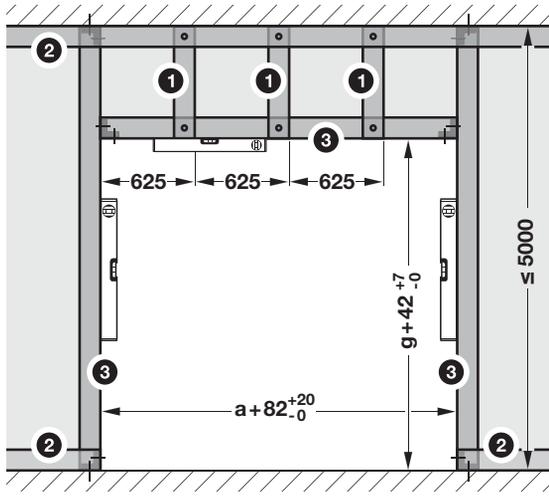
**i** [www.felko-systeme.de/teleskopstuetzen.php](http://www.felko-systeme.de/teleskopstuetzen.php)



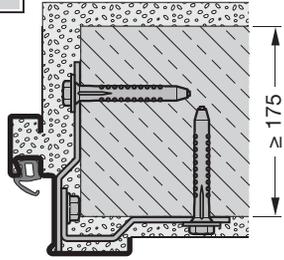
a



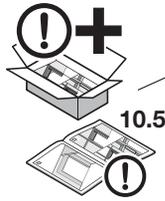
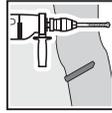
\*[www.felko-systeme.de/teleskopstuetzen.php](http://www.felko-systeme.de/teleskopstuetzen.php)



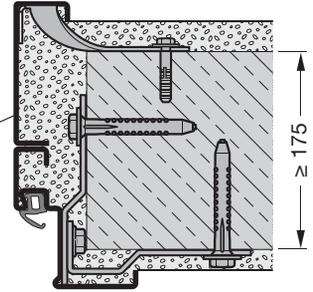
9/A1



9/A2



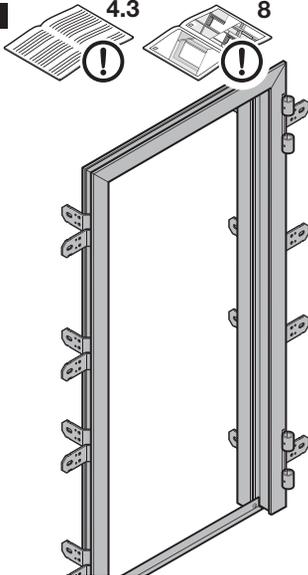
10.5



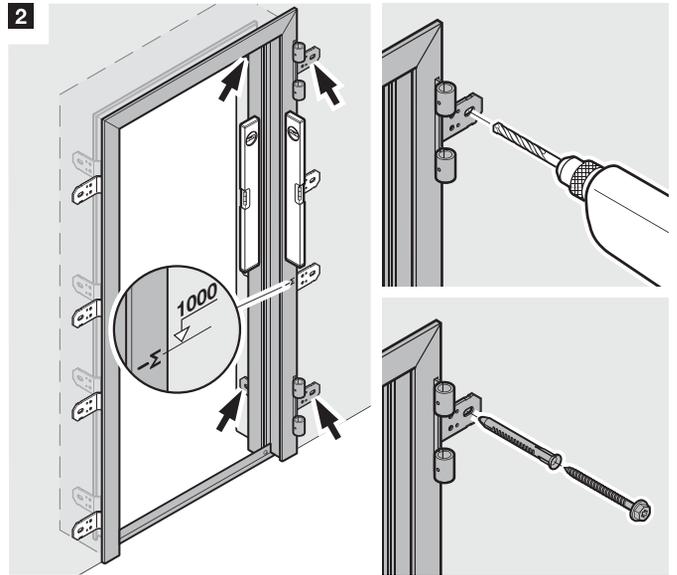
1

4.3

8

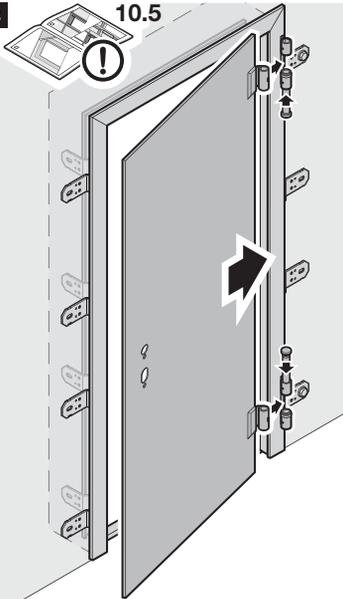


2

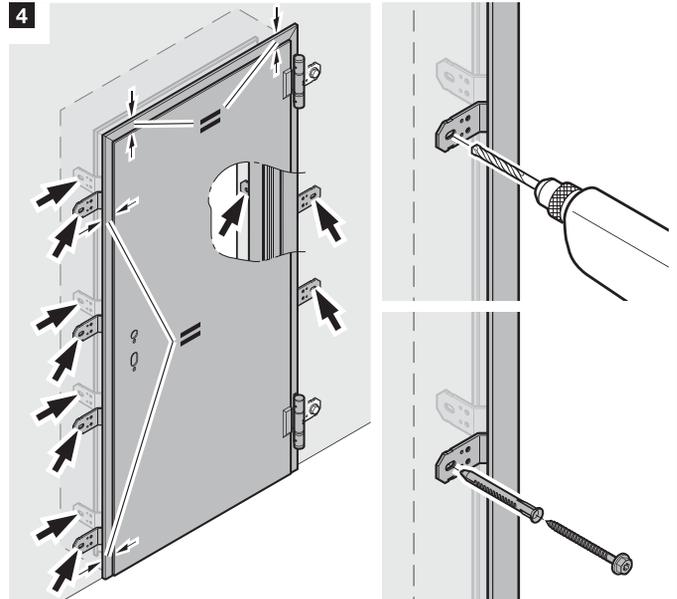


3

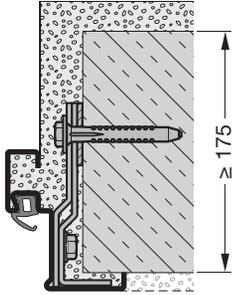
10.5



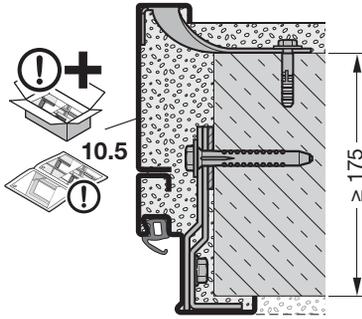
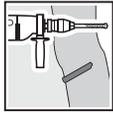
4



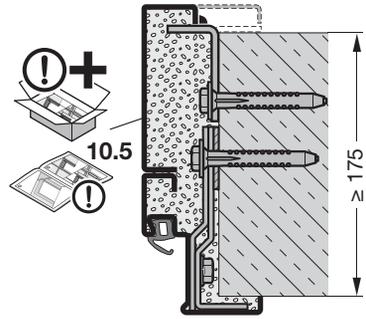
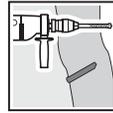
9/A3



9/A4



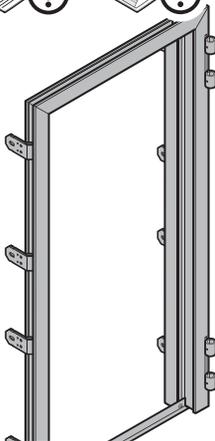
9/A5



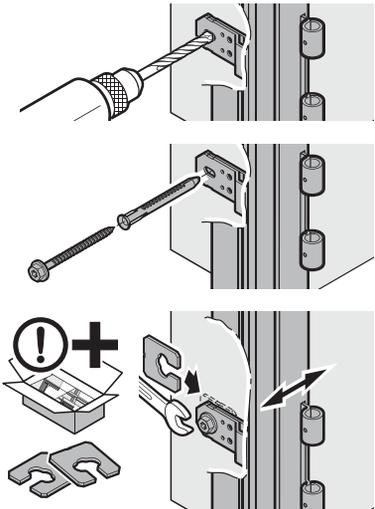
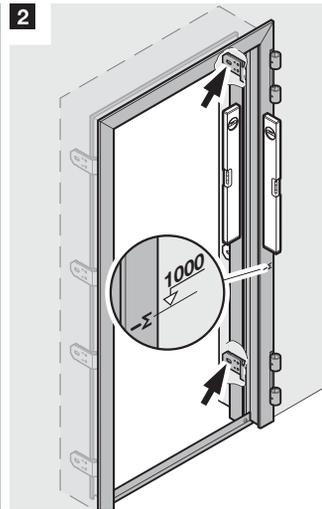
1

4.3

8

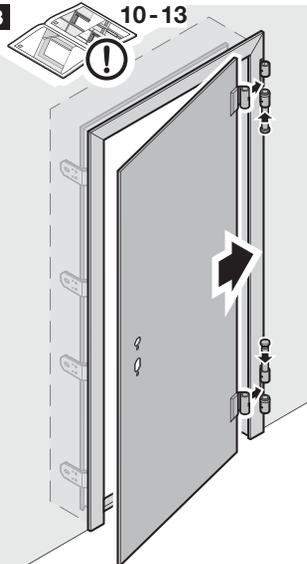


2

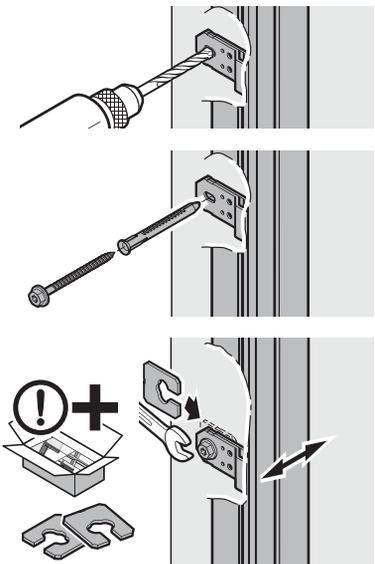
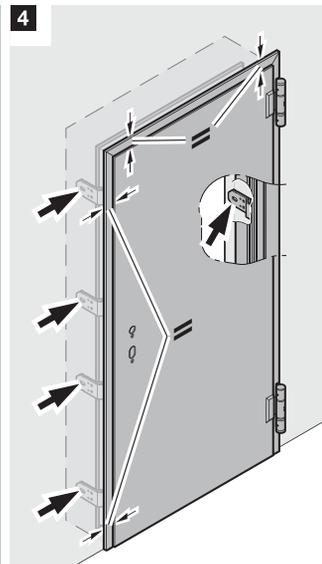


3

10-13



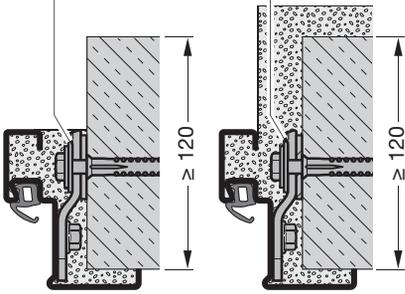
4



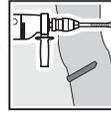
9/A6



DIN 9021-8.4-140 HV

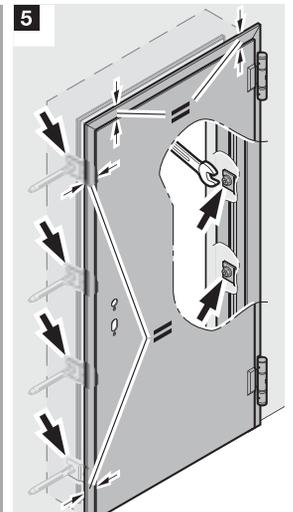
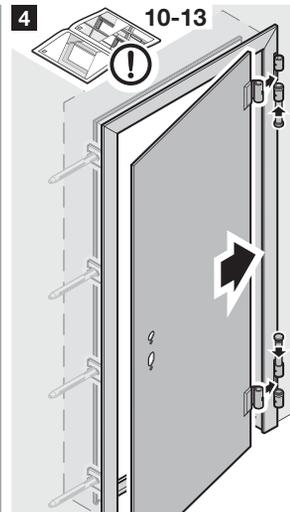
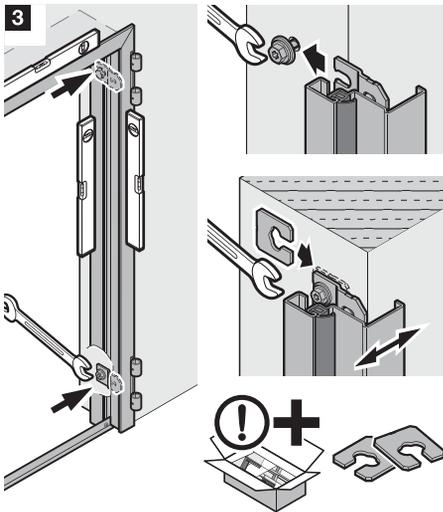
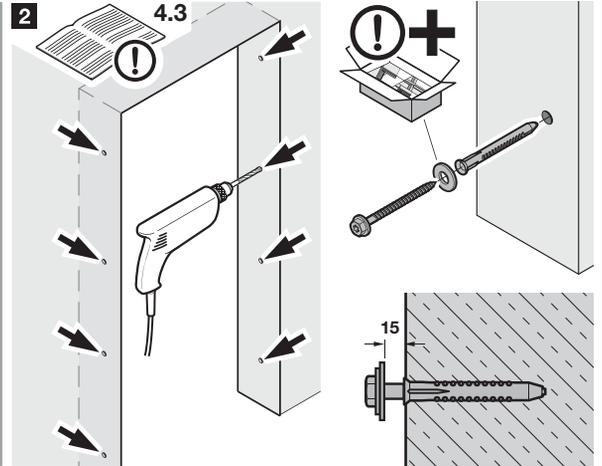
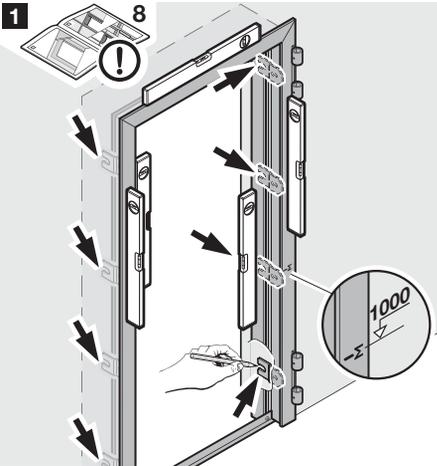
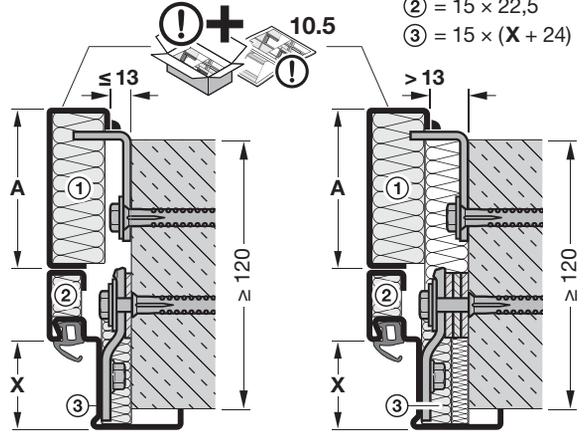


9/A7  
max. T30

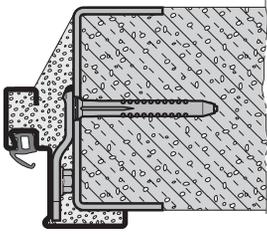


$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100

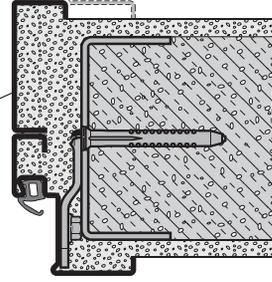
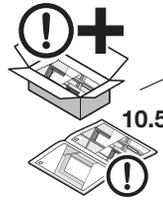
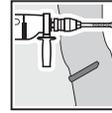
- ① =  $30 \times (A - 5)$
- ② =  $15 \times 22,5$
- ③ =  $15 \times (X + 24)$



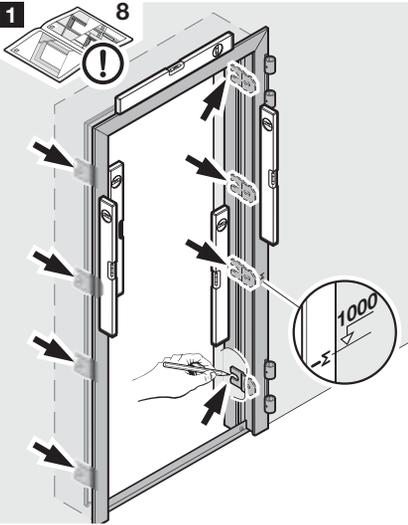
9/A8



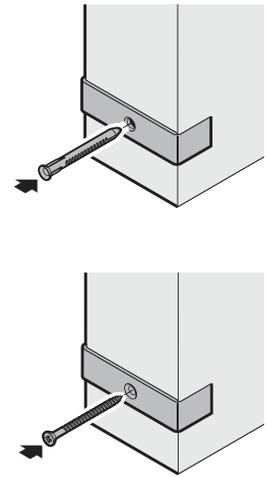
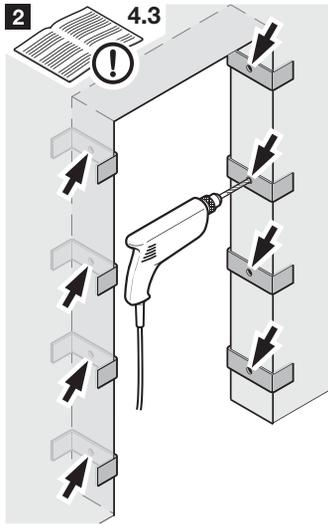
9/A9



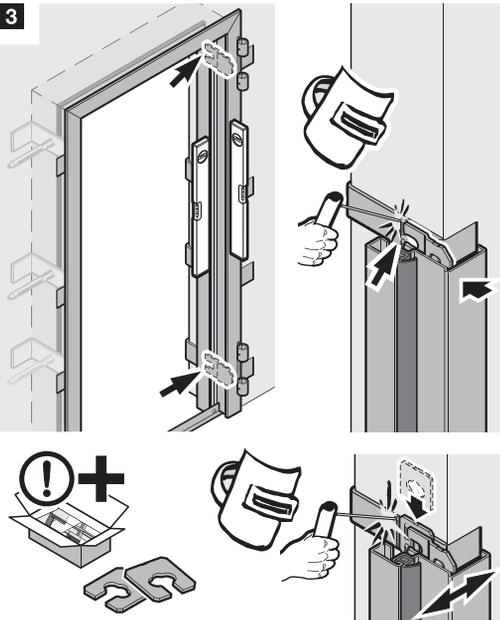
1 8



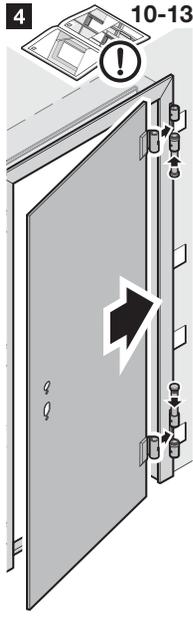
2 4.3



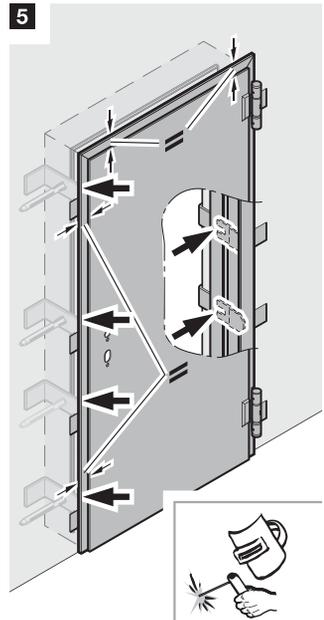
3



4 10-13

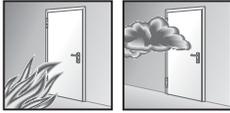


5

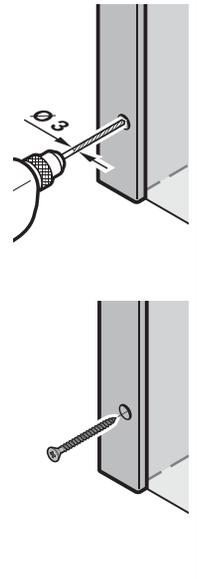
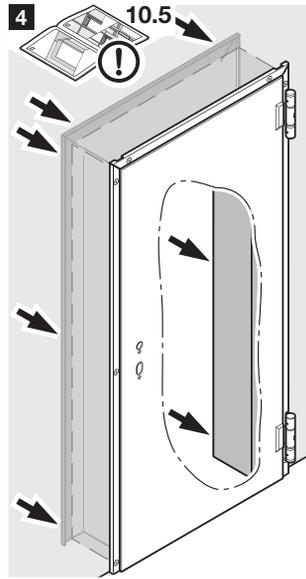
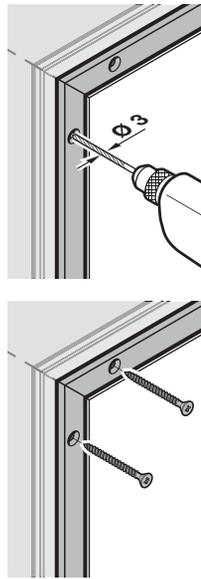
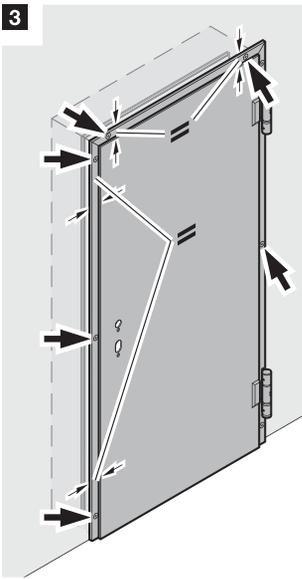
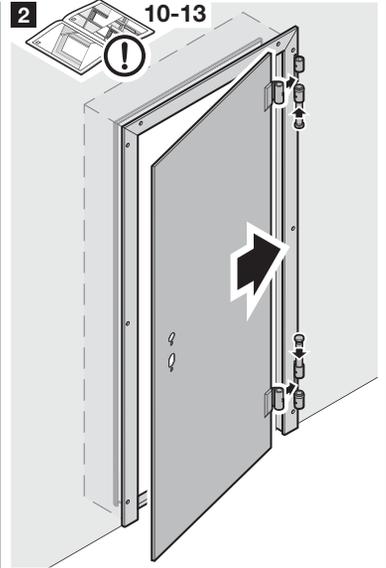
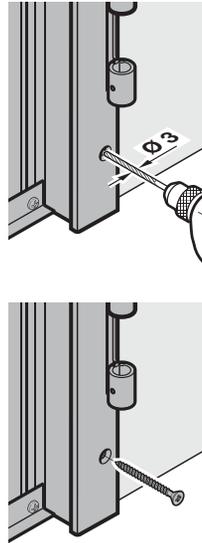
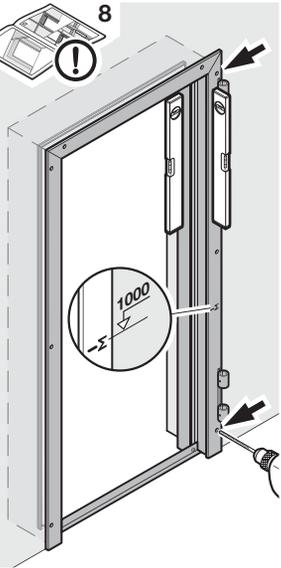
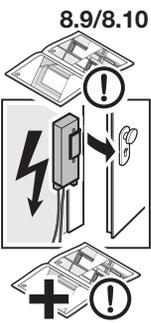
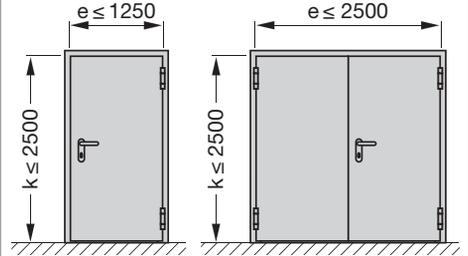
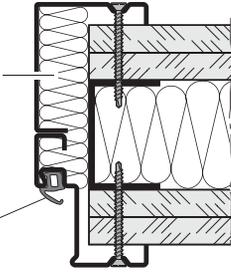
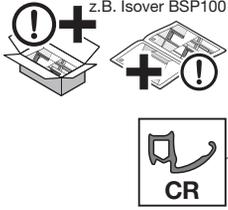


9/A10

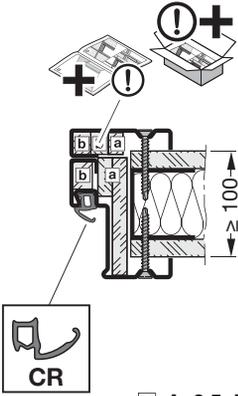
max. T30/  
EI<sub>230</sub>



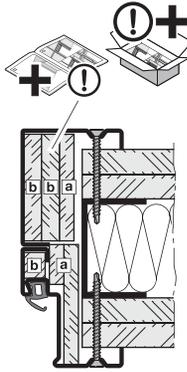
$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100



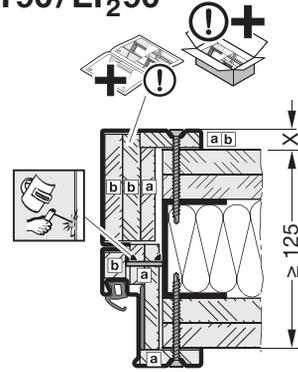
9/A11



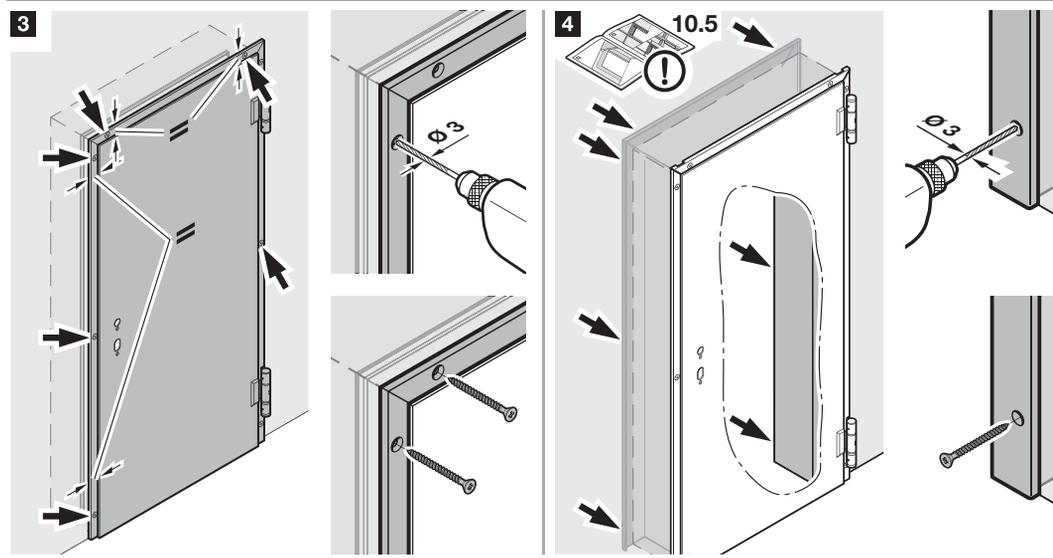
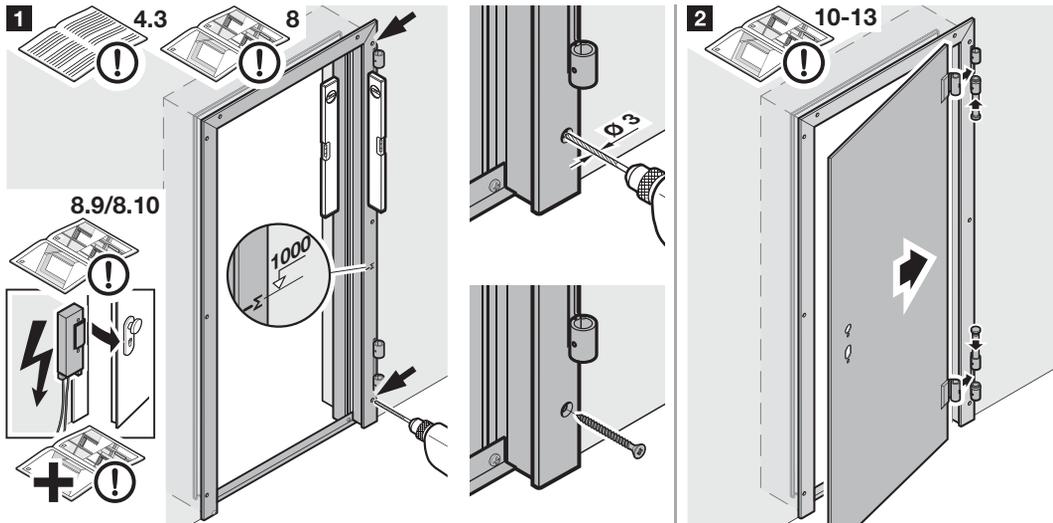
9/A12



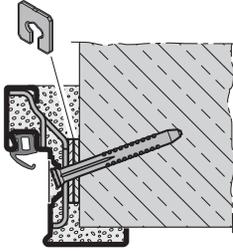
9/A13  
T90/EI<sub>2</sub>90



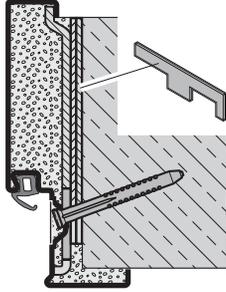
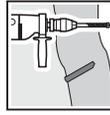
a A-9,5-EN 520 / b A-12,5-EN 520 / X = 10 → a / X = 15 → b



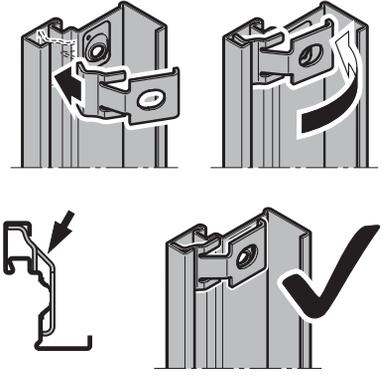
9/A14  
max. T30/  
EI<sub>2</sub>30



9/A15  
max. T90/  
EI<sub>2</sub>90



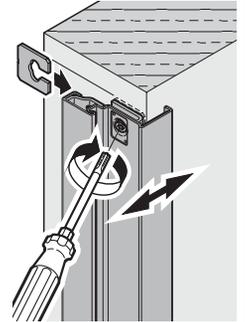
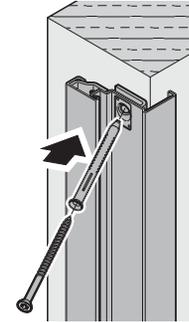
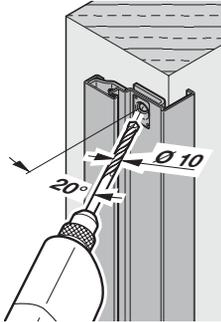
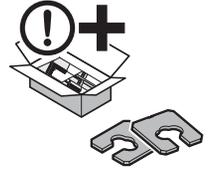
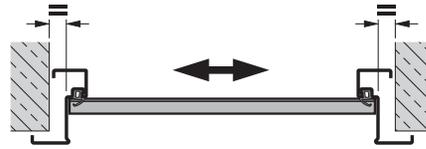
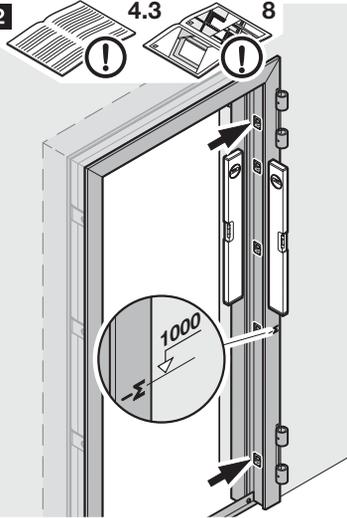
1



2

4.3

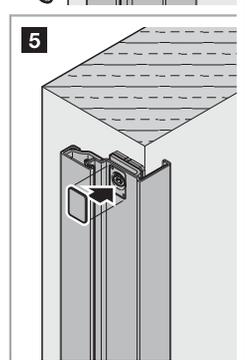
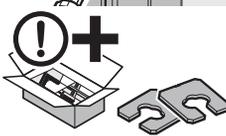
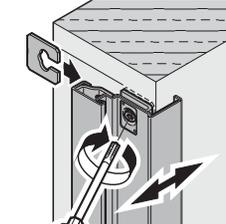
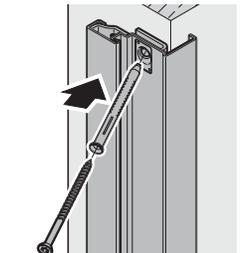
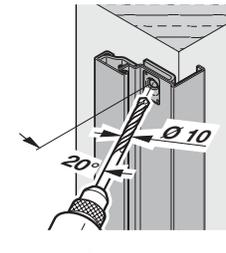
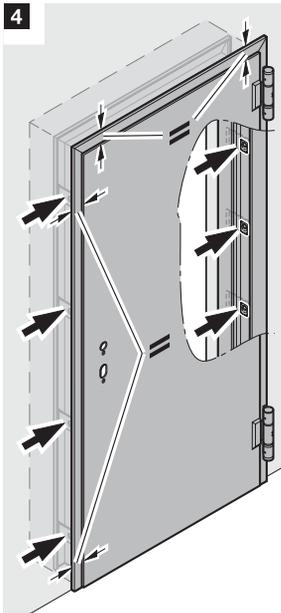
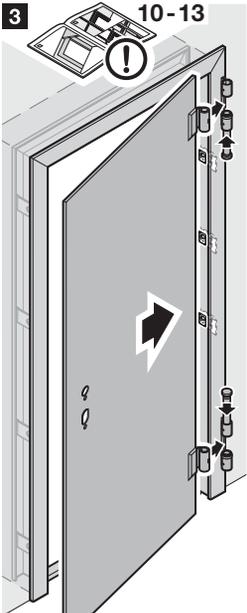
8



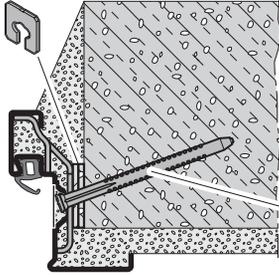
3

10-13

4

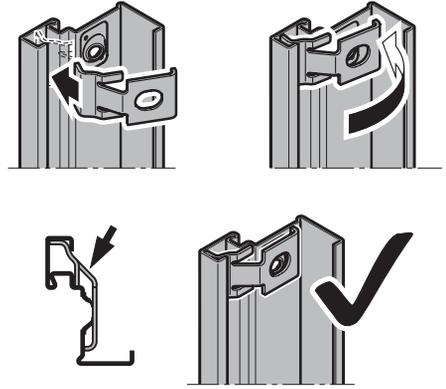


9/A16  
max. T30



FUR 10 x 160

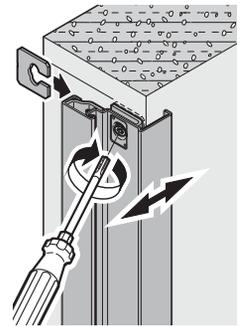
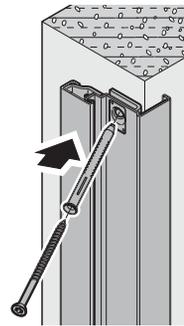
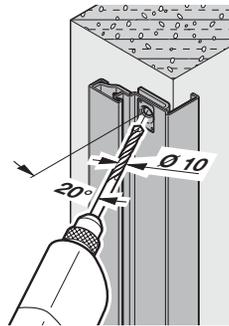
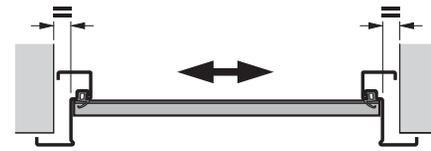
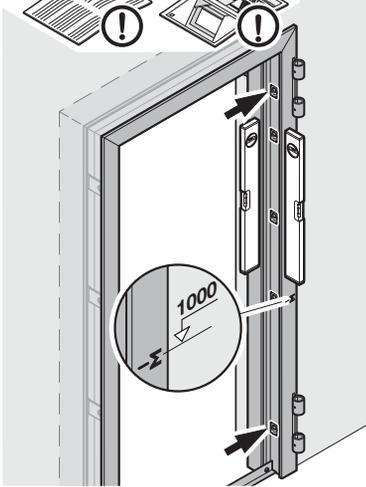
1



2

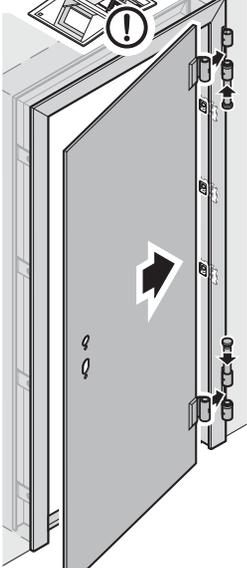
4.3

8

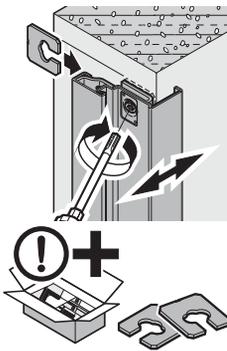
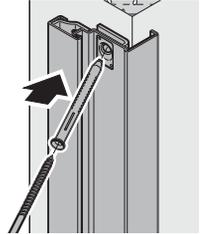
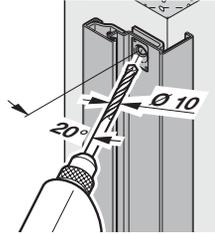
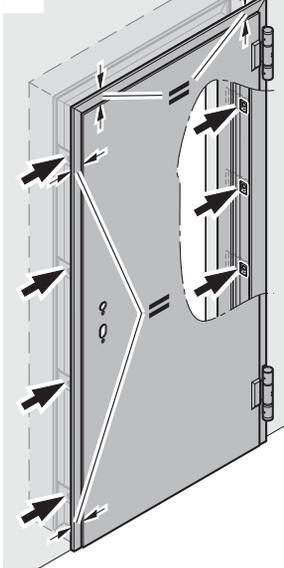


3

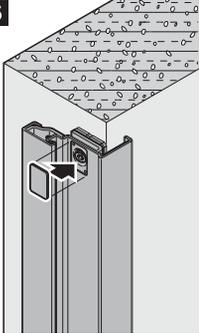
10-13



4



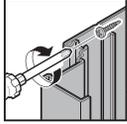
5



9/A17

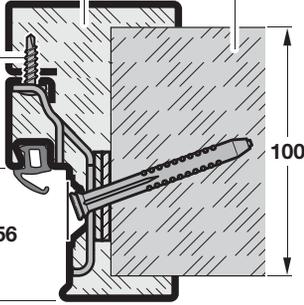


Multi Gips  
FG70



DIN 7504 ST  
4,8 x 19-N-H  
DIN 7981  
4,8 x 16

max. 56

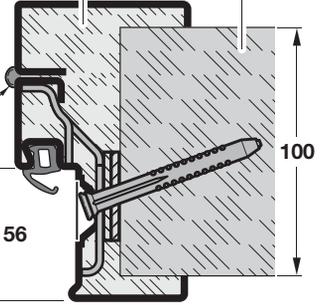


Multi Gips  
FG70

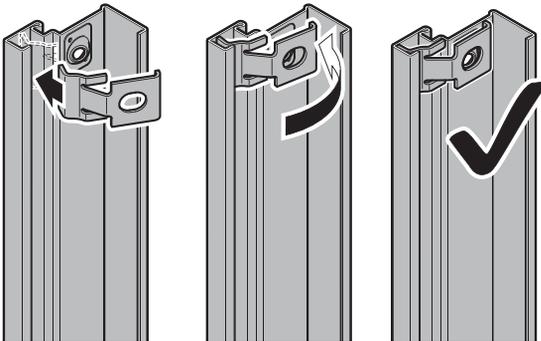
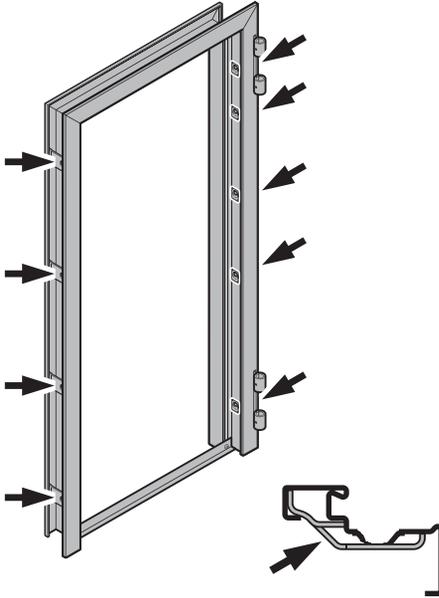


$2\sqrt{x} > 10$

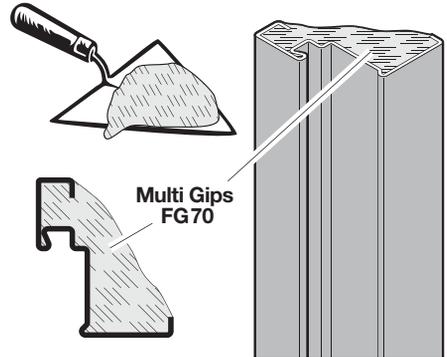
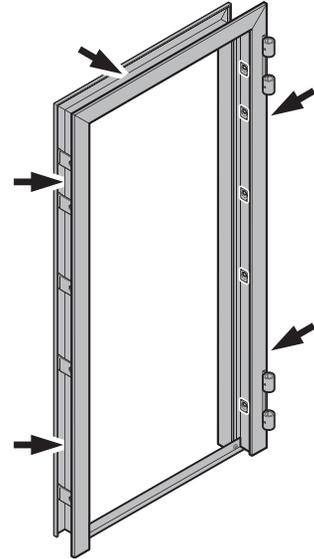
max. 56



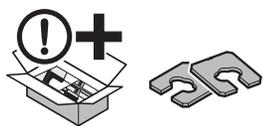
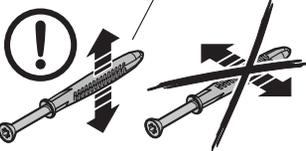
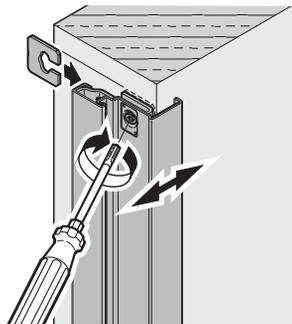
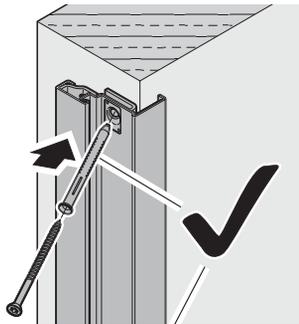
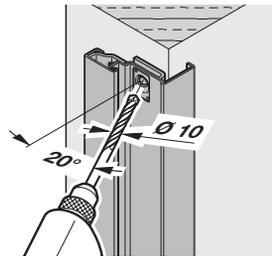
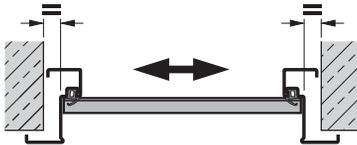
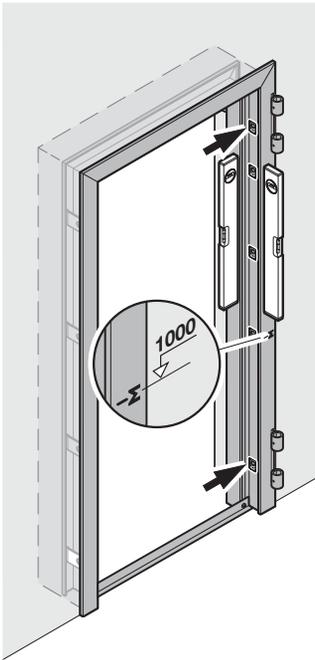
1



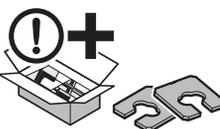
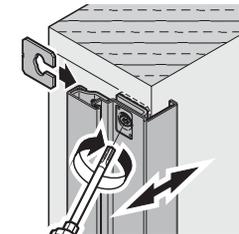
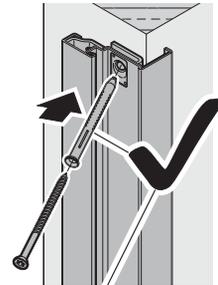
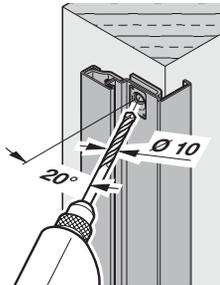
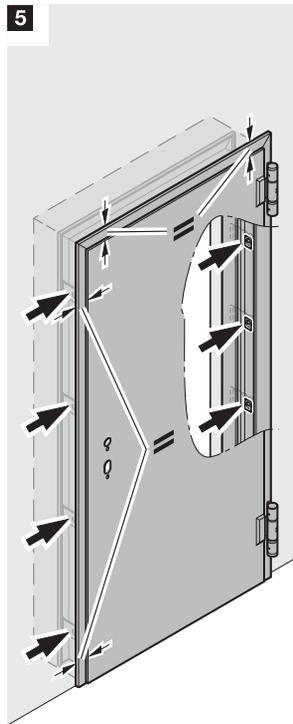
2



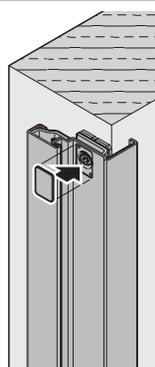
3 4.2/4.3 8

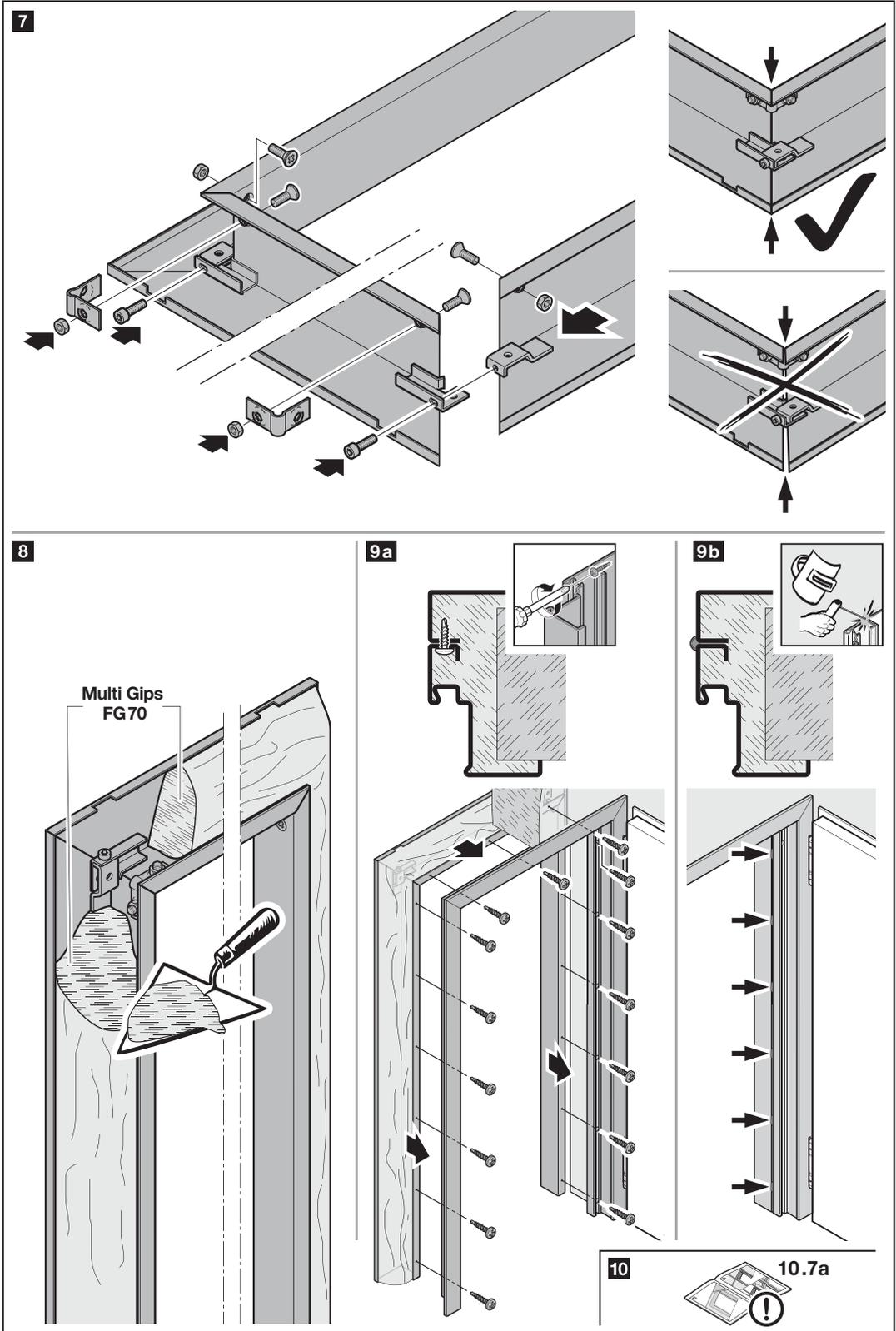


4 10-13



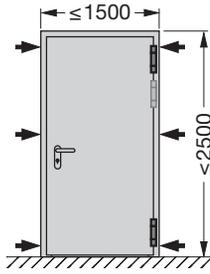
6



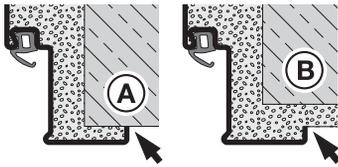
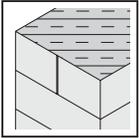
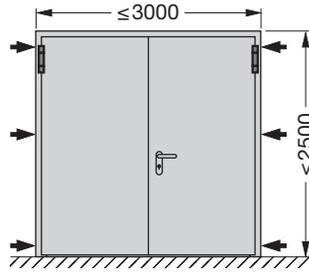


9/B1-B14

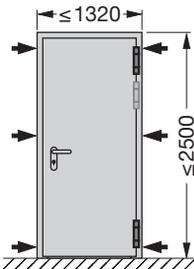
D65-1 OD



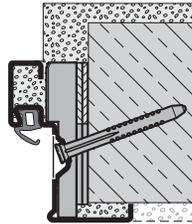
D65-2 OD



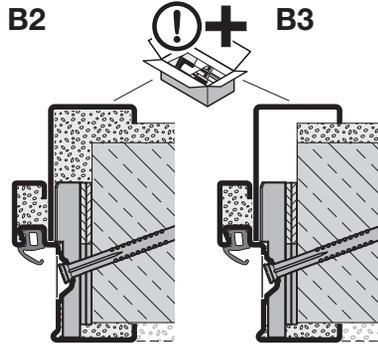
H3-1 OD



B1

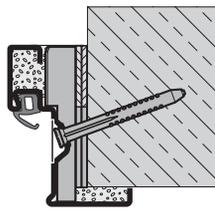


B2

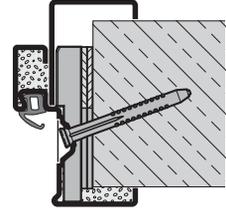


B3

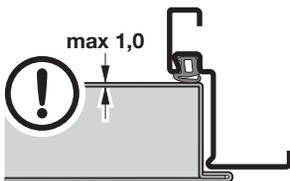
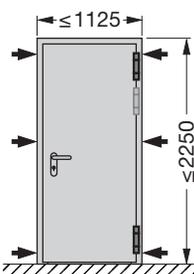
B4



B5



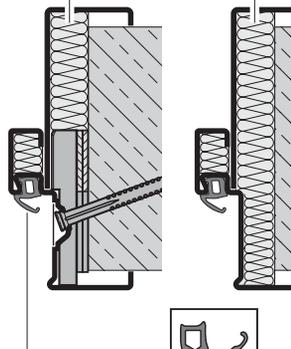
H3-1 OD



B6



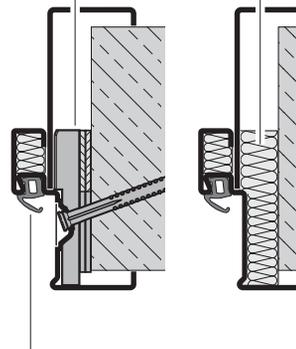
$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100



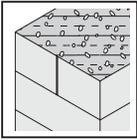
B7



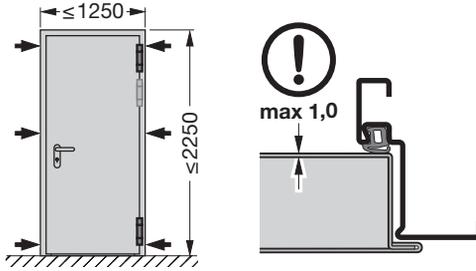
$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100



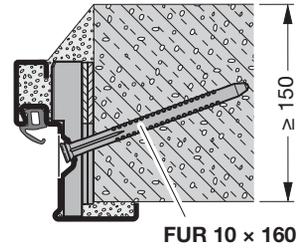
➔ 1 2 3a 4 ...



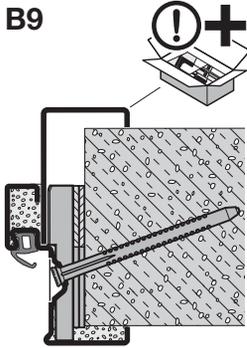
### H3-1 OD



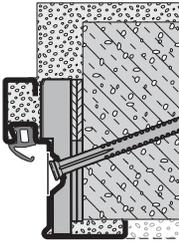
### B8



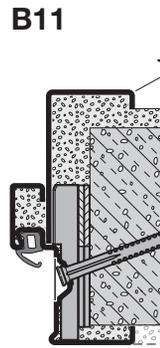
### B9



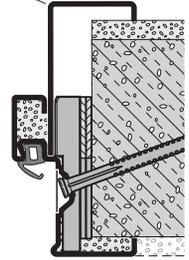
### B10



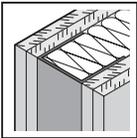
### B11



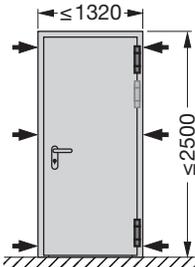
### B12



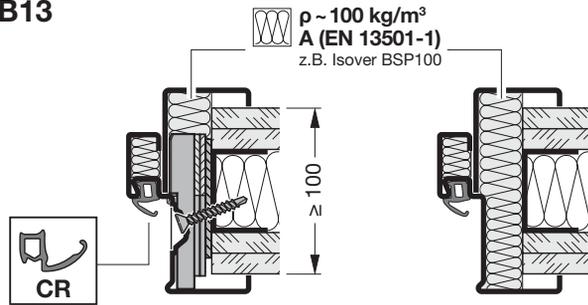
➔ 1 2 3a 4 ...



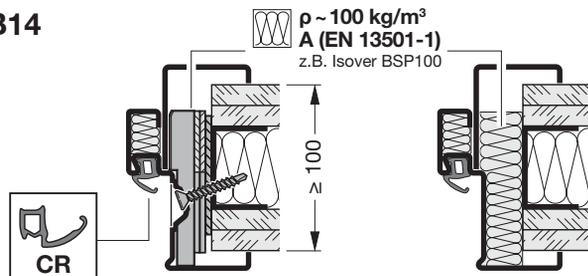
### H3-1 OD



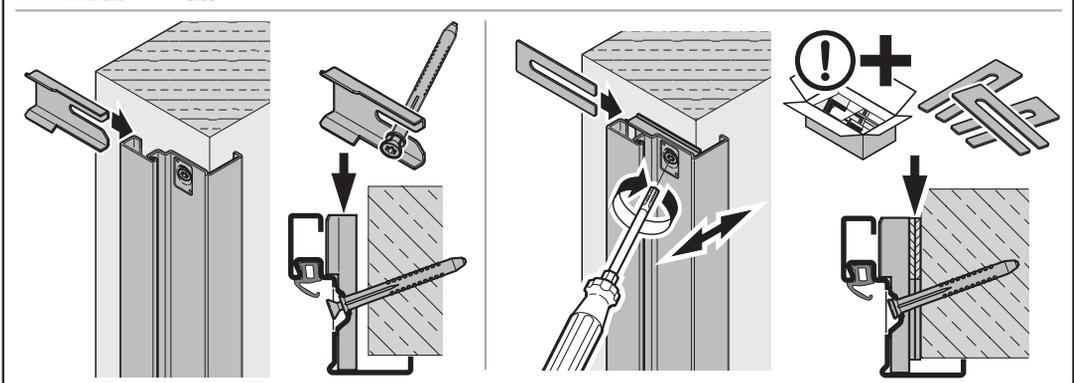
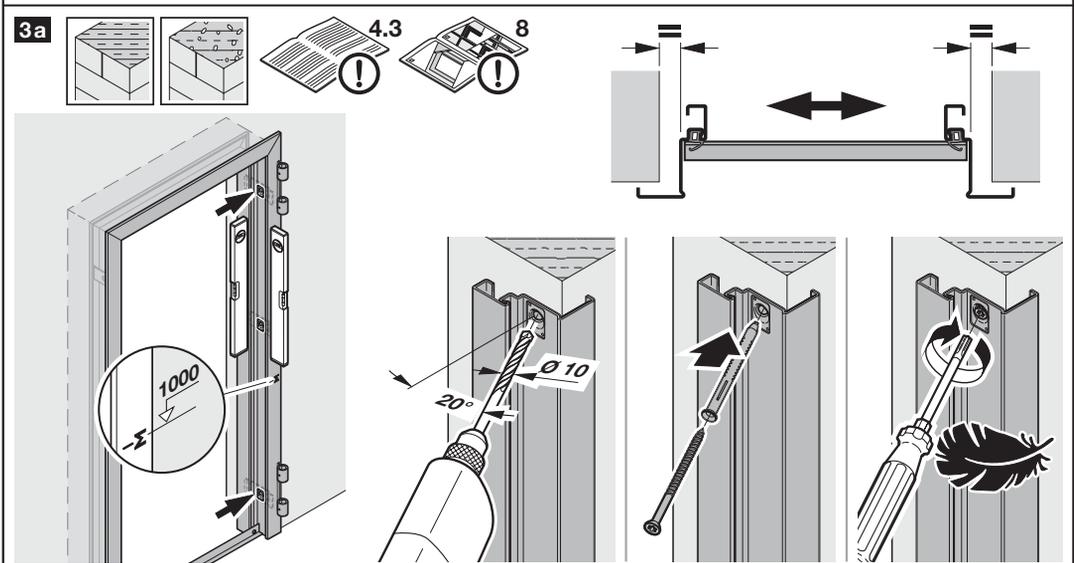
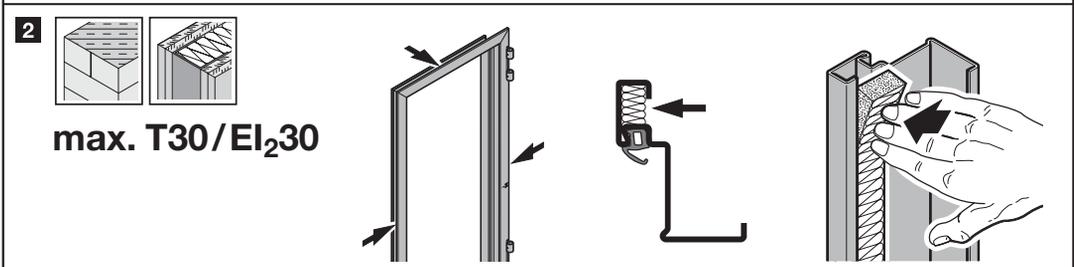
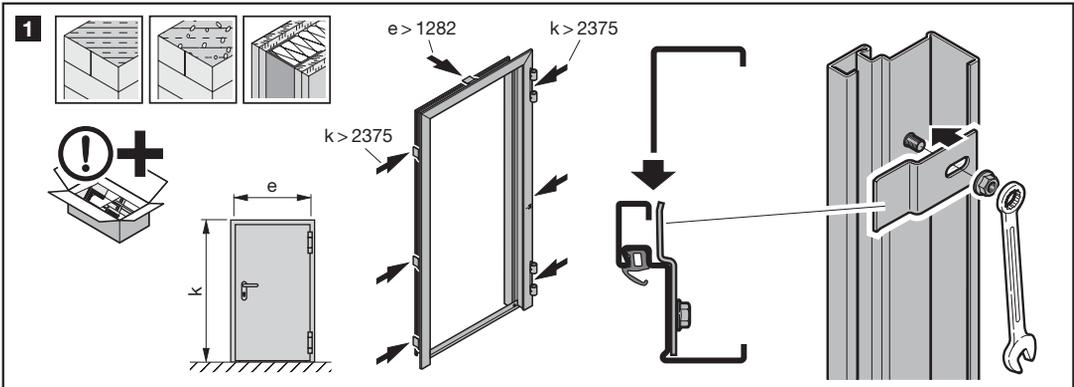
### B13

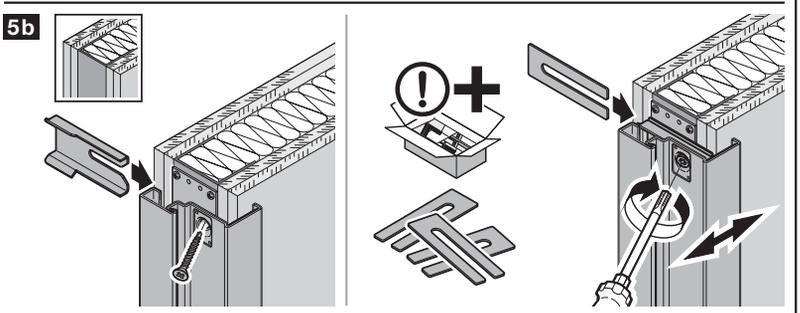
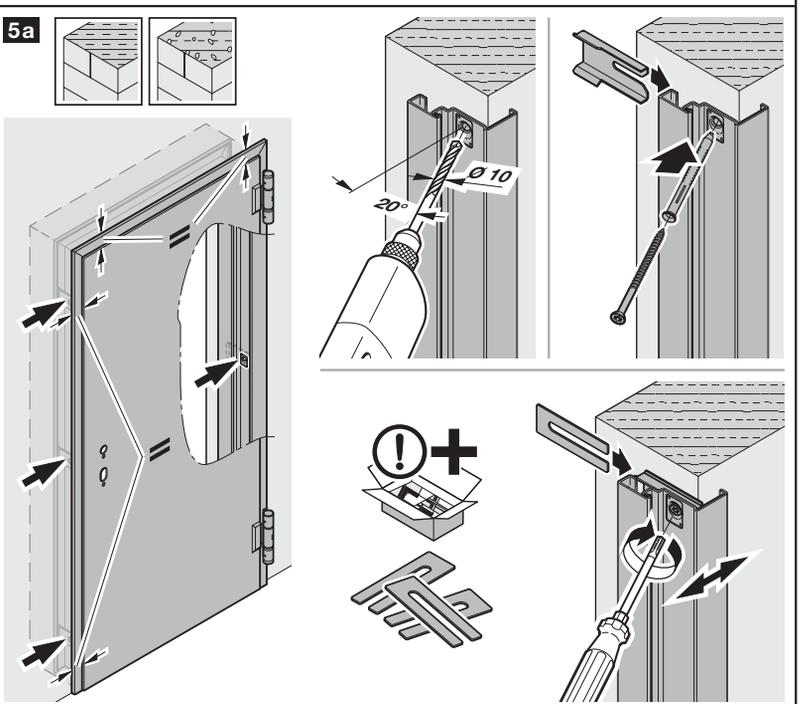
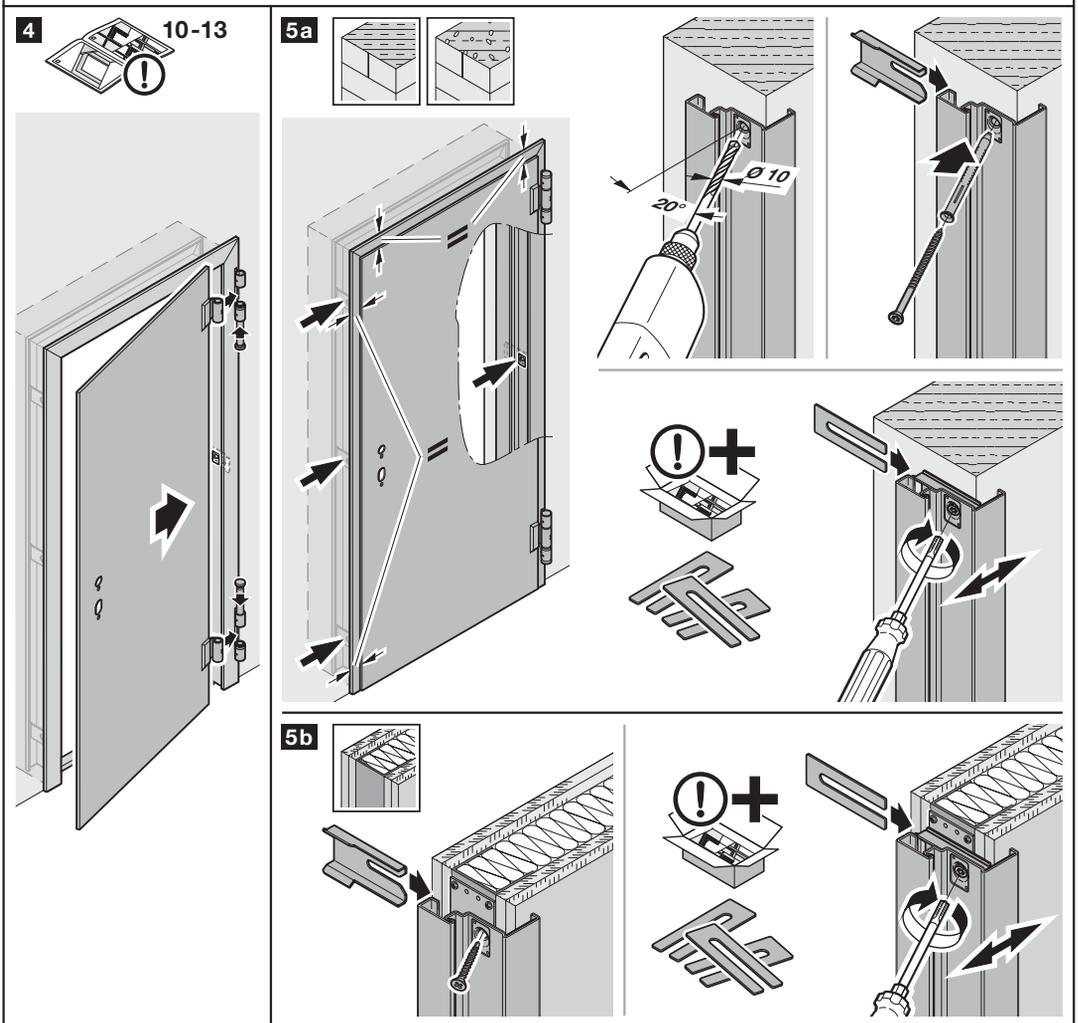
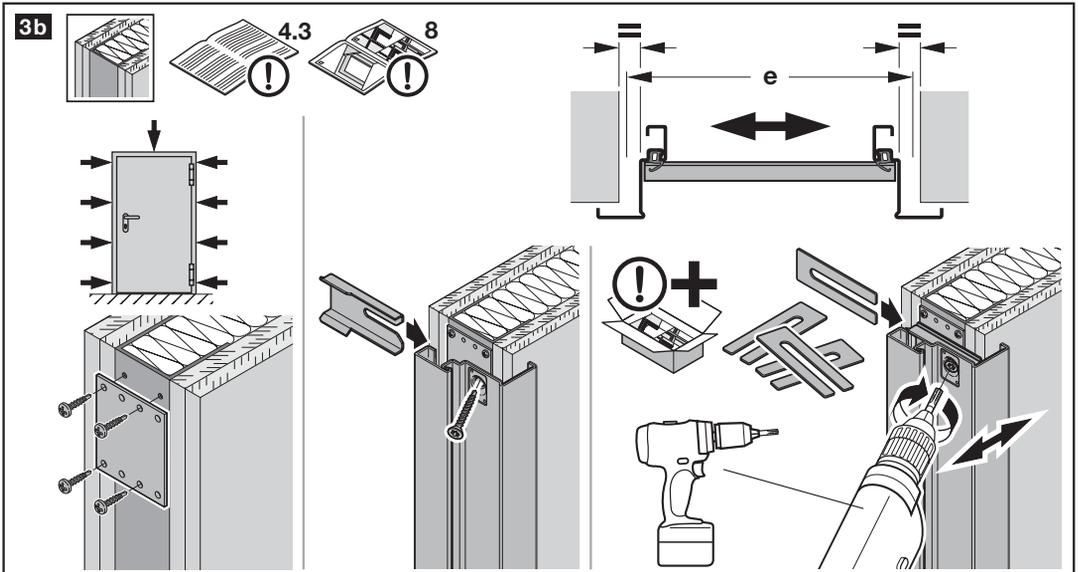


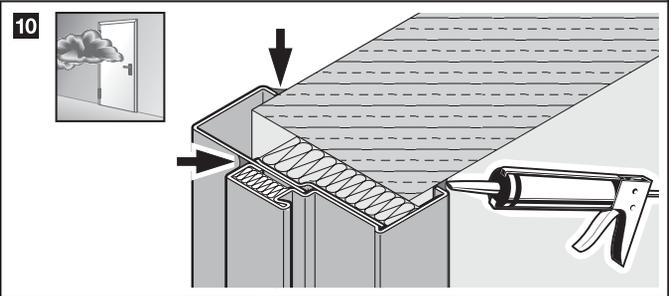
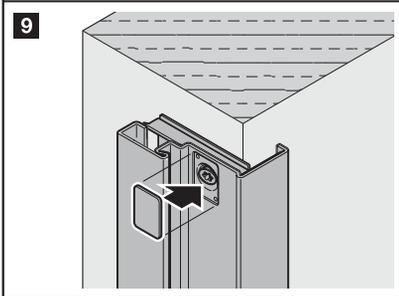
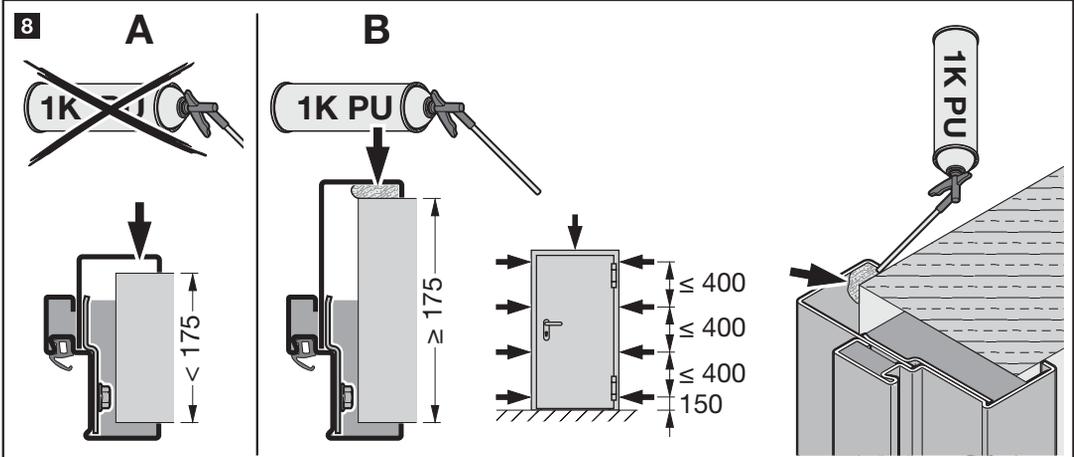
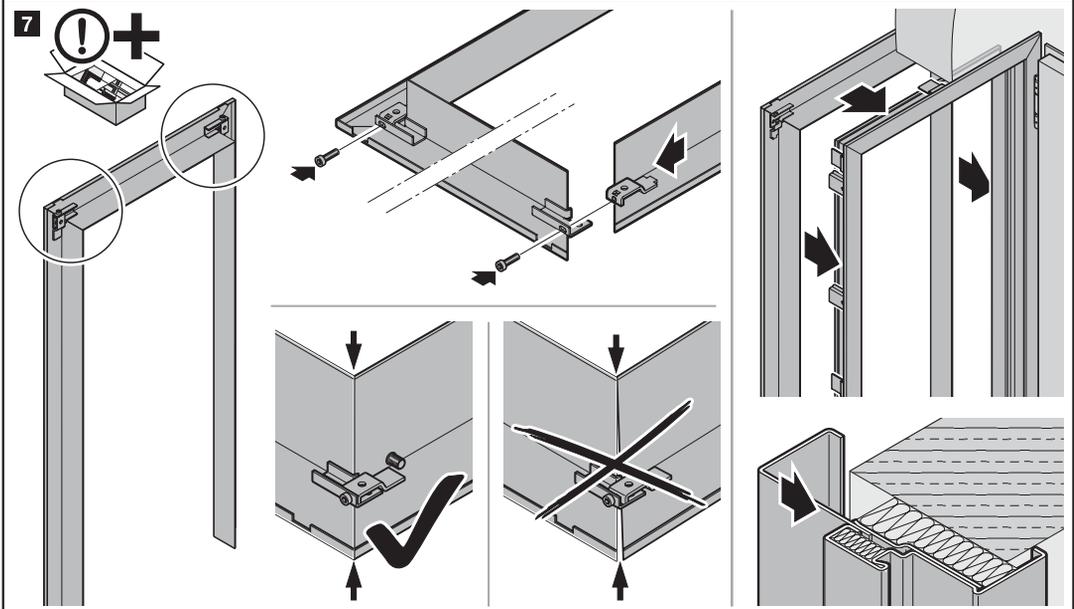
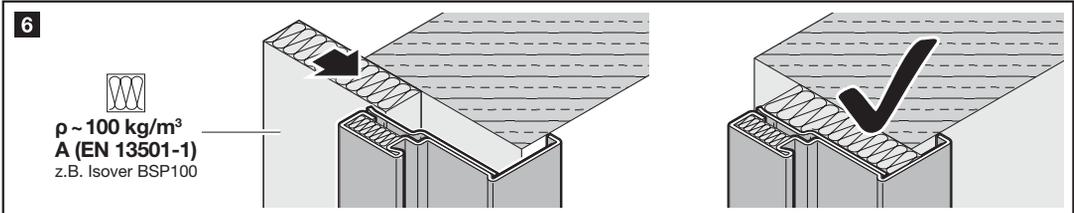
### B14



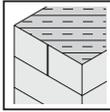
➔ 1 2 3b 4 ...





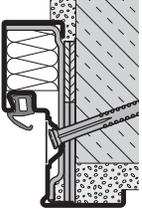


9/C1-C8  
max. T30/  
EI<sub>230</sub>

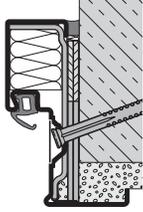


CR

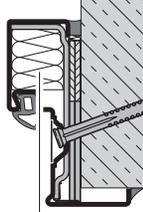
C1



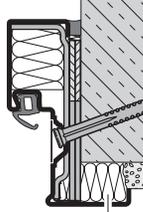
C2



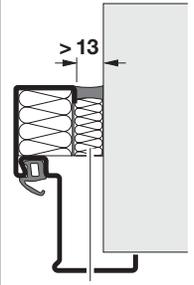
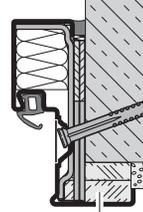
C3



C4



C5



$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100

A-EN 520

$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100

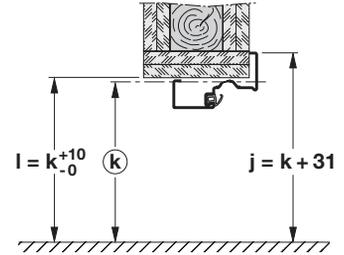
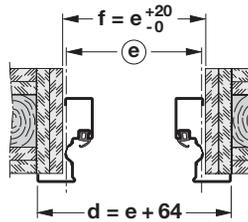
➔ 1a 2 ...

➔ 6

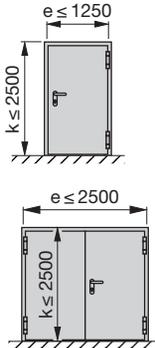
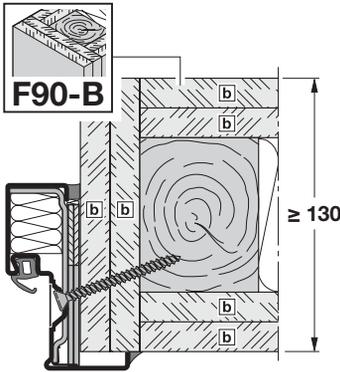
max. T30/  
EI<sub>230</sub>



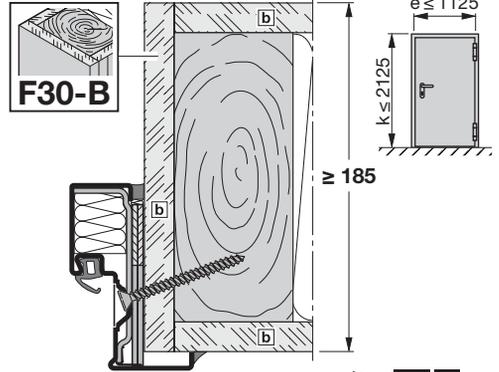
CR



C6 F90B DIN 4102-4 Tab. 49



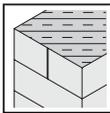
C7 F30B DIN 4102-4 Tab. 49



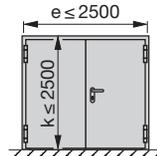
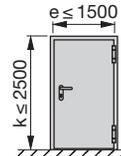
b A-12,5-EN 520

➔ 1b 2 ...

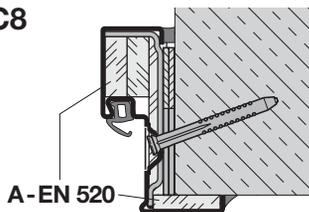
max. T90/  
EI<sub>290</sub>



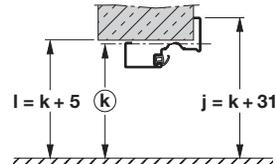
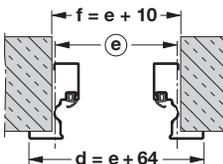
CR



C8

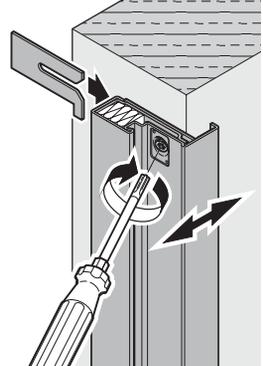
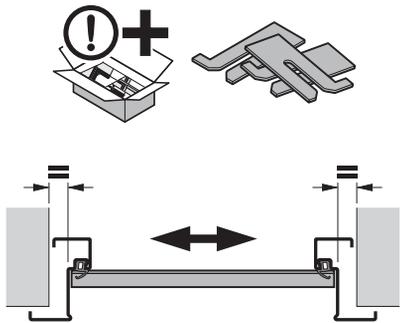
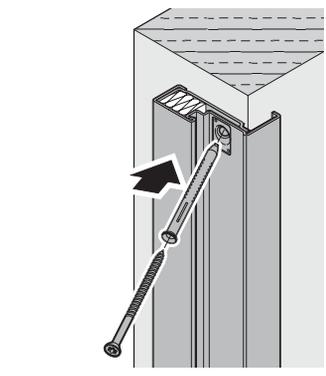
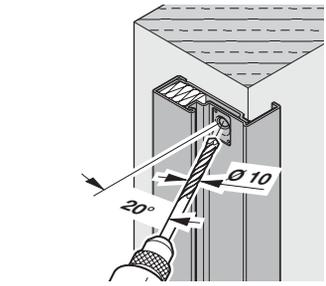
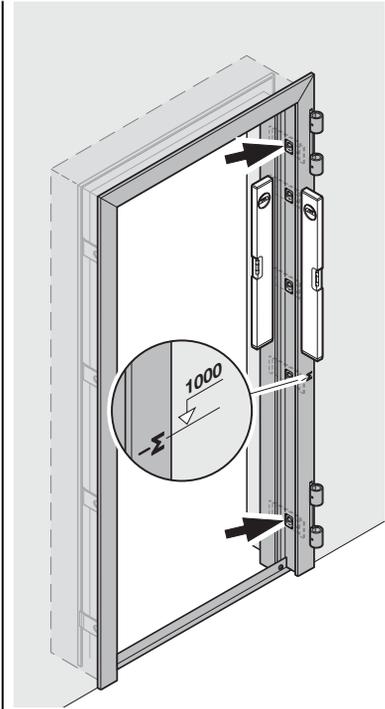
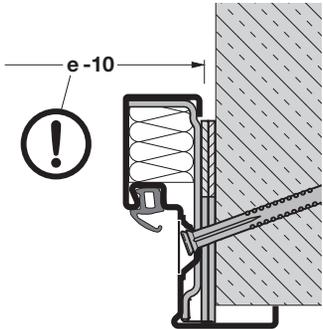
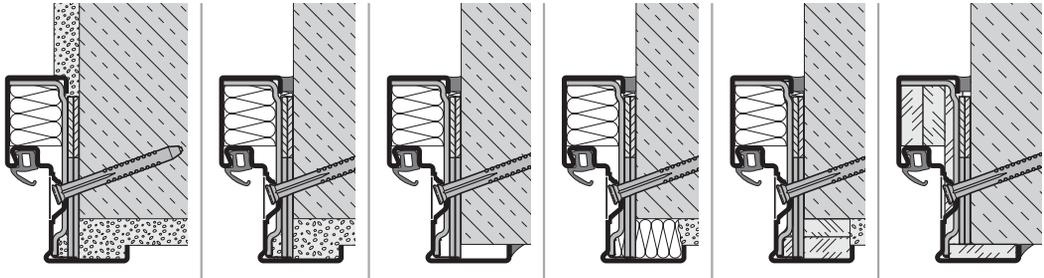
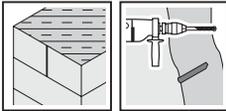


A-EN 520

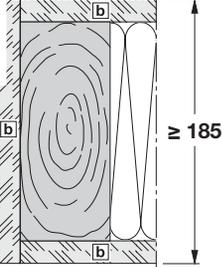
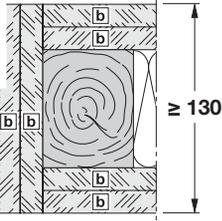


➔ 1a 2 ...

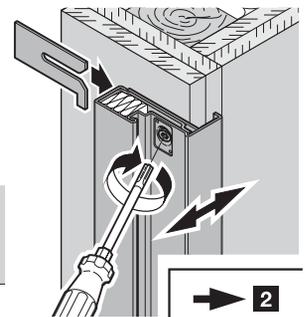
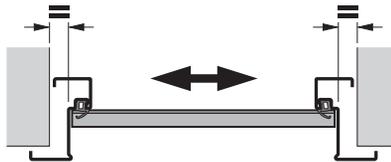
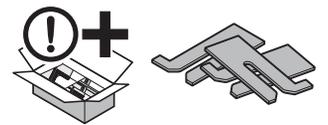
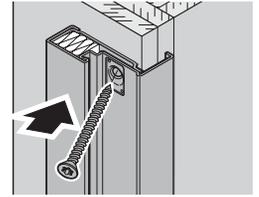
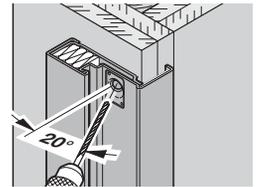
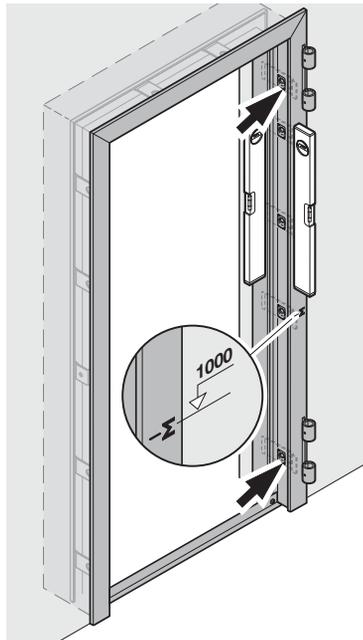
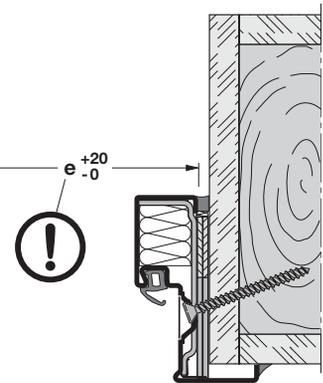
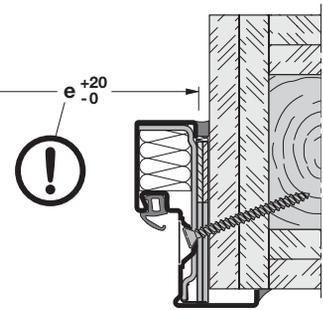
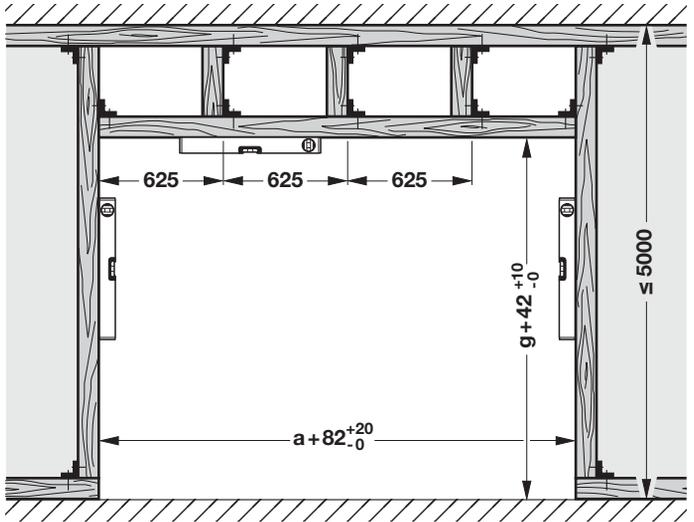
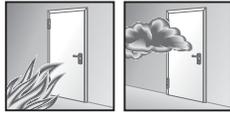
1a

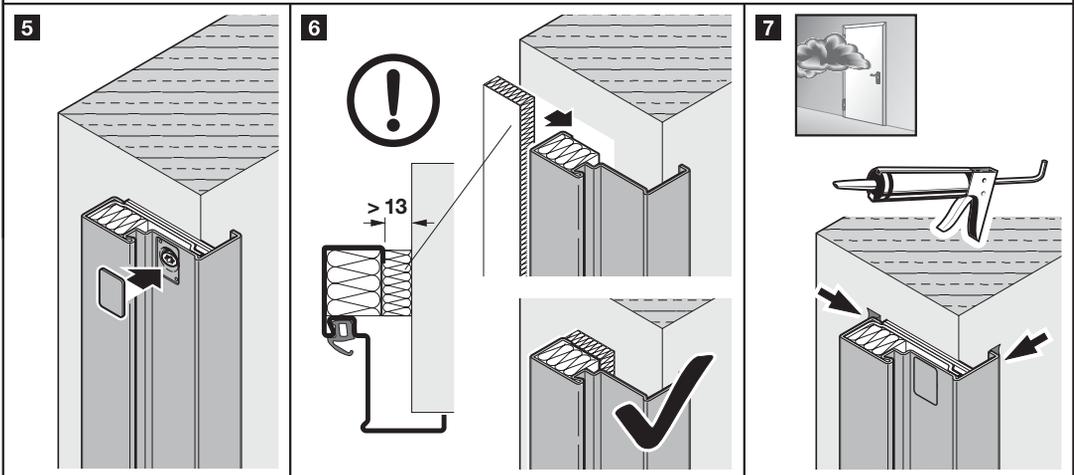
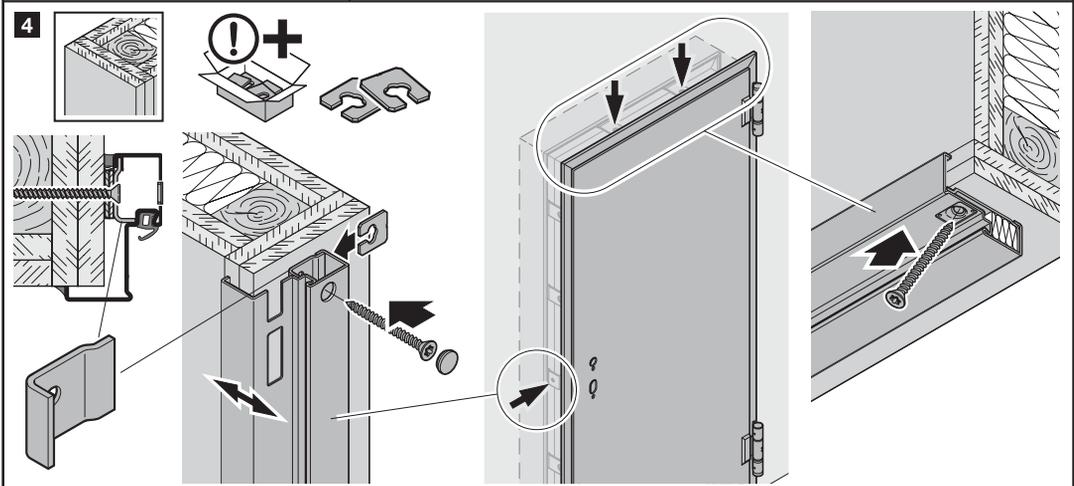
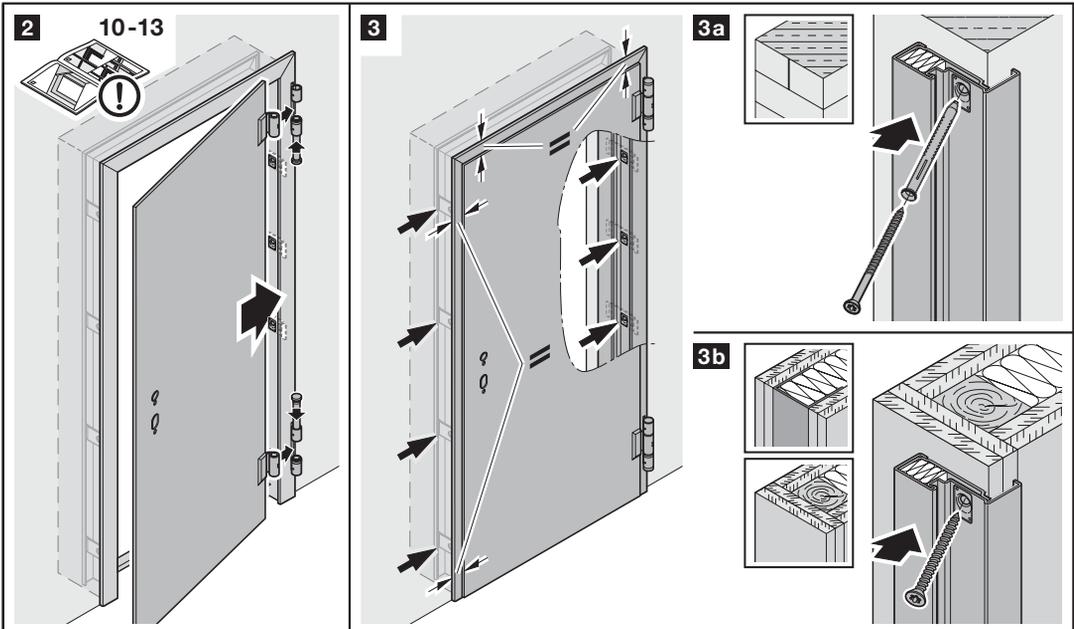


1b

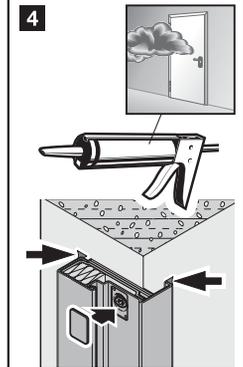
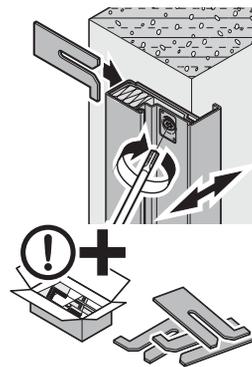
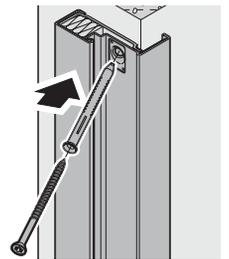
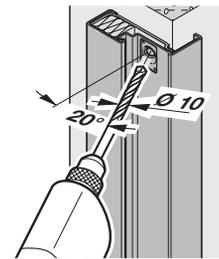
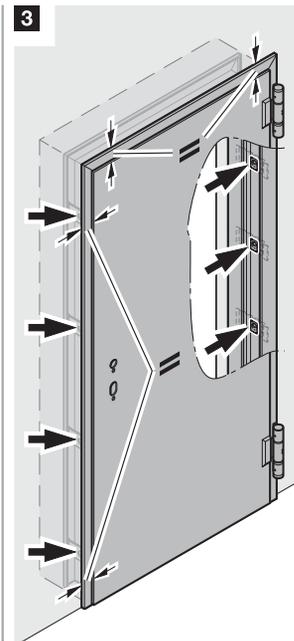
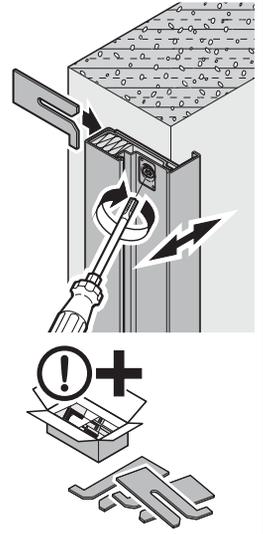
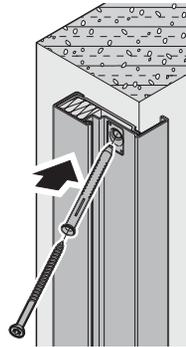
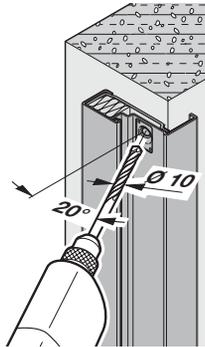
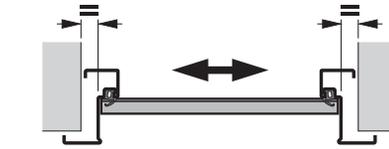
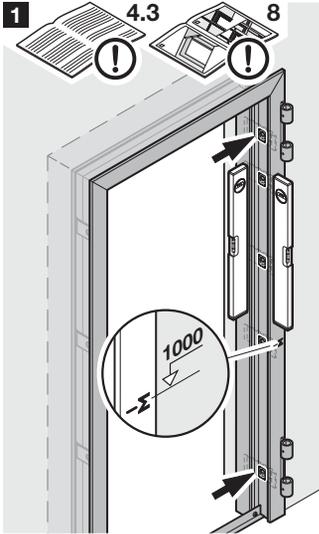
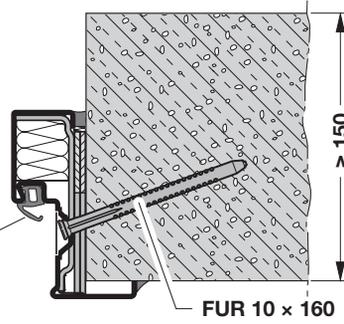


b) A-12,5-EN 520

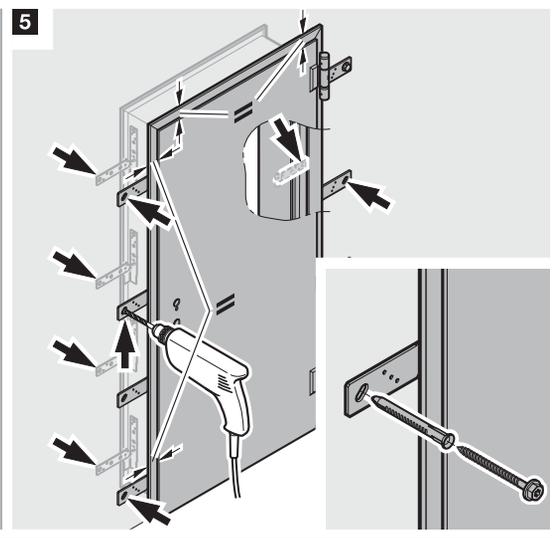
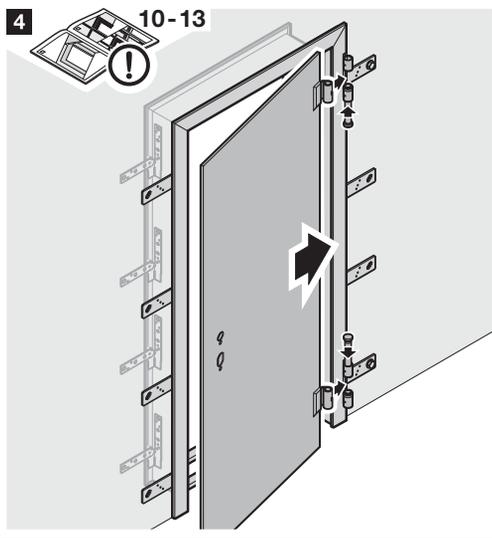
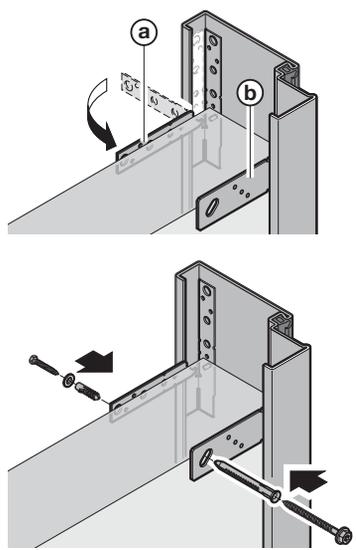
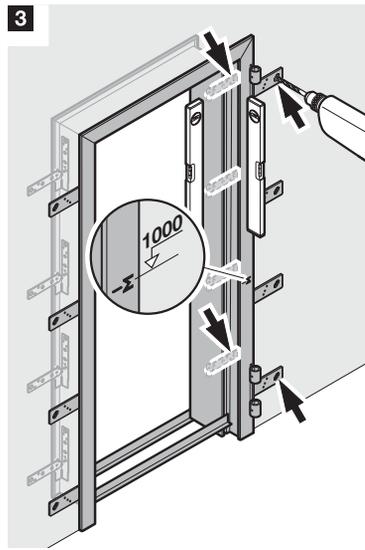
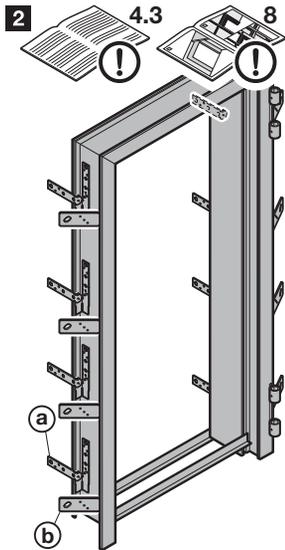
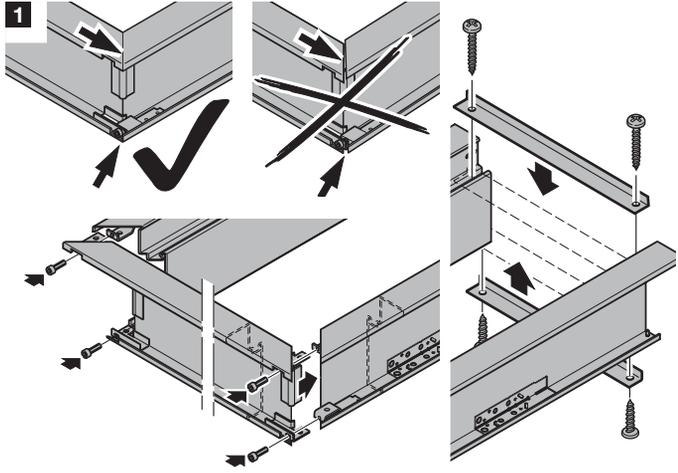
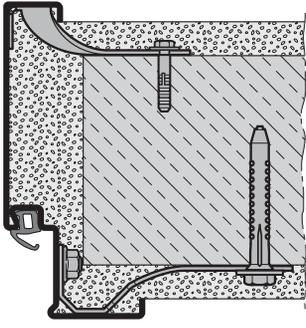


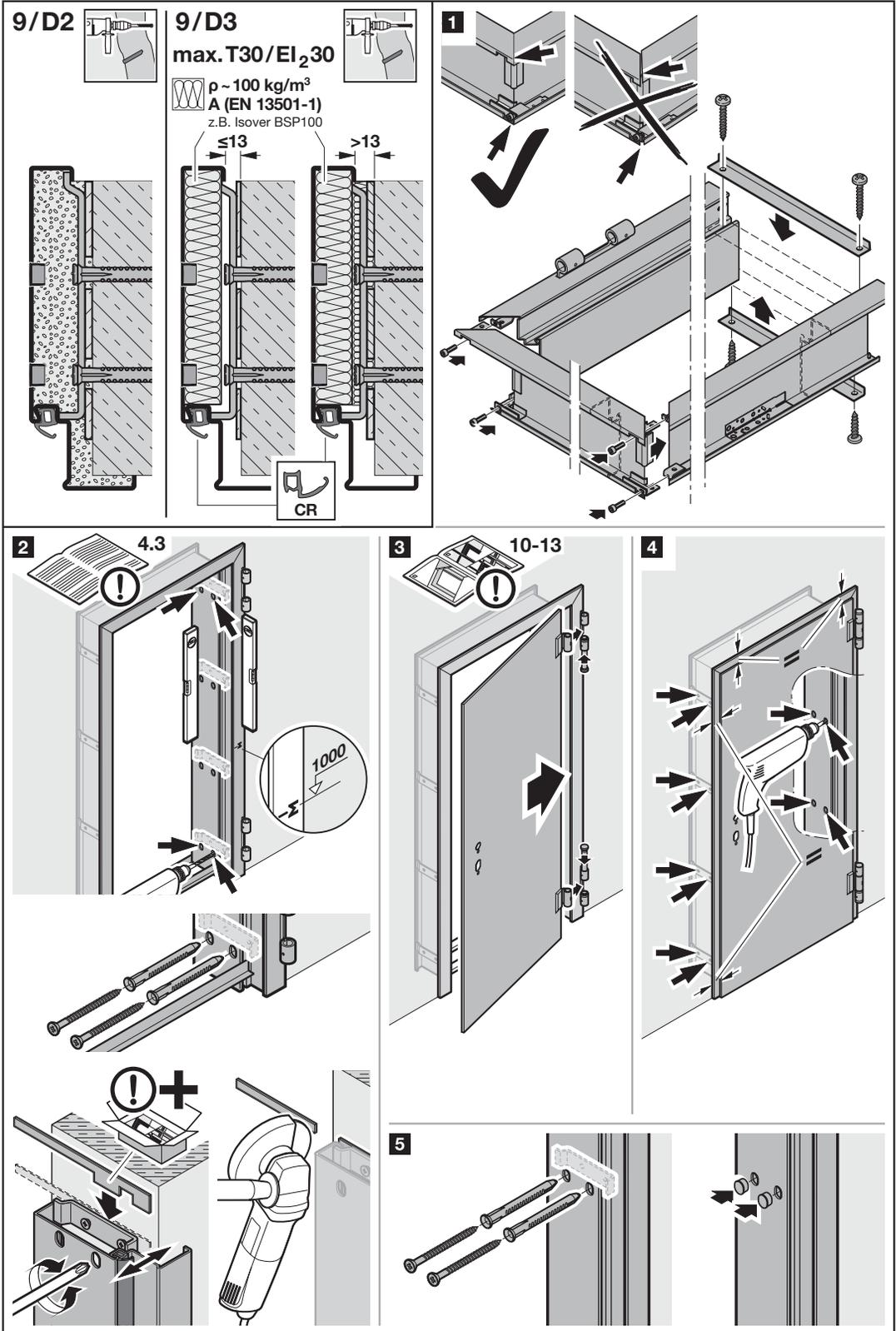


9/C9  
max. T30



9/D1





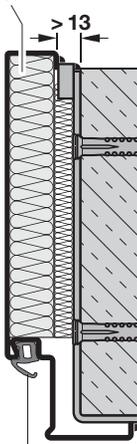
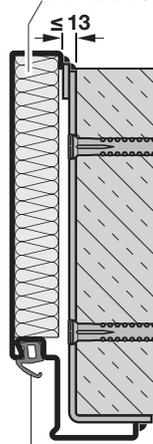
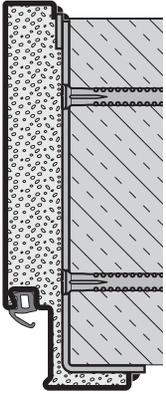
9/D4



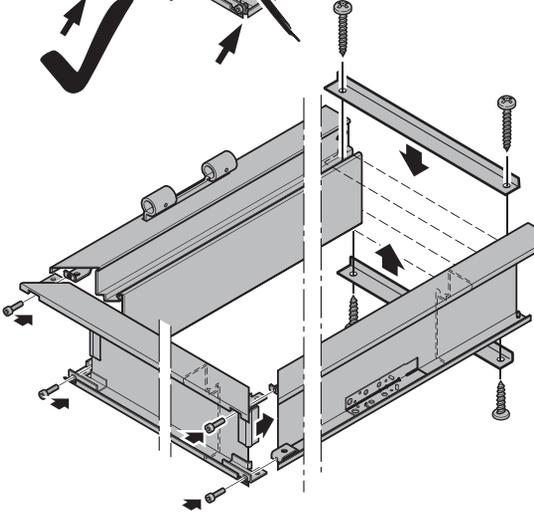
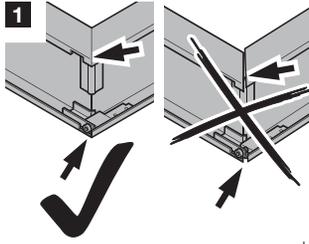
9/D5

max. T30/  
EI<sub>230</sub>

$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100



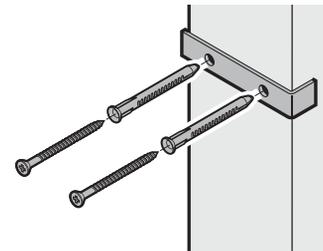
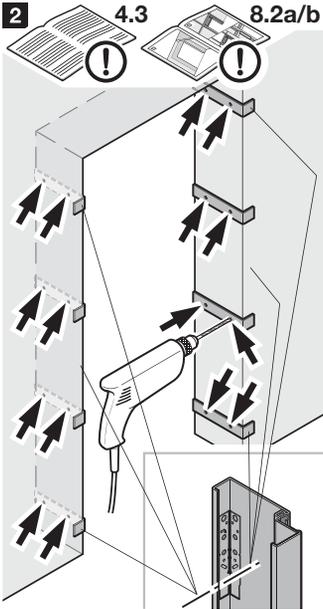
1



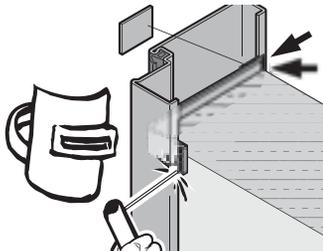
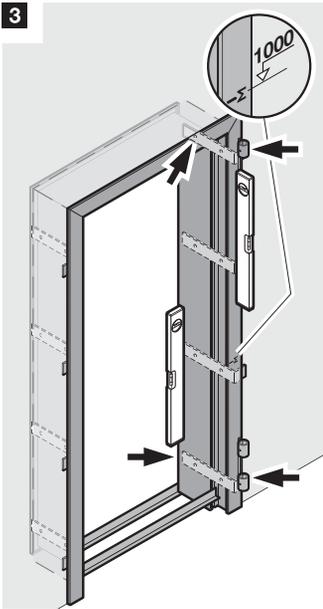
2

4.3

8.2a/b

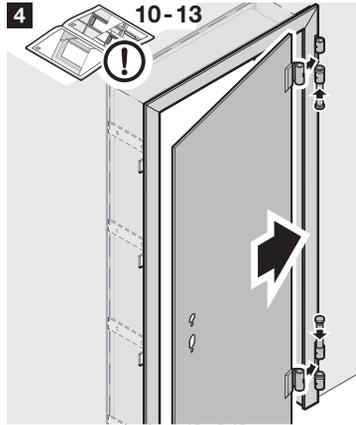


3

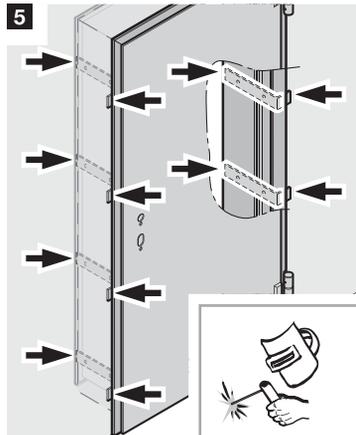


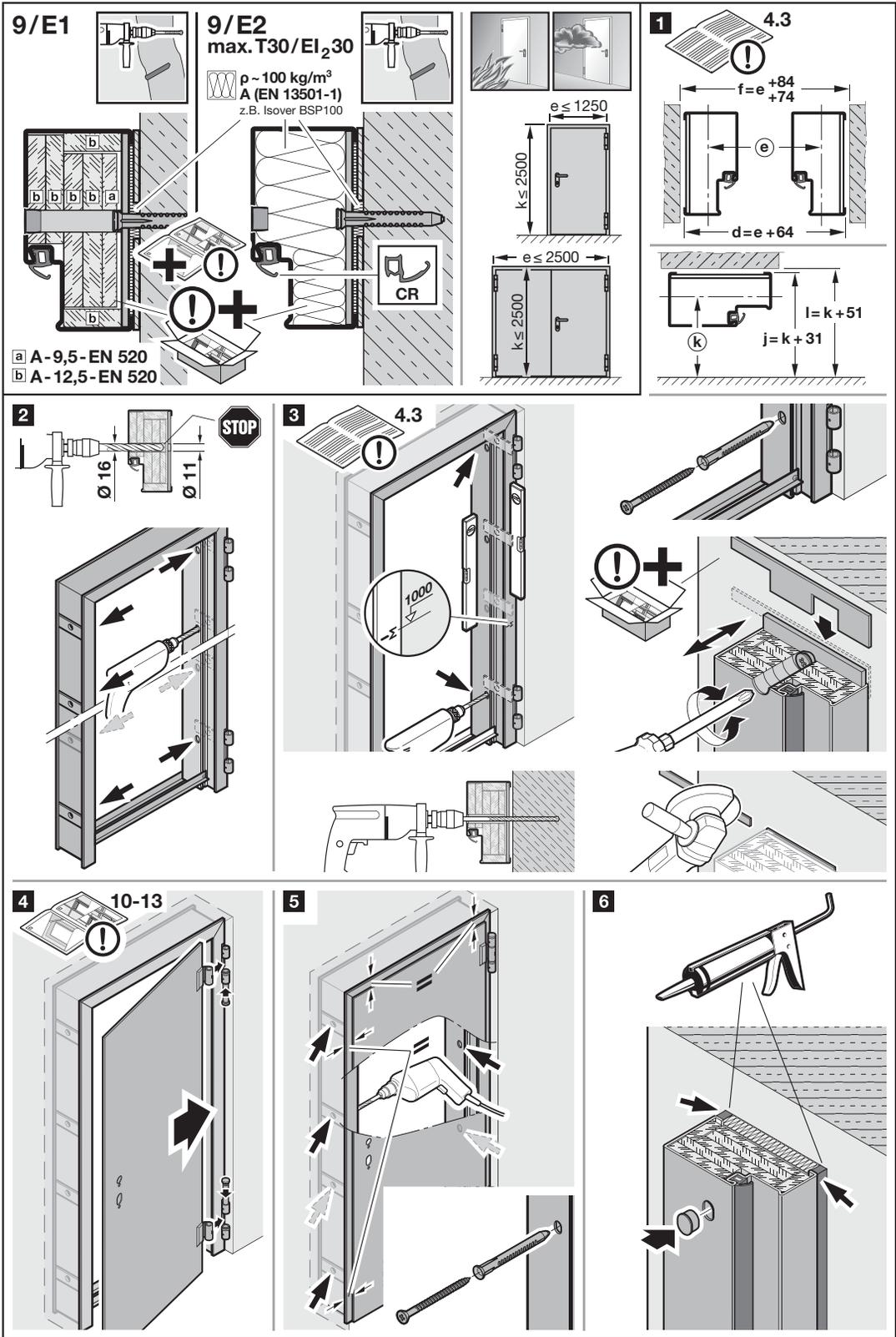
4

10-13

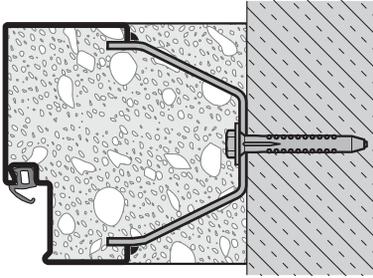


5

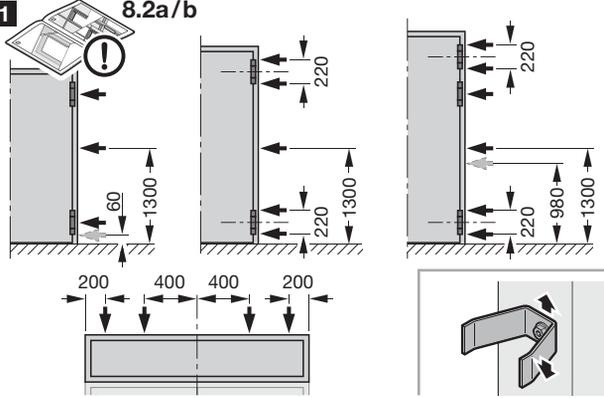




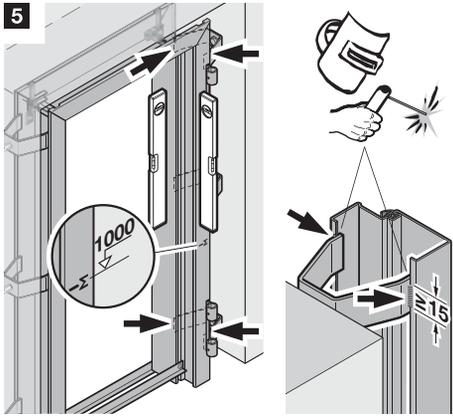
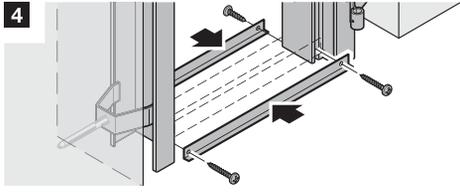
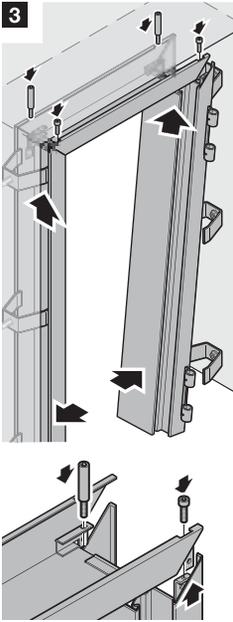
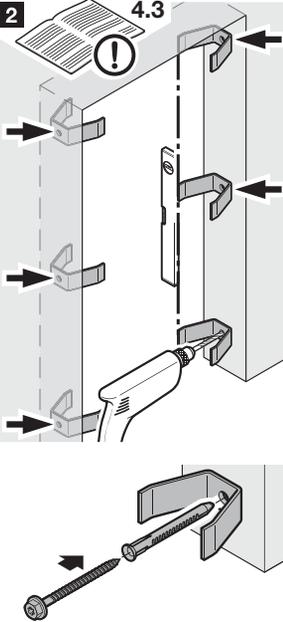
9/E3



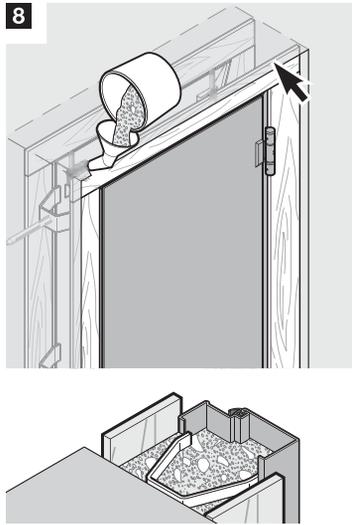
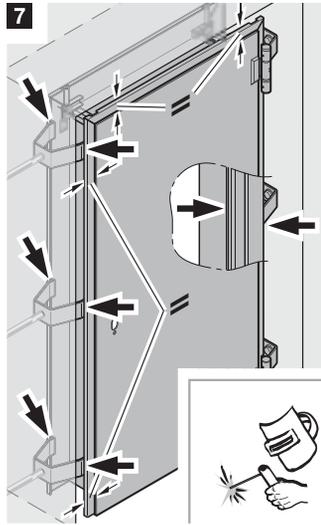
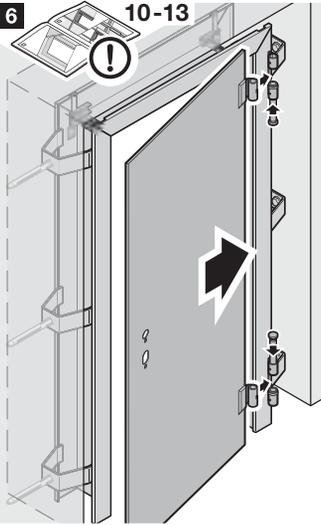
1 8.2a/b



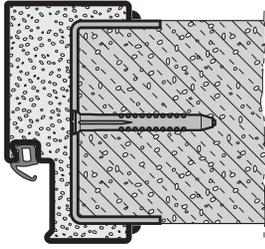
2 4.3



6 10-13

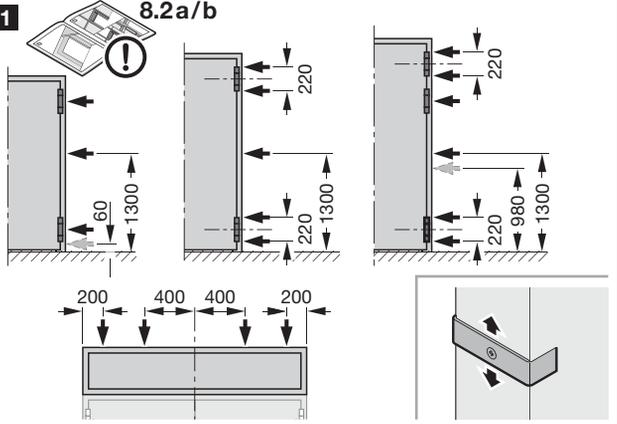


9/E4



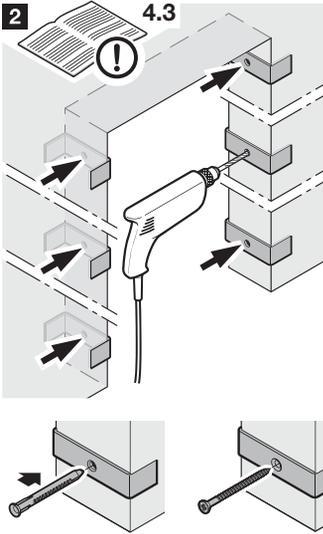
1

8.2a/b

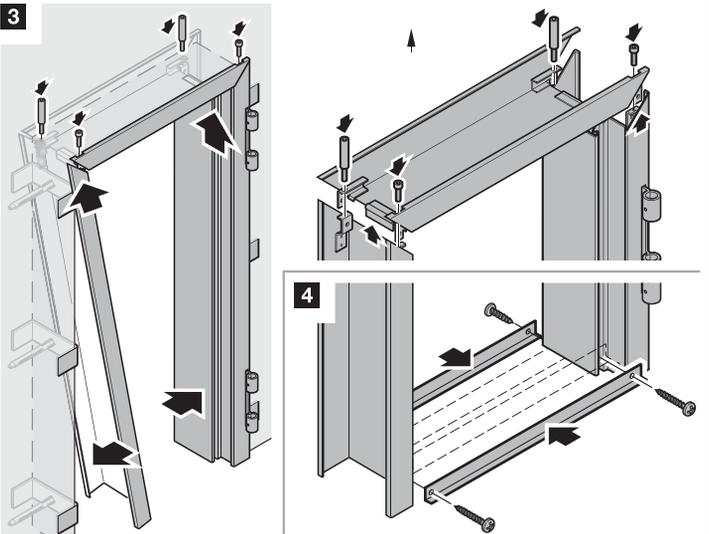


2

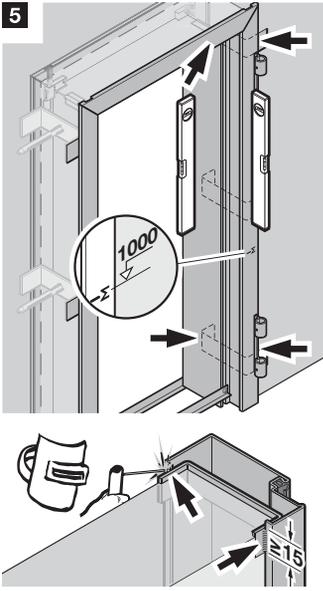
4.3



3

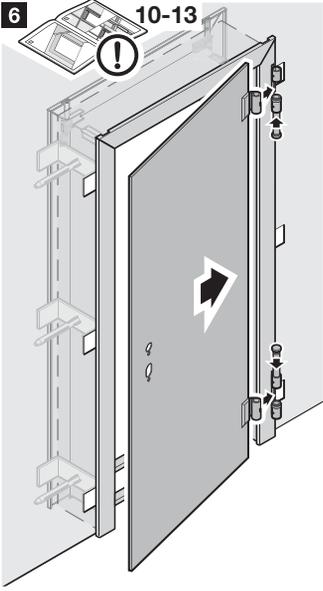


5

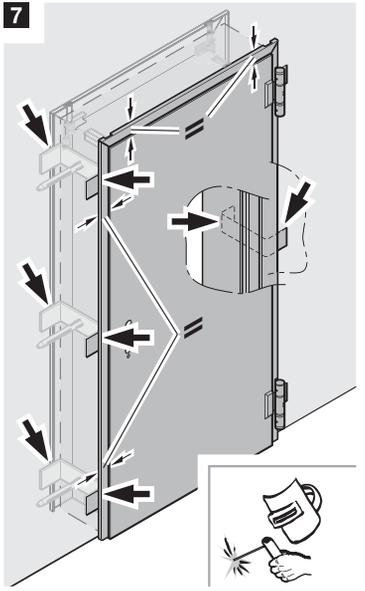


6

10-13

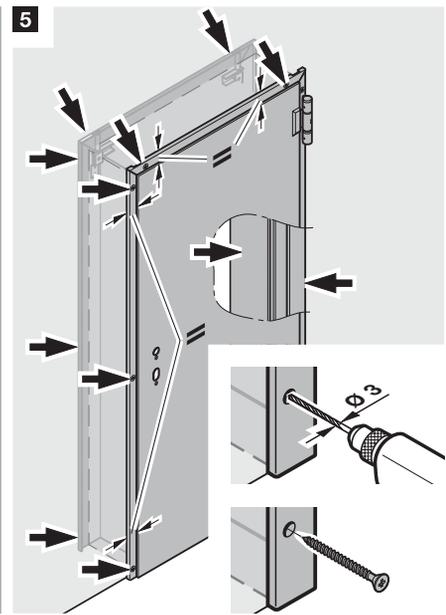
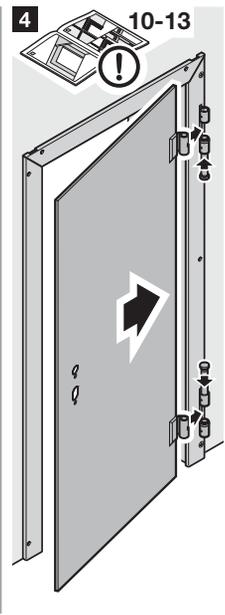
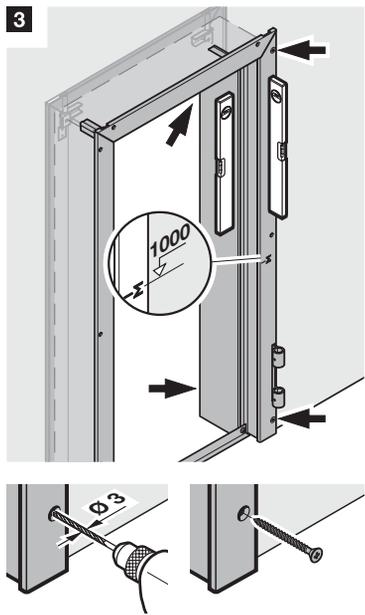
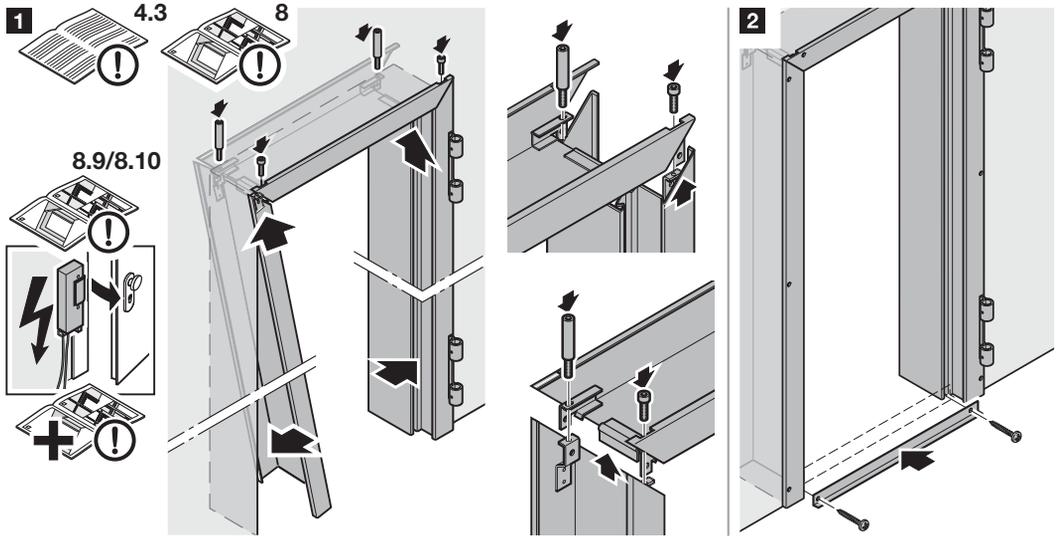
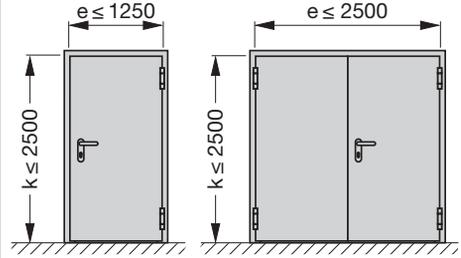
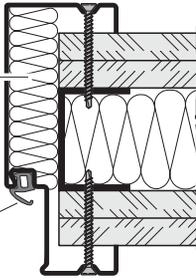
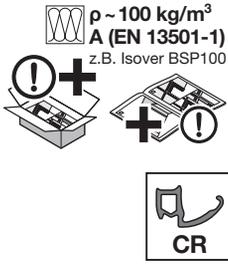


7

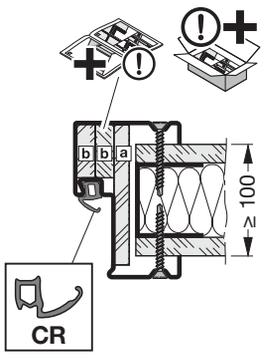


9/E5

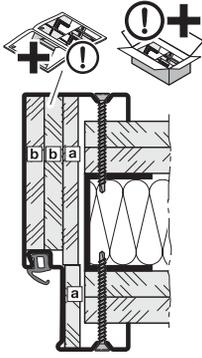
max. T30/  
EI<sub>2</sub>30



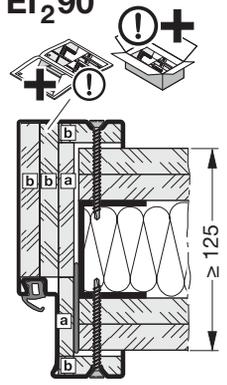
9/E6  
max T30/EI<sub>2</sub>30



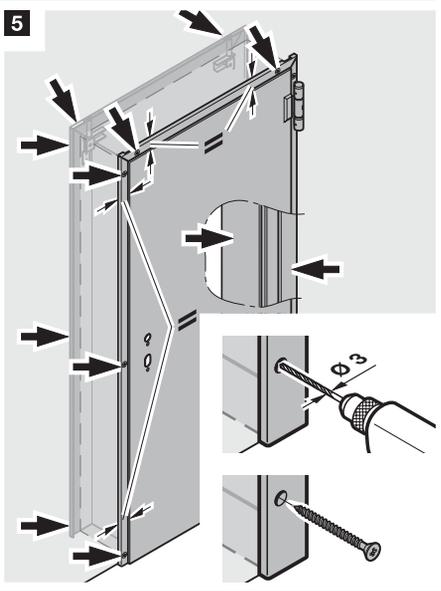
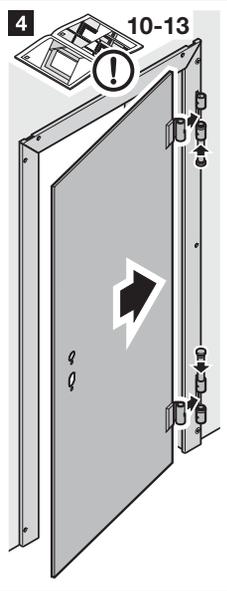
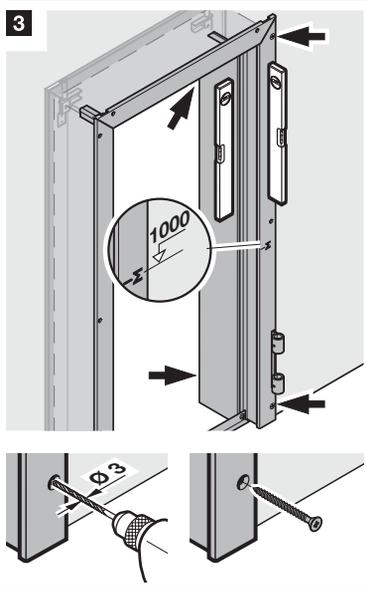
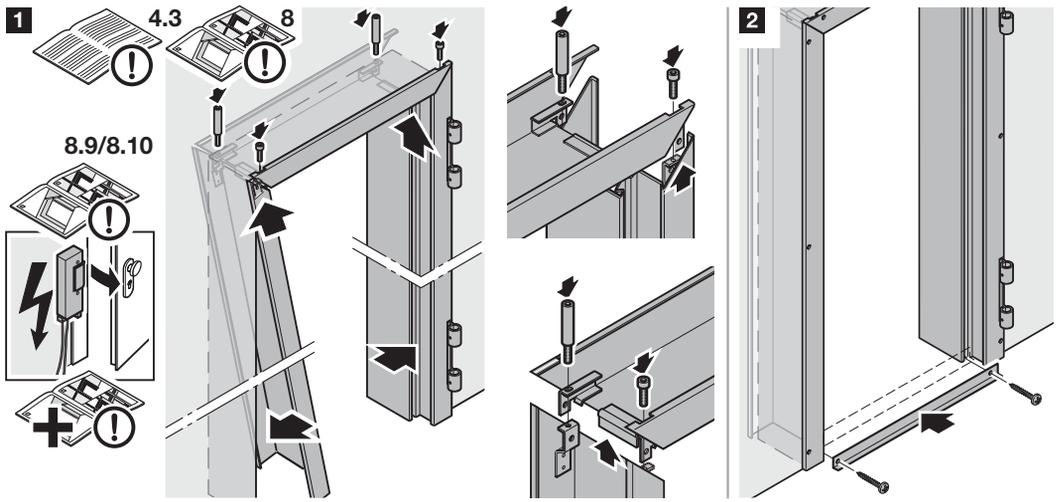
9/E7  
max T30/EI<sub>2</sub>30



9/E8  
T90/EI<sub>2</sub>90

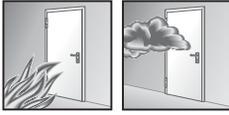


a A-9,5-EN 520 / b A-12,5-EN 520

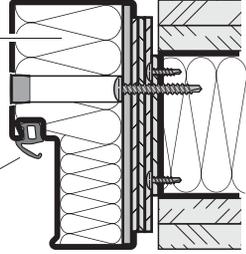
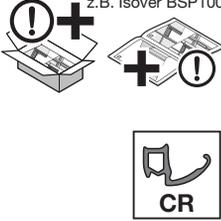


9/E9

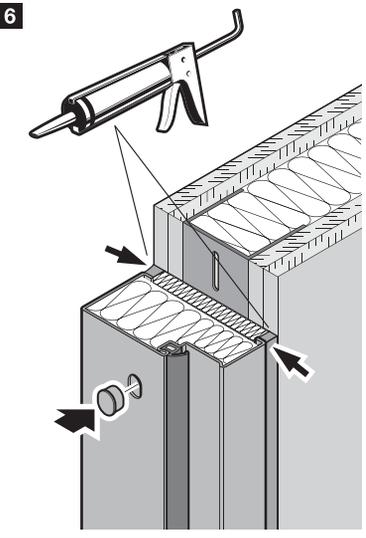
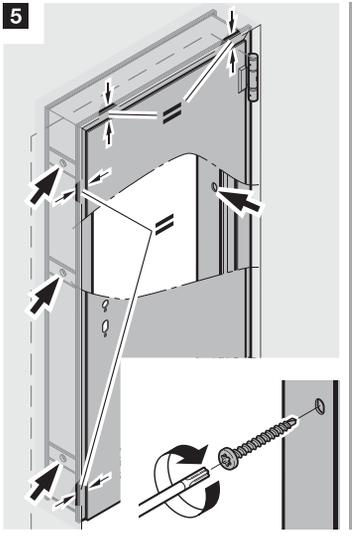
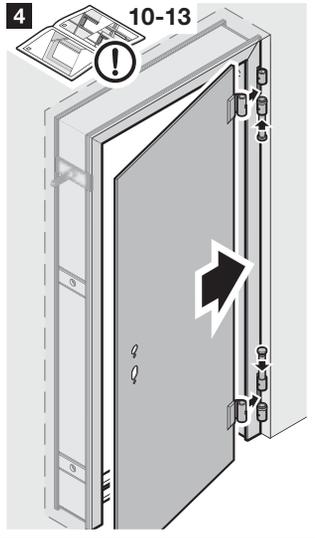
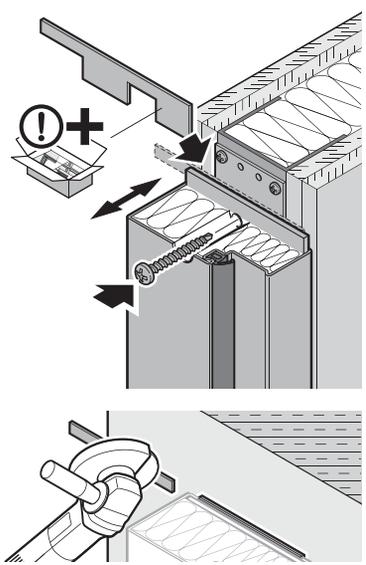
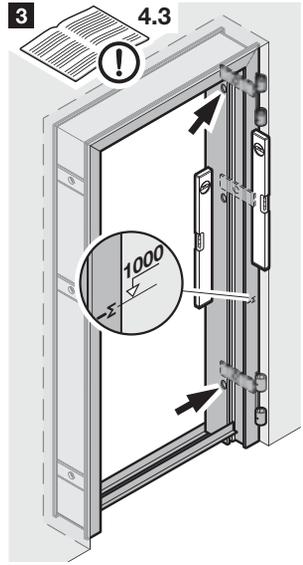
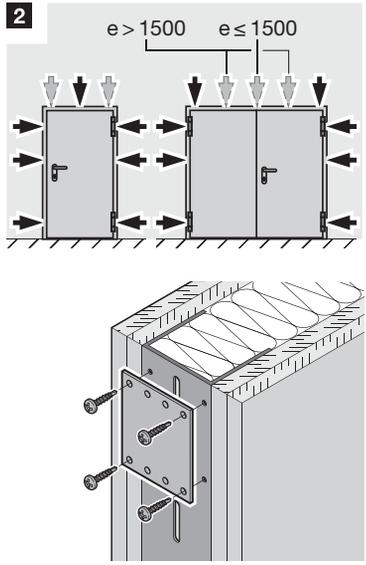
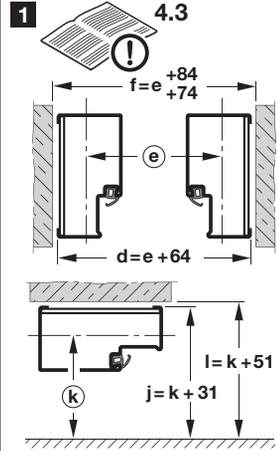
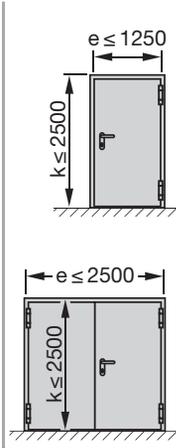
max. T30/  
EI<sub>2</sub>30



$\rho \sim 100 \text{ kg/m}^3$   
A (EN 13501-1)  
z.B. Isover BSP100



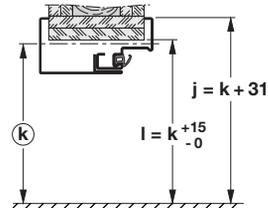
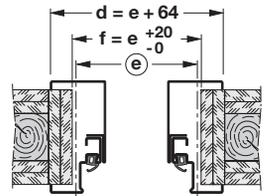
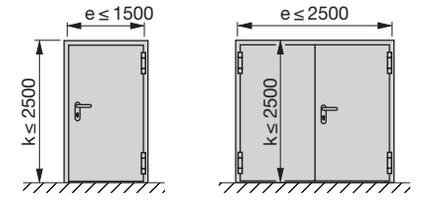
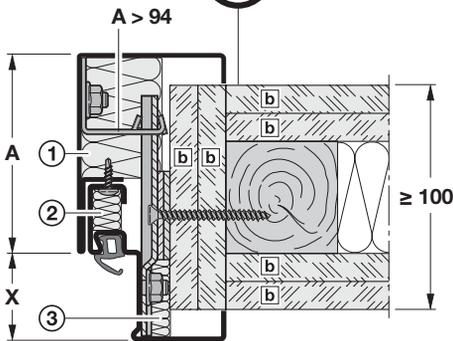
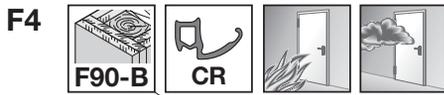
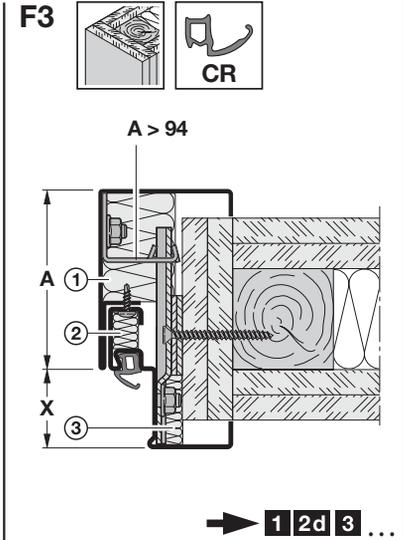
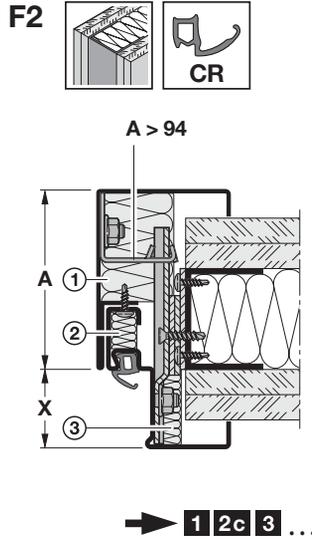
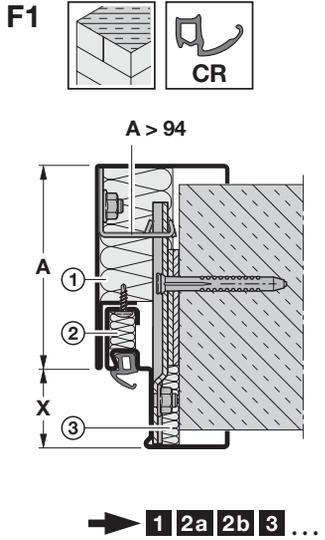
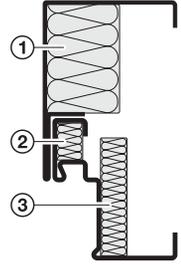
$\geq 125$



**9/F1-F4**  
**max. T30/ EI<sub>2</sub>30**

  $\rho \sim 100 \text{ kg/m}^3$   
**A (EN 13501-1)**  
 z.B. Isover BSP100

- ① =  $40 \times (A - 42)$
- ② =  $15 \times 22,5$
- ③ =  $15 \times (X + 24)$



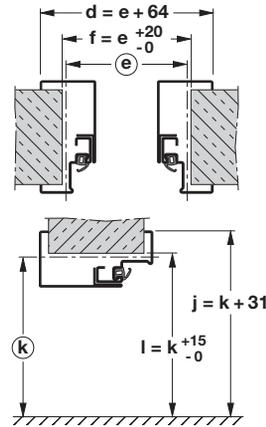
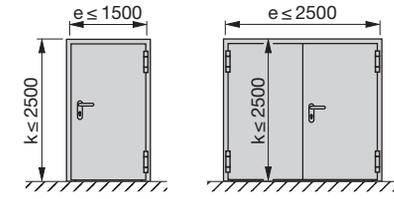
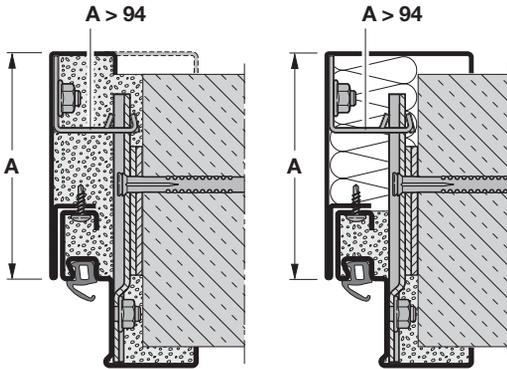
**F90B** DIN 4102-4 Tab. 49      **b** A-12,5-EN 520

**➔ 1 2e 3 ...**

9/F5-F6

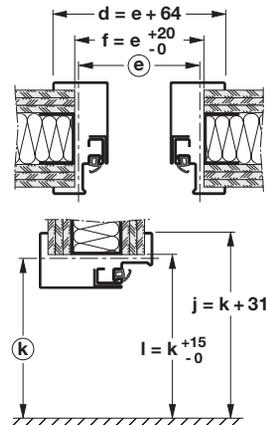
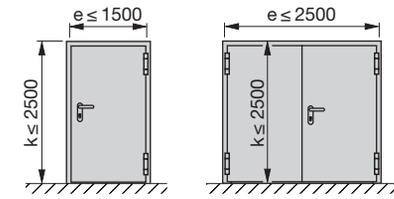
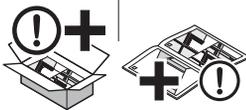
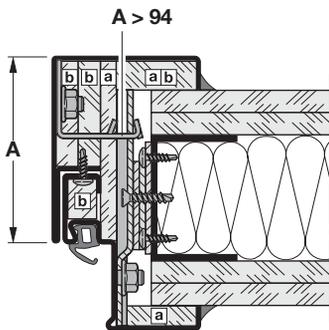
max. T90/ EI<sub>2</sub>90

F5



➔ 2a 2b 3 ...

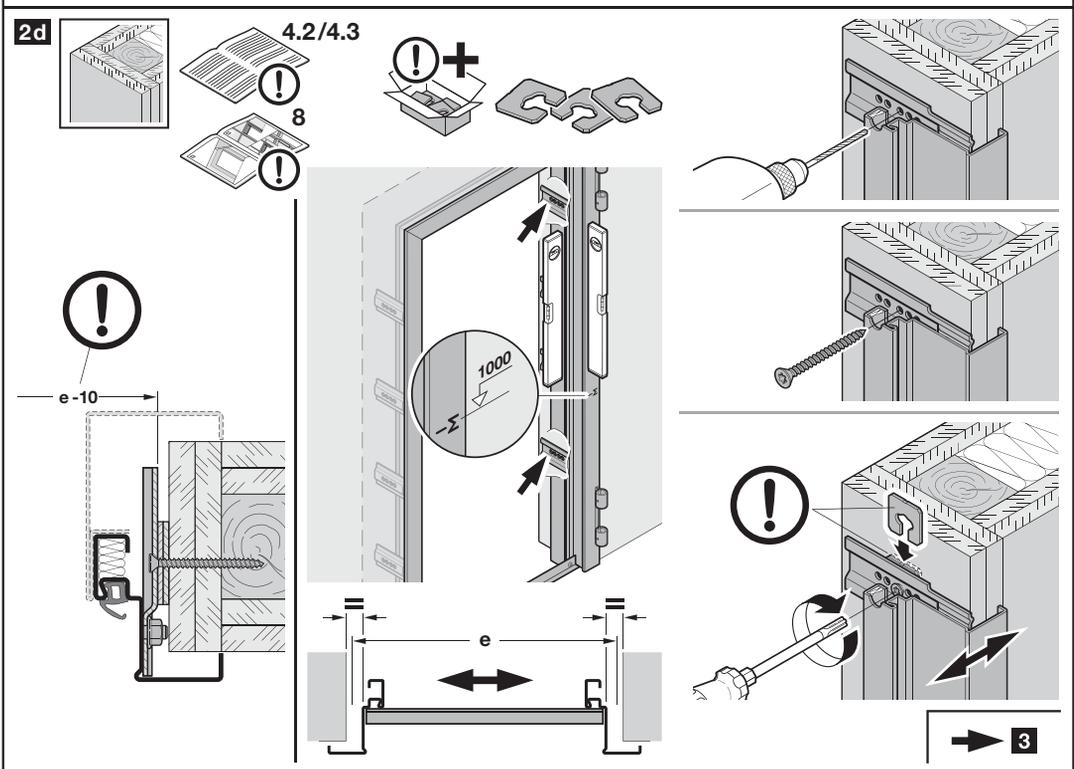
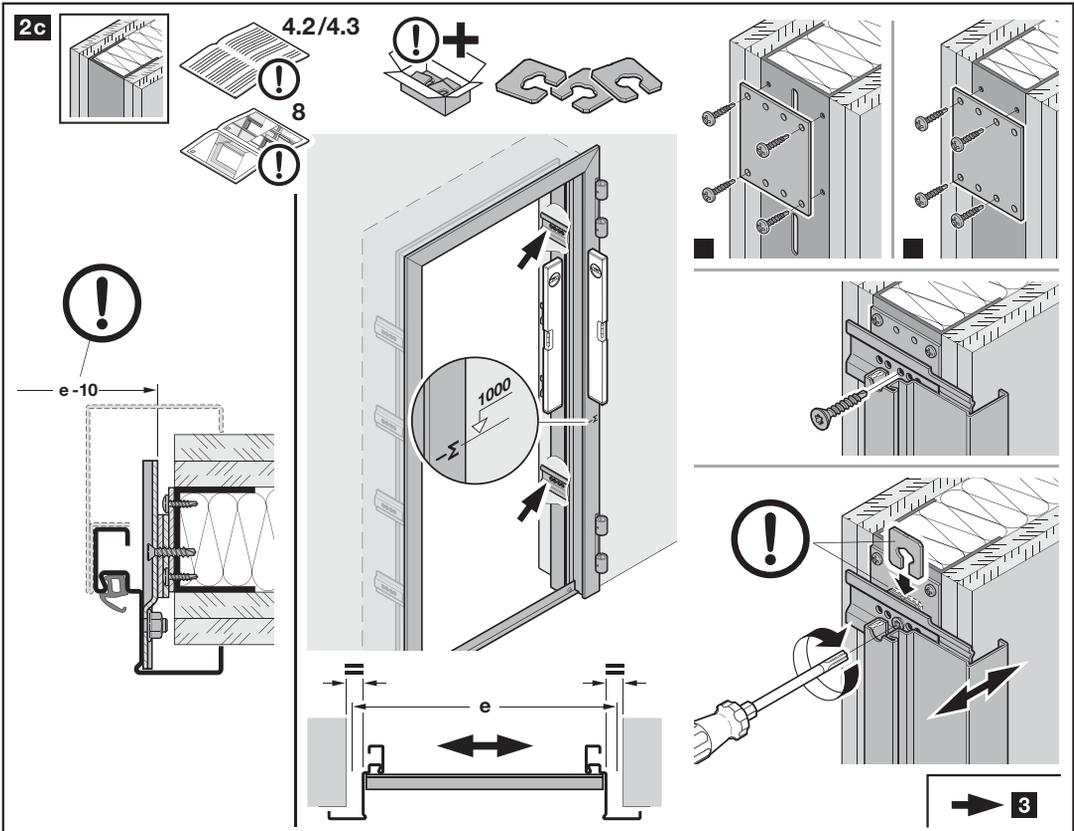
F6



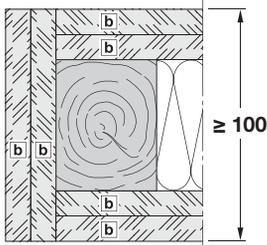
➔ 2c 3 ...

▣ A-9,5-EN 520 / ▣ A-12,5-EN 520

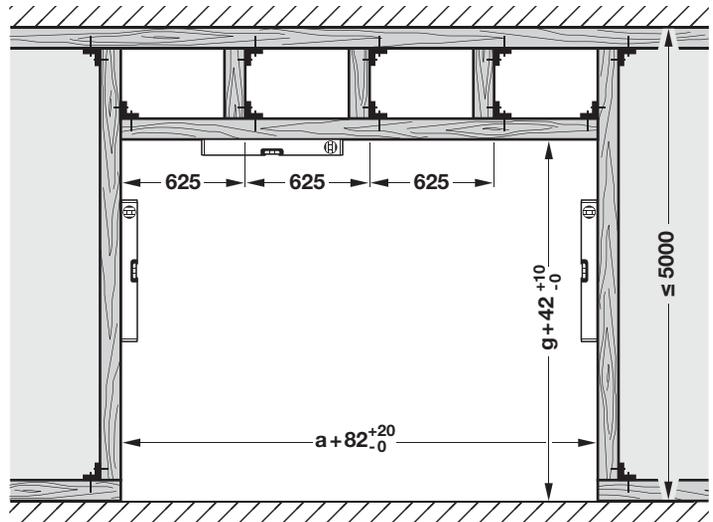




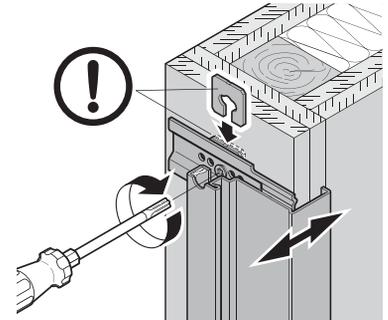
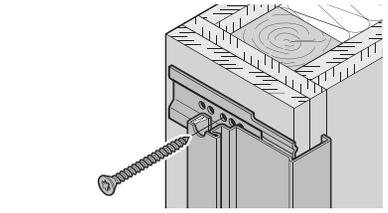
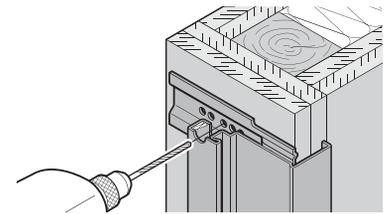
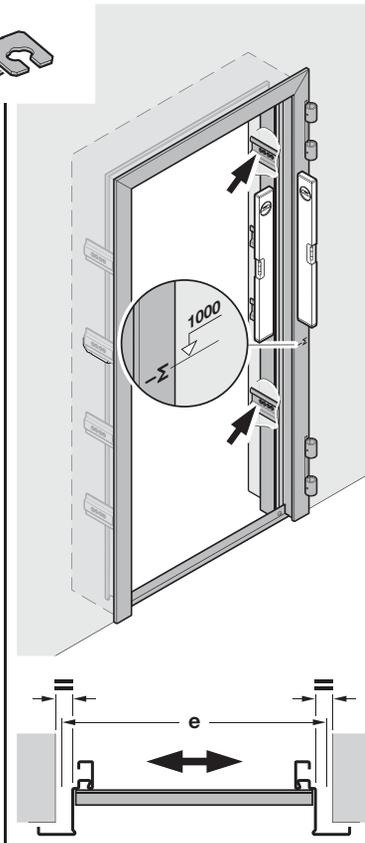
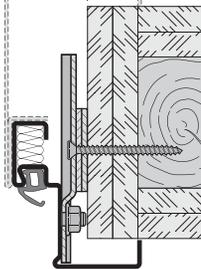
2e



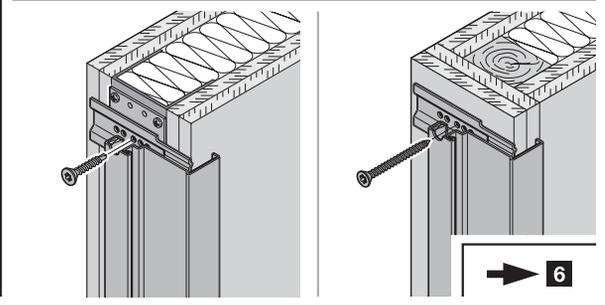
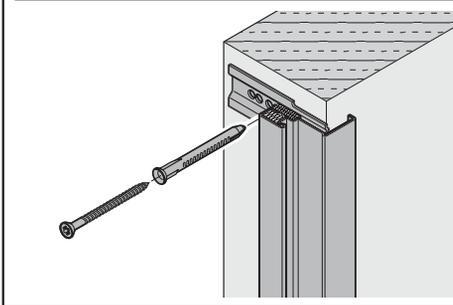
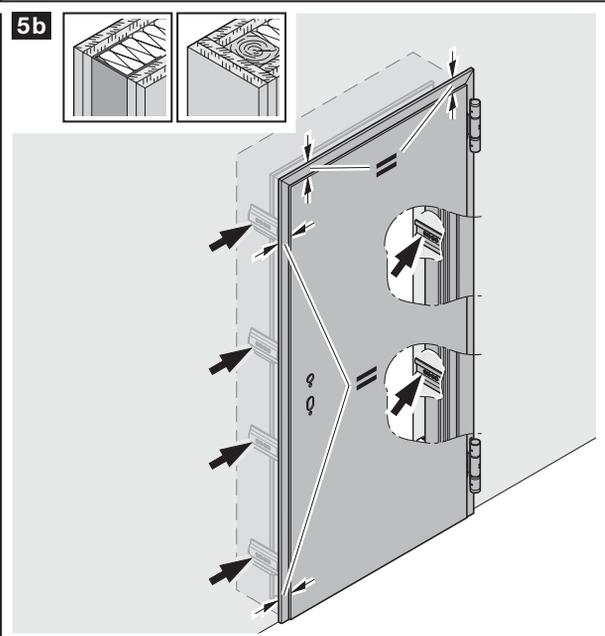
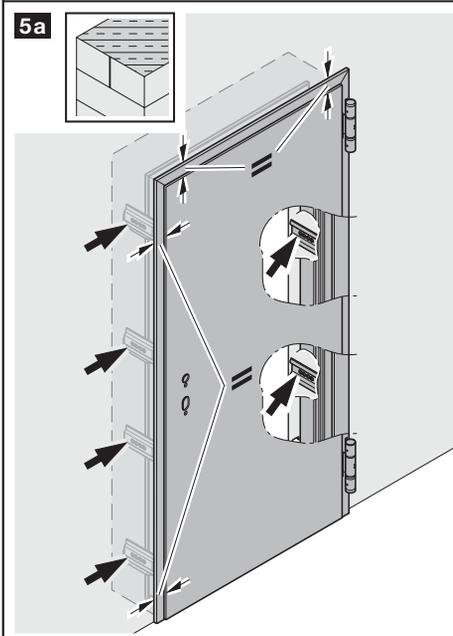
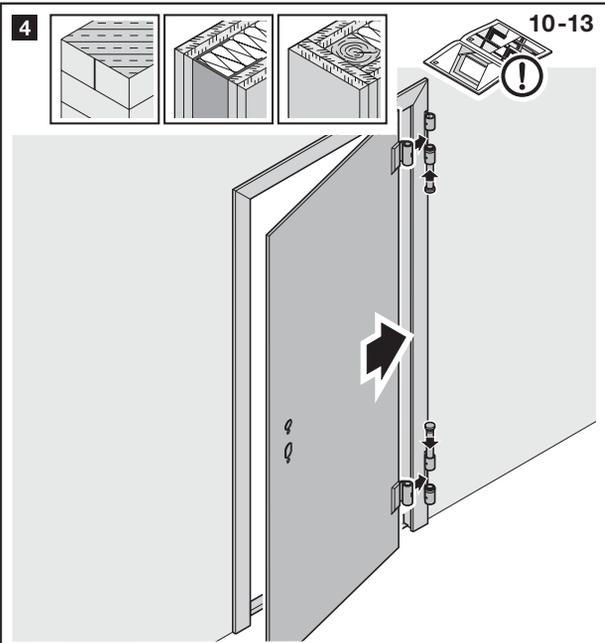
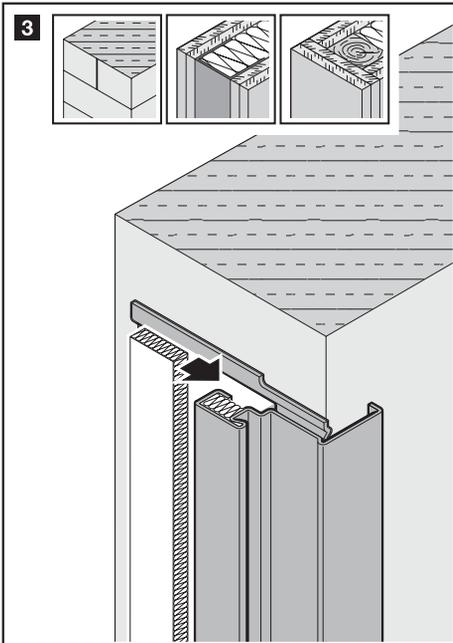
b A-12,5-EN 520

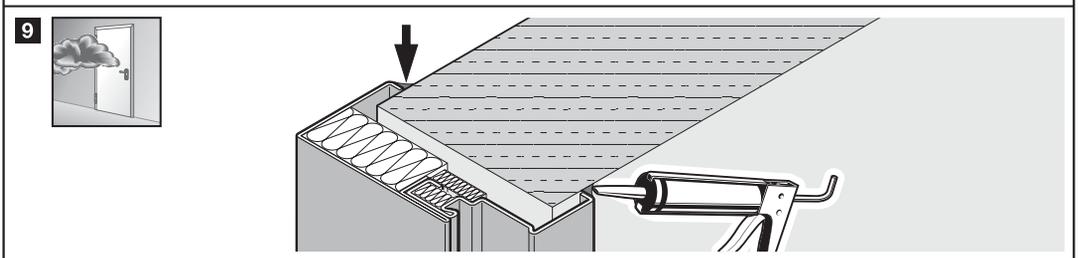
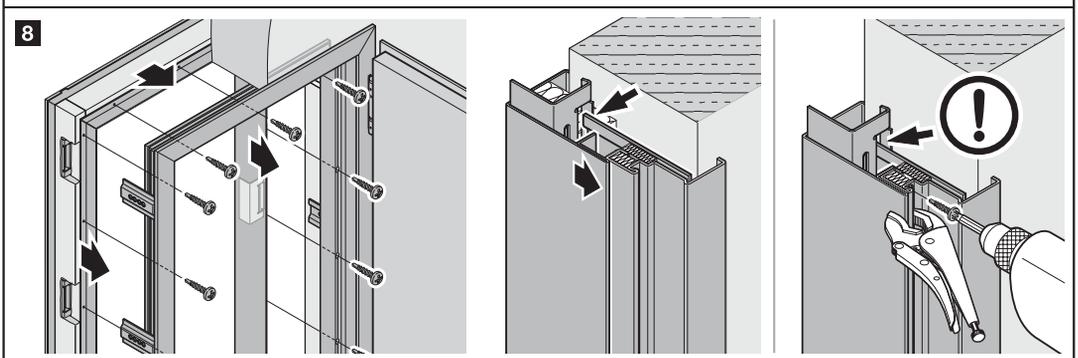
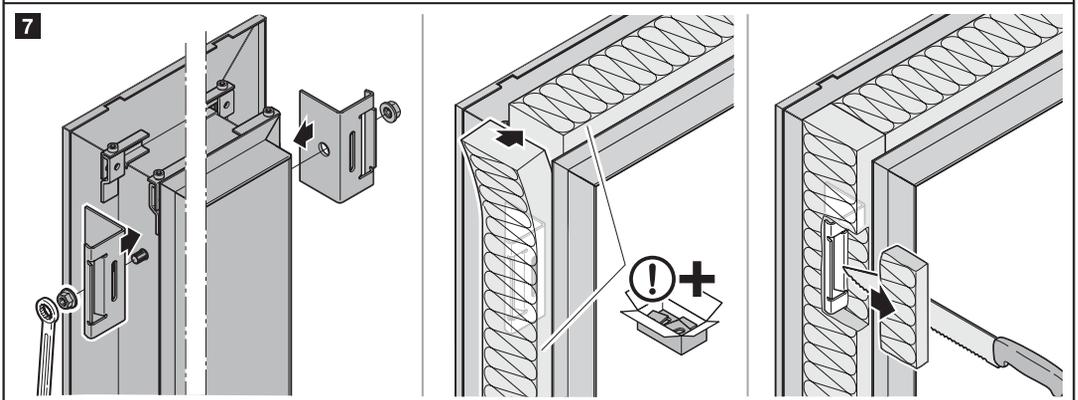
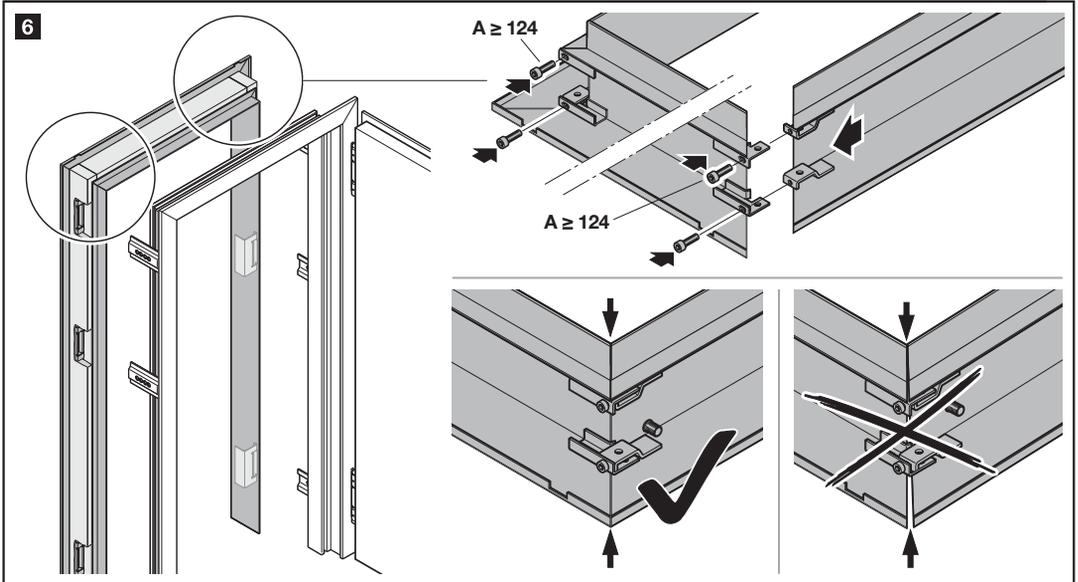


$e^{+20}_{-0}$

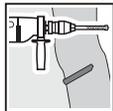


➔ 3





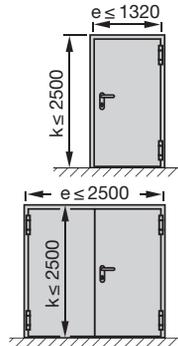
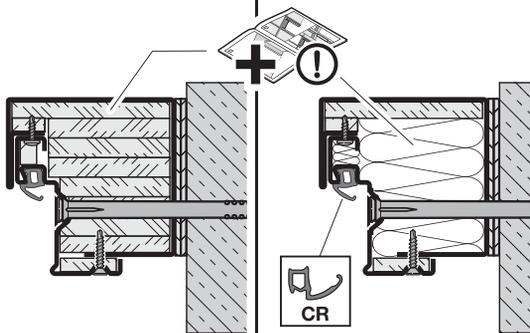
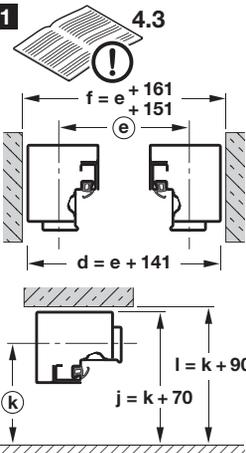
9/G1  
max. T90/  
EI<sub>2</sub>90



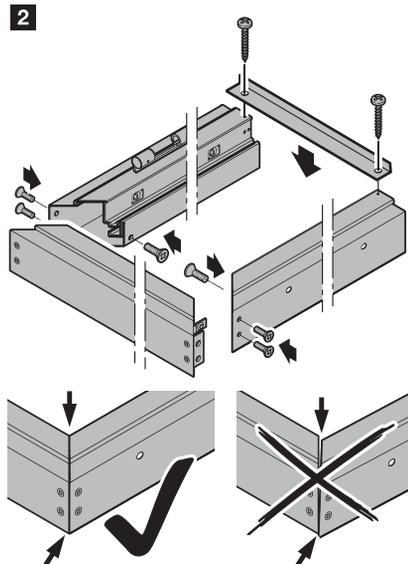
9/G2  
max. T30/  
EI<sub>2</sub>30



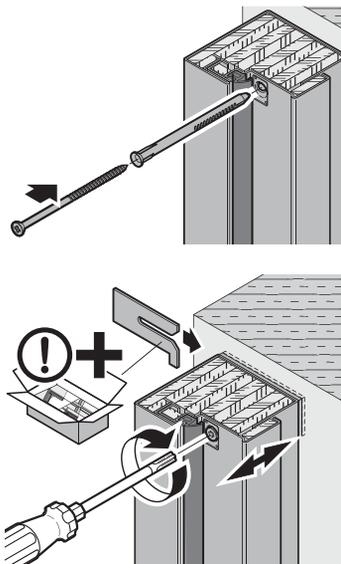
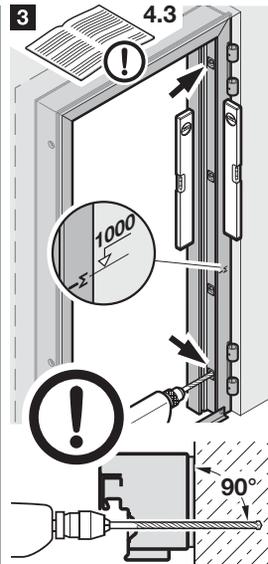
1



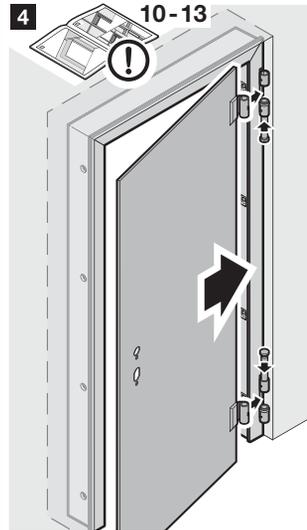
2



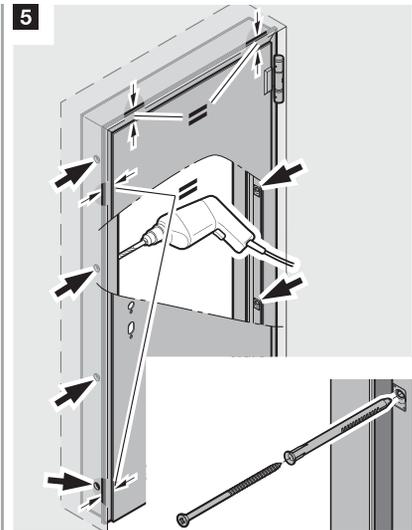
3



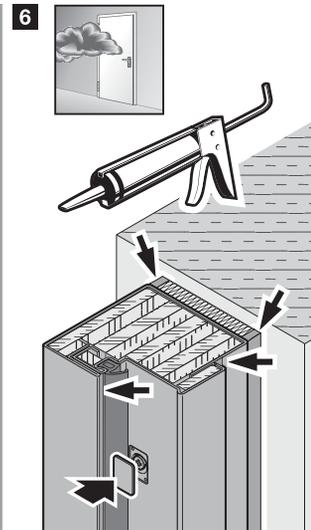
4



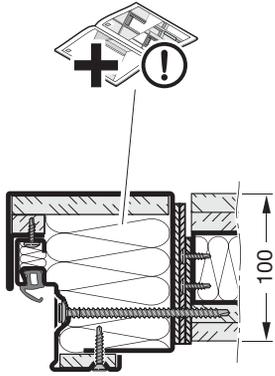
5



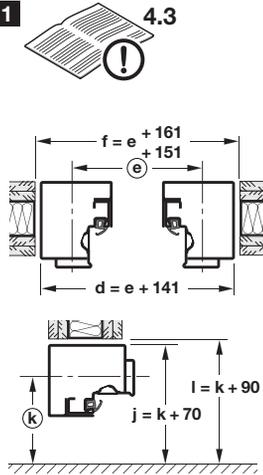
6



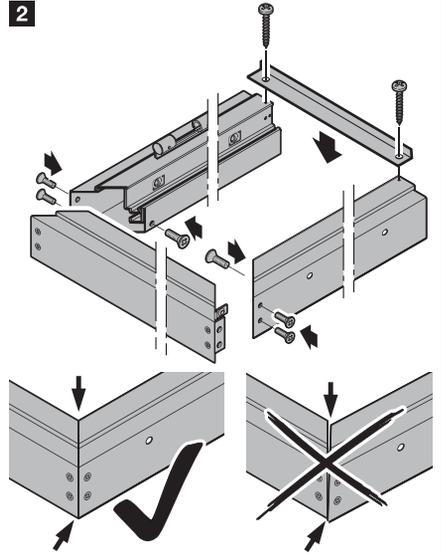
9/G3



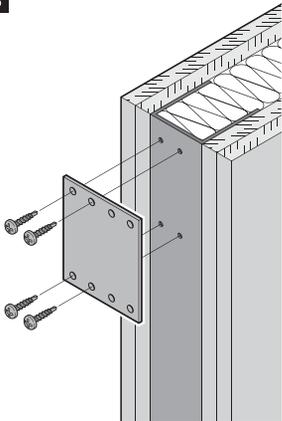
1 4.3



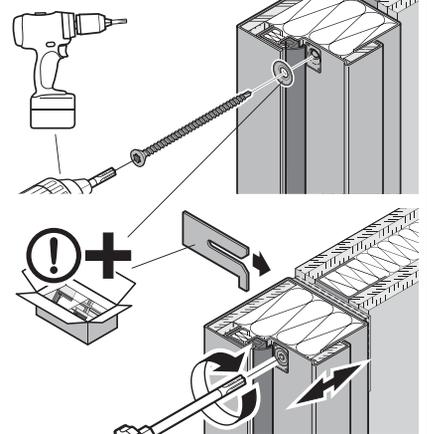
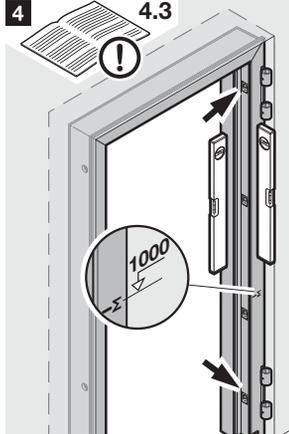
2



3

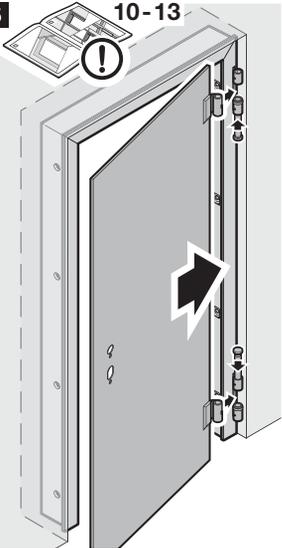


4 4.3

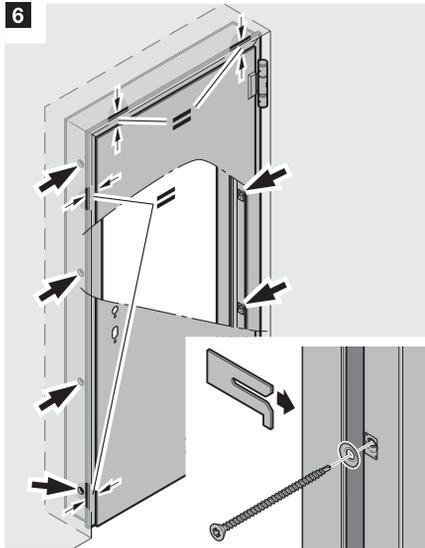


5

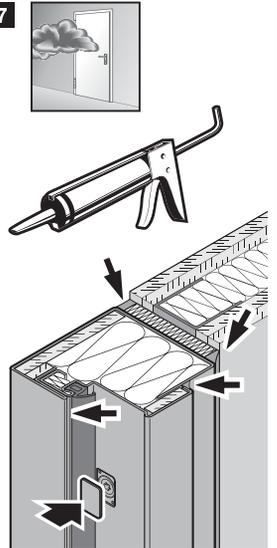
10-13



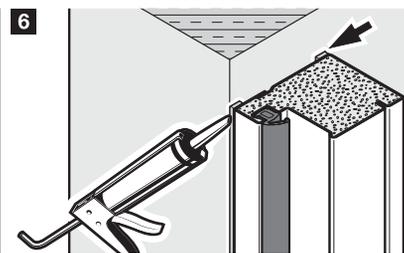
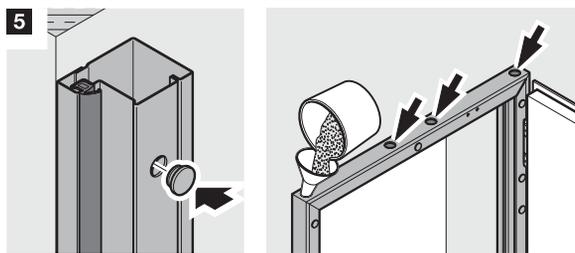
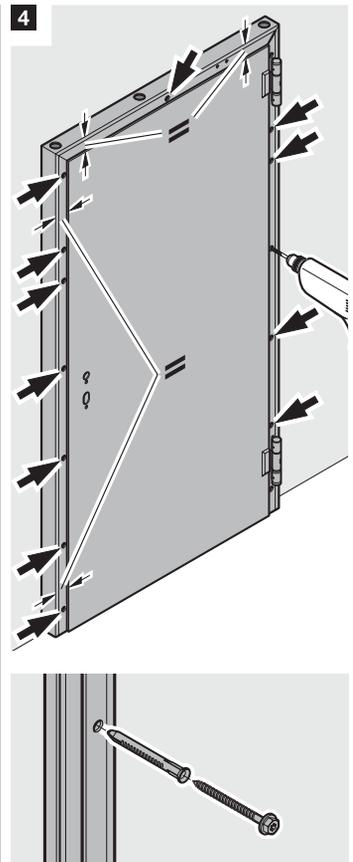
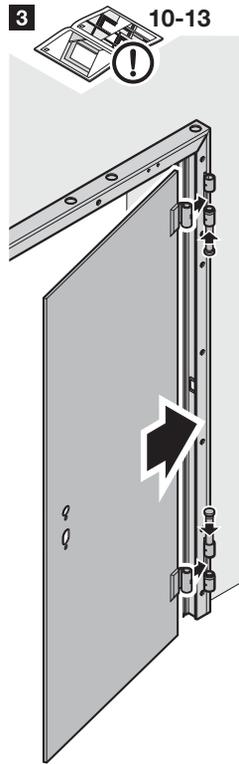
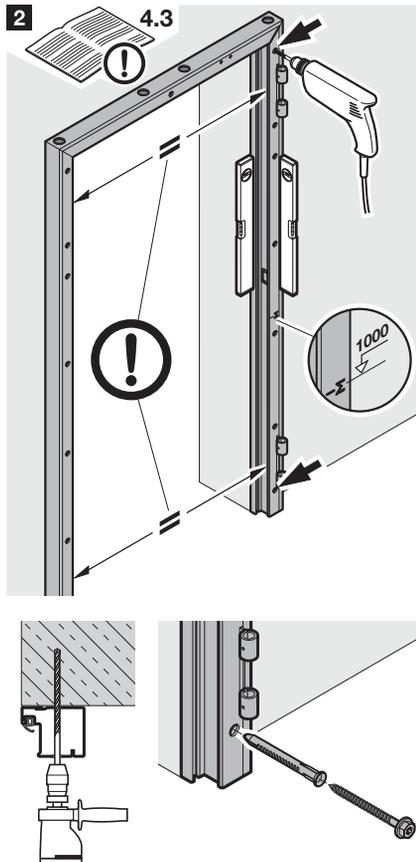
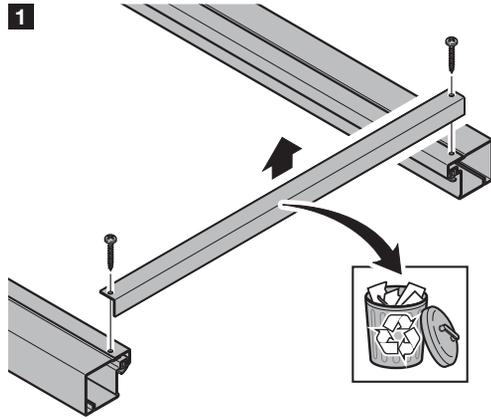
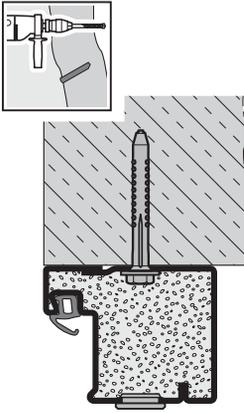
6



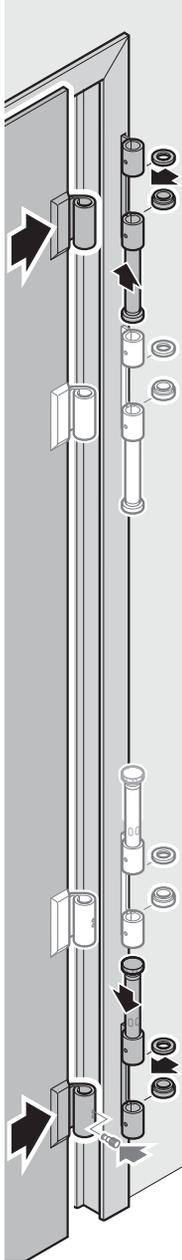
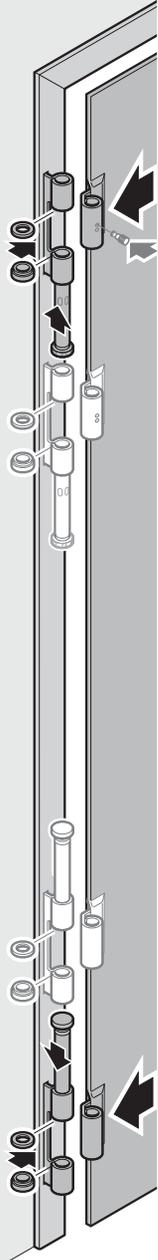
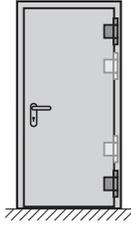
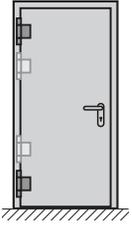
7



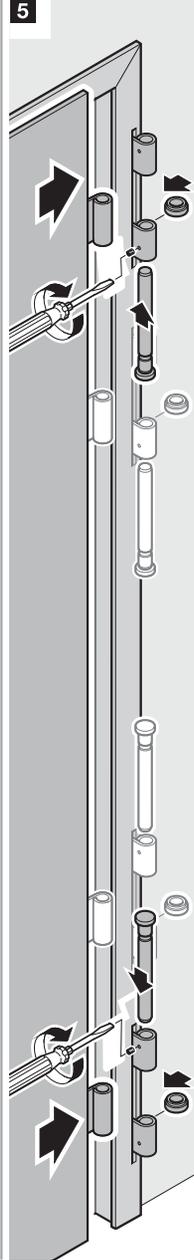
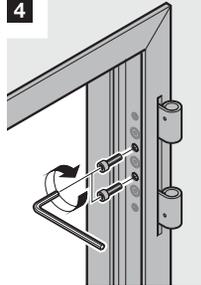
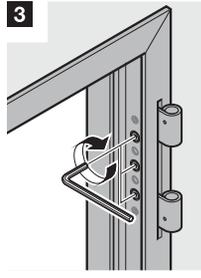
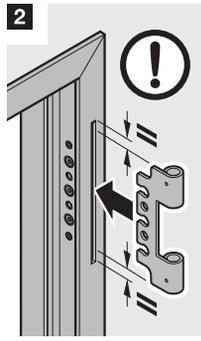
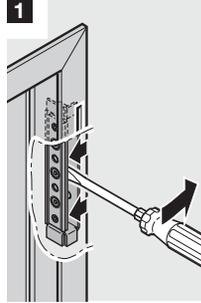
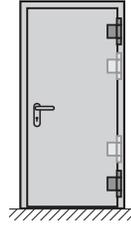
9/H1  
max. T30/  
EI<sub>2</sub>30



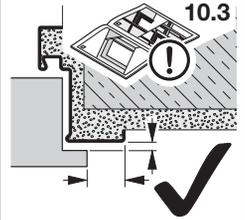
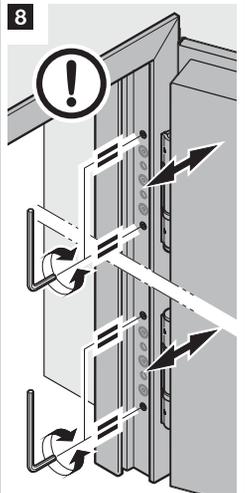
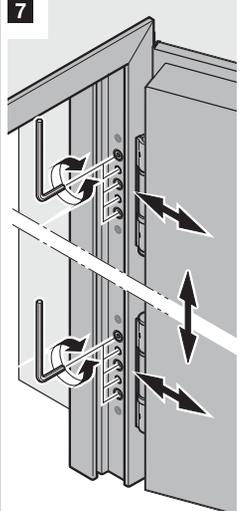
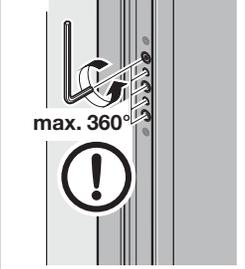
10.1a



10.1b



6

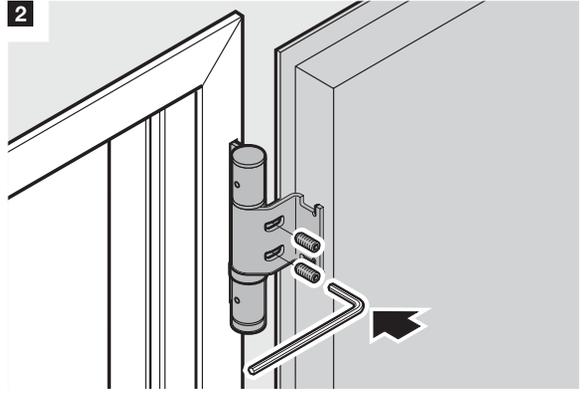


10.2

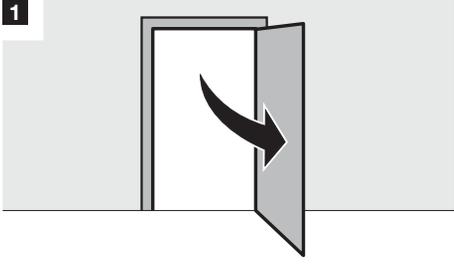
3.3



2



1



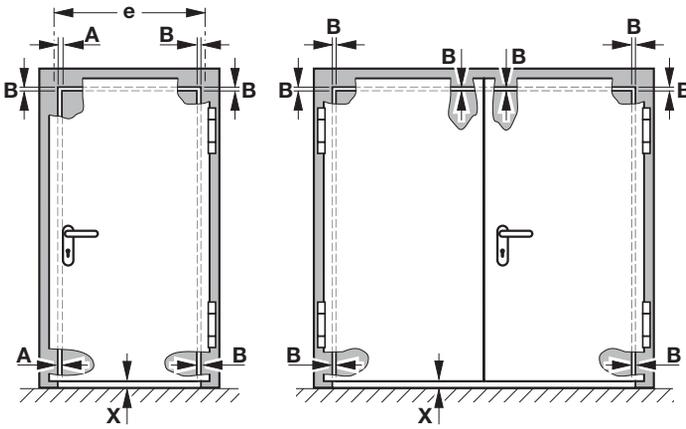
10.3

4.2



1

e	A	B	C max. T30	C T60, T90, T120
≤ 749	6 <sup>+1</sup> <sub>-2</sub>	4±2	4±2	10±2
750 - 874	6 <sup>+1</sup> <sub>-2</sub>			
≥ 875	5 <sup>+1</sup> <sub>-2</sub>			



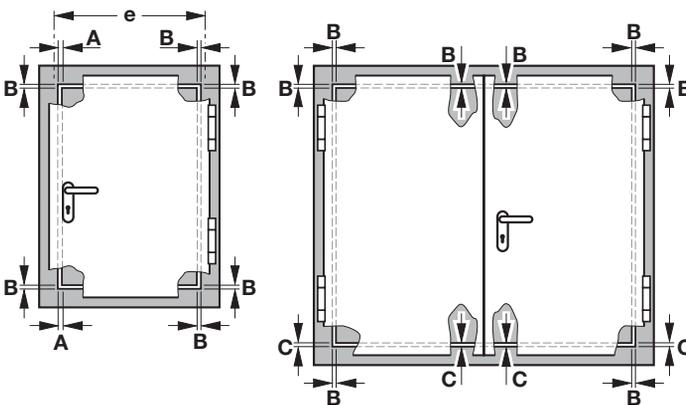
X=10±5

X=10<sup>+2</sup><sub>-5</sub>

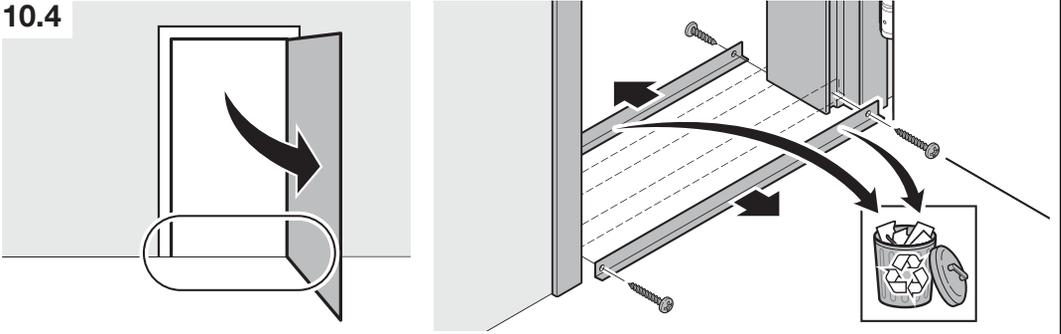
X=10-5



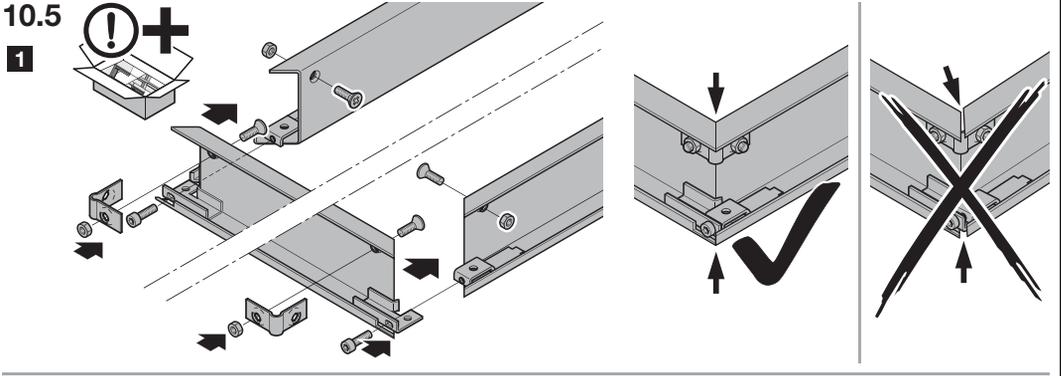
≤ 48 dB



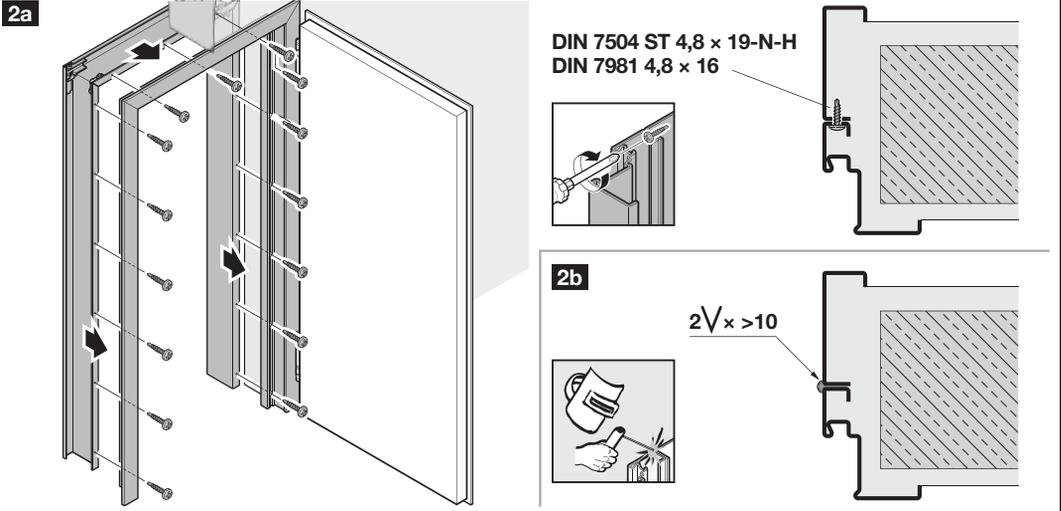
10.4



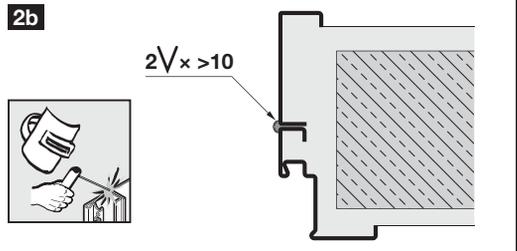
10.5



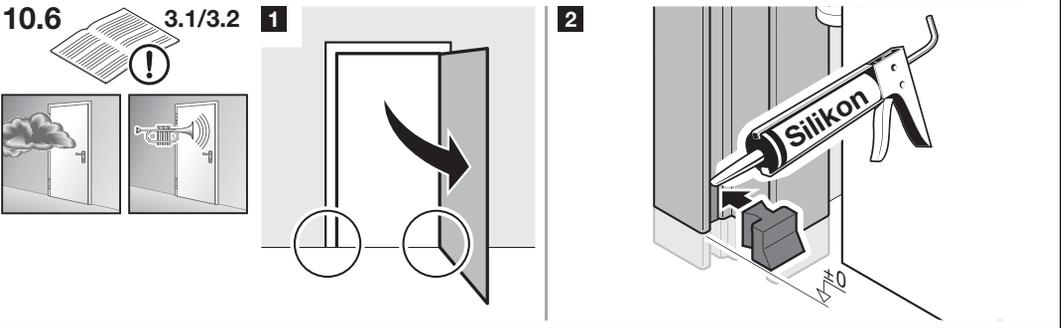
2a



2b

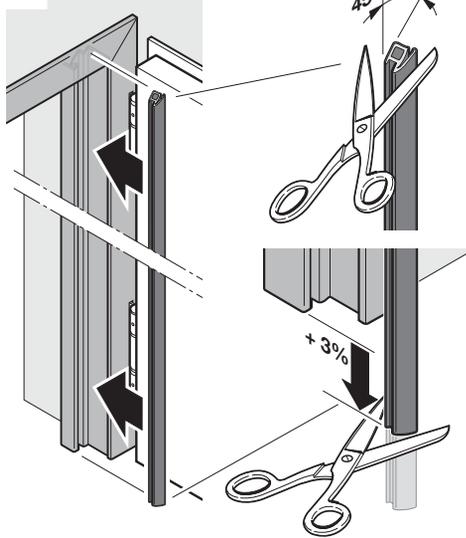
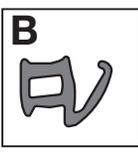


10.6

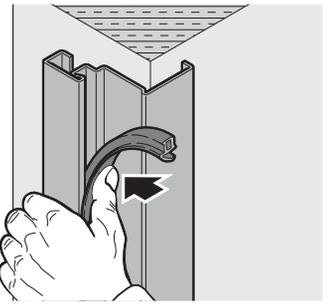


10.7a

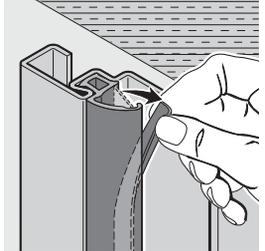
1



2



3

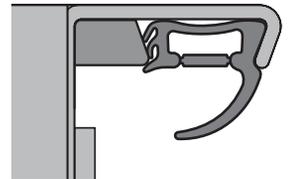
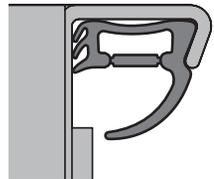
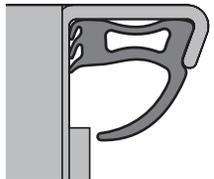


10.7b

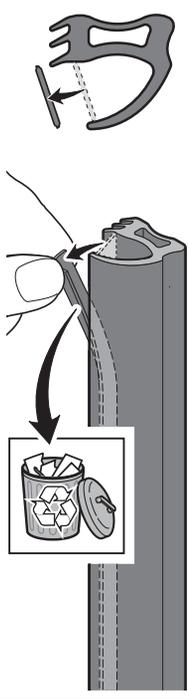
A

B

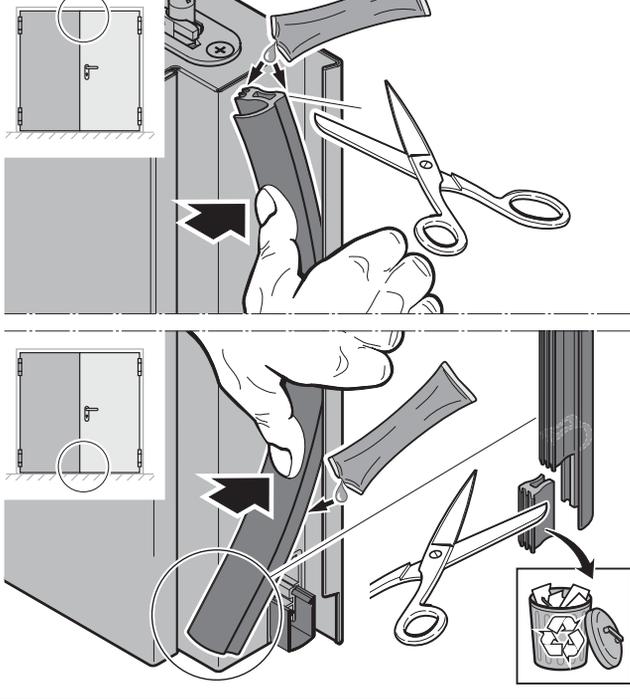
C



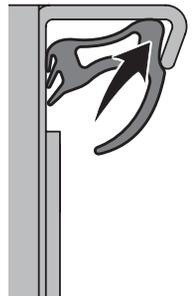
1



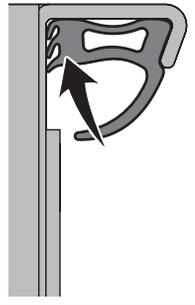
2



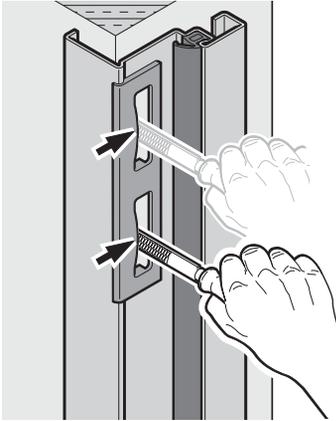
1.



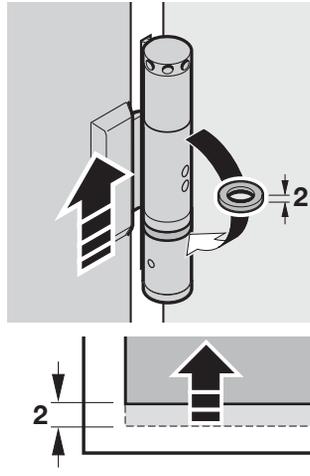
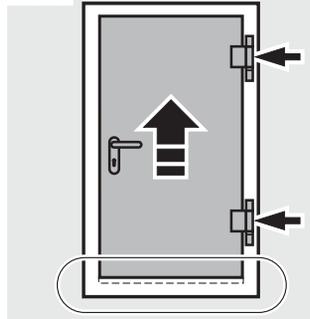
2.



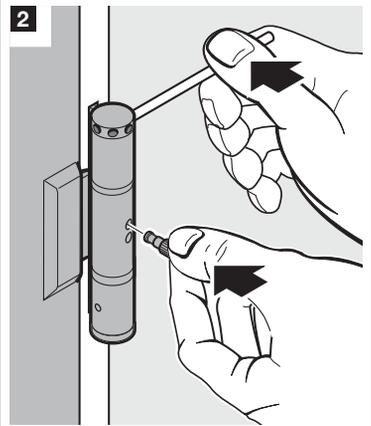
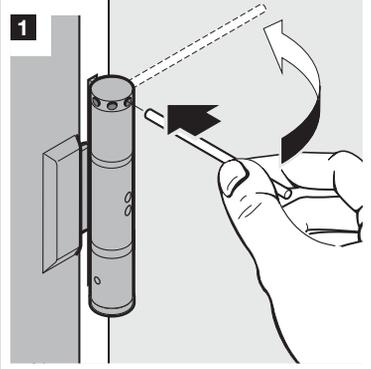
10.8



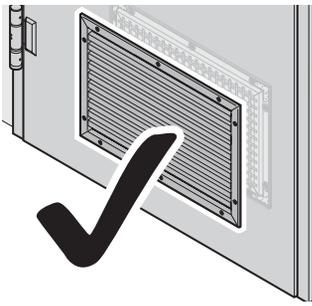
10.9



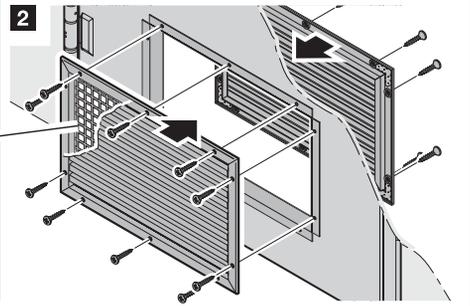
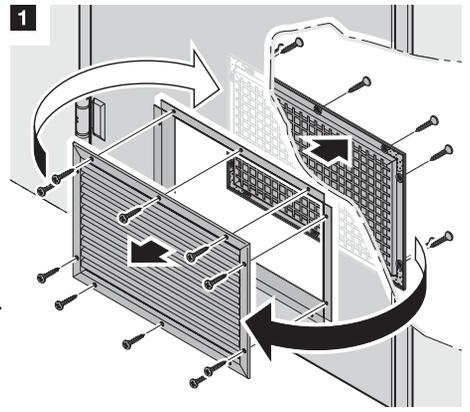
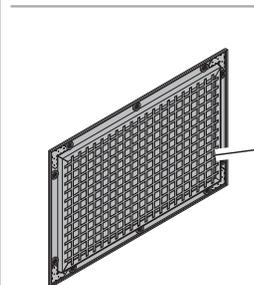
10.10



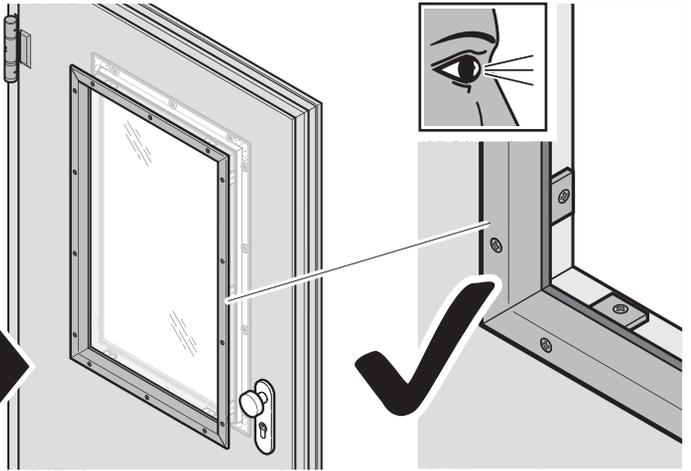
10.11a



10.11b



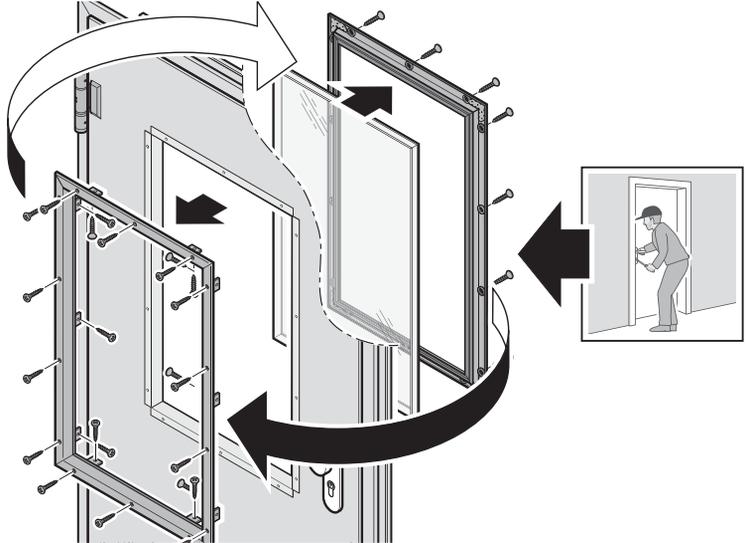
### 10.12a



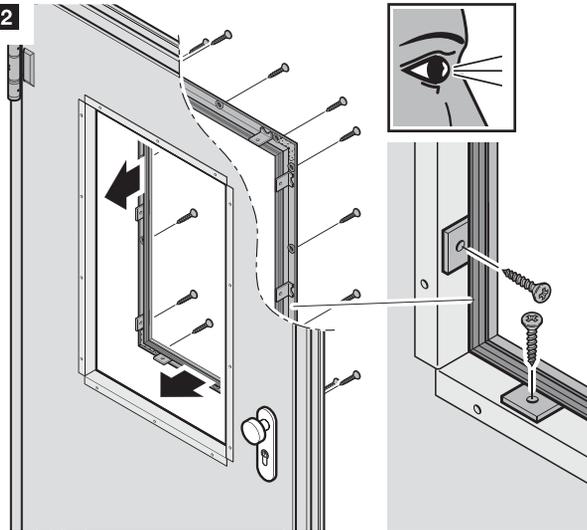
### 10.12b



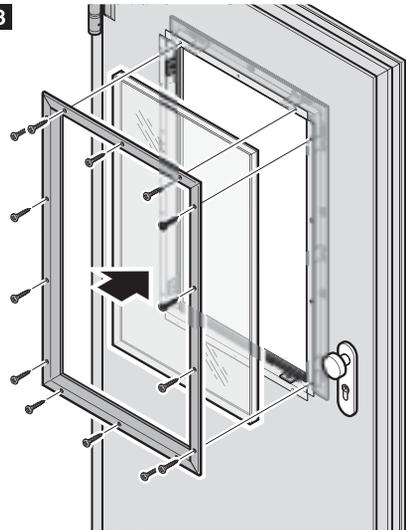
**1**



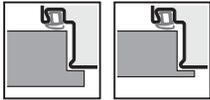
**2**



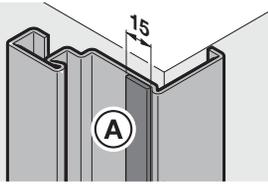
**3**



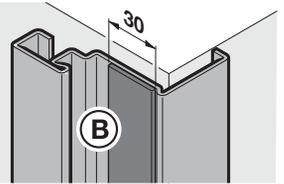
10.13a



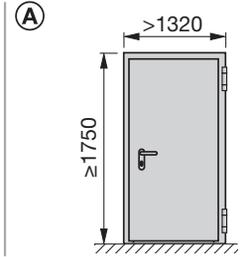
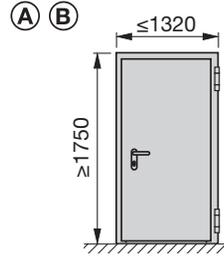
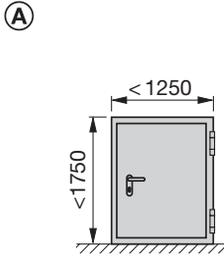
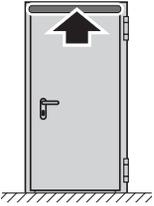
H3-1 OD/H3-2 OD



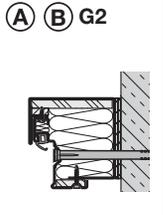
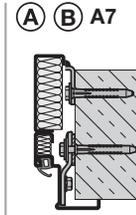
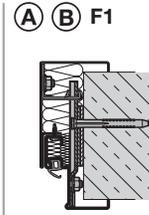
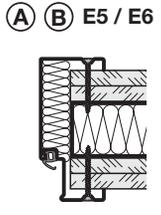
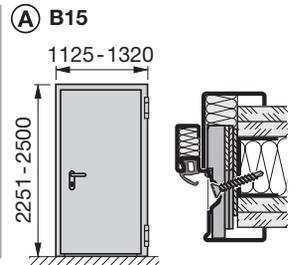
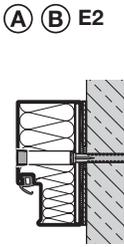
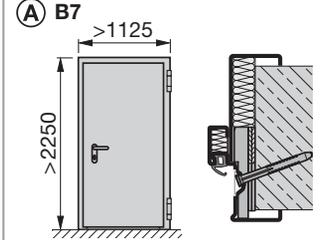
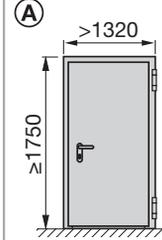
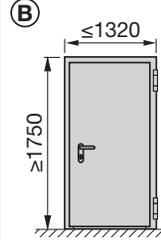
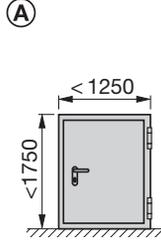
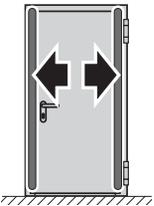
H3-1 OD/H3-2 OD



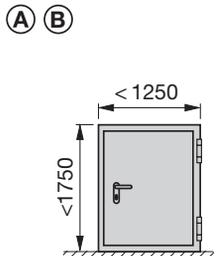
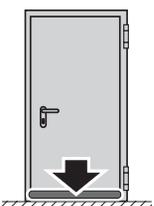
1



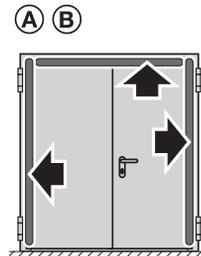
2



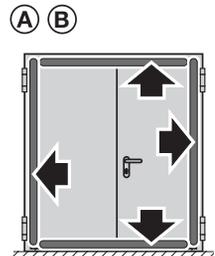
3

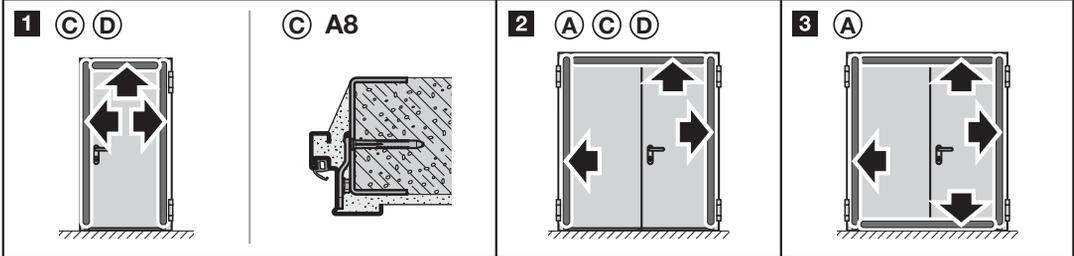
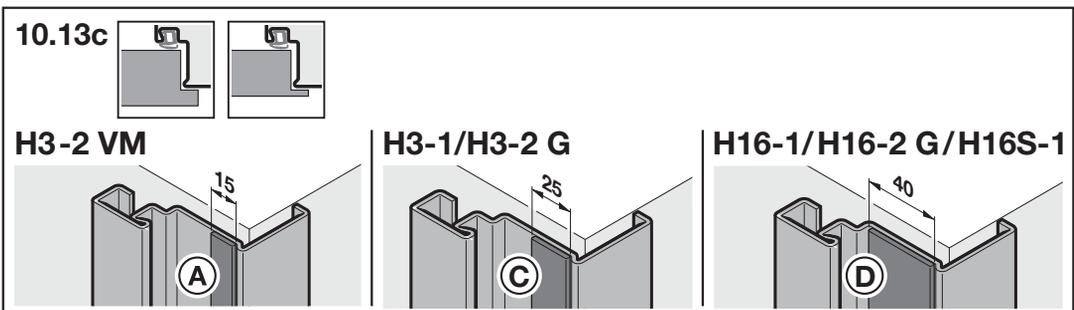
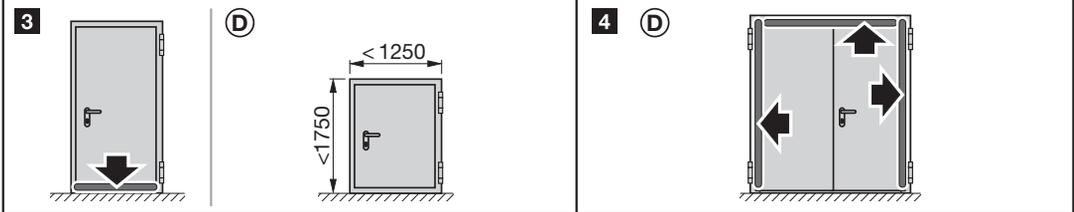
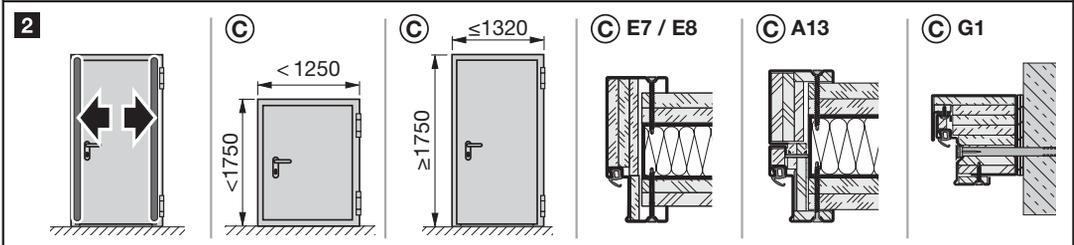
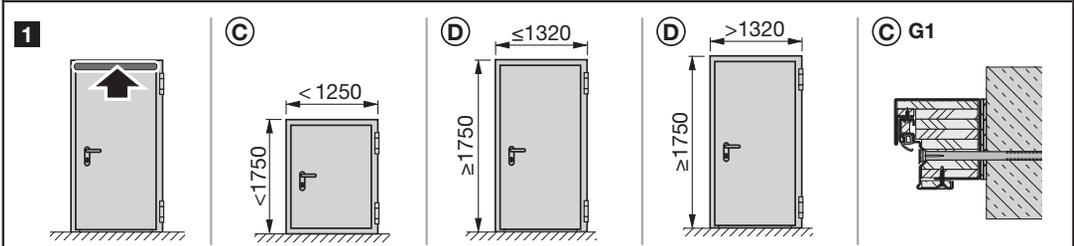
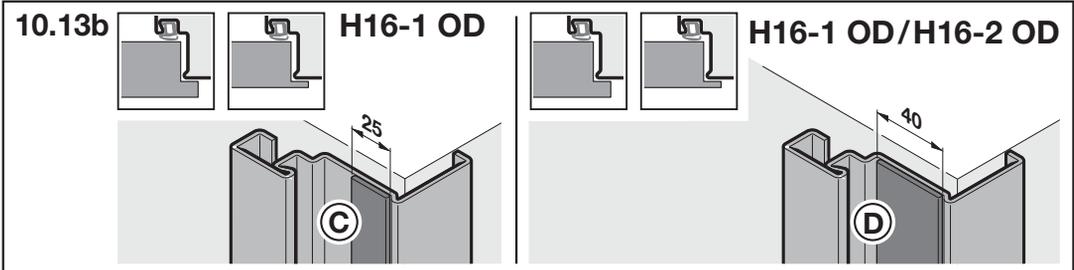


4

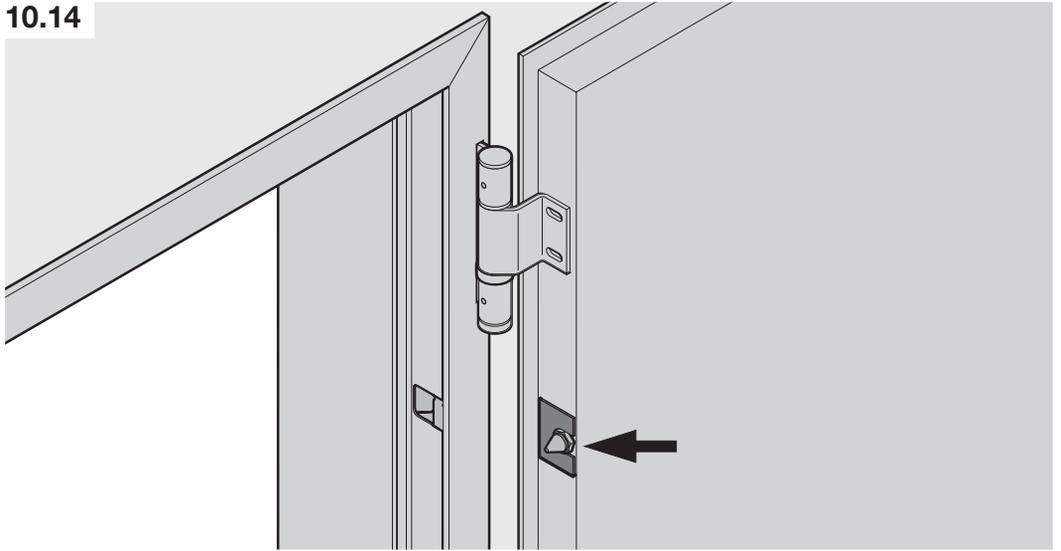


5

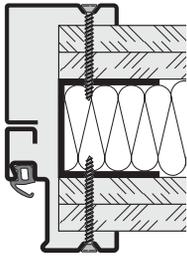




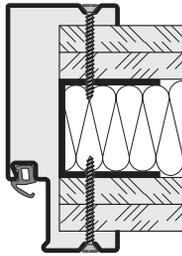
10.14



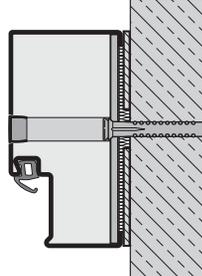
A10-A13



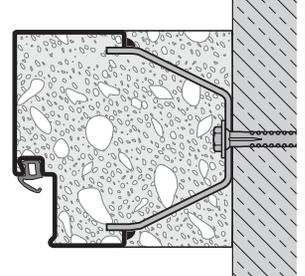
E5-E8



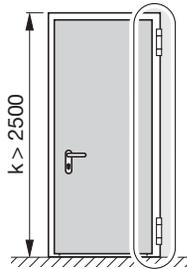
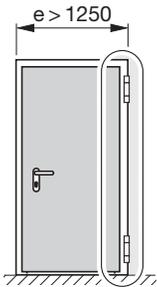
E1, E2



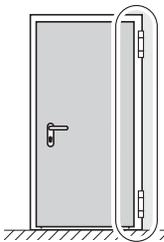
E3



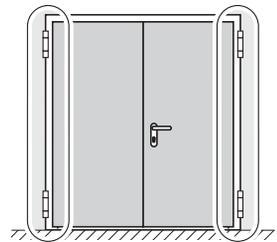
T30-1 / H\_30-1



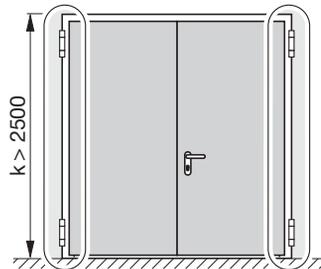
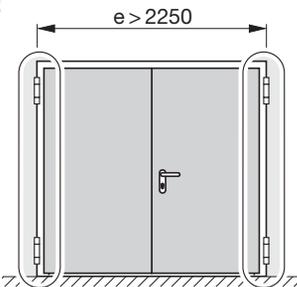
T90-1 / H\_90-1



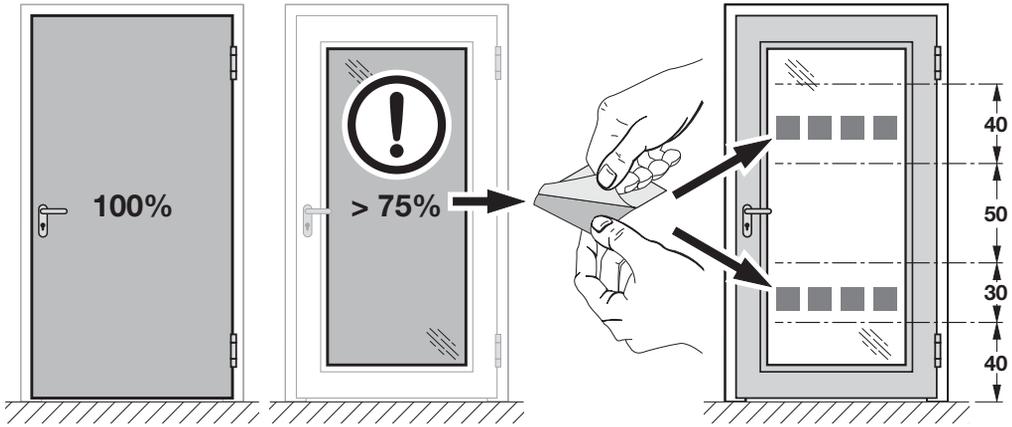
T30-2 RC3 / H\_30-2 RC3



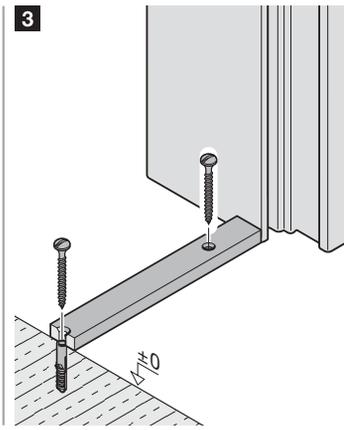
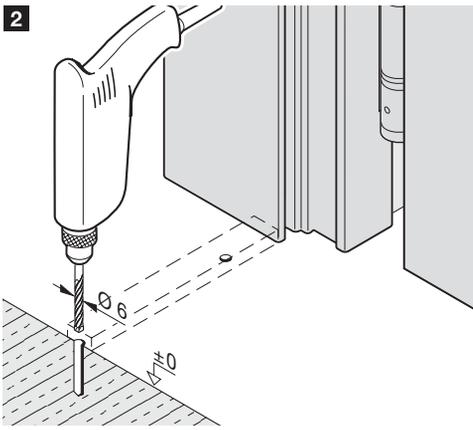
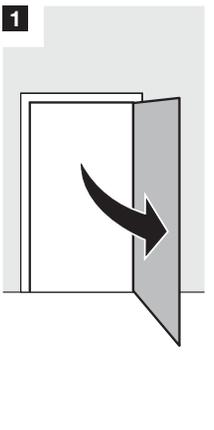
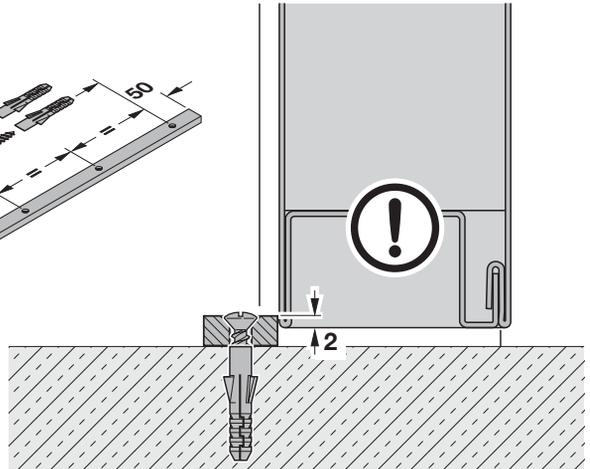
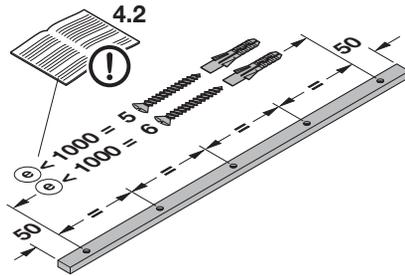
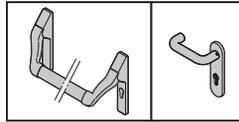
T90-2 / H\_90-2



10.15

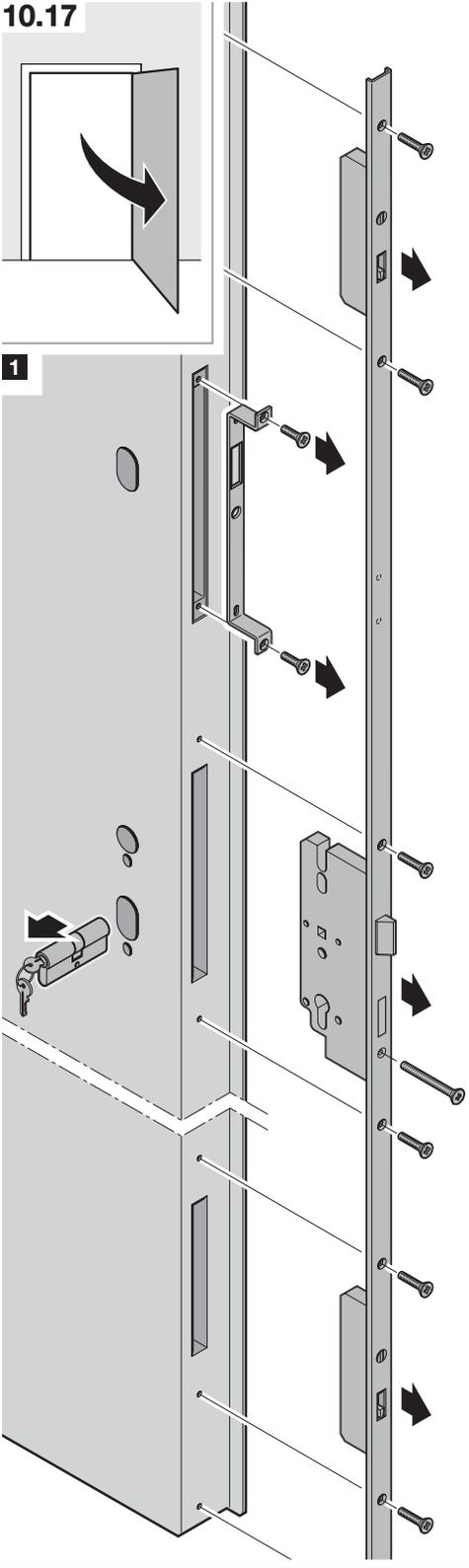


10.16

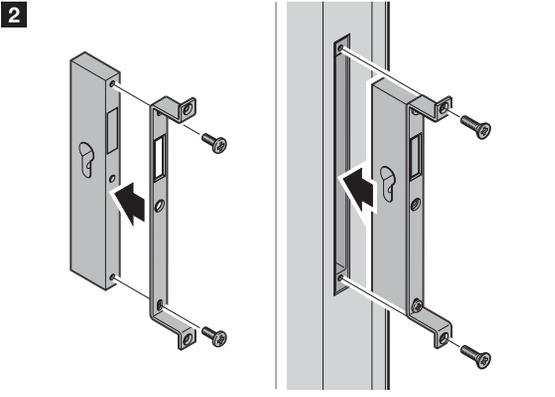


10.17

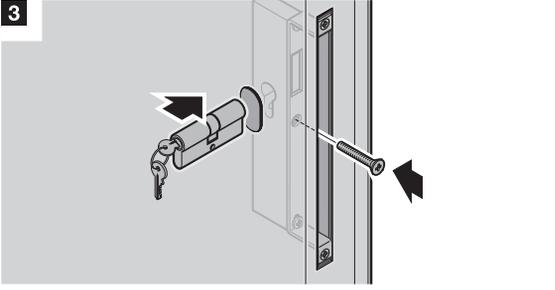
1



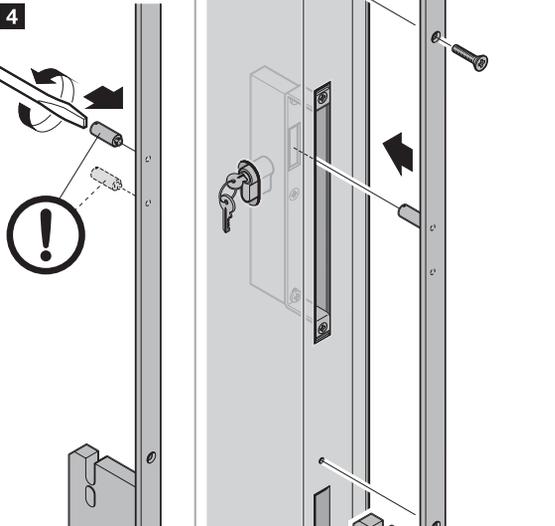
2



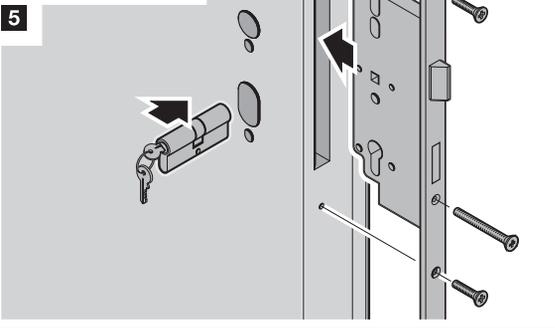
3



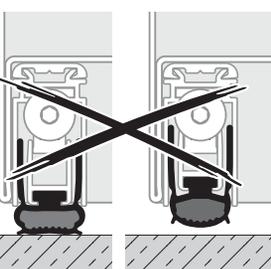
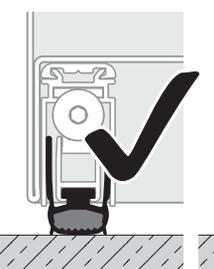
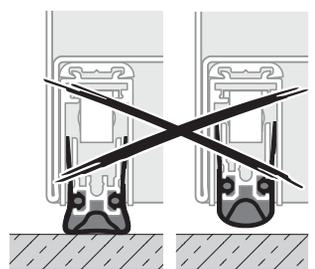
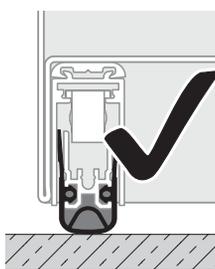
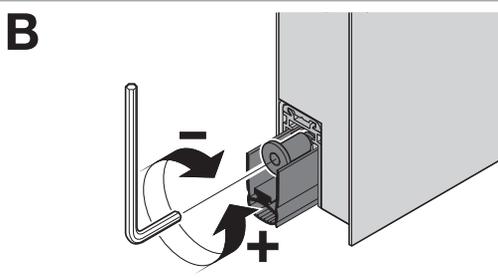
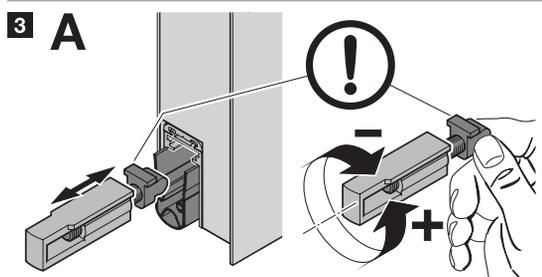
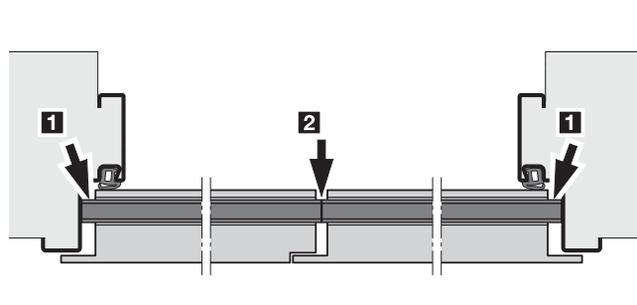
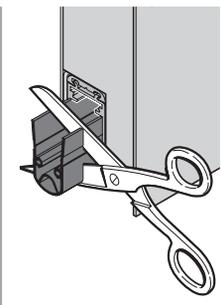
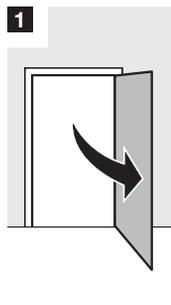
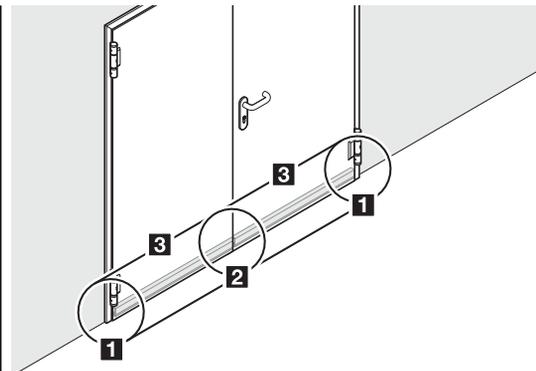
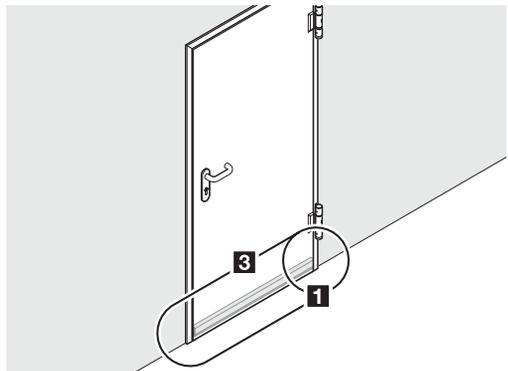
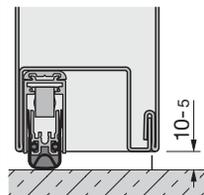
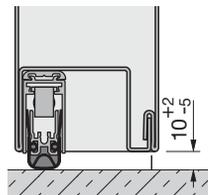
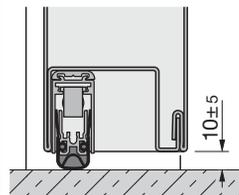
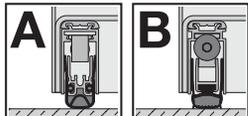
4

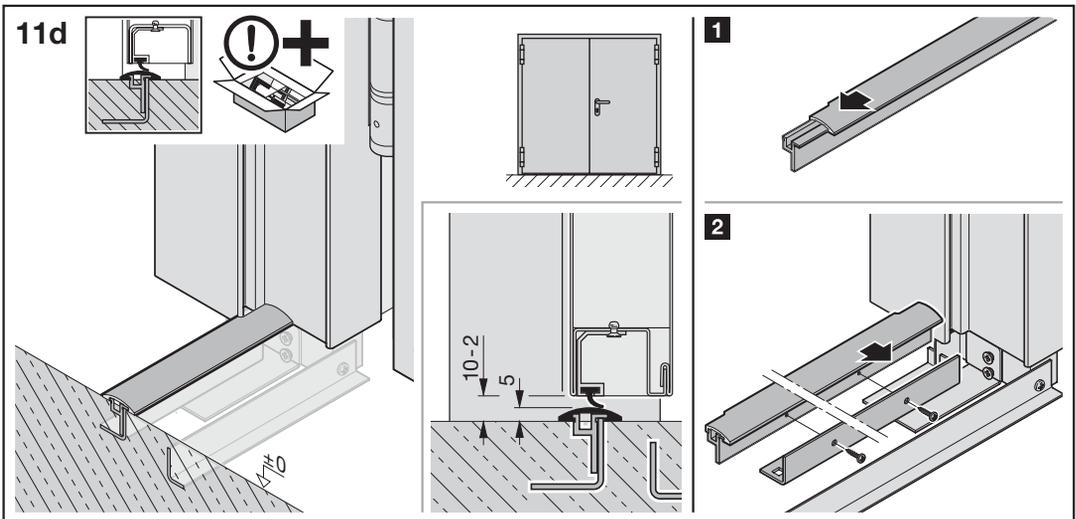
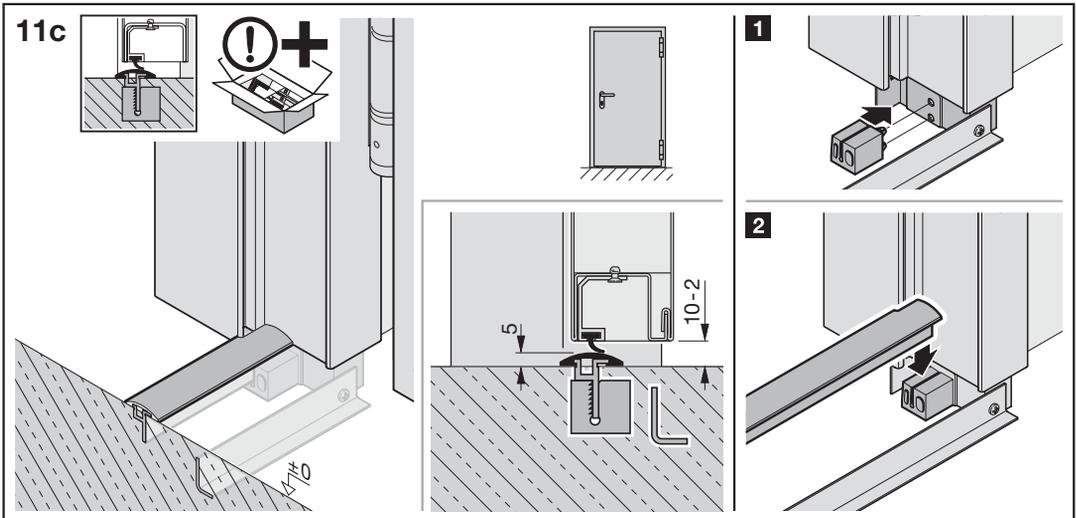
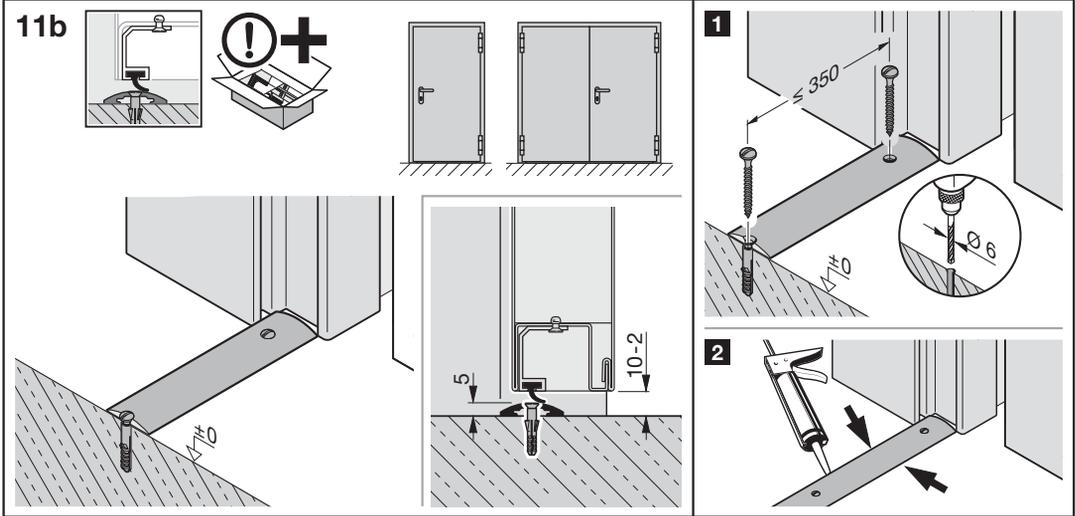


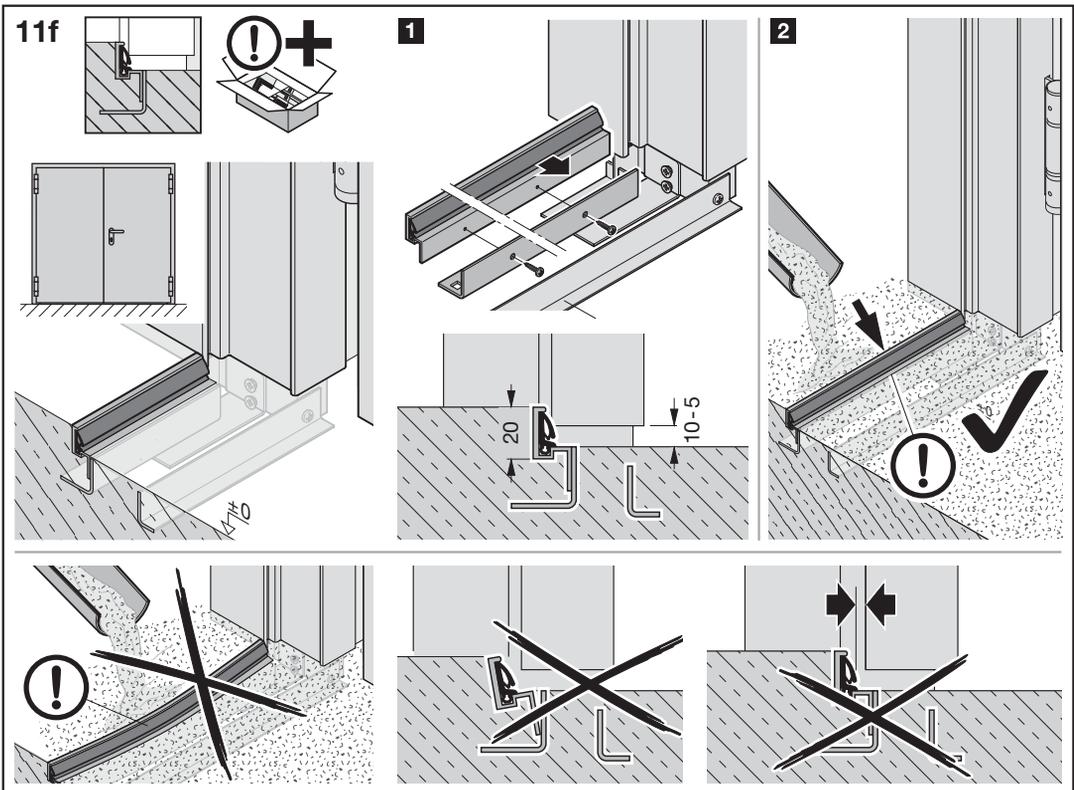
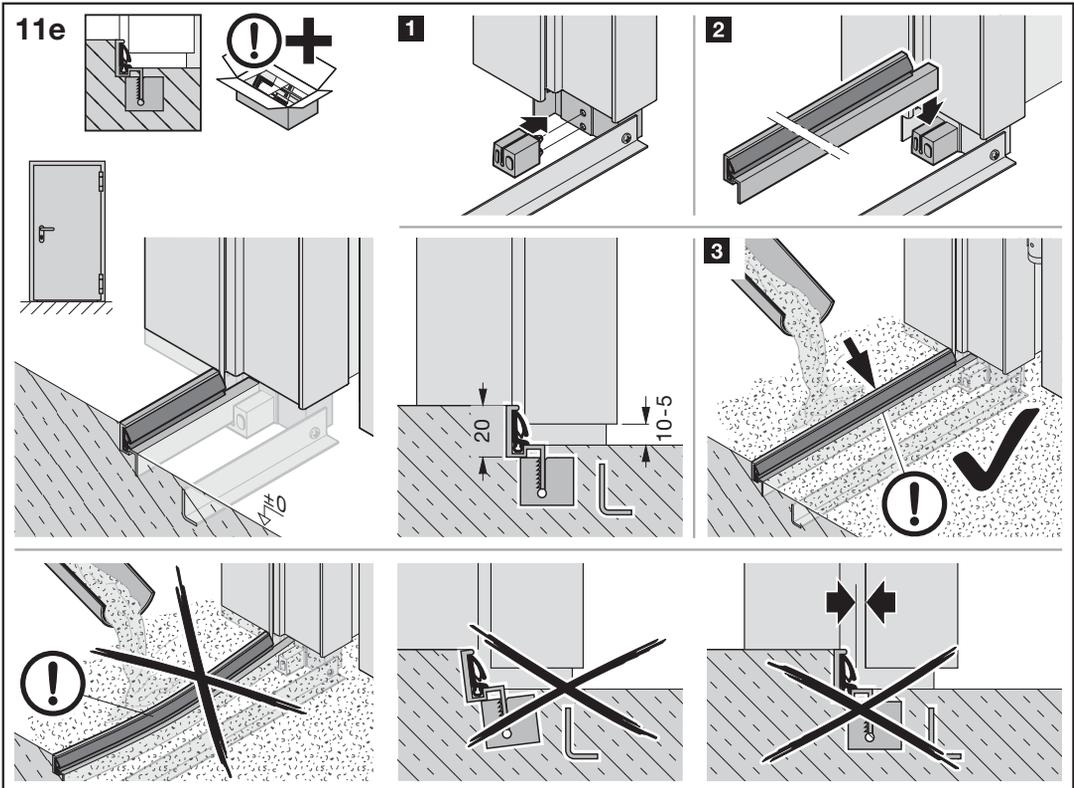
5



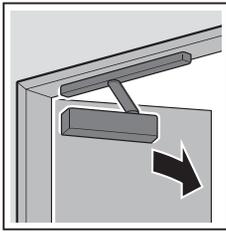
11a



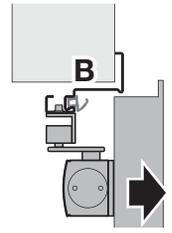
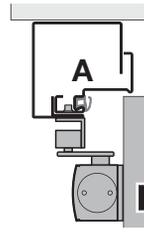




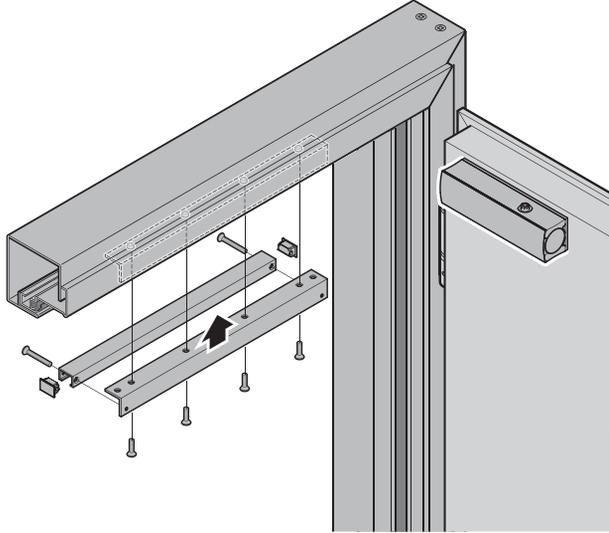
12a



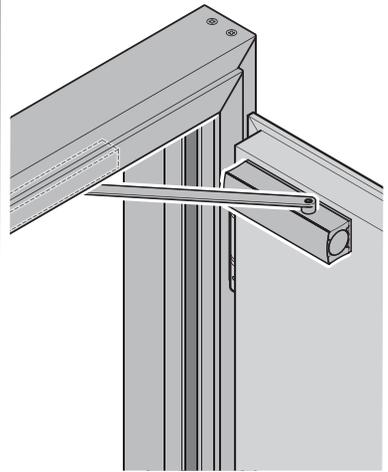
# HDC 35 BG



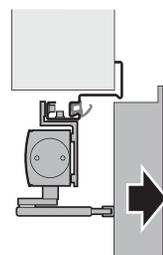
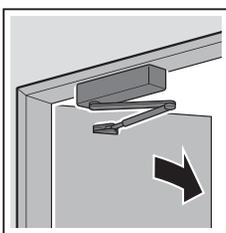
1



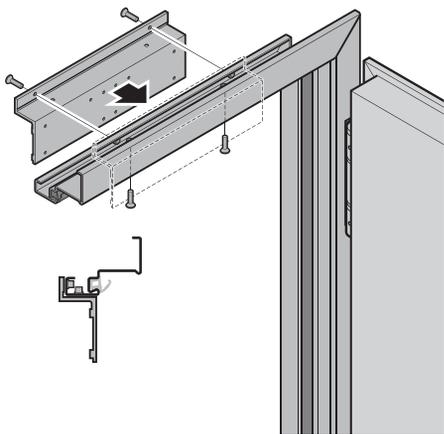
2



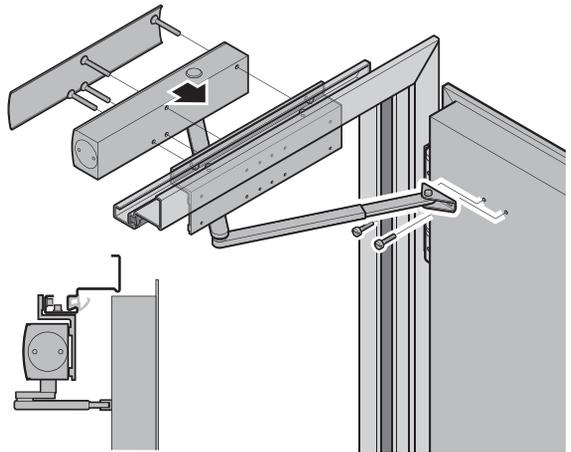
12b



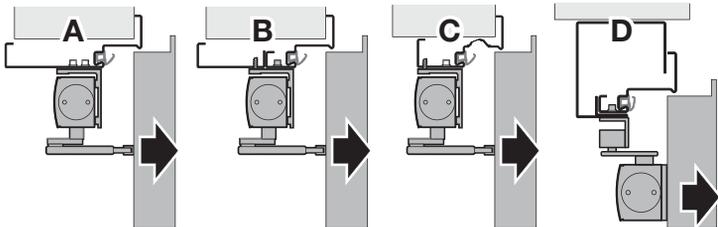
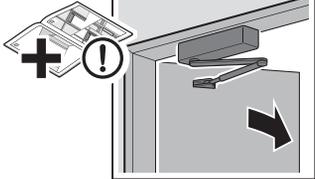
1



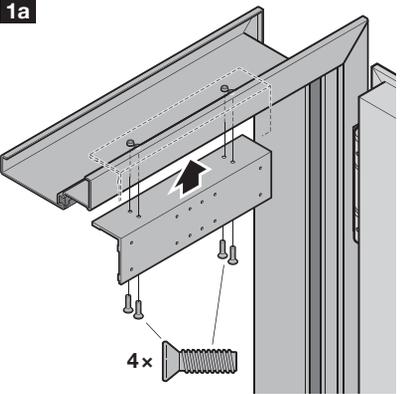
2



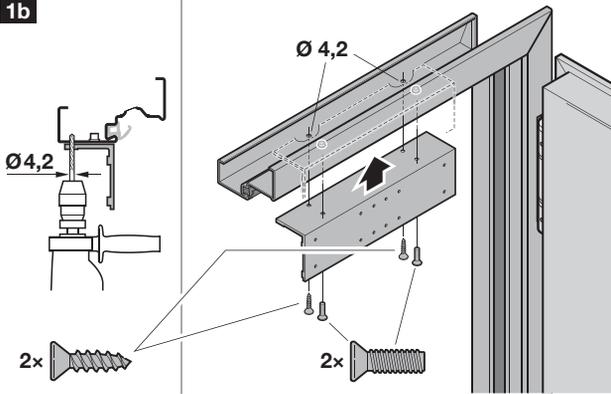
12c



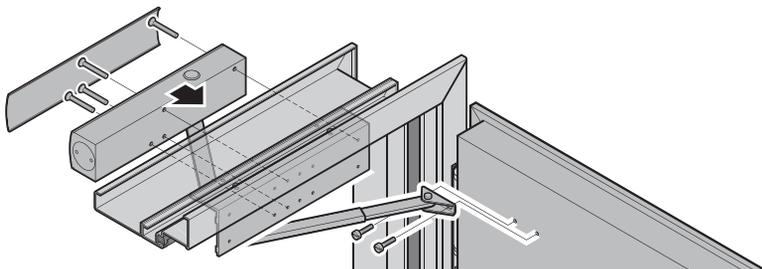
1a



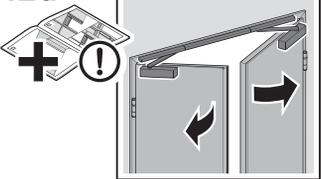
1b



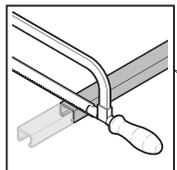
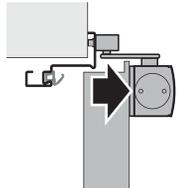
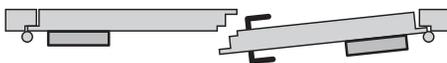
2



12d

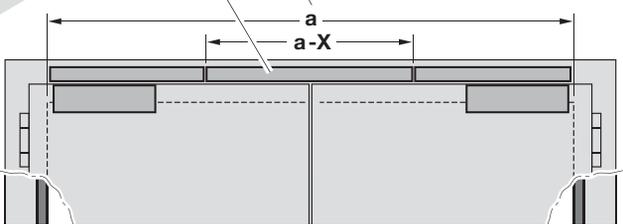


**GEZE TS 5000  
DORMA TS 93**

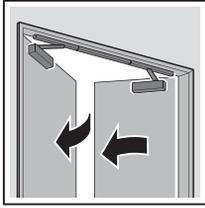


4.2 (EN 12519)

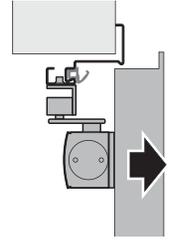
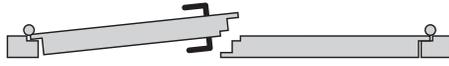
	X
GEZE TS 5000	1021
DORMA TS 93	1062



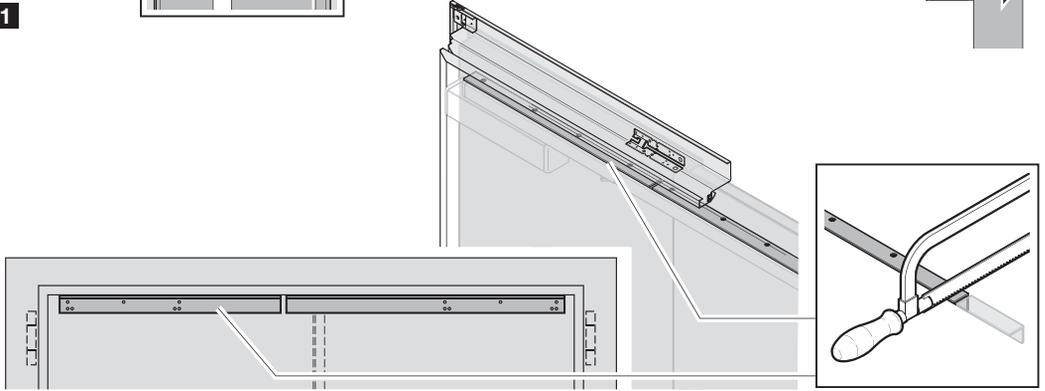
12e



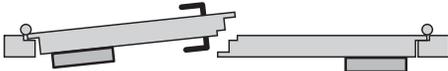
**GEZE TS 5000  
DORMA TS 93**



**1**

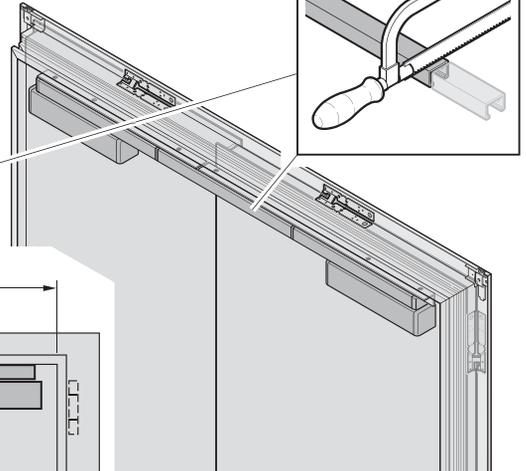
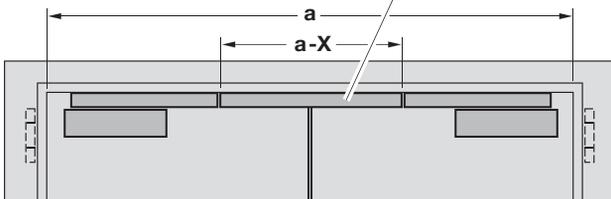


**2**

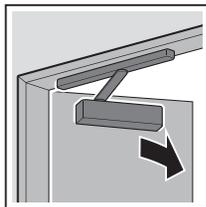


4.2 (EN 12519)

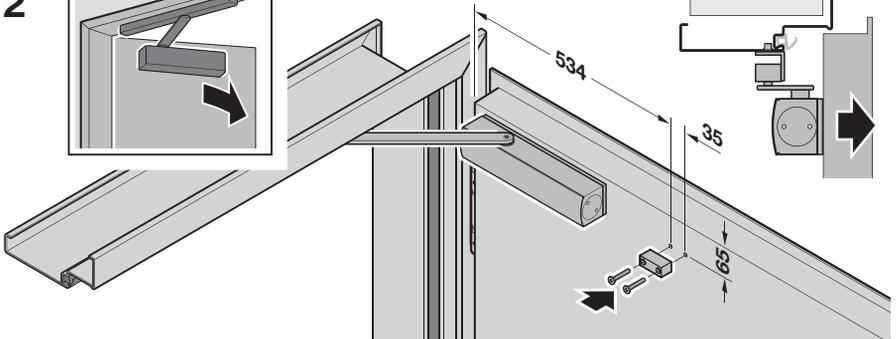
	X
GEZE TS 5000	1130
DORMA TS 93	1179



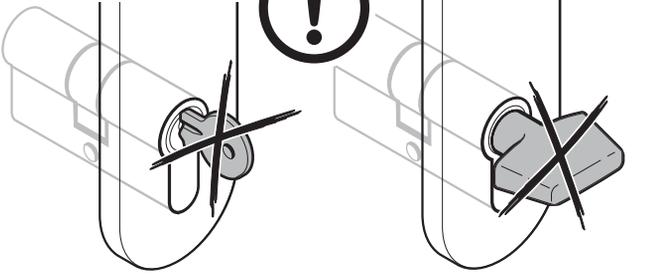
12f **H16-2  
H3-2**



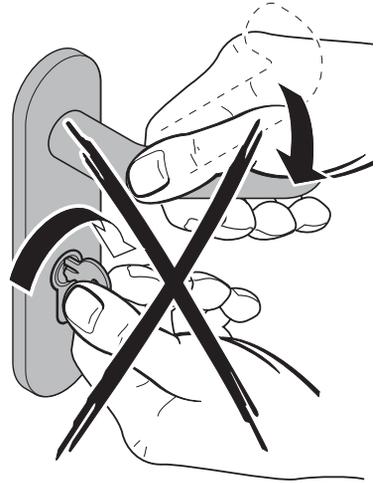
**TS 93 GSR BG**



13.1a



13.1b



1



2

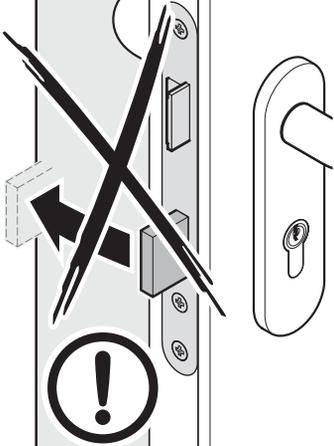


3



13.2

1



2



3

