



EMERUS

ALUMINIUM EXTRUSION



PK150tt

Podizno klizna vrata

TEHNIČKI KATALOG



INSTITUT IGH, d.d.
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RN 62570888

Zagreb, 2021-05-03

IZVJEŠTAJ O ISPITIVANJU I OCJENI SVOJSTAVA NA TEMELJU ISPITIVANJA BR. 72570/050/21-089/21

(utemeljeno na uzorkovanju koje je proveo proizvođač)

Naručitelj: EMERUS d.o.o.
Knešpolje bb
BA-88220 Široki Brijeg, BiH

Ugovor/narudžba: prihvaćena ponuda broj 72570-0-0345/21 od 2021-04-19

Građevni proizvod: aluminijska klizna stijena sustav PK150tt ostakljena dvostrukim IZO
staklom debljine 30 mm

Proizvođač: EMERUS d.o.o.
Knešpolje bb
BA-88220 Široki Brijeg, BiH

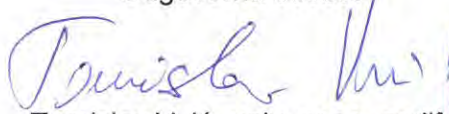
Datum zaprimanja uzorka: 2021-04-08

Mjesto ispitivanja: INSTITUT IGH, d.d., Zavod za materijale i konstrukcije, Laboratorij IGH,
Laboratorij za građevinsku fiziku, Janka Rakuše 1, HR-10000 Zagreb

Laboratorijska oznaka
uzorka: LGF 126/21

Ispitana svojstva: A dio: propusnost zraka
B dio: vodonepropusnost
C dio: otpornost na opterećenje vjetrom
D dio: ocjena svojstava građevnog proizvoda

Odgovorna osoba:


Tomislav Vuić, univ. spec. aedif.

Voditelja Laboratorija za građevinsku fiziku:


dr. sc. Mladen Bezjak, dipl. ing. stroj.

Institut IGH d.d. je prijavljeno tijelo (notified body) pri Europskoj komisiji za radnje ispitivanja svojstava prozora i vrata koji se koriste u graditeljstvu s brojem NB 2477 u NANDO bazi.

Rezultati ispitivanja odnose se samo na ispitane uzorke. Djelomično umnožavanje ovog izvještaja nije dopušteno bez pisanog odobrenja Voditelja laboratorija. Ukupan broj stranica 14, uključujući 0 dodatka.

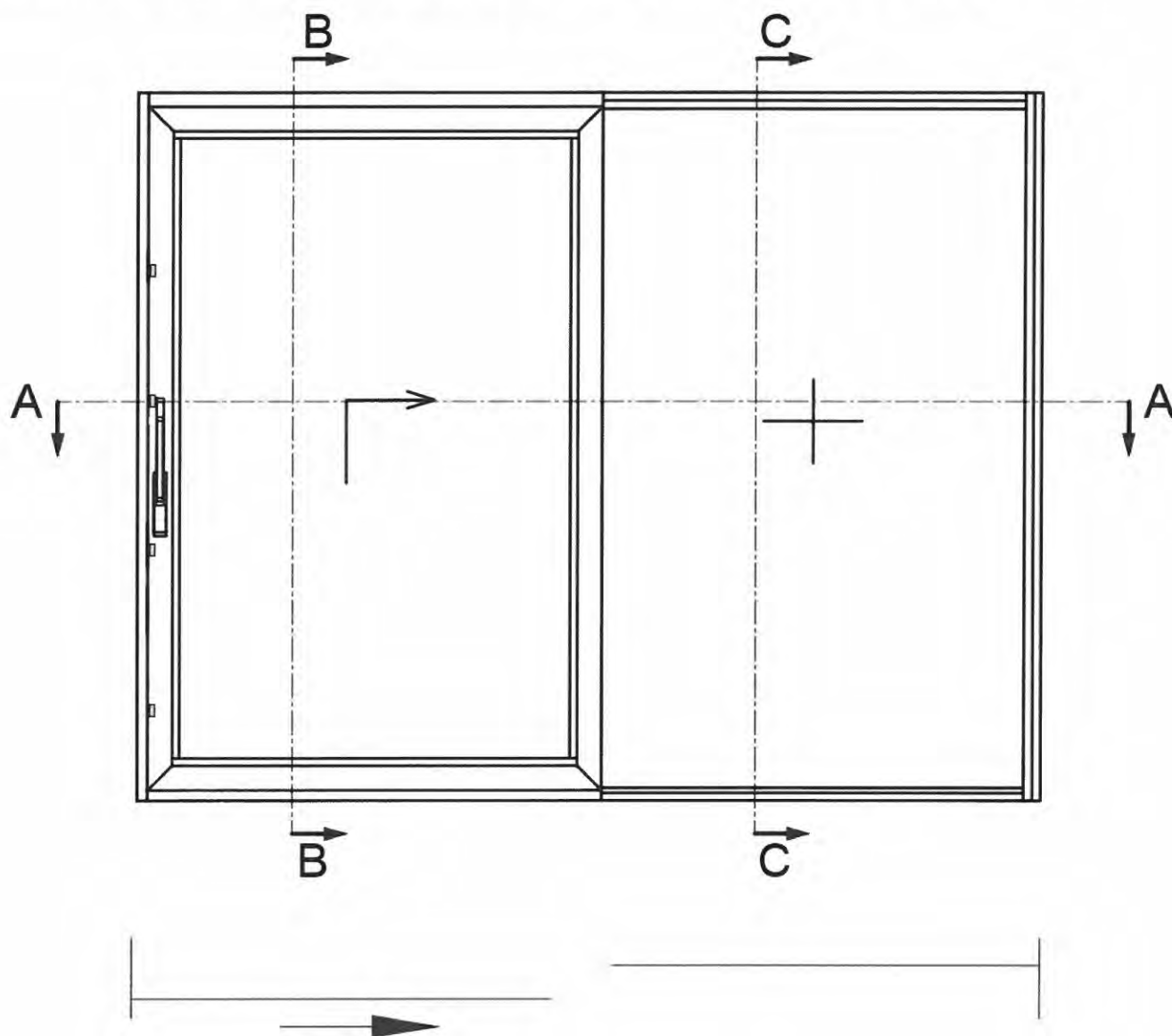
OPĆI DIO (podatci dostavljeni od naručitelja)

Opis ispitnog uzorka:

Ispitivanja propusnosti zraka, vodonepropusnosti i otpornosti na opterećenje vjetrom provedena su na uzorku aluminijske klizne stijene sustav PK150tt (klizno krilo i fiksni dio) ostakljenom dvostrukim IZO staklom debljine 30 mm (6/18/6), laboratorijske oznake LGF 126/21.

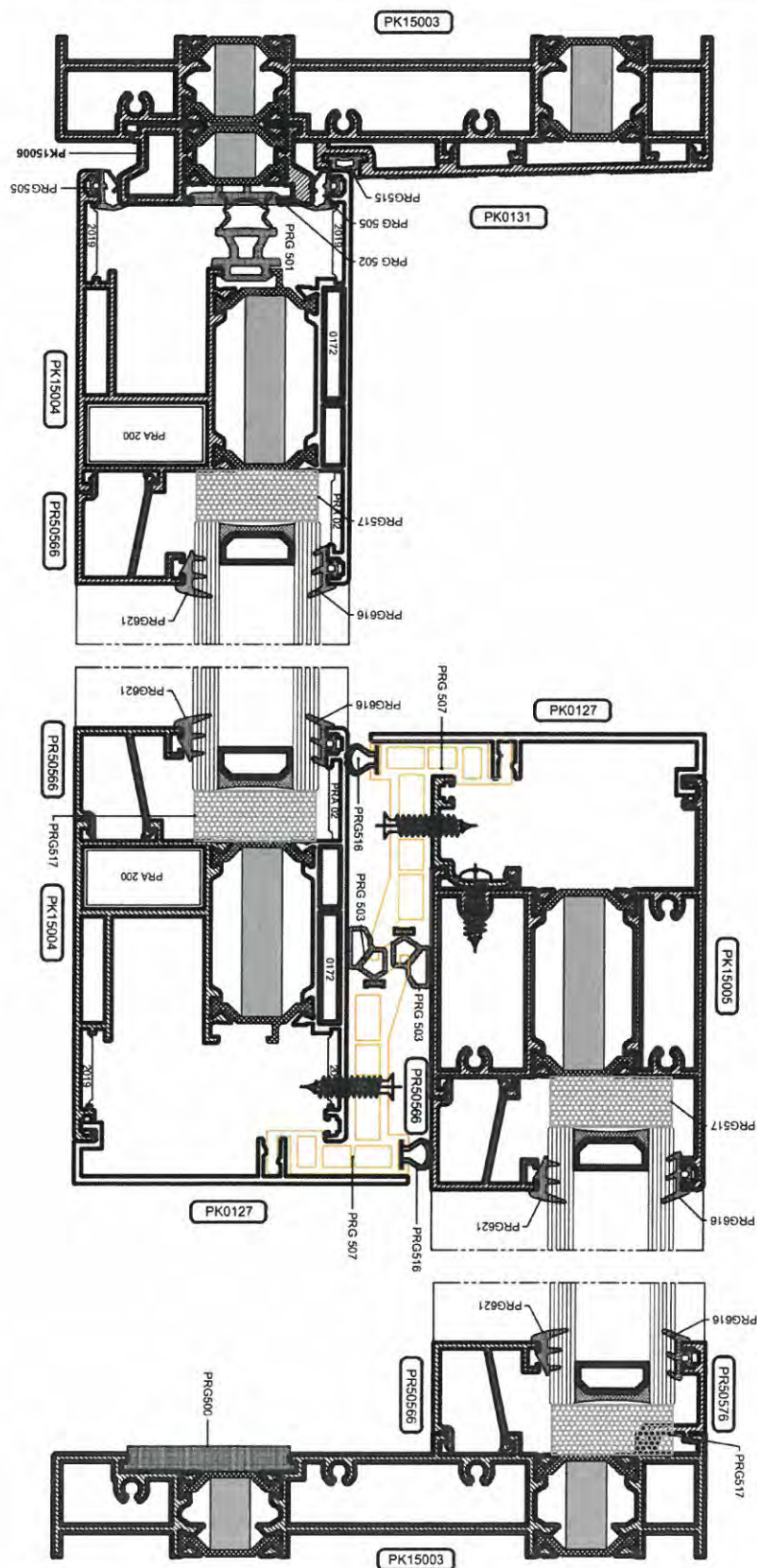
Vanjske izmjere klizne stijene: 2,61 m x 2,22 m.

Skica dostavljenog uzorka s mjestima učvršćenja, presjecima i popisom uporabljenih dijelova:

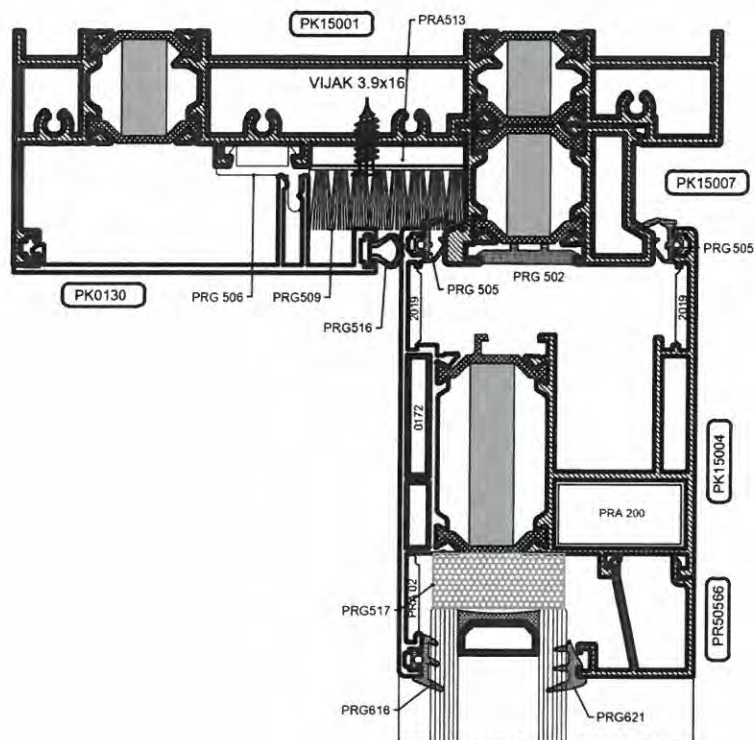


Izvještaj broj: 72570/050/21-089/21

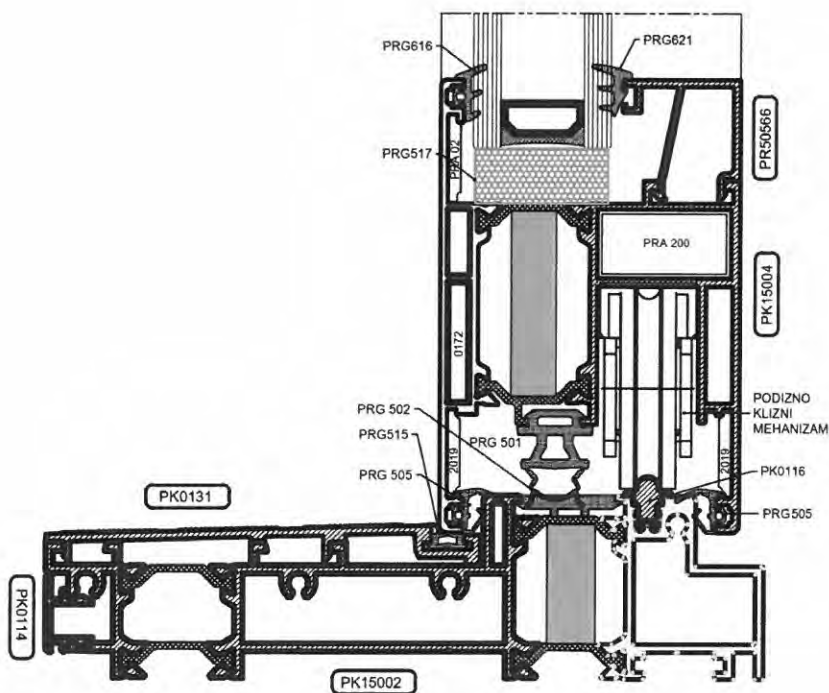
presjek A-A



Izvještaj broj: 72570/050/21-089/21

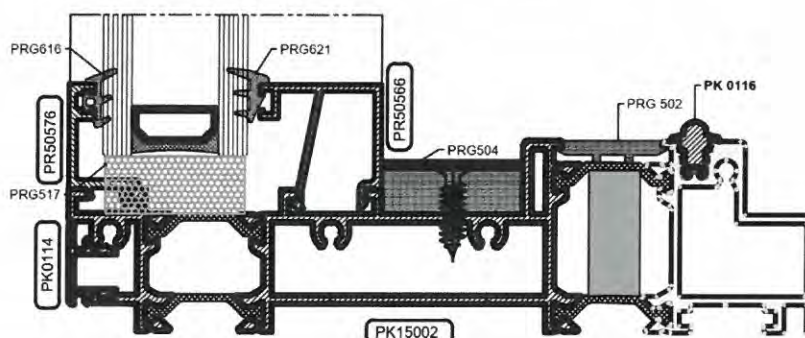
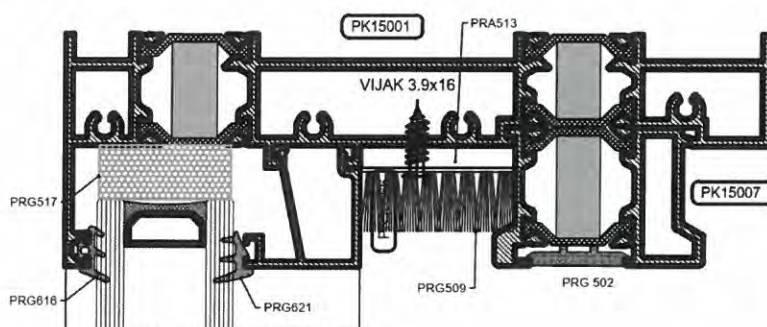


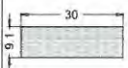
presjek B-B

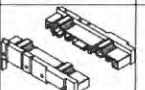


Izveštaj broj: 72570/050/21-089/21

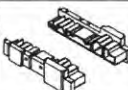
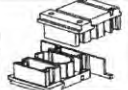
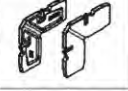
presjek C-C



KOD	OPIS	Komada po pakovanju	MATERIJAL
PRG500	 Brtva okvira	PK1500e	EPDM
PRG501	 Centralna brtva	PK1500e	EPDM
PRG502	 Brtva okvira	PK1500e	EPDM
PRG503	 Brtva spoja	PK1500e	EPDM
PRG504	 Brtva spoja(110mm)	PK1500e	EPDM
PRG505	 Brtva krila	PK1500e	EPDM
PRG621	 UNUTARNJA EPDM BRTVA ZA STAKLO, 2-3mm	PK1500e	EPDM
PRG616	 VANJSKA BRTVA ZA STAKLO 2-3mm	PK1500e	EPDM

KOD	OPIS	Komada po pakovanju	MATERIJAL
PRG515	 Donja brtva lajsne	PK1500e	EPDM
PRG516	 Četkasta brtva	PK1500e	EPDM
PRG517	 Ispuna	PK1500e	XPS
PRG506	 Plastika	PK1500e	PVC
PRG507	 Plastika	PK1500e	PVC
PRG508	 Čep za lajsnu PK0127	PK1500e	PVC
PRG509	 Četkica na srednjem spoju(110mm)	PK1500e	Polipropilen
PRG510	 Gornji čep	PK1500e	EPDM

Izveštaj broj: 72570/050/21-089/21

KOD	OPIS	Komada po pakovanju	MATERIJAL
PRG511	 Donji čep		EPDM
PRG512	 Srednji čep		EPDM
PRA513	 Plastika za četkicu PRG509		PVC
PRA02	 Kutnik poravnanja 2200 4.8mm x 17.4 mm.		Aluminijski odlivak
0092	 Bolcna za spajanje kutnika 0172.		Aluminijski odlivak
2019	 Pomoćni kutnik krila 2019.		Aluminijski odlivak
5011	 Glavni kutnik krila 5011 28.5 x 14.5 mm		Aluminijski odlivak
0172	 Pomoćni kutnik krila		Aluminijski odlivak

Tehnički opis ispitnog uzorka dostavljen od naručitelja ispitivanja:

Proizvod	aluminijska klizna stijena sustav PK150tt ostakljena dvostrukim IZO staklom debljine 30 mm
Proizvođač	Emerus d.o.o
Datum proizvodnje	17.04.2021
Sustav profila	PK150tt
Materijal	Aluminij
Tip otvaranja / Smjer otvaranja	Tipologija A-fiks+klizno
Dimenzije doprozornika (šxv)	2600 mm x 2200 mm
Dimenzije krila (šxv)	1173 mm x 2125 mm
Dopozornik	
Presjek profila (šxd)	155 mm x 40 mm, 155 mm x 52 mm, 155 mm x 53 mm
Oznaka profila	PK15001, PK15002, PK15003
Kutni spoj (metoda spajanja, detalji)	Spajanje pod 90° s EPDM čepovima i vijcima
Otvori za odvodnju vode	5

Izveštaj broj: 72570/050/21-089/21

Krilo/a	
Presjek profila (šxd)	65 mm x 99 mm
Oznaka profila	PK15004
Kutni spoj (metoda spajanja, detalji)	Spajanje pod kutom 45 ° s kutnicima
Težina krila/aktivnog krila	105,2 kg
Letvica krila	
Presjek profila (šxd)	25.5 mm x 22 mm
Oznaka profila	PR50566
Kutni spoj	Spajanje pod kutom 90 ° i brtvljenje spoja
Metoda učvršćenja	Mehanički na klik
Sustav brtvljenja – krilo, dovratnik	
Vanjsko brtvljenje – dovratnik	
Proizvođač, šifra	PRG505
Materijal	EPDM
Kutna konfiguracija/spoj	Spajanje pod 45° i brtvljenje spoja
Unutarnje, središnje brtvljenje – krilo	
Proizvođač, šifra	PRG501
Materijal	EPDM
Kutna konfiguracija/spoj	Spajanje pod 90 ° i brtvljenje spoja
Ispuna krila – staklo	
Proizvođač	Kristal
Sastav	6 mm + 18 mm + 6 mm
Brtvljenje stakla – Izvana	
Proizvođač, šifra	PRG616
Materijal	EPDM
Kutna konfiguracija/spoj	Spajanje pod 90 ° i brtvljenje spoja
Brtvljenje stakla – Iznutra	
Proizvođač, šifra	PRG621
Materijal	EPDM
Kutna konfiguracija/spoj	Spajanje pod 45° i brtvljenje spoja
Otvori za ventilaciju i odvodnju kondenzata	-
Okov	
Proizvođač, tip	Siegenia - podizno klizni
Broj spojnice (šarki)	-
Broj upadnica/pločica	4
Maksimalni razmak učvršćnih točaka	500 mm



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Izvještaj broj: 72570/050/21-089/21

Redoslijed ispitivanja uzorka:

1. ispitivanje propusnosti zraka ispitnog uzorka do maksimalne razlike tlaka od 600 Pa (pozitivno i negativno opterećenje na tlak),
2. Ispitivanje vodonepropusnosti ispitnog uzorka do maksimalne razlike tlaka od 600 Pa,
3. ispitivanje otpornosti na opterećenje vjetrom ispitnog uzorka
 - čeonu savijanje (pozitivno i negativno opterećenje na tlak) pri $P1 = 1200 \text{ Pa}$,
 - ispitivanje otpornosti promjenjivim tlakom pri $P2 = 600 \text{ Pa}$ ($0,5 \cdot P1$),
4. ispitivanje propusnosti zraka ispitnog uzorka do maksimalne razlike tlaka od 600 Pa nakon ispitivanja otpornosti na opterećenje vjetrom (pozitivno i negativno opterećenje na tlak),
5. ispitivanje otpornosti na opterećenje vjetrom ispitnog uzorka
 - sigurnosno ispitivanje (pozitivno i negativno opterećenje na tlak) pri $P3 = 1800 \text{ Pa}$ ($1,5 \cdot P1$).

A DIO: PROPUSNOST ZRAKA

- Zadatak:** Ispitati svojstvo propusnosti zraka ispitnog uzorka LGF 126/21 (alumijska klizna stijena sustav PK150tt, klizno krilo i fiksni dio, ostakljena dvostrukim IZO staklom debljine 30 mm).
Vanjske izmjere prozora: 2,61 m x 2,22 m.
- Norma ispitivanja:** HRN EN 1026:2016 Prozori i vrata -- Propusnost zraka -- Metoda ispitivanja (EN 1026:2016)
- Datum ispitivanja:** 2021-04-27
- Mjerna i ispitna oprema:**
- uređaj za ispitivanje prozora proizvođača HOLTEN, tip "Type VAEPC", oznaka mjerila 1674,
 - termohigrometar, ROTRONIC, tip Hygroclip S, oznaka mjerila 1680,
 - barometar, Präzisions-Barometer No 98895, oznaka mjerila 1135,
 - metalni metar, oznaka mjerila 622.

Temperatura, relativna vlažnost i tlak zraka tijekom ispitivanja: 24,2 °C 35,5 % rH 1002 hPa.

REZULTATI ISPITIVANJA PROPUSNOSTI ZRAKA

Ploština ispitnog uzorka: $A = 5,79 \text{ m}^2$.

Duljina sljubnica ispitnog uzorka: $l = 6,62 \text{ m}$.

Prozor je ispitan u neutralnom položaju zaključavanja (4 točaka učvršćenja).

Vanjska strana klizne stijene okrenuta je prema komori.

Protok zraka kroz uzorak Q_0 (srednja vrijednost pozitivnog i negativnog opterećenja na tlak), te protok zraka po jedinici duljine sljubnica Q_L i po jedinici ploštine otvarajućeg dijela uzorka Q_A prikazani su, kao funkcija razlike tlakova, tablicama i dijagramima.

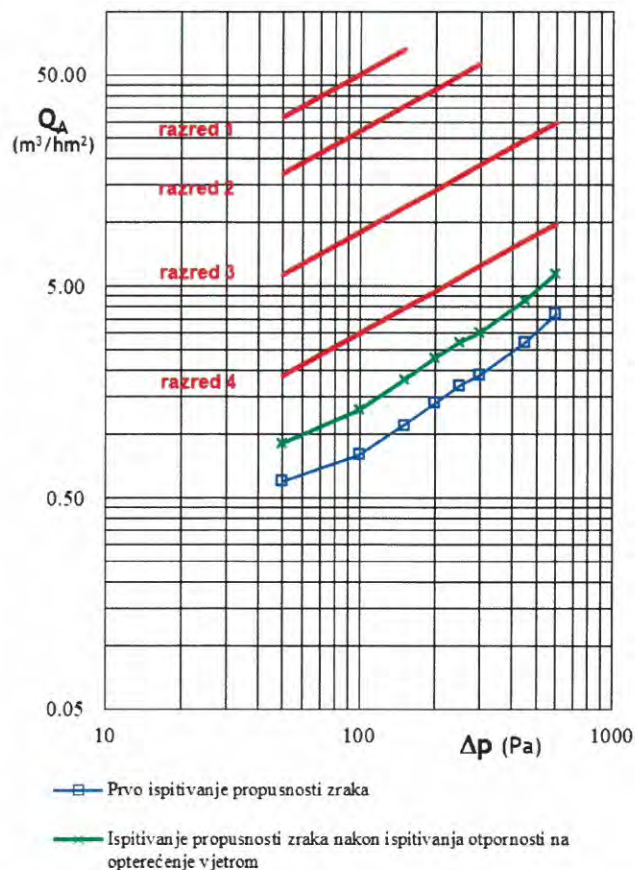
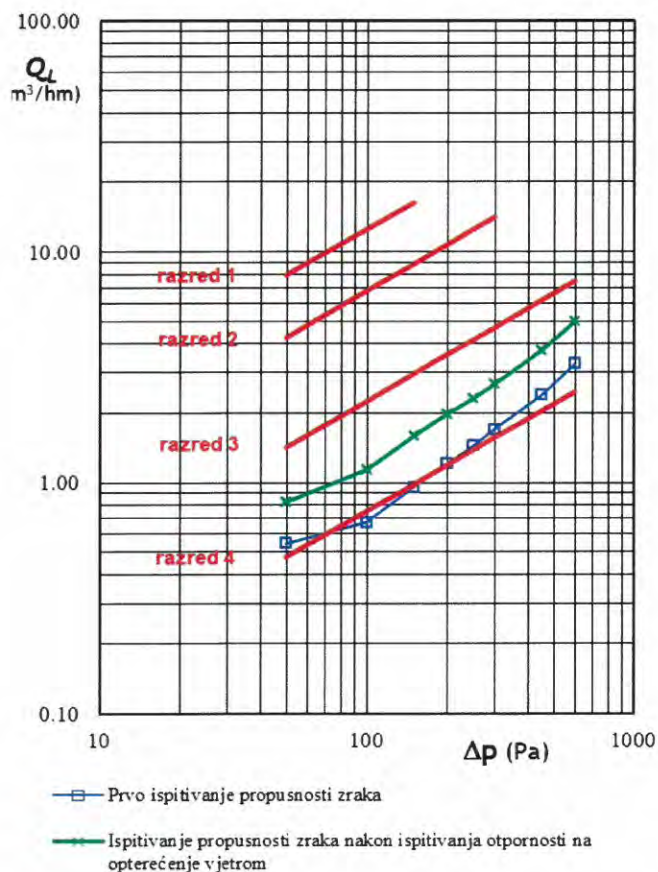
Tablica 1: rezultati ispitivanja propusnosti zraka, uzorak LGF 126/21:

Δp (Pa)	Q_0	Q_L					Q_A				
	(m ³ /h)	(m ³ /hm)	razred (prema HRN EN 12207:2017)				(m ³ /hm ²)	razred (prema HRN EN 12207:2017)			
			1	2	3	4		1	2	3	4
50	3.6	0.55	7,87	4,25	1,42	0,47	0.6	31,5	17,0	5,7	1,9
100	4.4	0.67	12,50	6,75	2,25	0,75	0.8	50,0	27,0	9,0	3,0
150	6.3	0.95	16,38	8,85	2,95	0,98	1.1	65,5	35,4	11,8	3,9
200	7.9	1.20		10,71	3,57	1,19	1.4		42,9	14,3	4,8
250	9.6	1.44		12,43	4,14	1,38	1.7		49,7	16,6	5,5
300	11.2	1.69		14,04	4,68	1,56	1.9		56,2	18,7	6,2
450	15.8	2.39			6,13	2,04	2.7			24,5	8,2
600	21.6	3.27			7,43	2,48	3.7			29,7	9,9

Izveštaj broj: 72570/050/21-089/21

Tablica 2: rezultati ispitivanja propusnosti zraka nakon ispitivanja otpornosti na opterećenje vjetrom, uzorak LGF 126/21:

Δp (Pa)	Q_0	Q_L					Q_A				
	(m³/h)	(m³/hm)	razred (prema HRN EN 12207:2017)				(m³/hm²)	razred (prema HRN EN 12207:2017)			
			1	2	3	4		1	2	3	4
50	5.5	0.82	7,87	4,25	1,42	0,47	0.9	31,5	17,0	5,7	1,9
100	7.5	1.13	12,50	6,75	2,25	0,75	1.3	50,0	27,0	9,0	3,0
150	10.5	1.59	16,38	8,85	2,95	0,98	1.8	65,5	35,4	11,8	3,9
200	13.1	1.98		10,71	3,57	1,19	2.3		42,9	14,3	4,8
250	15.4	2.32		12,43	4,14	1,38	2.7		49,7	16,6	5,5
300	17.6	2.66		14,04	4,68	1,56	3.0		56,2	18,7	6,2
450	24.8	3.74			6,13	2,04	4.3			24,5	8,2
600	32.9	4.97			7,43	2,48	5.7			29,7	9,9



B DIO: VODONEPROPUSNOST

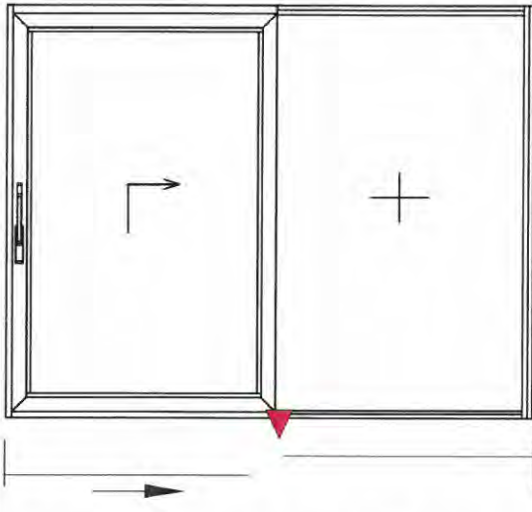
- Zadatak:** Ispitati svojstvo vodonepropusnosti ispitnog uzorka LGF 126/21 (alumijska klizna stijena sustav PK150tt, klizno krilo i fiksni dio, ostakljena dvostrukim IZO staklom debljine 30 mm).
Vanjske izmjere prozora: 2,61 m x 2,22 m.
- Norma ispitivanja:** HRN EN 1027:2016 Prozori i vrata -- Vodonepropusnost -- Metoda ispitivanja, Metoda 1A
- Datum ispitivanja:** 2021-04-27
- Mjerna i ispitna oprema:**
- uređaj za ispitivanje prozora proizvođača HOLTEN, tip "Type VAEPC", oznaka mjerila 1674,
 - termohigrometar, ROTRONIC, tip Hygroclip S, oznaka mjerila 1680,
 - barometar, Präzisions-Barometer No 98895, oznaka mjerila 1135,
 - metalni metar, oznaka mjerila 622.

Temperatura, relativna vlažnost i tlak zraka tijekom ispitivanja: 24,2 °C 35,5 % rH 1002 hPa.

Rezultati ispitivanja vodonepropusnosti prikazani su tablicom 3.

Oznaka „+“ označuje da nije došlo do propuštanja vode pri navedenoj razlici tlaka, oznaka „∇“ označuje propuštanje vode pri navedenoj razlici tlaka (mjesto propuštanja označeno crvenim trokutom na skici), a oznaka „-“ označuje da pri navedenoj razlici tlaka nije provedeno ispitivanje.

Tablica 3: rezultati ispitivanja vodonepropusnosti, uzorak LGF 126/21:

tlak Δp (Pa)	vrijeme τ (min)	ispitni rezultat	razred (prema HRN EN 12208:2001)	
0	15	+	1 A	
50	5	+	2 A	
100	5	+	3 A	
150	5	+	4 A	
200	5	+	5 A	
250	5	+	6 A	
300	5	+	7 A	
450	5	∇	8 A	
600	5	-	9 A	Skica ispitnog uzorka s mjestom propuštanja vode (označeno crveno)

Tijekom ispitivanja u skladu s HRN EN 1027:2016, u rasponu natisnog tlaka od 0 Pa do 600 Pa (pozitivno opterećenje), alumijska klizna stijena sustav PK150tt, klizno krilo i fiksni dio, ostakljena dvostrukim IZO staklom debljine 30 mm je propustila vodu u drugoj minuti pri natisnom tlaku od 450 Pa.

C DIO: OTPORNOST NA OPTEREĆENJE VJETROM

Zadatak: Ispitati svojstvo otpornosti na opterećenje vjetrom ispitnog uzorka LGF 126/21 (alumijska klizna stijena sustav PK150tt, klizno krilo i fiksni dio, ostakljena dvostrukim IZO staklom debljine 30 mm).
Vanjske izmjere prozora: 2,61 m x 2,22 m.

Norma ispitivanja: HRN EN 12211:2016 Prozori i vrata -- Otpornost na opterećenje vjetrom -- Metoda ispitivanja (EN 12211:2016)

Datum ispitivanja: 2021-04-27

Mjerna i ispitna oprema:

- uređaj za ispitivanje prozora proizvođača HOLTEN, tip "Type VAEPC", oznaka mjerila 1674,
- termohigrometar, ROTRONIC, tip Hygroclip S, oznaka mjerila 1680,
- barometar, Präzisions-Barometer No 98895, oznaka mjerila 1135,
- metalni metar, oznaka mjerila 622.

Temperatura, relativna vlažnost i tlak zraka tijekom ispitivanja: 24,2 °C 35,5 % rH 1002 hPa.

Klizna stijena je ispitan u neutralnom položaju zaključavanja (4 točaka učvršćenja).
Vanjska strana klizne stijene okrenuta je prema komori.

C1. REZULTATI ISPITIVANJA ČEONOG SAVIJANJA

Ispitivanje čeonog savijanja provedeno je na mjestima kako je prikazano skicom.

A, B i C – mjerna mjesta,

A₀, B₀ i C₀, – početna stanja s obzirom na pomak, koja su ugođena da pokazuju 0 mm pri $\Delta p = 0$ Pa,

A_p – čeonu pomak na mjestu A pri razlici tlakova P1,

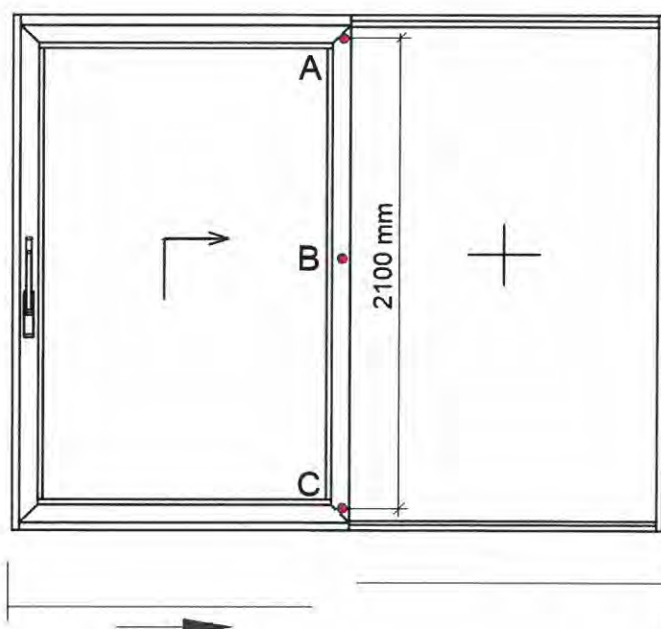
B_p – čeonu pomak na mjestu B pri razlici tlakova P1,

C_p – čeonu pomak na mjestu C pri razlici tlakova P1,

F_p = (B_p) - ((A_p) + (C_p))/2 - čeonu savijanje,

L = 2,100 m - razmak između točaka A i C,

F_{rp} = F_p / L - relativno čeonu savijanje.

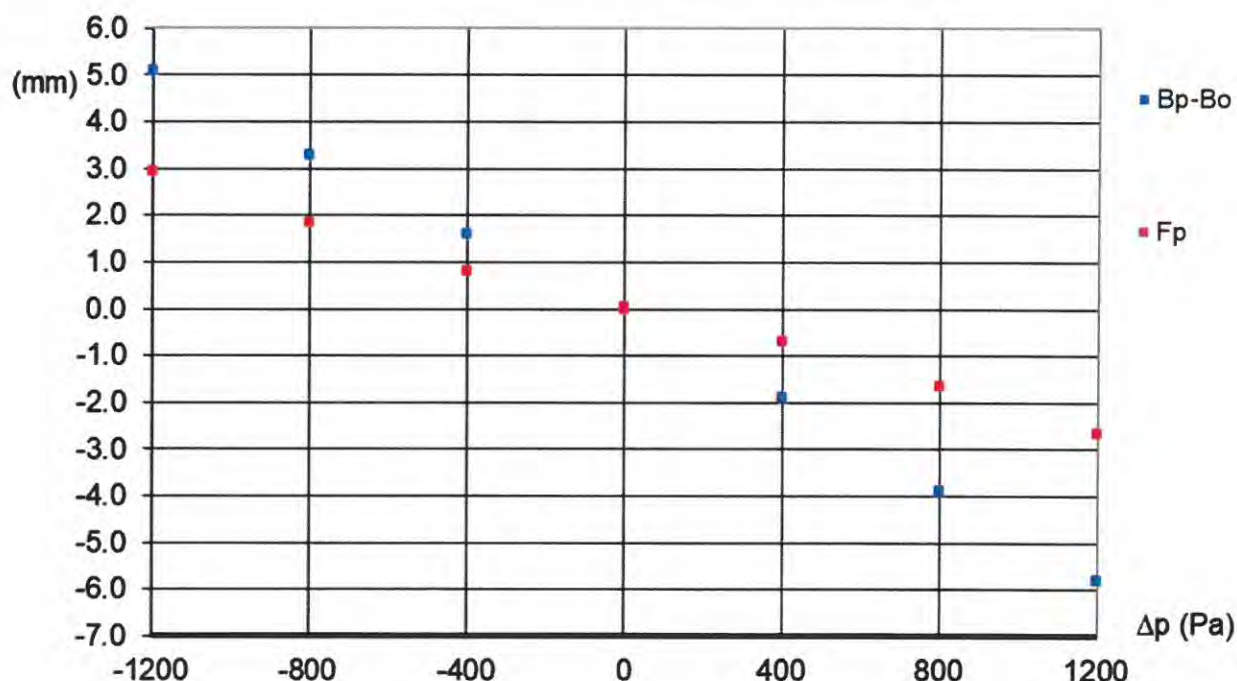


Izveštaj broj: 72570/050/21-089/21

Tablica 4: rezultati ispitivanja čeonog savijanja, uzorak LGF 126/21.

tlak Δp (Pa)	ispitni rezultat				
	A_p-A_0 (mm)	B_p-B_0 (mm)	C_p-C_0 (mm)	F_p (mm)	F_{rp} ($\times 10^{-4}$)
-1200,0	2.3	5.1	2.0	2.95	14.05
-800,0	1.5	3.3	1.4	1.85	8.81
-400,0	0.8	1.6	0.8	0.80	3.81
400,0	-1.7	-1.9	-0.7	-0.70	-3.33
800,0	-3.0	-3.9	-1.5	-1.65	-7.86
1200,0	-4.2	-5.8	-2.1	-2.65	-12.62

$F_{rpmax} = 1/710$



C2. REZULTATI ISPITIVANJA OTPORNOSTI PROMJENJIVIM TLAKOM P2

Ispitivanje je provedeno s 50 impulsa promjenjivog tlaka P2 od ± 600 Pa, koji iznosi polovicu maksimalnog tlaka $P1 = 1200$ Pa kod ispitivanja čeonog savijanja.

Nakon provedenog opterećenja na uzorku LGF 126/21 nije bilo vidljivih oštećenja niti promjena u funkcionalnosti uzorka.

C3. REZULTATI SIGURNOSNOG ISPITIVANJA

Ispitivanje sigurnosti je provedeno s po jednim impulsom od -1800 Pa i $+1800$ Pa ($1,5 \times P1$).

Nakon provedenog opterećenja na uzorku LGF 126/21 nije bilo vidljivih napuknuća na bilo kojem dijelu uzorka (staklo, okvir i okovi), niti je došlo do otvaranja krila.

C4. REZULTATI ISPITIVANJA ZRAKOPROPUSNOSTI NAKON ISPITIVANJA OTPORNOSTI NA OPTEREĆENJE VJETROM

Ponovljeno ispitivanje zrakopropusnosti nakon ispitivanja otpornosti na opterećenje vjetrom uzorka LGF 126/21 (Tablica 2 - A dio izvještaja) pokazuje da nije došlo do povećanja vrijednosti zrakopropusnosti većeg od 20 % u odnosu na granične vrijednosti dobivenog razreda nakon prvog ispitivanja zrakopropusnosti.

D DIO: OCJENA SVOJSTAVA GRAĐEVNOG PROIZVODA

S obzirom na rezultate ispitivanja propusnosti zraka (A dio ovog izvještaja), vodonepropusnosti (B dio ovog izvještaja) i otpornosti na opterećenje vjetrom (C dio ovog izvještaja), ispitani proizvod:

Građevni proizvod:	alumijska klizna stijena sustav PK150tt, klizno krilo i fiksni dio, ostakljena dvostrukim IZO staklom debljine 30 mm (vanjske izmjere prozora: 2,61 m x 2,22 m)
Proizvođač:	EMERUS d.o.o., Knešpolje bb, BA-88220 Široki Brijeg, BiH

ima razredbu prema navedenim normama:

HRN EN 12207:2017 Prozori i vrata -- Propusnost zraka -- Razredba (EN 12207:2016)	4
HRN EN 12208:2001 Prozori i vrata -- Vodonepropusnost -- Razredba (EN 12208:1999)	7A
HRN EN 12210:2016 Prozori i vrata -- Otpornost na opterećenje vjetrom -- Razredba (EN 12210:2016)	C3



IZVJEŠTAJ O PRORAČUNU KOEFICIJENTA PROLASKA TOPLINE (U VRIJEDNOST)

Broj izvještaja: **017-00-20**

Datum izdavanja izvještaja: **17.12.2020**

Mjesto ispitivanja:



OPĆI PODATCI:

Podnositelj zahtjeva **EMERUS d.o.o. Knešpolje bb 88220 Široki Brijeg**

Naziv proizvoda / tip: **Aluminijski prozor 2,8 x 2,2 m PK150**

Proizvođač: **EMERUS d.o.o. Knešpolje bb 88220 Široki Brijeg**

Podrijetlo proizvoda: **Bosna i Hercegovina**

REZULTAT:

HRN EN ISO 10077-1:2017 Toplinska svojstva prozora, vrata i zaslona – Proračun koeficijenta prolaska topline – 1 dio: Općenito (ISO 10077-1:2017, ispravljena verzija 2020-02; EN ISO 10077-1:2017)

$$1,0 \left[\frac{W}{m^2 K} \right]$$



1 Zahtjevi ispitivanja prema hrvatskim normama

Tvrtka **EMERUS d.o.o. Knešpolje**, postavila je zahtjev za ispitivanje proizvoda prema hrvatskoj normi kako slijedi:

HRN EN ISO 10077-1:2017 Toplinska svojstva prozora, vrata i zaslona – Proračun koeficijenta prolaska topline – 1. dio: Općenito (ISO 10077-1:2017, ispravljena verzija 2020-02; EN ISO 10077-1:2017)

2 Opći podatci o referentnom uzorku

Oznaka referentnog uzorka: **017-00-20**

Datum Izračuna: **17.12.2020**

3 Opis ispitnog uzorka

Proizvod je izrađen od aluminijskog profila s toplinskim prekidom, ostakljen troslojnim staklom debljine 48 [mm]; 4 [mm] low-e – 16 [mm] – 4 [mm] float – 14 [mm] – ESG 6 [mm] low-e + Arg. Čije je brtvljenje na unutarnjoj strani krila ostvareno pomoću trajno elastične brtve smještene u utoru spojnih letvica, dok su na vanjskoj strani krila rubovi brtvljeni trajno elastičnom brtvom smještenom u profilu krila.

Sustav profila: PK150TT, aluminijski profili s toplinskim mostom

Proizvođač profila: EMERUS d.o.o. Knešpolje, Bosna i Hercegovina

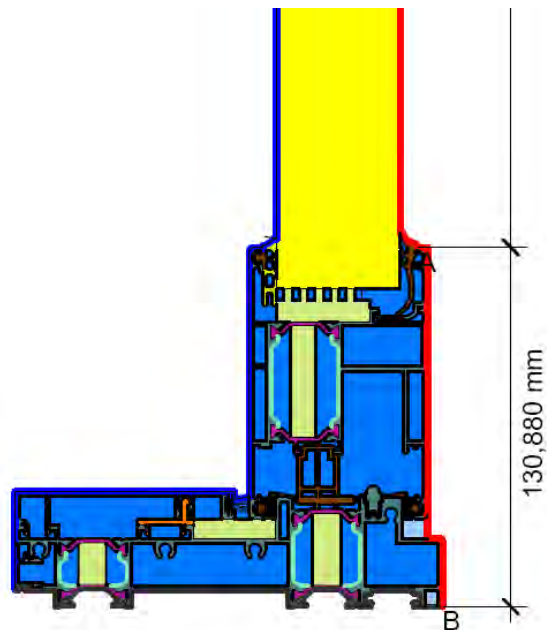
Profil doprozornika, oznaka:	PK15002
Brtva doprozornik, vanjska:	EPDM, espanso
Brtva doprozornika, središnja:	EPDM

Profil krila, oznaka:	PK15004
Brtva stakla, unutarnja, vanjska:	EPDM, espanso
Brtva krila, unutarnja:	EPDM

Profil prečke, oznaka:	PK15005
Brtva stakla, unutarnja, vanjska:	EPDM, espanso
Brtva prečke, unutarnja:	EPDM

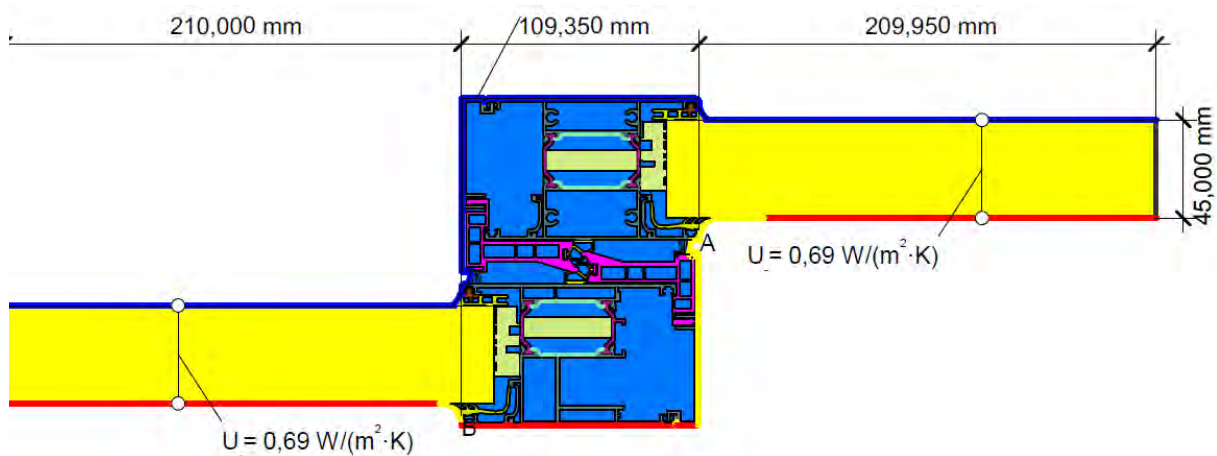
Okov – tip, proizvođač: EMERUS d.o.o. Knešpolje, Bosna i Hercegovina

Skice karakterističnih presjeka uzorka:



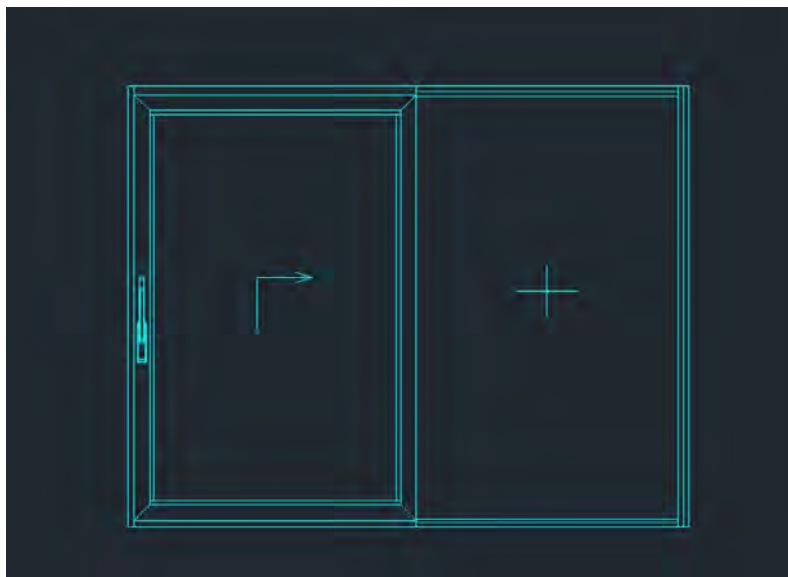
$$U_{fA,B} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{8,262}{20,000} - 0,687 \cdot 0,235}{0,131} = 1,9 \text{ W/(m}^2 \cdot \text{K)}$$

Presjek dovratnika i krila serije PK150tt



$$U_{fA,B} = \frac{\frac{\Phi}{\Delta T} - U_{p1} \cdot b_{p1} - U_{p2} \cdot b_{p2}}{b_f} = \frac{\frac{12,160}{20,000} - 0,687 \cdot 0,210 - 0,687 \cdot 0,210}{0,109} = 2,9 \text{ W/(m}^2 \cdot \text{K)}$$

Presjek prečke i krila serije PK150tt



Nacrt karakterističnog prozora

4 Rezultat

4.1 Aluminijska stijena:

Širina proizvoda [m]:	2,800
Visina proizvoda [m]:	2,200
Širina doprozornika i krila [m]:	0,130
Širina prečke i krila [m]:	0,109

4.2 Površine elemenata sustava

Ukupna površina [m ²]:	6,160
Površina stakla [m ²]:	4,716
Opseg stakla [m]:	12,622
Površina profila [m ²]:	1,444

4.3 Toplinske prohodnosti elemenata sustava

Toplinska prohodnost stakla Ug [W/m ² K] (EN 673)	0,6
Toplinska prohodnost profila Uf [W/m ² K]: doprozornik i krilo	1,9



Toplinska prohodnost profila U_f [W/m^2K]: Prečka i krilo Prema dostavljenom izvještaju o proračunu IFT Rosenheim br.19-004254-PR01, od 08.10.2019.	2,9
Linearni prolaz topline za niskoemisijski distancer [W/mK] (HRN EN ISO 10077-1:2017)	0,04

5 ZAKLJUČAK

Toplinska prohodnost aluminijske stijene U_w [W/m^2K]	1,02
---	------

Potpis ovlaštenog inženjera:

EMERUS d.o.o.
Široki Brijeg

Zertifikat / Certificate

Zertifikatsnr. / Certificate No.: 588-9027637-1-2



ift-zertifizierter Fachbetrieb zur Berechnung von Wärmedurchgangskoeffizienten

ift-certified company for calculation of thermal transmittance

Gegenstand
building product

**Erstellung von Dokumenten zu wärmetechnischen
Berechnungen von Außenbauteilen auf Grundlage der EN
ISO 10211 und EN ISO 10077** *Preparation of documents for thermal
calculations of external building components based on EN ISO 10211 and EN ISO
10077*

Rechnende Stelle
calculating body

EMERUS d.o.o.
Knespolje bb, BA 88220 Siroki Brijeg

Mit diesem Zertifikat wird bescheinigt, dass die benannte rechnende Stelle den Anforderungen des zugrundeliegenden ift-Zertifizierungsprogramms in der aktuellen Fassung entspricht.

Die rechnende Stelle ist in der Lage, Dokumente und Berechnungen auf Grundlage der EN ISO 10211 und EN ISO 10077 durch die in Anlage 1 aufgeführten Personen durchzuführen. Diese können vom ift Rosenheim als Grundlage für ihre wärmetechnischen Berechnungen von Außenbauteilen verwendet werden.

Das Zertifikat darf nicht in Verbindung mit Hersteller eigenen Berechnungen verwendet werden.

Dieses Zertifikat wurde erstmals am 17.09.2019 ausgestellt. Die aktuelle Version gilt bis zum 08.12.2025, wenn sich zwischenzeitlich die Festlegungen in der oben angeführten technischen Spezifikation oder die personellen Voraussetzungen nicht wesentlich verändert haben.

Das Zertifikat darf nur unverändert vervielfältigt werden. Alle Änderungen der Voraussetzungen für die Zertifizierung sind dem ift-Zert mit den erforderlichen Nachweisen unverzüglich schriftlich anzuzeigen.

Das Unternehmen ist berechtigt, gemäß der ift-Zeichensatzung das „ift-zertifiziert“-Zeichen zu nutzen.

Dieses Zertifikat enthält 2 Anlagen.

This certificate attests that the calculating body mentioned fulfils the requirements of the underlying ift-certification scheme in its current version.

The calculating body is able to calculate windows and curtain wall profiles as per EN ISO 10077-2:2017 under supervision of ift Rosenheim.

The certificate may only be used in combination with an ift-protocol "calculation of the thermal transmittance coefficient" issued and released by ift Rosenheim.

This certificate was first issued on 17.09.2019. The current version is valid until 08.12.2025, as long as neither the conditions laid down in the technical specification listed above nor the personnel prerequisites are modified significantly.

The reproduction of the certificate without any change from the original is permitted. Any changes to the prerequisites applicable to certification shall be immediately communicated in writing to ift-Zert accompanied by the necessary evidence.

The company is authorized to use the "ift-certified"-mark according to the ift-rules for use of the "ift-certified"-mark.

This certificate contains 2 annexes.

Grundlage(n) /
Basis:

ift-Zertifizierungsprogramm
„ift-zertifizierter Fachbetrieb zur
Berechnung des
Wärmedurchgangskoeffizienten“
*ift-certification scheme
"ift-certified company for
calculation of thermal
transmittance"*
ift-Zertifizierungs QM339:2020-07



Validierte Rechenverfahren
validated calculation method

ift Rosenheim
09.12.2022

Christian Kehrer
Leiter der ift-Zertifizierungs- und Überwachungsstelle
Head of ift Certification and Surveillance Body

Gültig bis /
Valid until:

08.12.2025



588 9027637



Identitäts-Check
Identity check



www.ift-rosenheim.de/
ift-zertifiziert
ID: CA7-48B66

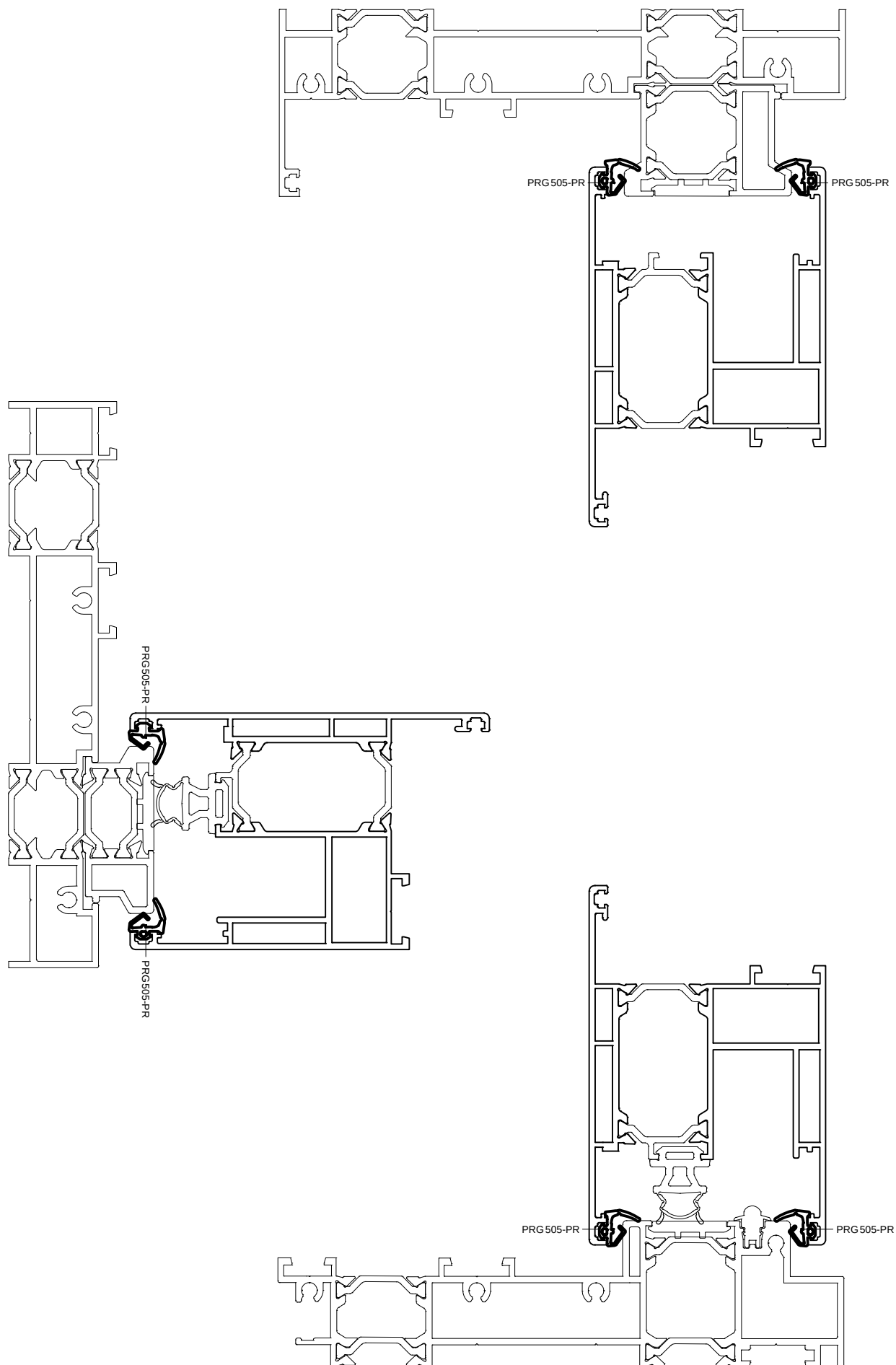
**Zertifikatsnr. / Certificate No.: 588-9027637-1-2**

Rechnende Personen, die für die Erstellung von Grundlagendokumenten zu wärmetechnischen Berechnungen von Außenbauteilen auf Grundlage der EN ISO 10211 und EN ISO 10077 im Rahmen dieses Zertifizierungsprogramms qualifiziert sind und diese durchführen dürfen.

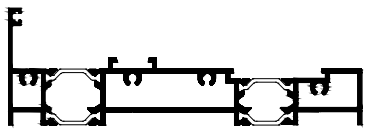
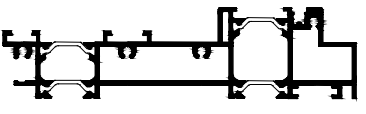
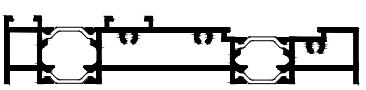
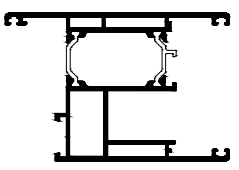
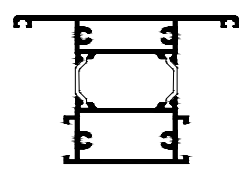
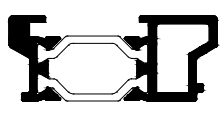
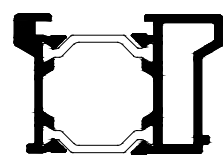
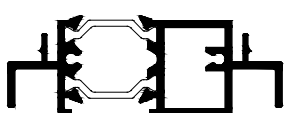
Invoicing persons who are qualified to prepare basic documents on thermal calculations of external building components on the basis of EN ISO 10211 and EN ISO 10077 within the scope of this certification programme and who are allowed to perform such calculations.

Nr. No.	Name Name	Firma Company
1.	Ivan Bosnjak	EMERUS d.o.o.

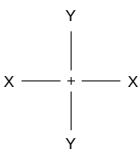
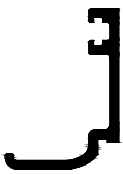
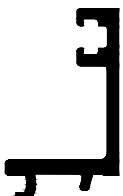
Pozicioniranje brtve PRG505-PR unutar krila



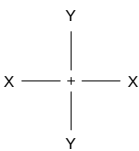
Profili

Kod Codice Code	Presjek Sezione Cross Section		Težina Peso Weight Kg/m	Perimetar Perimetro Perimeter mm	Vidljiva površina Sup. in Vista Exposed surface mm	Jx cm ⁴	Wx cm ⁴	Jy cm ⁴	Wy cm ⁴
PK15001		PK0105	2.723	420.1	98.63	11.67	3.21	270.50	32.36
		PK0101							
		PK0102							
PK15002		PK0113	2.942	385.2	136.41	16.87	7.88	260.47	31.23
		PK0112							
		PK0111							
PK15003		PK0100	2.615	359.8	71.43	7.97	4.92	248.12	30.71
		PK0101							
		PK0102							
PK15004		PK0122	2.112	359.8	188.86	48.81	13.48	42.52	8.34
		PK0123							
PK15005		PK0128	1.988	359.8	161.52	40.01	10.93	38.05	7.70
		PK0129							
PK15006		PK0117	0.758	126.1	44.60	1.19	1.21	6.56	2.70
		PK0118							
PK15007		PK0119	0.951	151.4	90.82	4.49	2.84	8.11	3.42
		PK0120							
PK15008		PK0124	1.192	173.4	64.22	2.92	2.21	19.52	5.26
		PK0125							

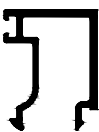
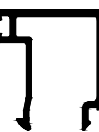
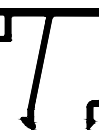
Profili

Kod Codice Code	Presjek Sezione Cross Section	Težina Peso Weight Kg/m	Perimetar Perimetro Perimeter mm	Vidljiva površina Sup. in Vista Exposed surface mm	Jx cm ⁴	Wx cm ⁴	Jy cm ⁴	Wy cm ⁴
								
PK0114		0.134	77.9	17.4				
PK0116		0.143	44.7	14.9				
PK0121		0.607	287.2	92.4				
PK0127		0.558	239.8	79.9				
PK0130		0.581	278.6	79.9				
PK0131		0.597	249.3	95.3				
PR50574		0.211	104.5	26.6				
PR50576		0.218	103.6	27.1				

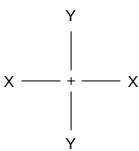
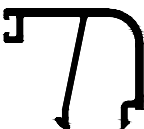
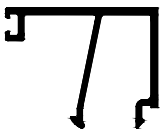
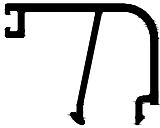
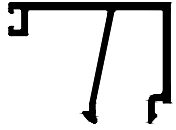
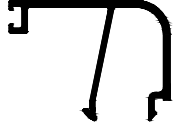
Profili

Kod Codice Code	Presjek Sezione Cross Section	Težina Peso Weight Kg/m	Perimetar Perimetro Perimeter mm	Vidljiva površina Sup. in Vista Exposed surface mm	Jx cm ⁴	Wx cm ⁴	Jy cm ⁴	Wy cm ⁴
								
PR50553		0.258	151.12	31.1				
PR50554		0.260	151.84	32.1				
PR50555		0.248	146.01	28.8				
PR50556		0.266	154.02	35.1				
PR50557		0.255	148.35	31.88				
PR50558		0.271	155.47	37.1				
PR50559		0.259	149.81	33.88				
PR50560		0.275	156.92	39.1				

Profili

Kod Codice Code	Presjek Sezione Cross Section	Težina Peso Weight Kg/m	Perimetar Perimetro Perimeter mm	Vidljiva površina Sup. in Vista Exposed surface mm	Jx cm ⁴	Wx cm ⁴	Jy cm ⁴	Wy cm ⁴
PR50561		0.263	151.26	35.88				
PR50562		0.298	170.22	42.1				
PR50563		0.287	164.55	38.88				
PR50564		0.306	173.09	45.1				
PR50565		0.294	167.42	41.88				
PR50566		0.322	182.16	47.1				
PR50567		0.301	176.49	43.88				
PR50568		0.342	192.16	52.1				

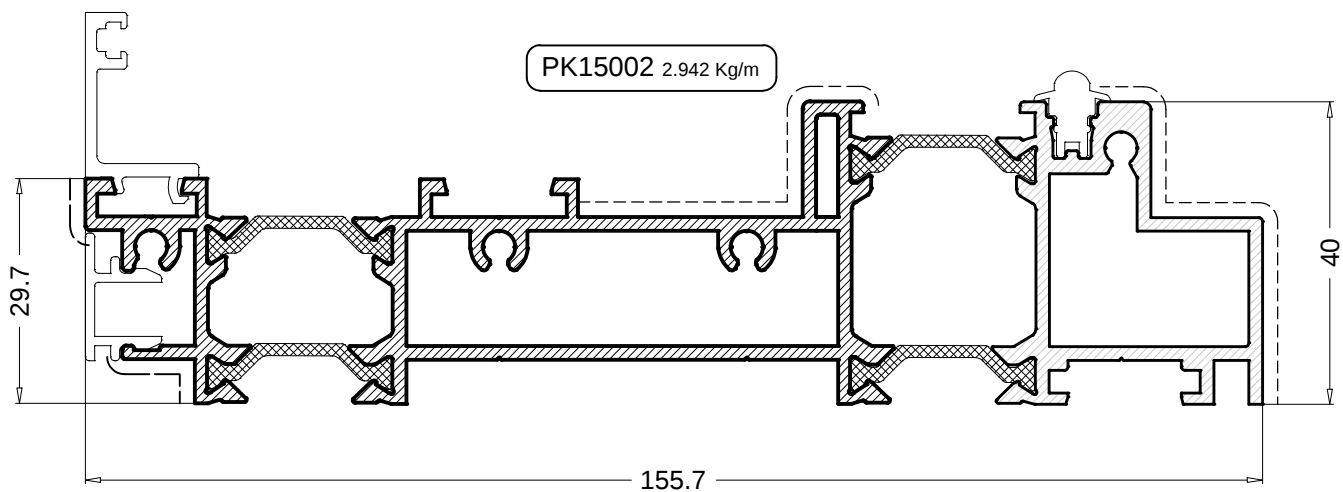
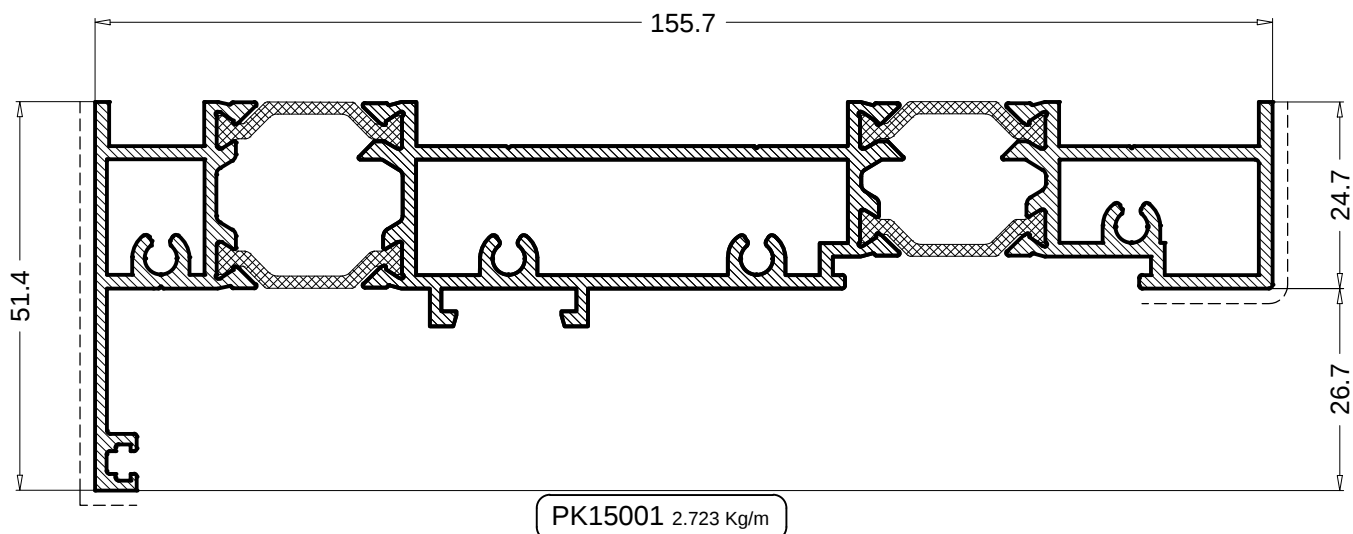
Profili

Kod Codice Code	Presjek Sezione Cross Section	Težina Peso Weight Kg/m	Perimetar Perimetro Perimeter mm	Vidljiva površina Sup. in Vista Exposed surface mm	Jx cm ⁴	Wx cm ⁴	Jy cm ⁴	Wy cm ⁴
								
PR50569		0.330	176.49	48.88				
PR50570		0.354	198.16	55.1				
PR50571		0.341	192.49	51.88				
PR50572		0.362	202.16	57.1				
PR50573		0.350	196.49	53.88				
PR60554		0.250	92.55	32.78				
PR60558		0.275	111.38	37.78				
PR60562		0.293	120.50	42.78				

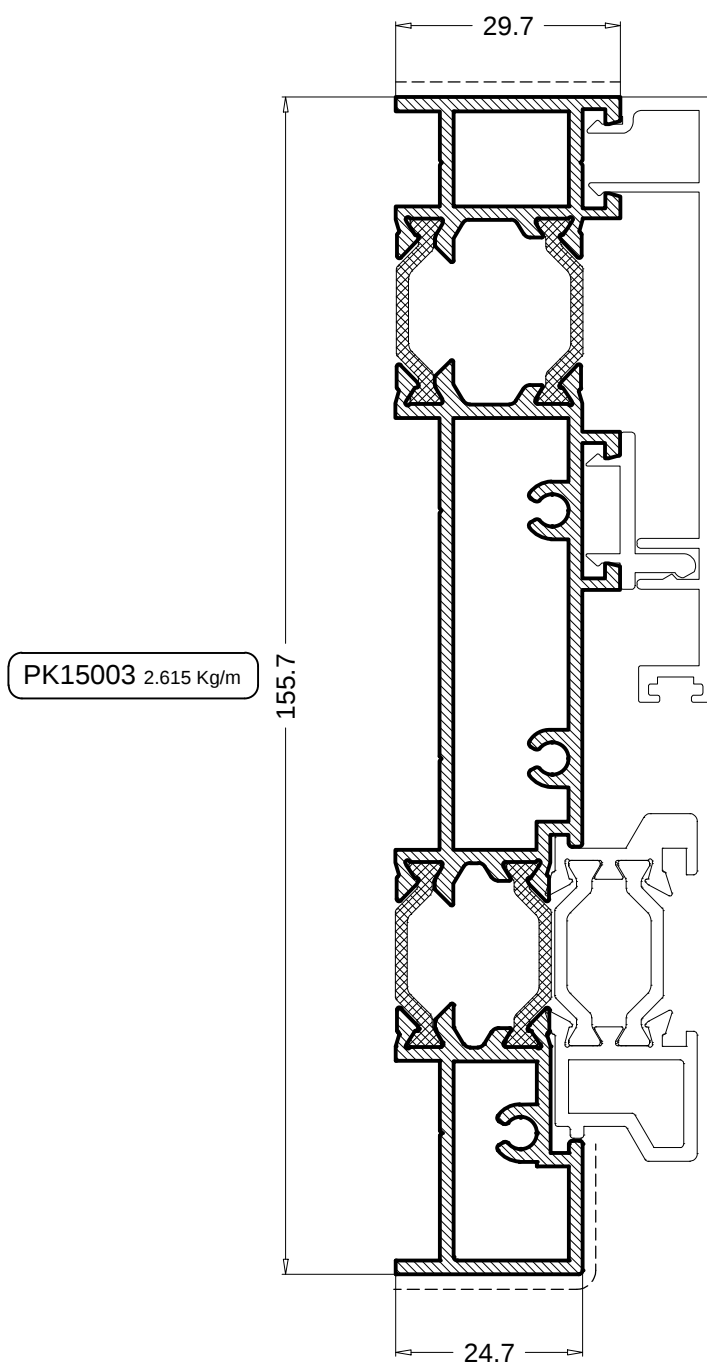
Profil

[illegible]

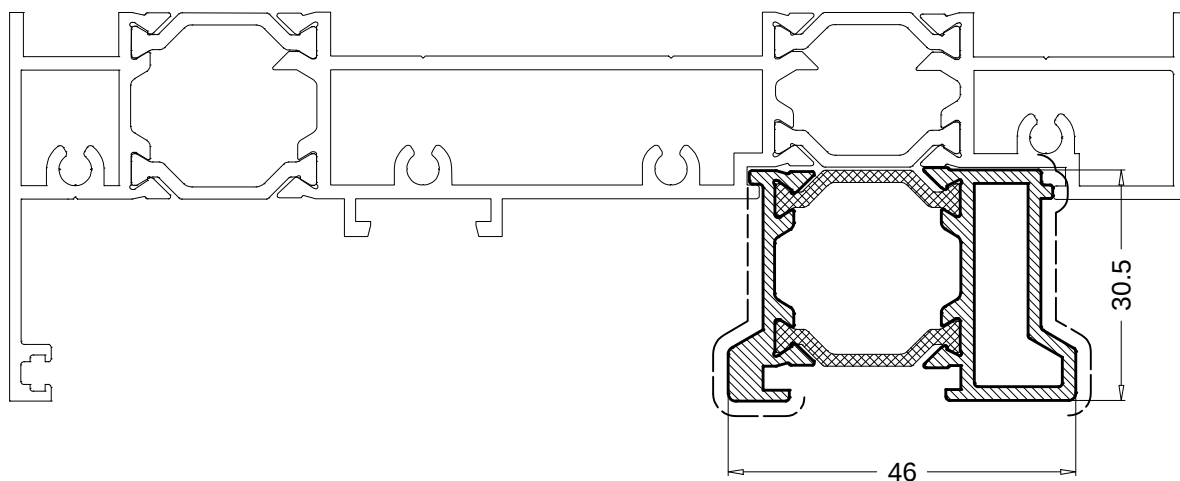
PROFILI OKVIRA - gornji i donji presjek



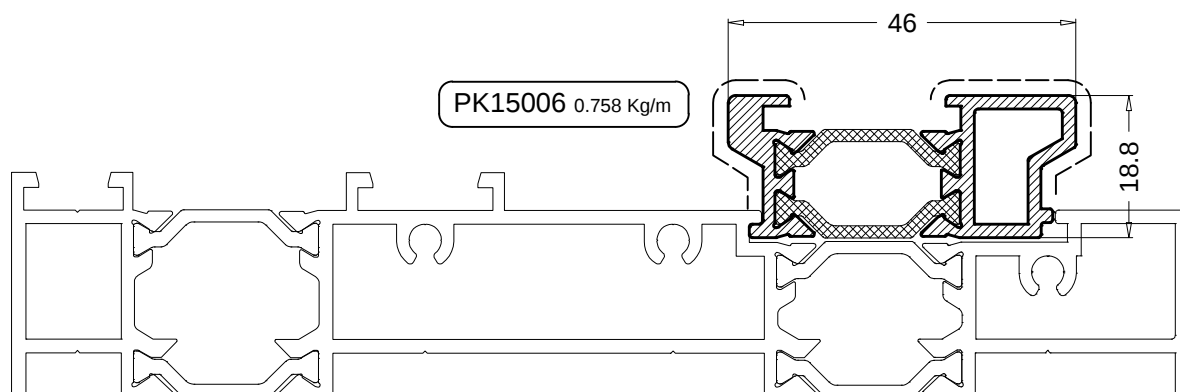
PROFILI OKVIRA - bočni presjek



Dodatni profili okvira

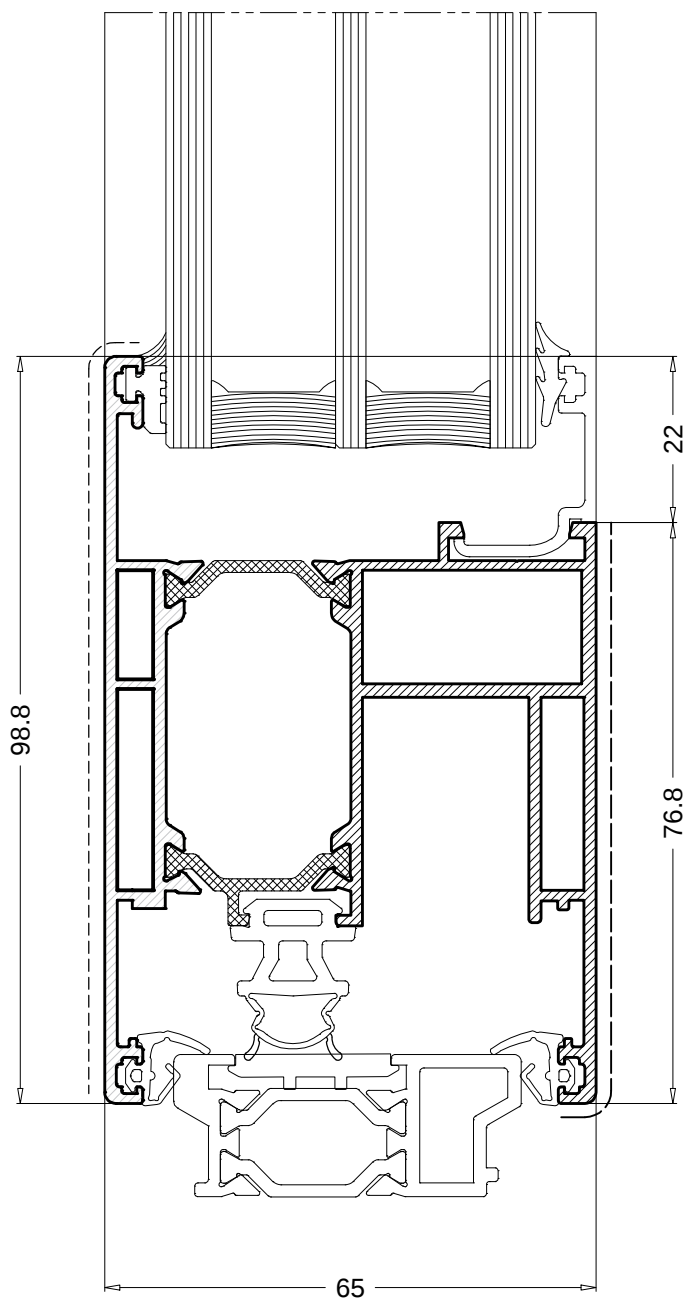


PK15007 0.951 Kg/m



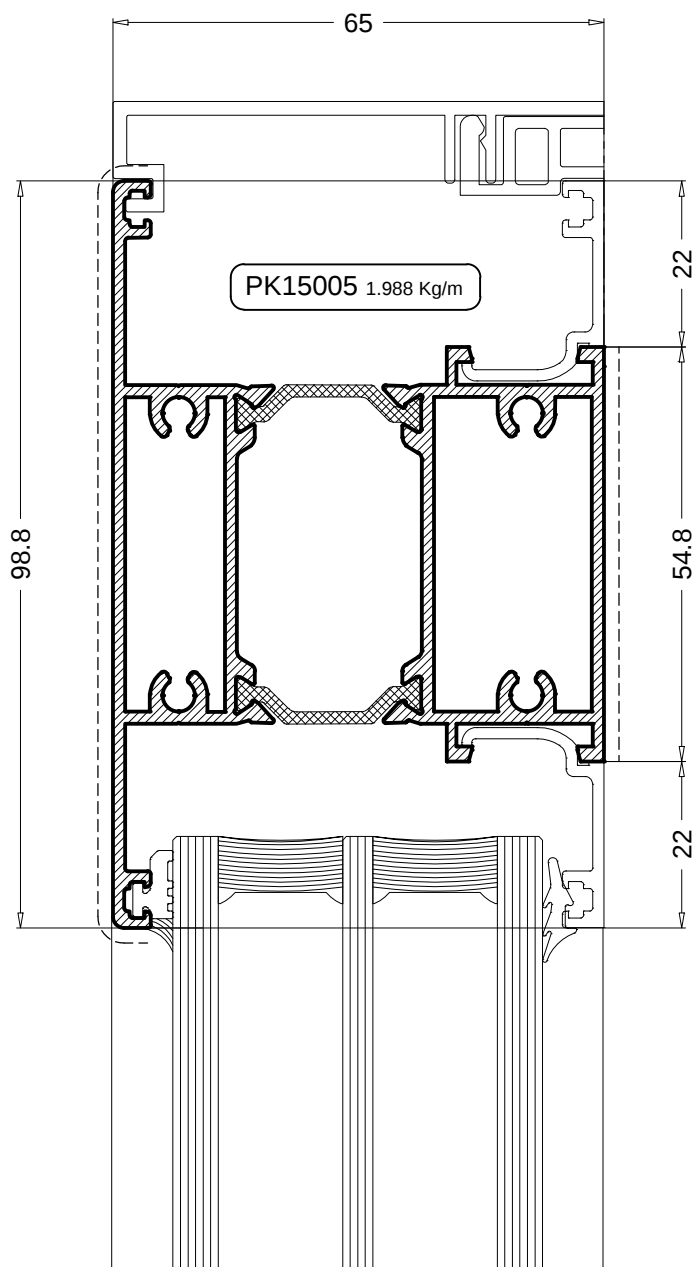
PK15006 0.758 Kg/m

Profil krila

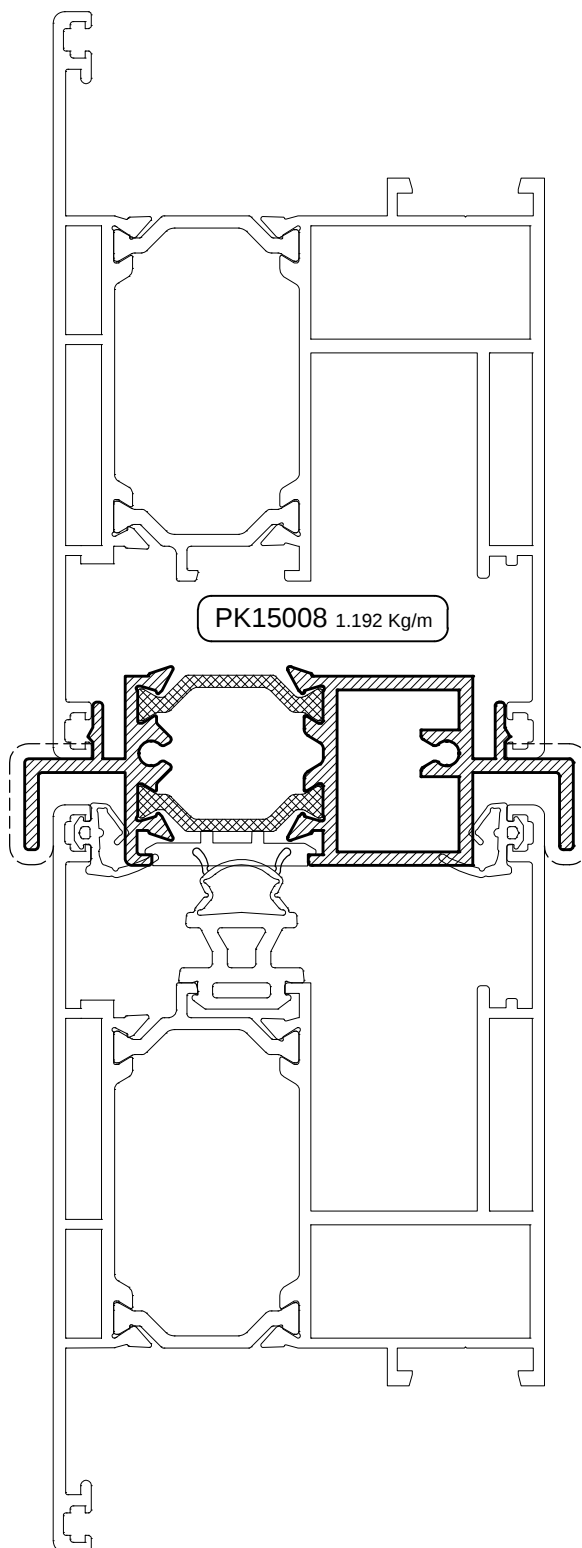


PK15004 2.112 Kg/m

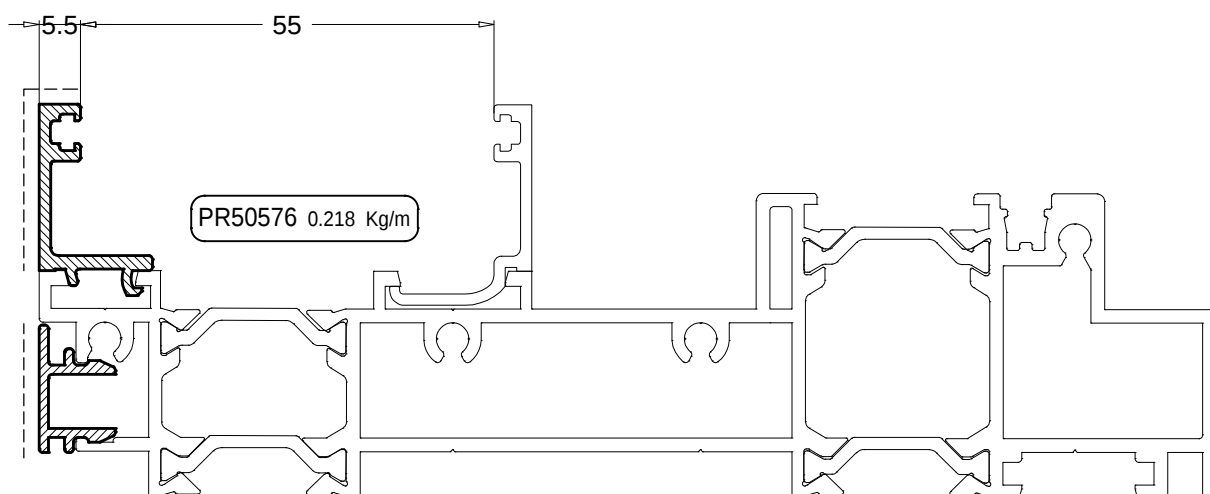
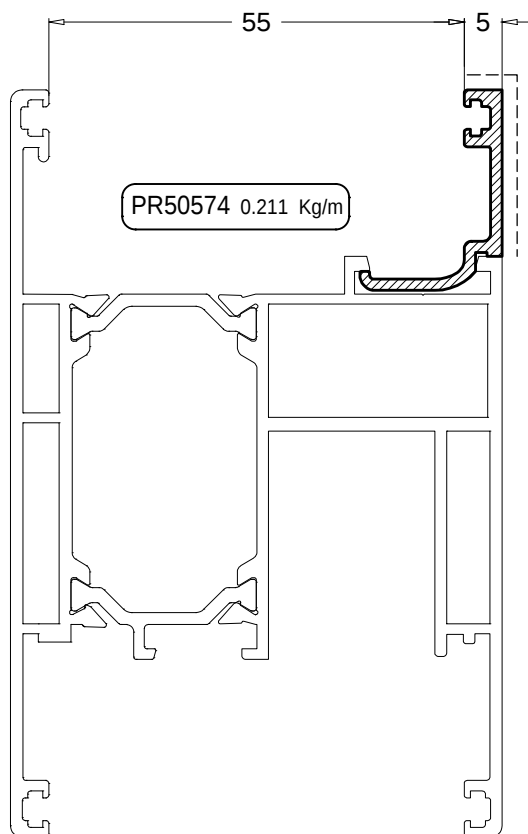
Profil prečke



Centralni profil

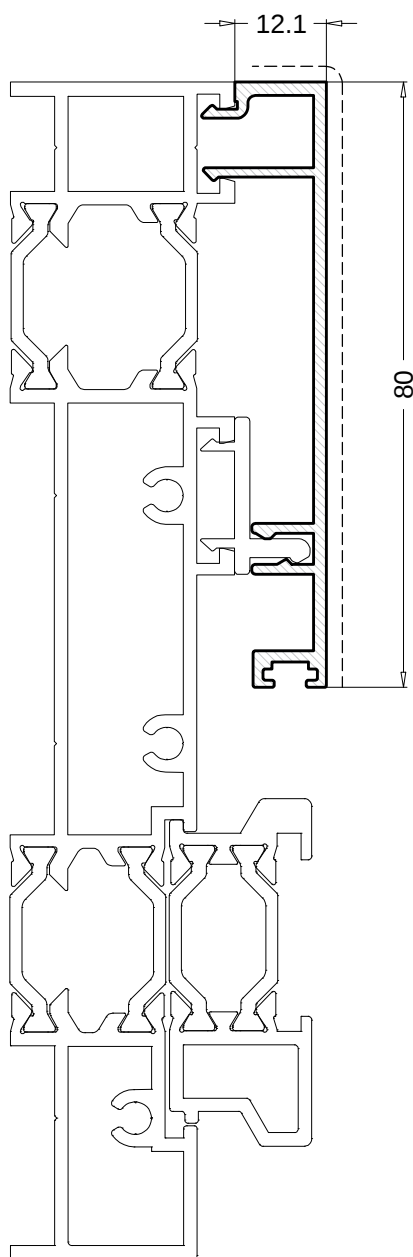


Profili lajsne



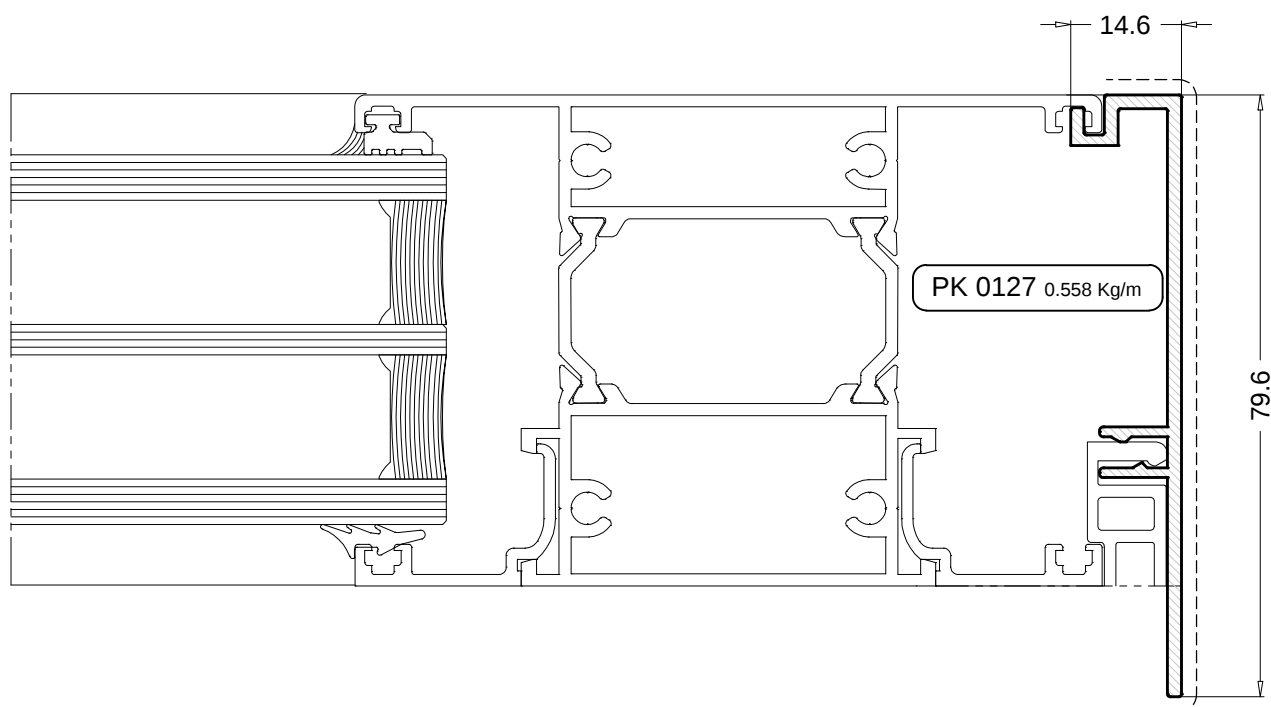
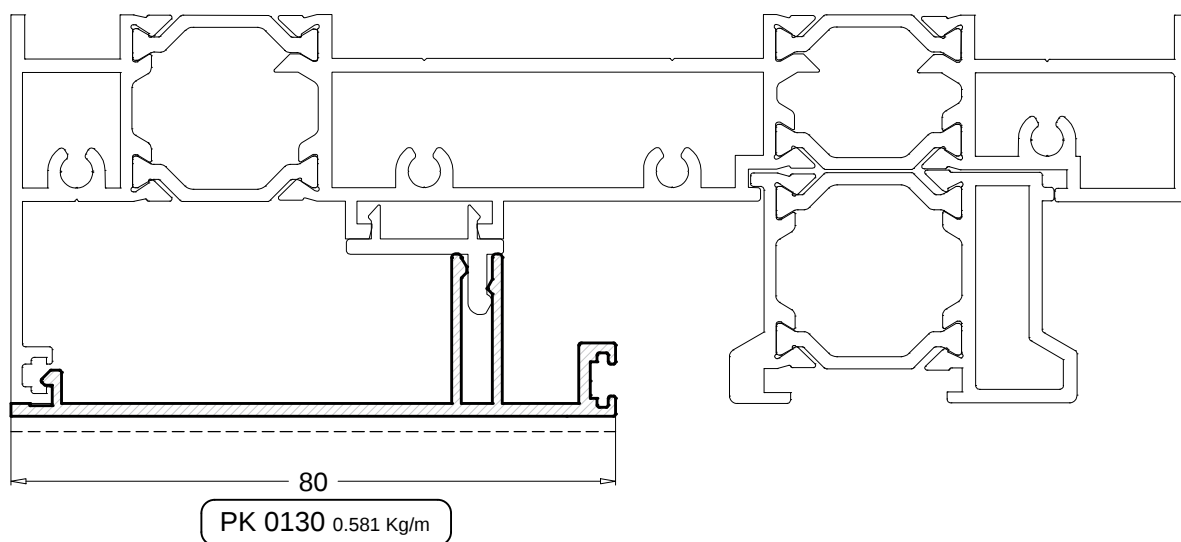
PK0114 0.134 Kg/m

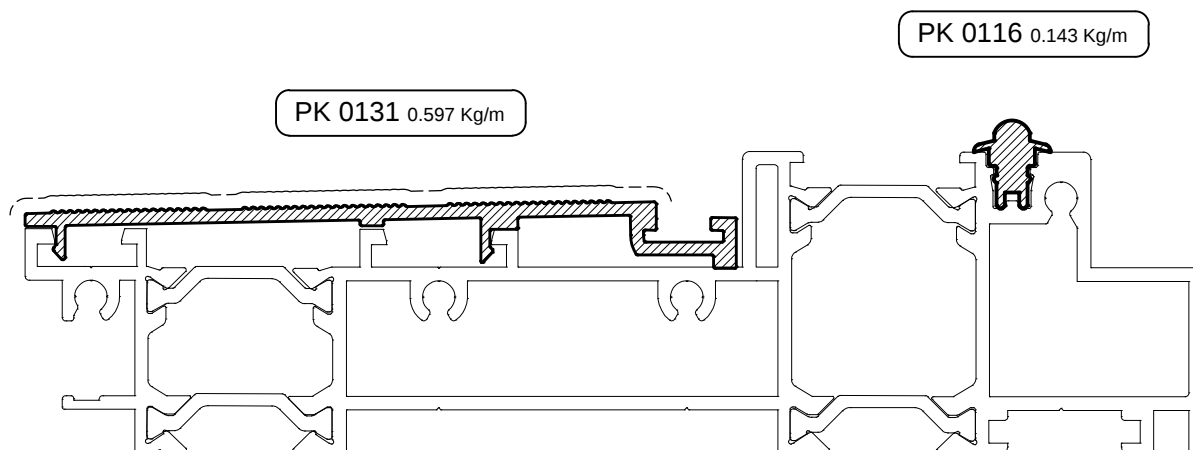
Profil poklopne lajsne

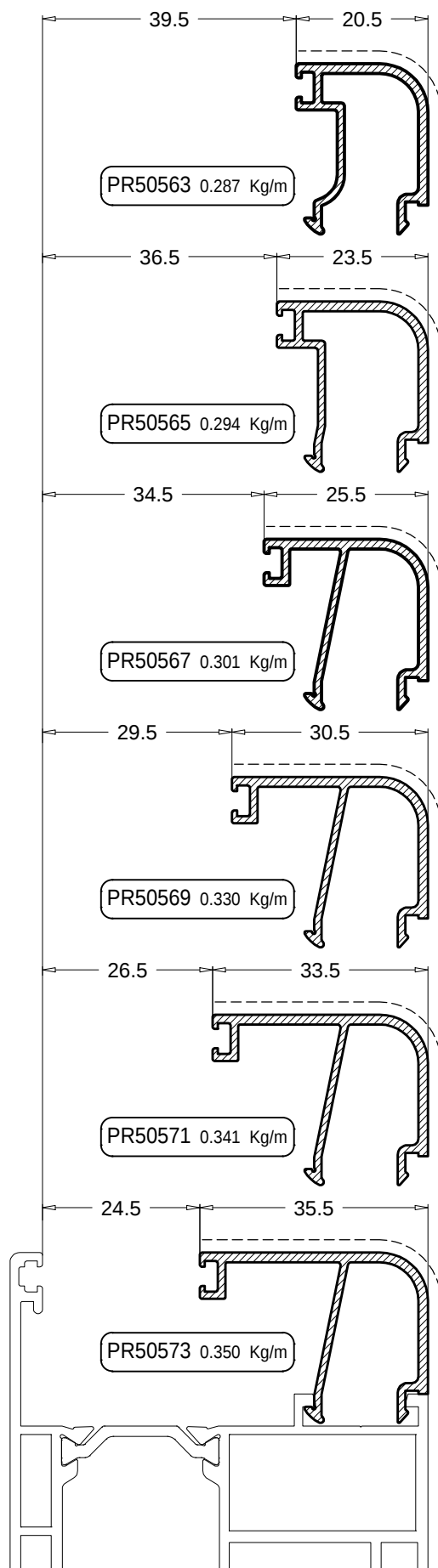
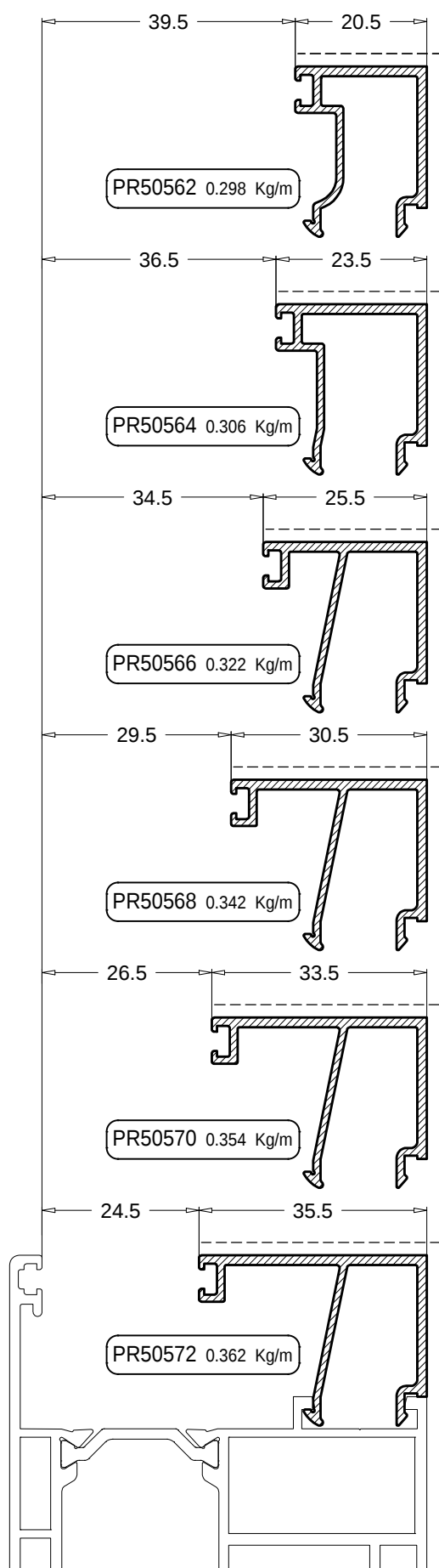


PK 0121 0.607 Kg/m

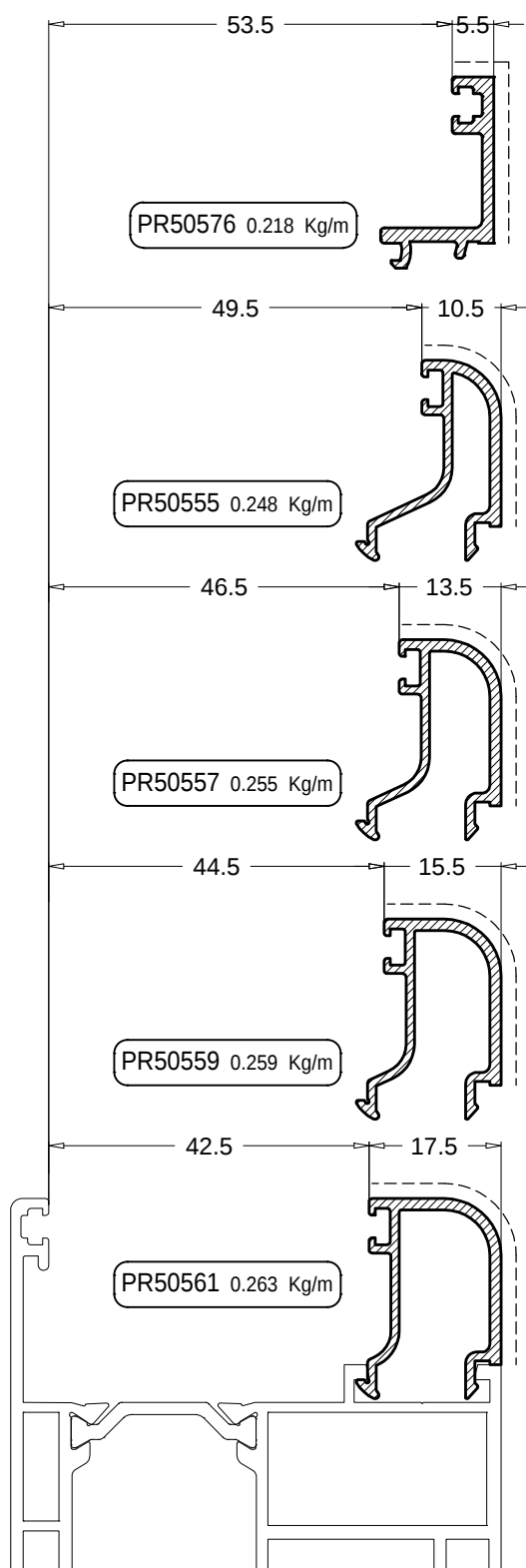
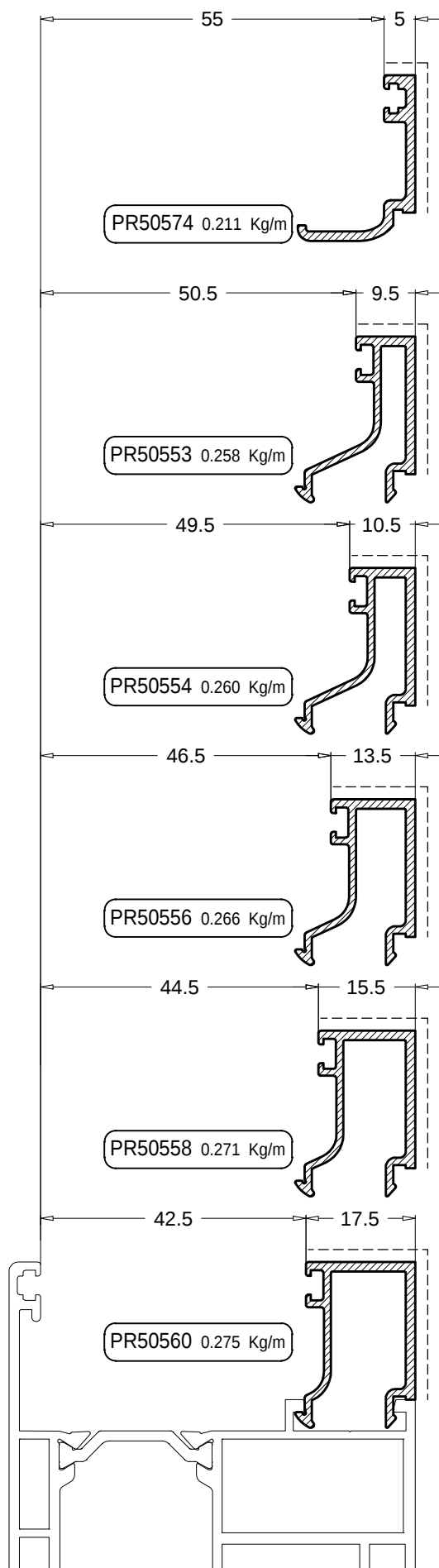
Profil poklopne lajsne

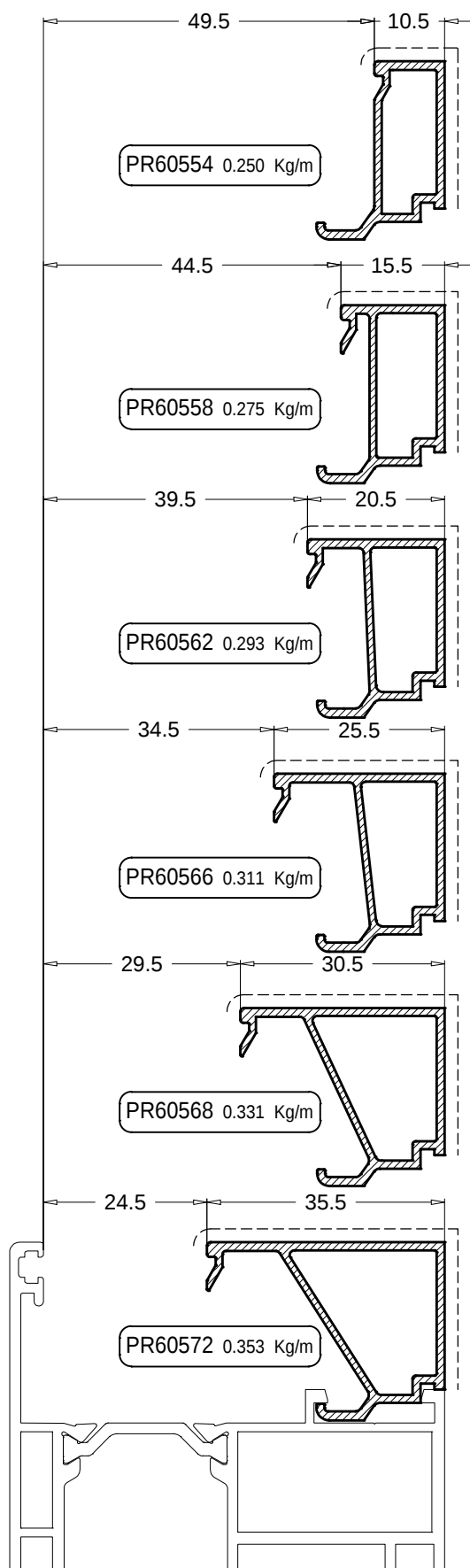


Profil vodilice i poklopne lajsne


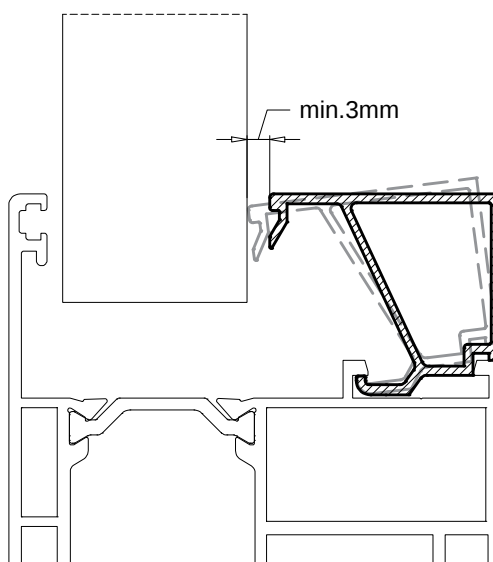
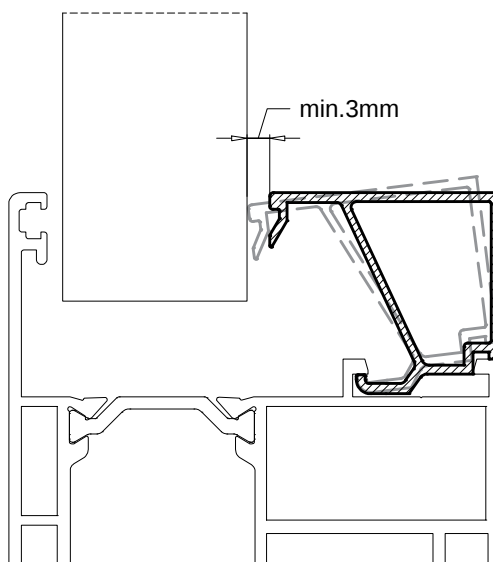


Profili lajsne

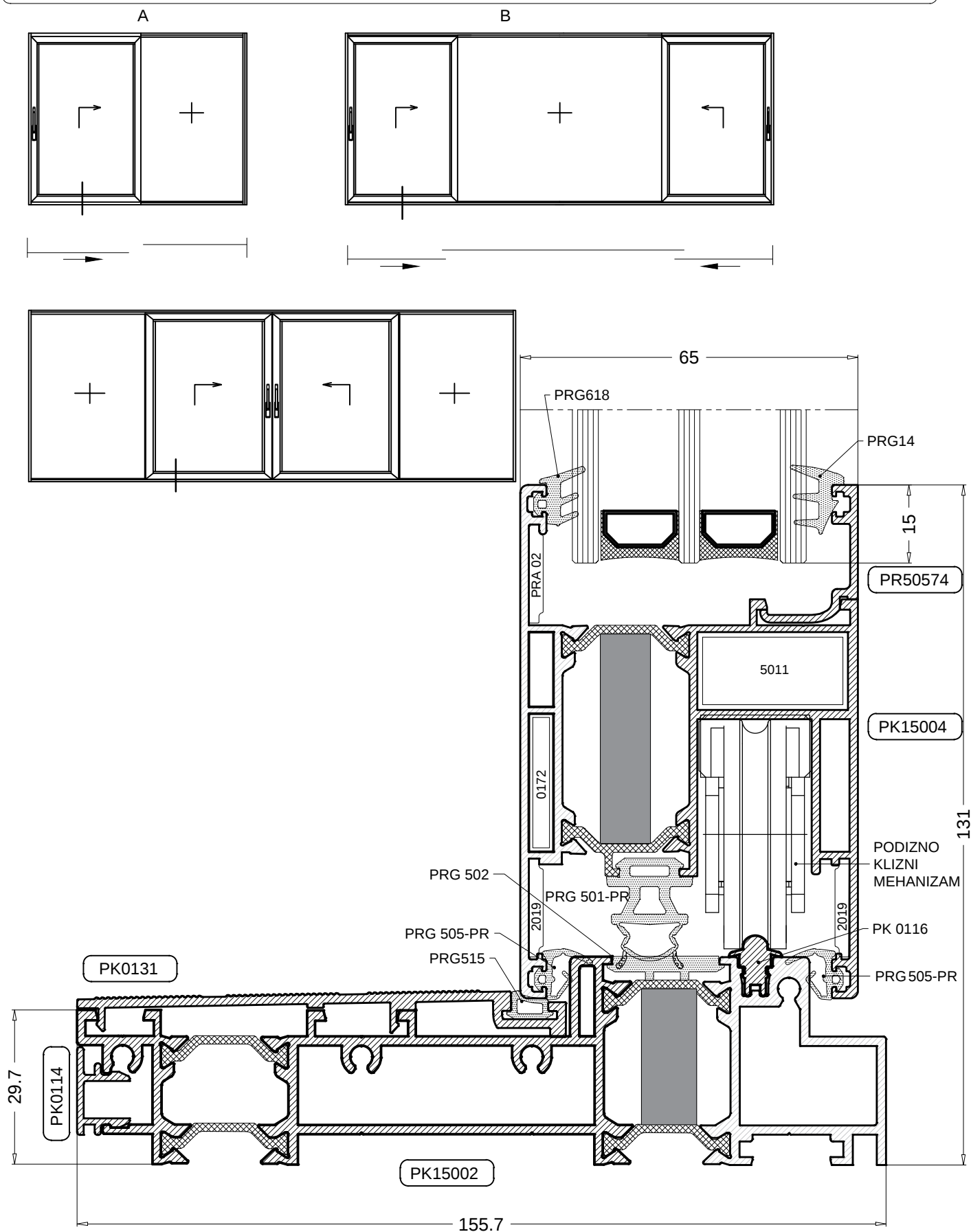




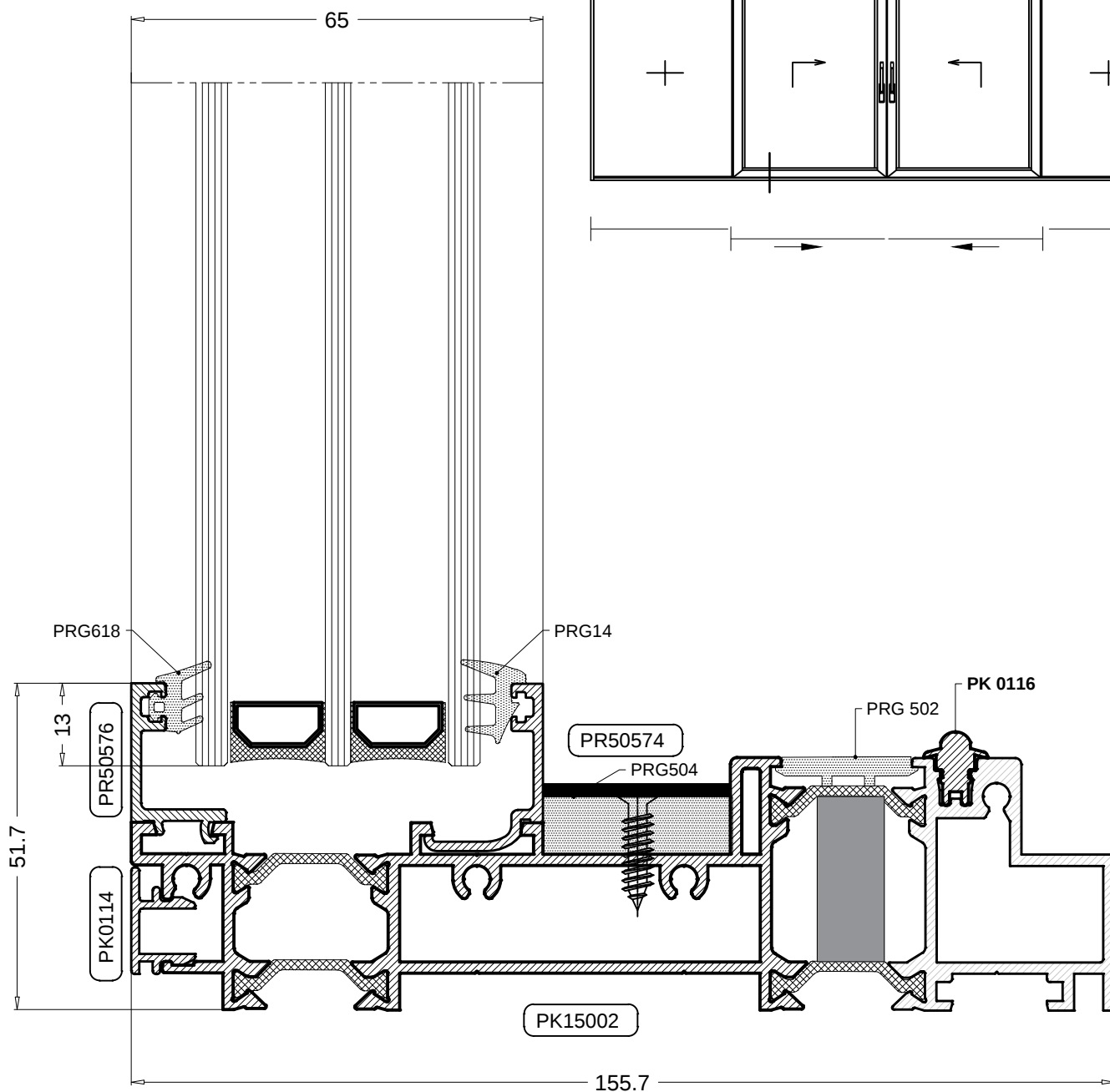
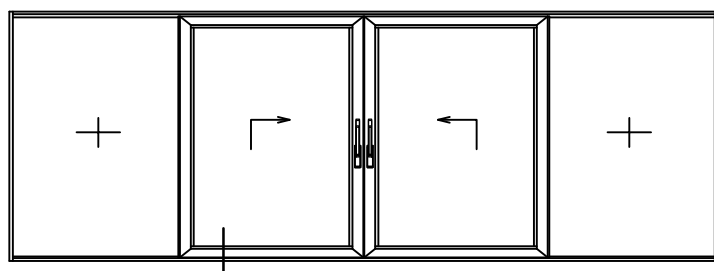
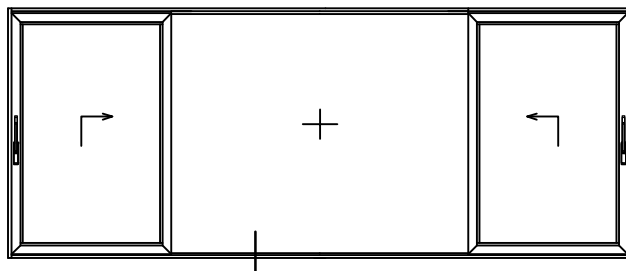
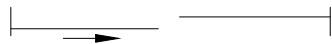
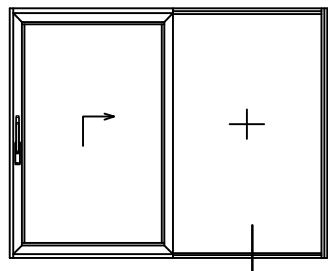
- * NAPOMENA: Minimalan zazor između ispune i sigurnosne lajsne potreban za ugradnju sigurnosne lajsne je 3mm !



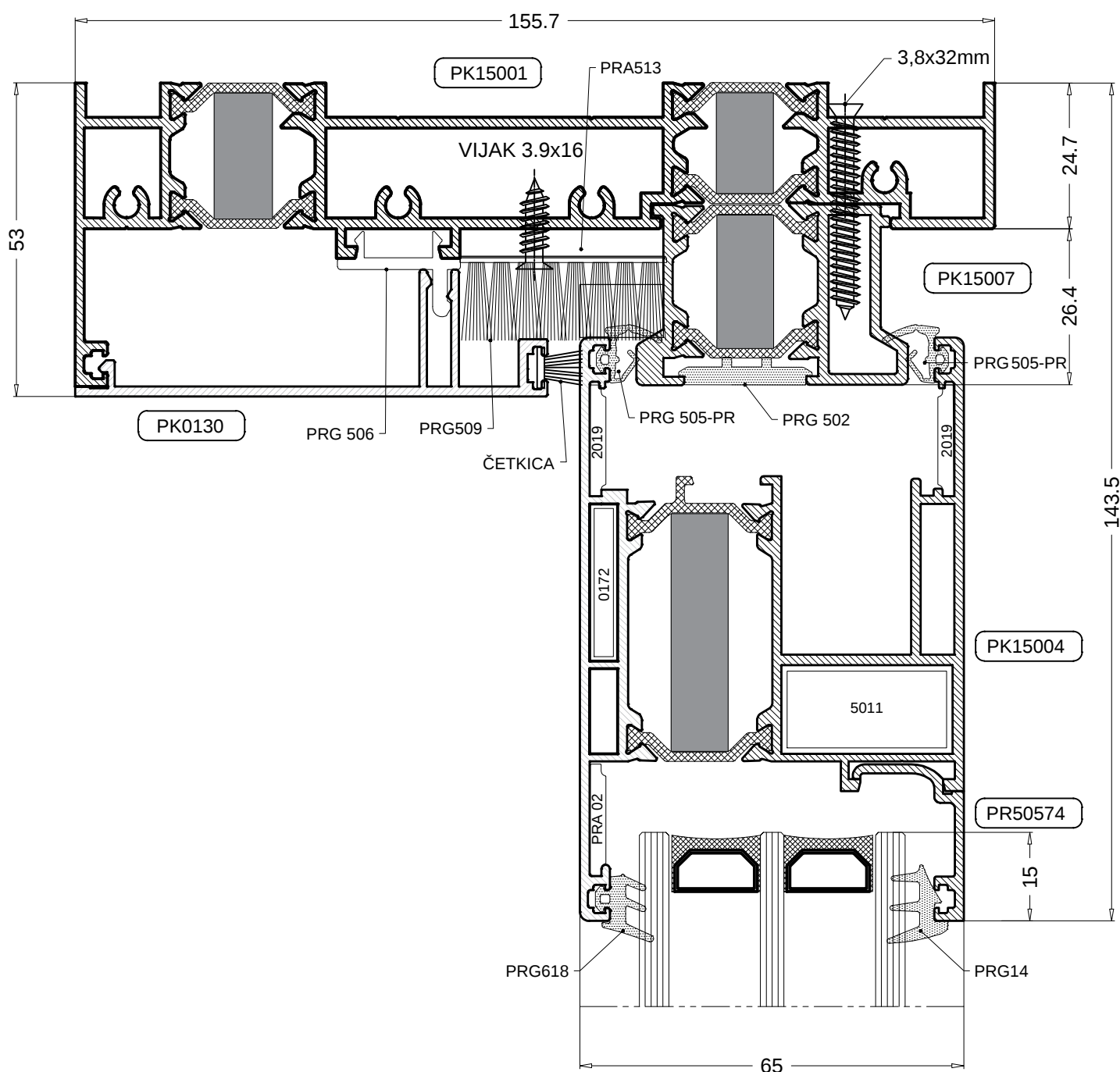
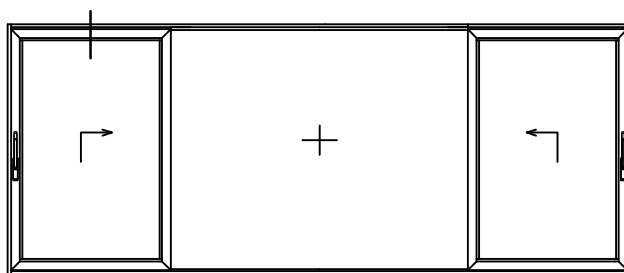
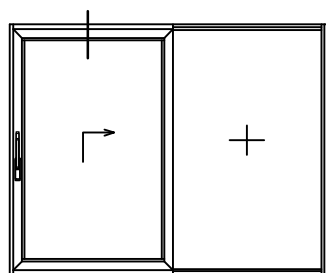
Donji presjek pokretnog krila



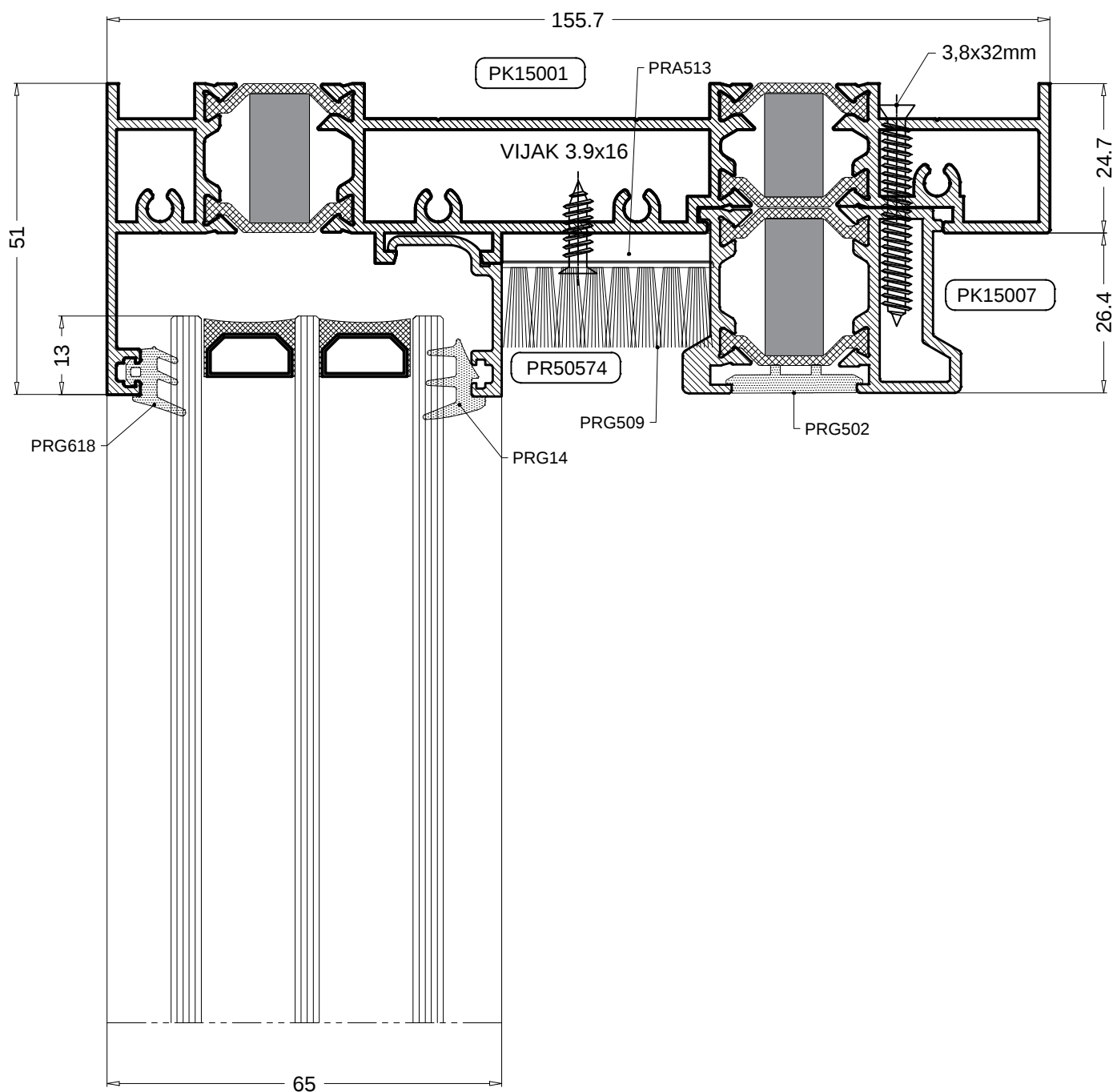
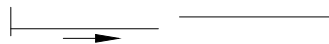
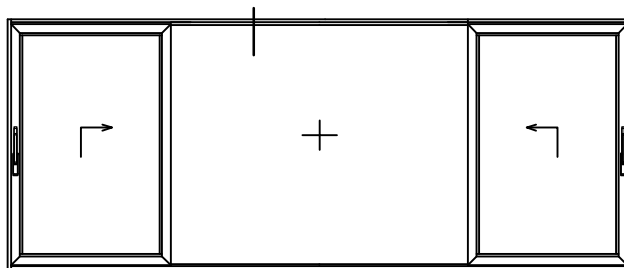
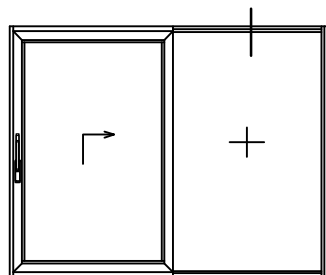
Donji presjek fiksnog dijela



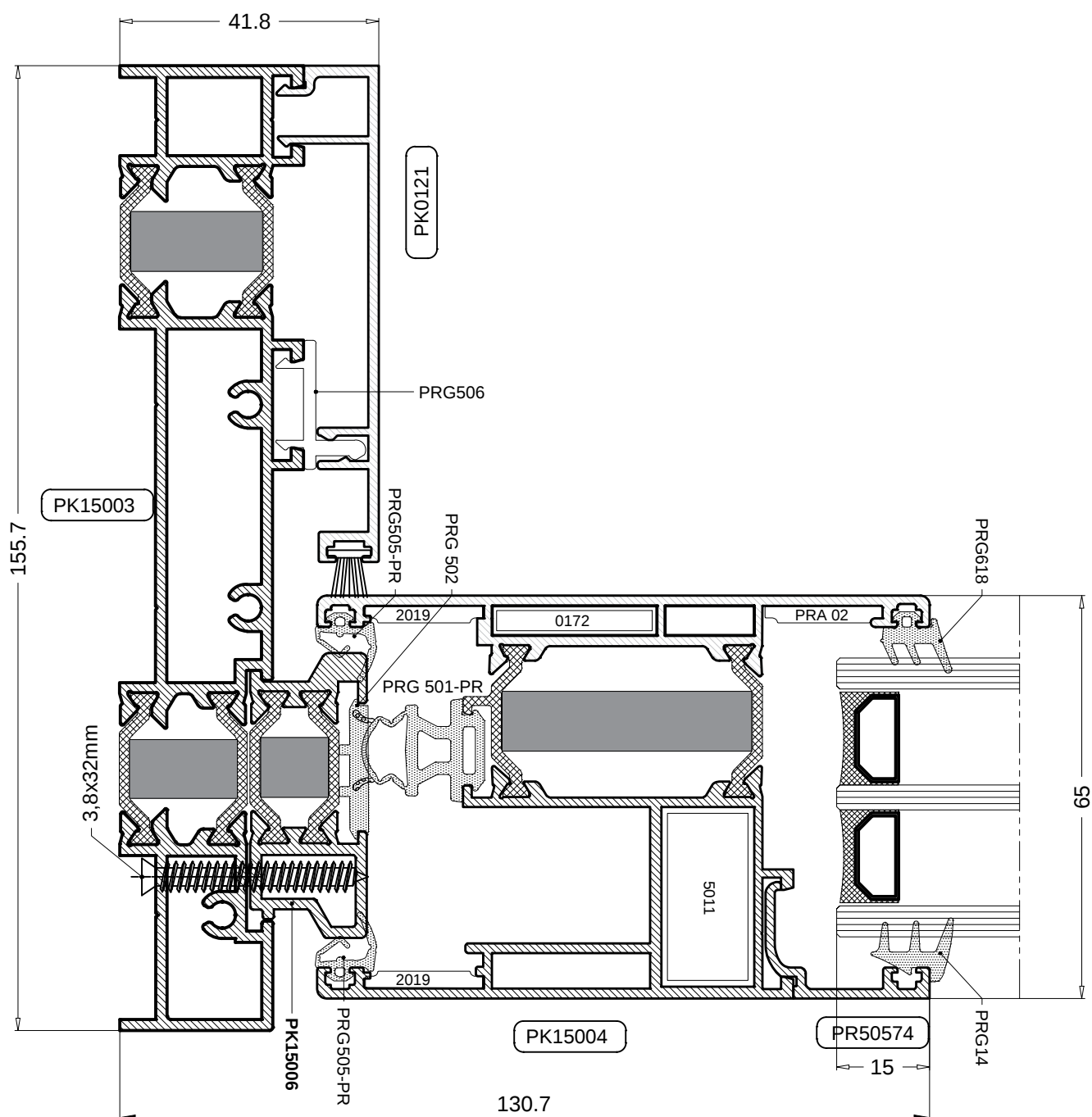
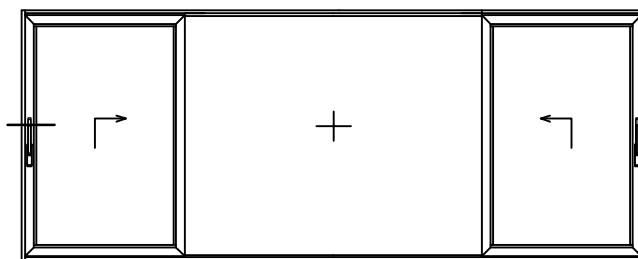
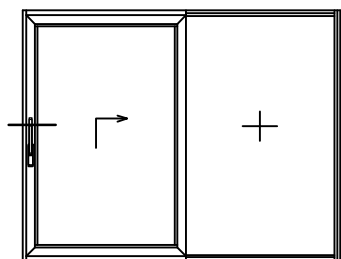
Gornji presjek pokretnog krila



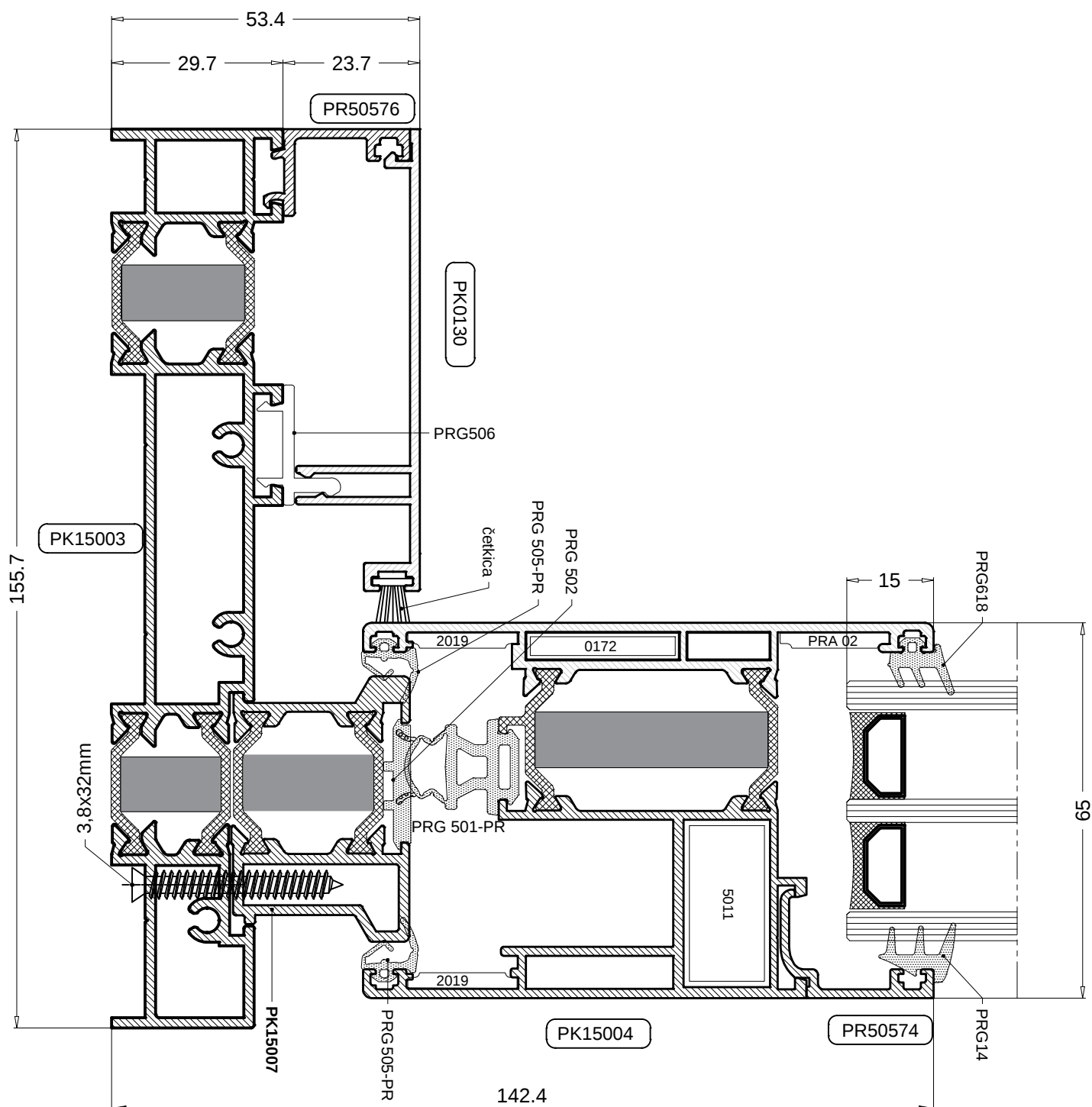
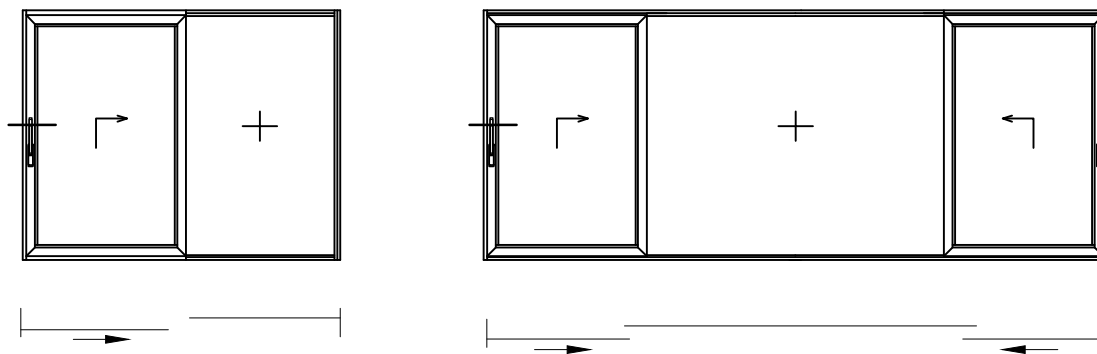
Gornji presjek fiksnog dijela



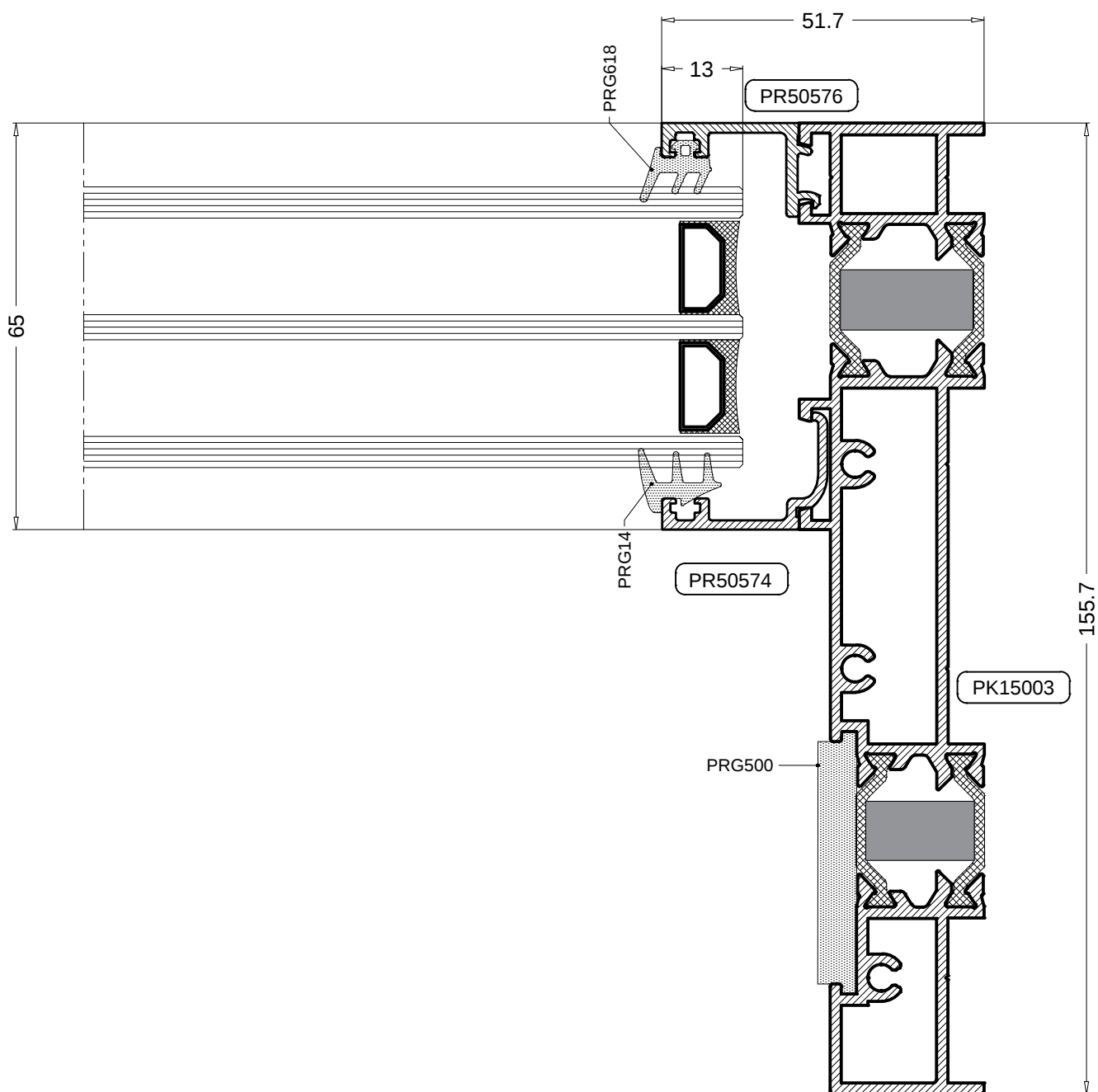
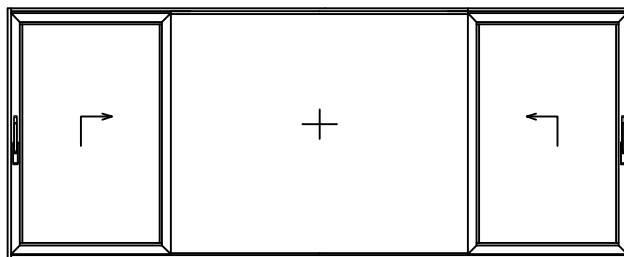
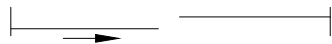
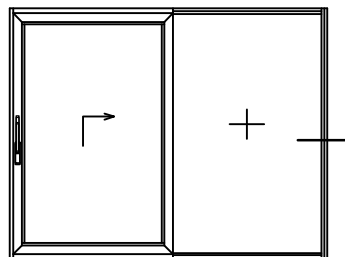
Bočni presjek pokretnog krila - presjek bez rolete



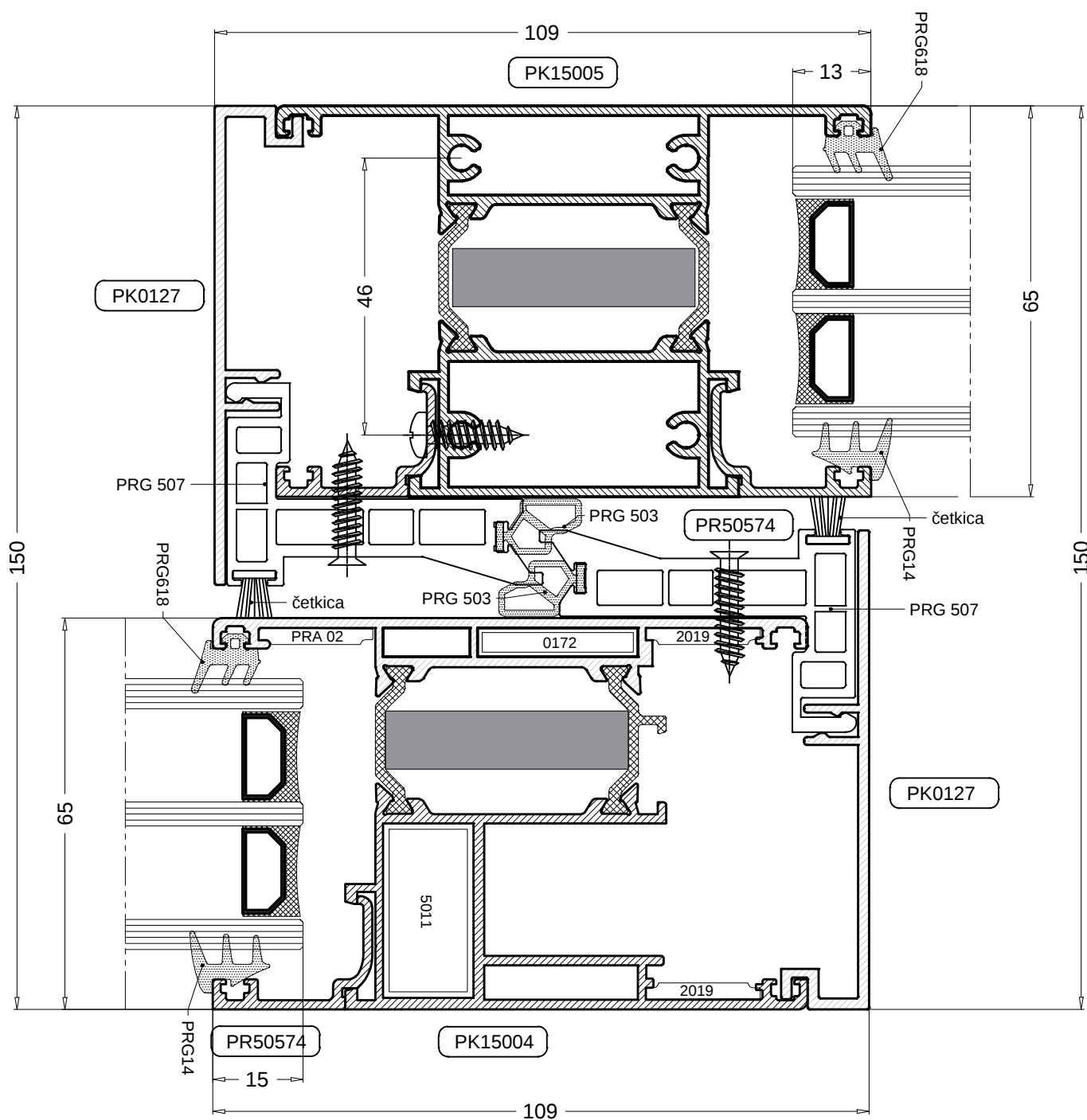
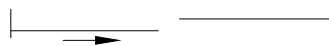
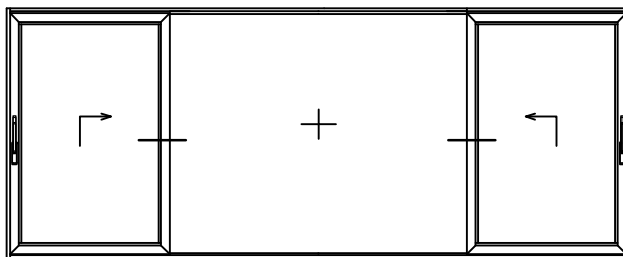
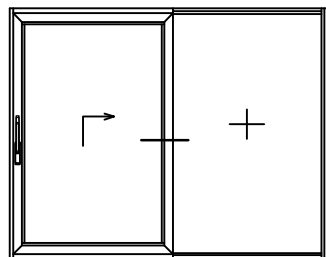
Bočni presjek pokretnog krila - presjek sa roletom



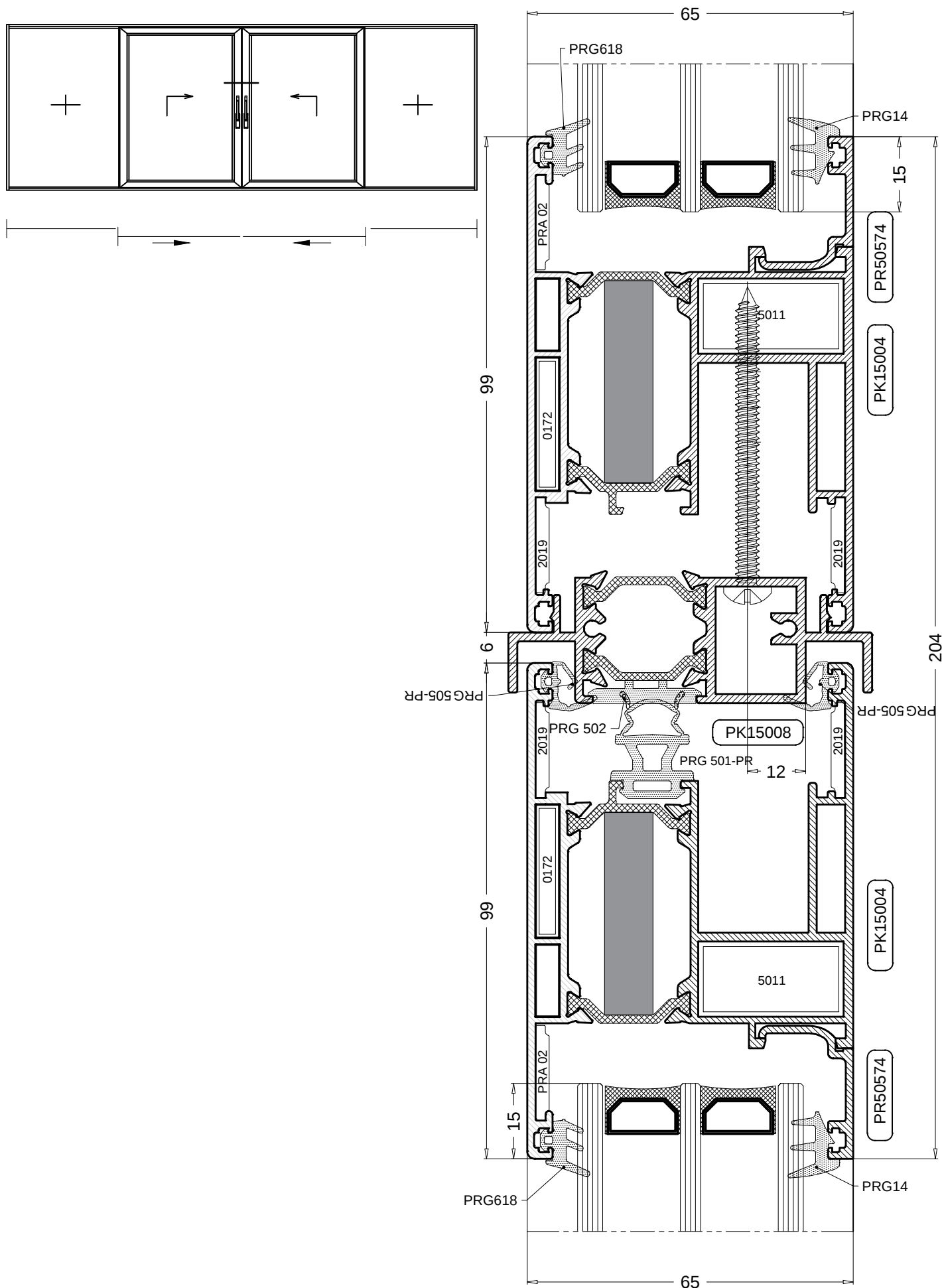
Bočni presjek fiksnog dijela



Centralni presjek prečke i krila



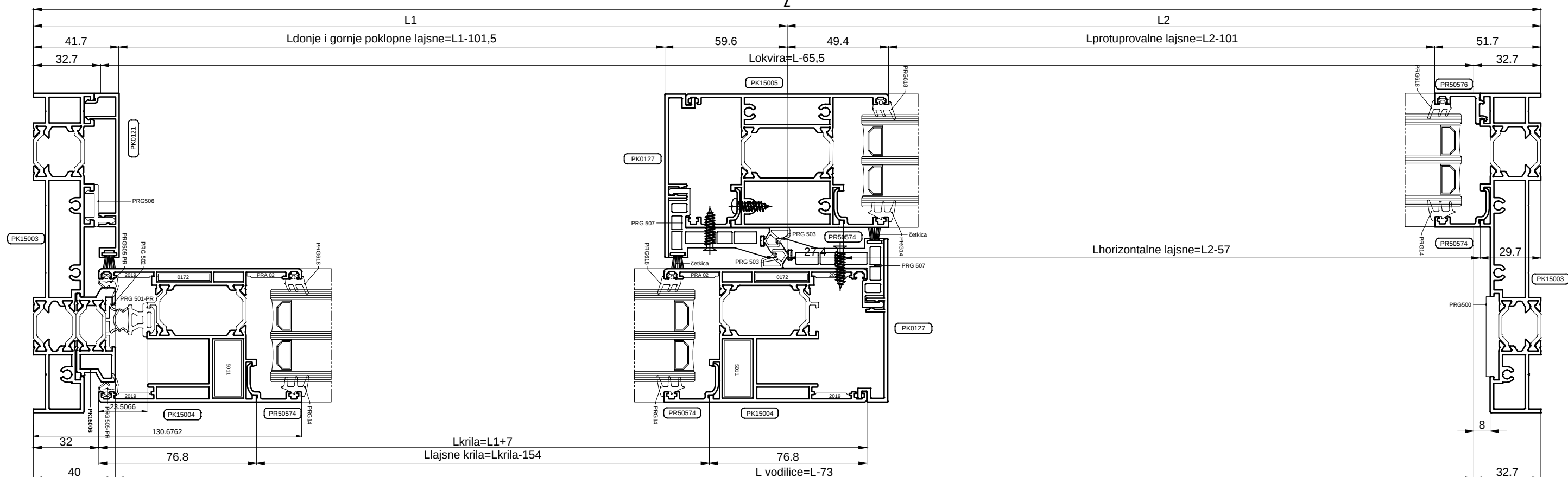
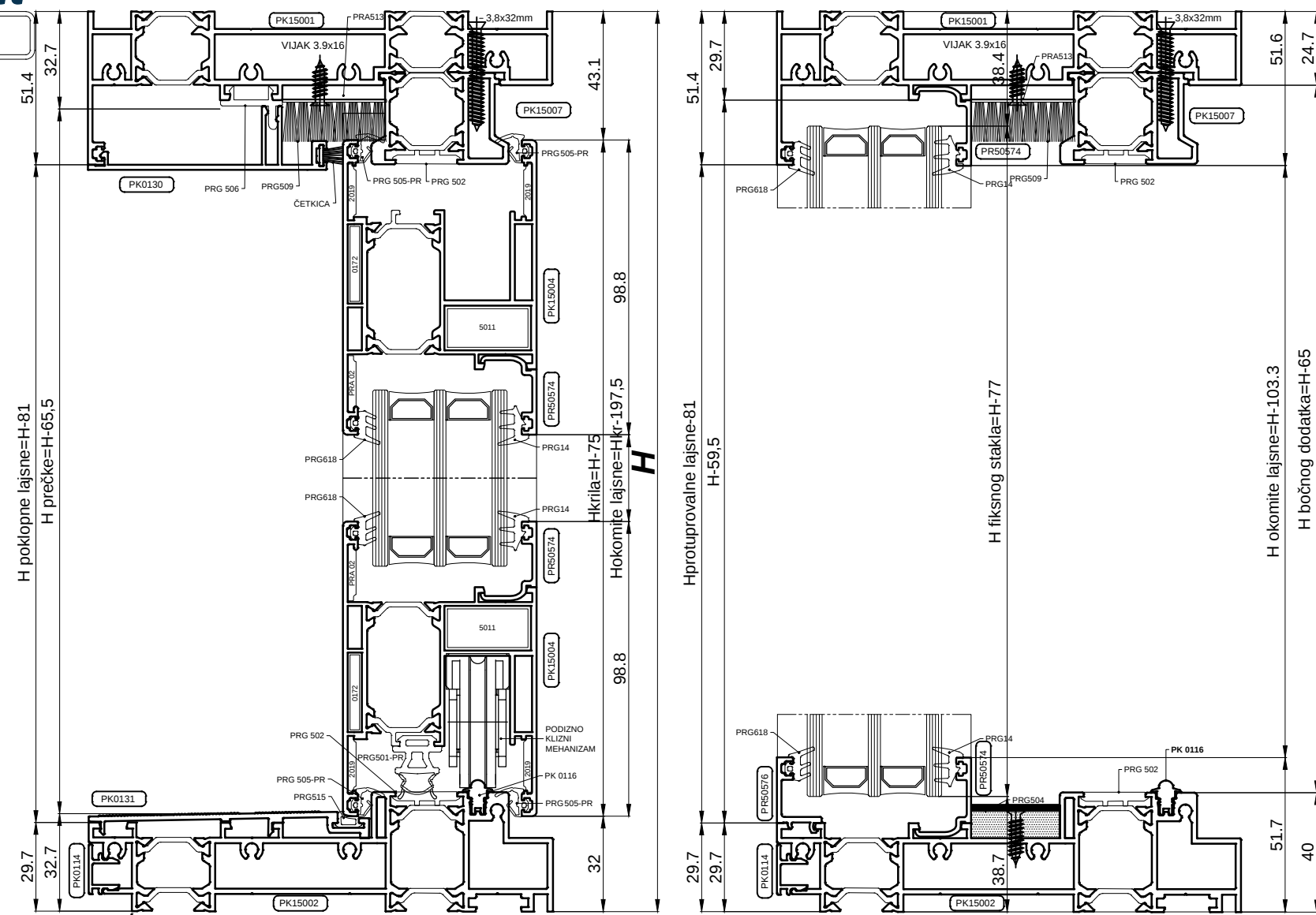
Centralni presjek na spoju dva krila



REZNE LISTE - FIKSNO + KLIZNO - Detalj bez rolete

KOD	PROFIL	BR. KOM	REZANJE	KOD	OKOVI	BR. KOM	NOTE
PK 15003	OKOMICA OKVIRA	2	H	0172	KUTNIK PORAVNANJA KRILA	4	
PK 15001	GORNJA VODORAVNICA OKVIRA	1	L-65,5	0092	BOLCNA ZA SPAJANJE 0172	8	
PK 15002	DONJA VODORAVNICA OKVIRA	1	L-65,5	PRA 02	KUTNIK PORAVNANJA KRILA	4	
PK 15004	OKOMICA KRILA	2	Hkr=H-75	TONALE 5011	KUTNIK KRILA	4	
PK 15004	VODORAVNICA KRILA	2	Lkr=L1+7	VILM	VIJAK ZA KUTNIK 5011	8	
PK 15005	CENTRALNI "T" PROFIL	1	H-65,5	2019	KUTNIK PORAVNANJA KRILA	8	
PK 15006	BOČNI DODATAK OKVIRA	1	H-65	PRG 500	BRTVA OKVIRA	1	H
PK 15007	GORNJI DODATAK OKVIRA	1	L-65	PRG 501 -PR	CENTRALNA BRTVA	2	L/2 + H
PK 0114	LAJSNA DONJA	1	L-65,5	PRG 505 -PR	BRTVA KRILA	4	2L + 2H
PK 0116	VODILICA	1	L-73	PRG 502	BRTVA OKVIRA	3	2L + H
PK 0131	DONJA POKLOPNA LAJSNA (VODORAVNA)	1	L1-101,5	PRG 503	BRTVA CENTRALNOG SPOJA	2	2H
PK 0121	POKLOPNA LAJSNA (OKOMITA)	1	H-81	PRG 515	BRTVA POKLOPNE LAJSNE PK0131	1	L1
PK 0127	POKLOPNA LAJSNA NA KRILU	1	Hkr	PRG -	VANJSKA BRTVA STAKLA	6	2L + 4H
PK 0127	POKLOPNA LAJSNA NA PREČKI	1	H-59.5	PRG -	UNUTARNJA BRTVA STAKLA	6	2L + 4H
PK 0130	POKLOPNA LAJSNA (GORNJA HORIZONTALNA)	1	L1-101,5	ČETKICA	ČETKICA	4	3H + L
PR 505--	VODORAVNA LAJSNA (KRILO)	2	Lkr-154	PRG 507	PLASTIKA SREDNJA	2	Hkr
PR 505--	OKOMITA LAJSNA (KRILO)	2	Hkr-198	PRG 506	PLASTIKA ZA POKLOPNU LAJSNU	2	L+H
PR 50576	OKOMITA PROTUPROVALNA LAJSNA (FIKSNO)	1	H-81	PRG 510	GORNJI ČEP	1	-
PR 50574	OKOMITA LAJSNA (FIKSNO) ZA PRG507	1	H-59.5	PRG 511	DONJI ČEP	1	-
PR 505--	OKOMITA LAJSNA (FIKSNO)	2	H-103.2	PRG 512	SREDNJI ČEP	1	-
PR 50576	VODORAVNA PROTUPROVALNA LAJSNA (FIKSNO)	1	L2-101	PRG 504	BRTVA SPOJA(110mm)	1	-
PR 505--	VODORAVNA LAJSNA (FIKSNO)	2	L2-57	PRG-508	ČEP ZA POKLOPNU LAJSNU PK0127	1	-
PRG 506	PLASTIKA ZA POKLOPNU LAJSNU	2	1x(L1-101.5) + 1x(H-81)	PRG 509	ČETKICA NA SPOJU(110mm)	1	-
STAKLO FIKSNO		STAKLO KLIZNO		PRA 513	PLASTIKA ZA PRG509	1	-
(H-77,5) x (L2-75)	1	(Hkr-167,5) x (Lkr-167,5)	1	PRA 514	PVC KONDENZ	-	-

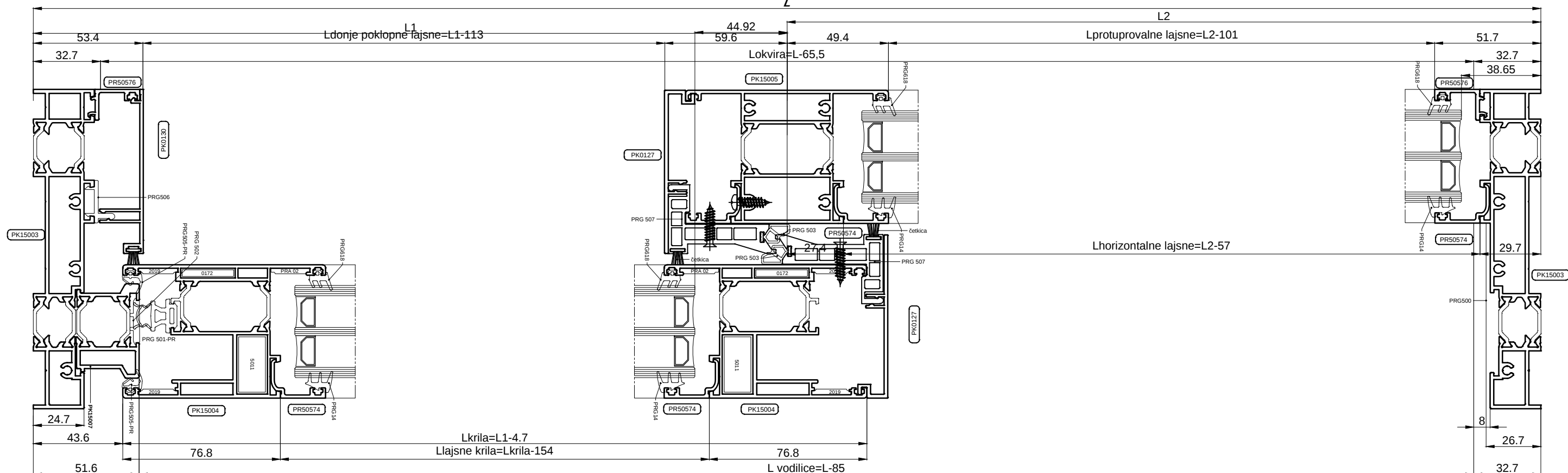
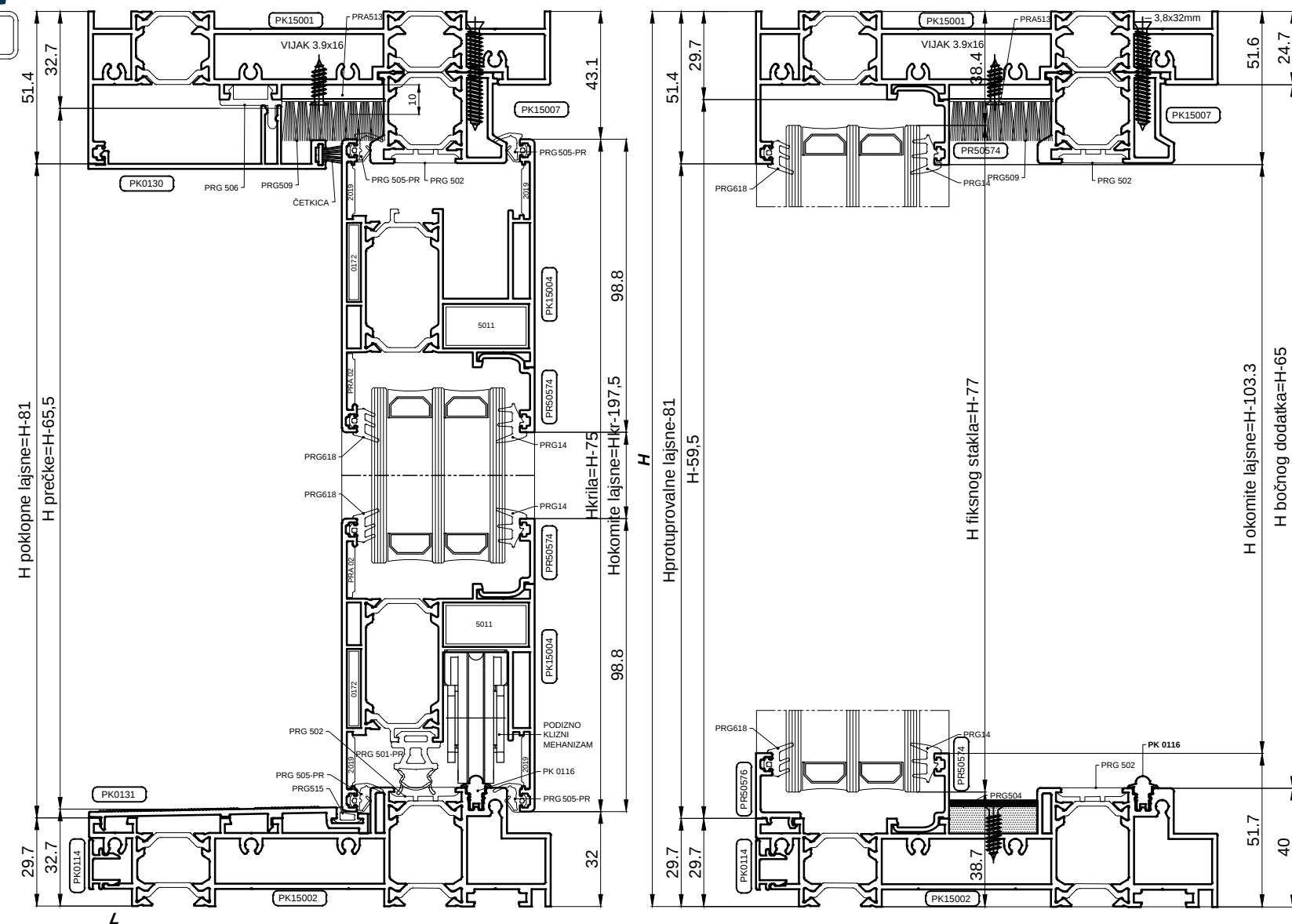
Technical drawing of a window frame. The drawing shows a rectangular frame with a central opening. Dimensions are indicated by arrows and numbers: 1000 (width), 1000 (height), and 1000 (depth). The frame is divided into two main sections by a vertical line. The left section is labeled '1000' and the right section is labeled '1000'. The frame is shown in a perspective view, with a front view and a side view. The front view shows the frame with a central opening. The side view shows the frame with a central opening. The frame is shown in a perspective view, with a front view and a side view. The front view shows the frame with a central opening. The side view shows the frame with a central opening.

$$L1=L2$$


REZNE LISTE - FIKSNO + KLIZNO - Detalj sa roletom

KOD	PROFIL	BR. KOM	REZANJE	KOD	OKOVI	BR. KOM	NOTE
PK 15003	OKOMICA OKVIRA	2	H	0172	KUTNIK PORAVNANJA KRILA	4	
PK 15001	GORNJA VODORAVNICA OKVIRA	1	L-65,5	0092	BOLCNA ZA SPAJANJE 0172	8	
PK 15002	DONJA VODORAVNICA OKVIRA	1	L-65,5	PRA 02	KUTNIK PORAVNANJA KRILA	4	
PK 15004	OKOMICA KRILA	2	Hkr=H-75	TONALE 5011	KUTNIK KRILA	4	
PK 15004	VODORAVNICA KRILA	2	Lkr=L1-4.7	VILM	VIJAK ZA KUTNIK 5011	8	
PK 15005	CENTRALNI "T" PROFIL	1	H-65,5	2019	KUTNIK PORAVNANJA KRILA	8	
PK 15007	BOČNI DODATAK OKVIRA	1	H-65	PRG 500	BRTVA OKVIRA	1	H
PK 15007	GORNJI DODATAK OKVIRA	1	L-76,7	PRG 501 -PR	CENTRALNA BRTVA	2	L/2 + H
PK 0114	LAJSNA DONJA	1	L-65,5	PRG 505 -PR	BRTVA KRILA	4	2L + 2H
PK 0116	VODILICA	1	L-85	PRG 502	BRTVA OKVIRA	3	2L + H
PK 0131	DONJA POKLOPNA LAJSNA (VODORAVNA)	1	L1-113	PRG 503	BRTVA SPOJA	2	2H
PK0130 PR50576	POKLOPNA LAJSNA (OKOMITA)+PROTUPROV.	1	H-81	PRG -	VANJSKA BRTVA STAKLA	6	2L + 4H
PK 0127	POKLOPNA LAJSNA NA KRILU	1	Hkr	PRG -	UNUTARNJA BRTVA STAKLA	6	2L + 4H
PK 0127	POKLOPNA LAJSNA NA PREČKI	1	H-59.5	ČETKICA	ČETKICA	4	3H + L
PK 0130	POKLOPNA LAJSNA (GORNJA HORIZONTALNA)	1	L1-113	PRG 507	PLASTIKA SREDNJA	2	Hkr
PR 505--	VODORAVNA LAJSNA (KRILO)	2	Lkr-154	PRG 506	PLASTIKA ZA POKLOPNU LAJSNU	2	L+H
PR 505--	OKOMITA LAJSNA (KRILO)	2	Hkr-198	PRG 510	GORNJI ČEP	1	-
PR 50576	OKOMITA PROTUPROVALNA LAJSNA (FIKSNO)	1	H-81	PRG 511	DONJI ČEP	1	-
PR 50574	OKOMITA LAJSNA (FIKSNO) ZA PRG507	1	H-59.5	PRG 512	SREDNJI ČEP	1	-
PR 505--	OKOMITA LAJSNA (FIKSNO)	2	H-103.2	PRG 504	BRTVA SPOJA(110mm)	1	-
PR 50576	VODORAVNA PROTUPROVALNA LAJSNA (FIKSNO)	1	L2-101	PRG-508	ČEP ZA POKLOPNU LAJSNU PK0127	1	-
PR 505--	VODORAVNA LAJSNA (FIKSNO)	2	L2-57	PRG 509	ČETKICA NA SPOJU(110mm)	1	-
PRG 506	PLASTIKA ZA POKLOPNU LAJSNU	2	1x(L1-113) + 1x(H-81)	PRA 513	PLASTIKA ZA PRG509	1	-
STAKLO FIKSNO		STAKLO KLIZNO		PRA 514	PVC KONDEZN	-	-
(H-77) x (L2-75)	1	(Hkr-167.5) x (Lkr-167.5)	1				

A technical drawing of a window or door frame. The frame is composed of multiple parallel lines, suggesting a double frame or a thick border. A central crosshair is drawn on the right side of the frame. Arrows indicate the direction of light or view: a large arrow points right from the left side, and a smaller arrow points right from the bottom center. The drawing is a black and white line art.

$$L1=L2$$


REZNE LISTE - KLIZNO + FIKSNO + KLIZNO

KOD	PROFIL	BR. KOM	REZANJE
PK 15003	OKOMICA OKVIRA	2	H
PK 15001	GORNJA VODORAVNICA OKVIRA	1	L-65,5
PK 15002	DONJA VODORAVNICA OKVIRA	1	L-65,5
PK 15004	OKOMICA KRILA	4	Hkr=H-75
PK 15004	VODORAVNICA KRILA	4	Lkr=L1+7
PK 15005	CENTRALNI "T" PROFIL	2	H-65,5
PK 15006	BOČNI DODATAK OKVIRA	2	H-65
PK 15007	GORNJI DODATAK OKVIRA	1	L-80
PK 0114	LAJSNA DONJA	1	L-65,5
PK 0116	VODILICA	1	L-80
PK 0131	DONJA POKLOPNA LAJSNA (VODORAVNA)	2	L1-101,5
PK 0121	POKLOPNA LAJSNA (OKOMITA)	2	H-81
PK 0127	POKLOPNA LAJSNA NA KRILU	2	Hkr
PK 0127	POKLOPNA LAJSNA NA PREČKI	2	H-59.5
PK 0130	POKLOPNA LAJSNA (GORNJA HORIZONTALNA)	2	L1-101,5
PR 505--	VODORAVNA LAJSNA (KRILO)	4	Lkr-154
PR 505--	OKOMITA LAJSNA (KRILO)	4	Hkr-198
PR 50574	OKOMITA LAJSNA (FIKSNO) ZA PRG507	2	H-59.5
PR 50576	VODORAVNA PROTUPROVALNA LAJSNA (FIKSNO)	1	L3-99
PR 505--	VODORAVNA LAJSNA (FIKSNO)	2	L3-55
PR 505--	OKOMITA LAJSNA (FIKSNO)	2	H-103.3
PRG 507	PLASTIKA SREDNJA	4	2x(H-59.5) 2xHkr
PRG 506	PLASTIKA ZA POKLOPNU LAJSNU	4	2x(L1-101.5) + 2x(H-81)

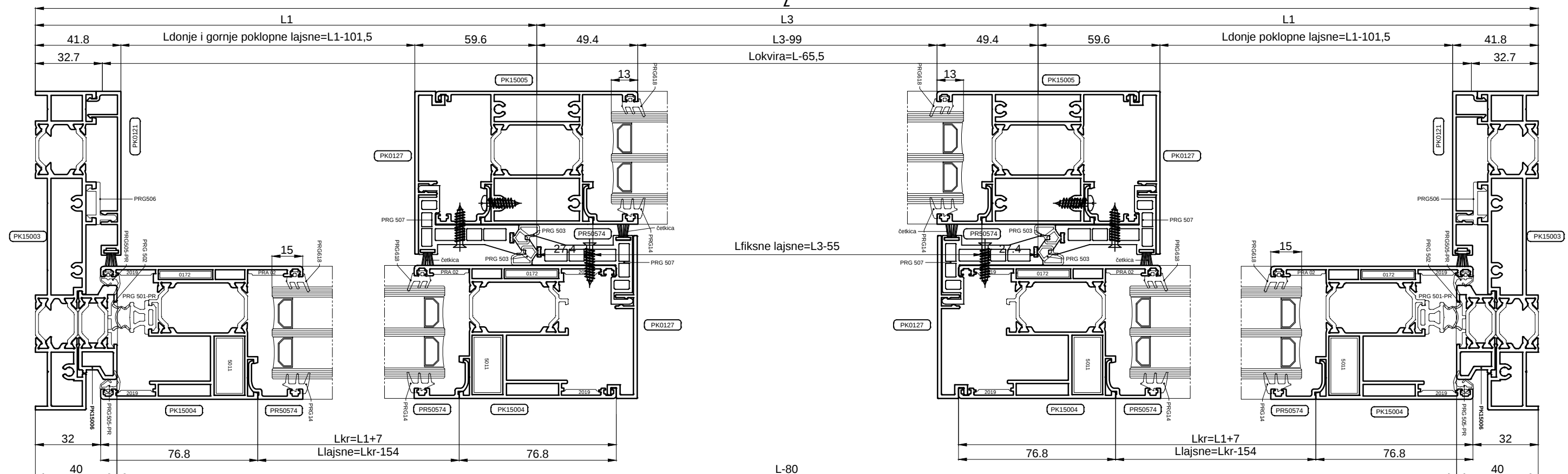
KOD	OKOVI	BR. KOM	NOTE
0172	KUTNIK PORAVNANJA KRILA	8	
PRA 02	KUTNIK PORAVNANJA KRILA	8	
PRA 200 ILI TONALE 5011	KUTNIK KRILA	8	
2019	KUTNIK PORAVNANJA KRILA	16	

KOD	BRTVE/ČEPOVI	BR. KOM	NOTE
PRG 501 -PR	CENTRALNA BRTVA	3	L+2H
PRG 505 -PR	BRTVA KRILA	7	3L+4H
PRG 502	BRTVA OKVIRA	4	1.5L+2H
PRG 503	BRTVA SPOJA	4	4H
PRG 515	BRTVA POKLOPNE LAJSNE	1	L3
PRG -	VANJSKA BRTVA STAKLA	8	2L+6H
PRG -	UNUTARNJA BRTVA STAKLA	8	2L+6H
ČETKICA	ČETKICA	8	1.5L+6H
PRG 507	PLASTIKA SREDNJA	4	4H
PRG 506	PLASTIKA ZA POKLOPNU LAJSNU	4	1.5L+2H
PRG 510	GORNJI ČEP	1	-
PRG 511	DONJI ČEP	1	-
PRG 512	SREDNJI ČEP	2	-
PRG 504	BRTVA SPOJA(110mm)	2	-
PRG-508	ČEP ZA POKLOPNU LAJSNU PK0127	1	-
PRG 509	ČETKICA NA SPOJU(110mm)	2	-

STAKLO FIKSNO		STAKLO KLIZNO	
(H-77,5) x (L3-73)	1	(Hkr-167.5) x (Lkr-167.5)	2

The image contains four technical drawings of window and door profiles, showing cross-sections and dimensions. The drawings are arranged in a 2x2 grid.

- Top Left:** A cross-section of a window profile. Dimensions include 51.4, 32.7, 43.1, 98.8, 32, and 29.7. Components labeled include PK0130, PRG 506, PRG509, ČETKICA, VIJAK 3.9x16, PK15001, PRG515, 3.8x32mm, PK15007, PRG 505-PR, PRG 502, PK15004, PRG5074, PRG14, PRG618, PRG501-PR, PK0114, PK15002, PK0131, and PRG 502.
- Top Right:** A cross-section of a window profile. Dimensions include 51.4, 29.7, 43.1, 98.8, 32, and 29.7. Components labeled include PK15001, VIJAK 3.9x16, PRG515, 3.8x32mm, PK15007, PRG 505-PR, PRG 502, PK15004, PRG5074, PRG14, PRG618, PRG501-PR, PK0114, PK15002, PK0131, and PRG 502.
- Bottom Left:** A cross-section of a door profile. Dimensions include 51.4, 29.7, 43.1, 98.8, 32, and 29.7. Components labeled include PK15001, VIJAK 3.9x16, PRG515, 3.8x32mm, PK15007, PRG 505-PR, PRG 502, PK15004, PRG5074, PRG14, PRG618, PRG501-PR, PK0114, PK15002, PK0131, and PRG 502.
- Bottom Right:** A cross-section of a door profile. Dimensions include 51.4, 29.7, 43.1, 98.8, 32, and 29.7. Components labeled include PK15001, VIJAK 3.9x16, PRG515, 3.8x32mm, PK15007, PRG 505-PR, PRG 502, PK15004, PRG5074, PRG14, PRG618, PRG501-PR, PK0114, PK15002, PK0131, and PRG 502.

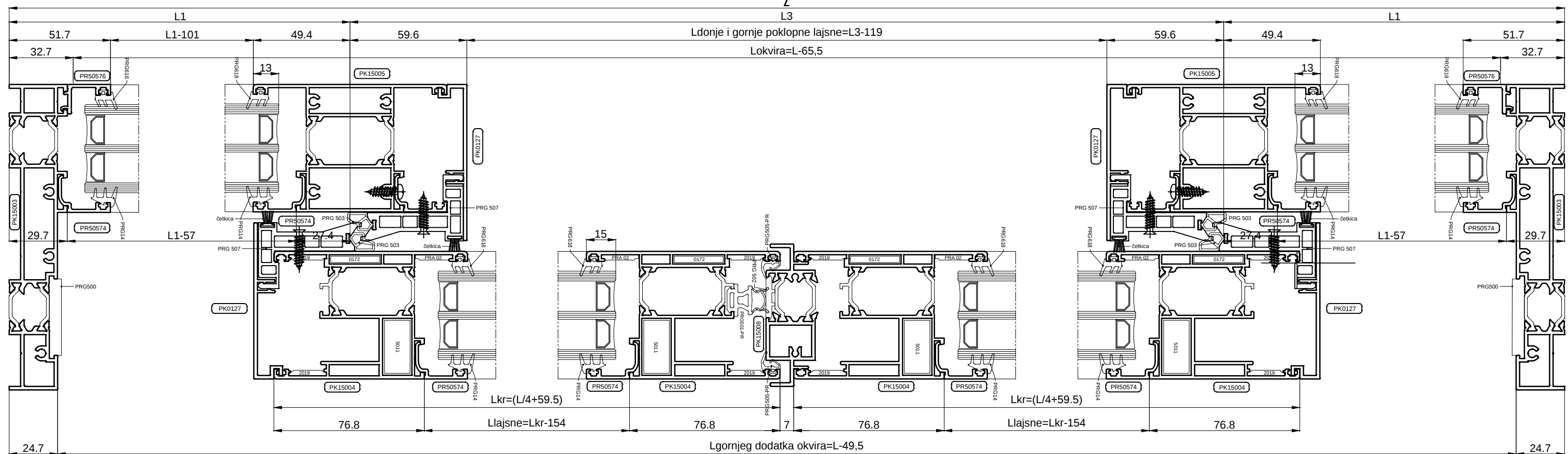
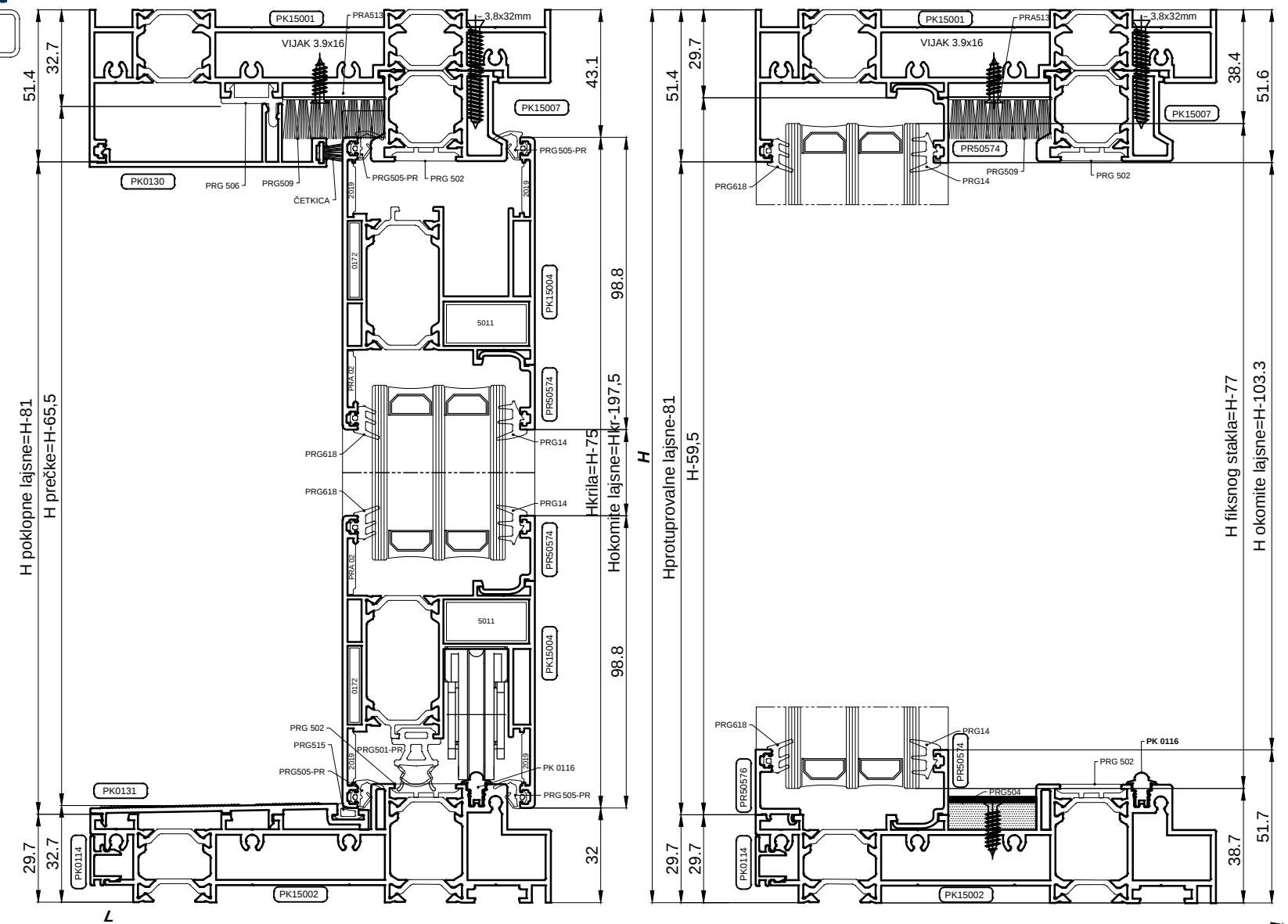


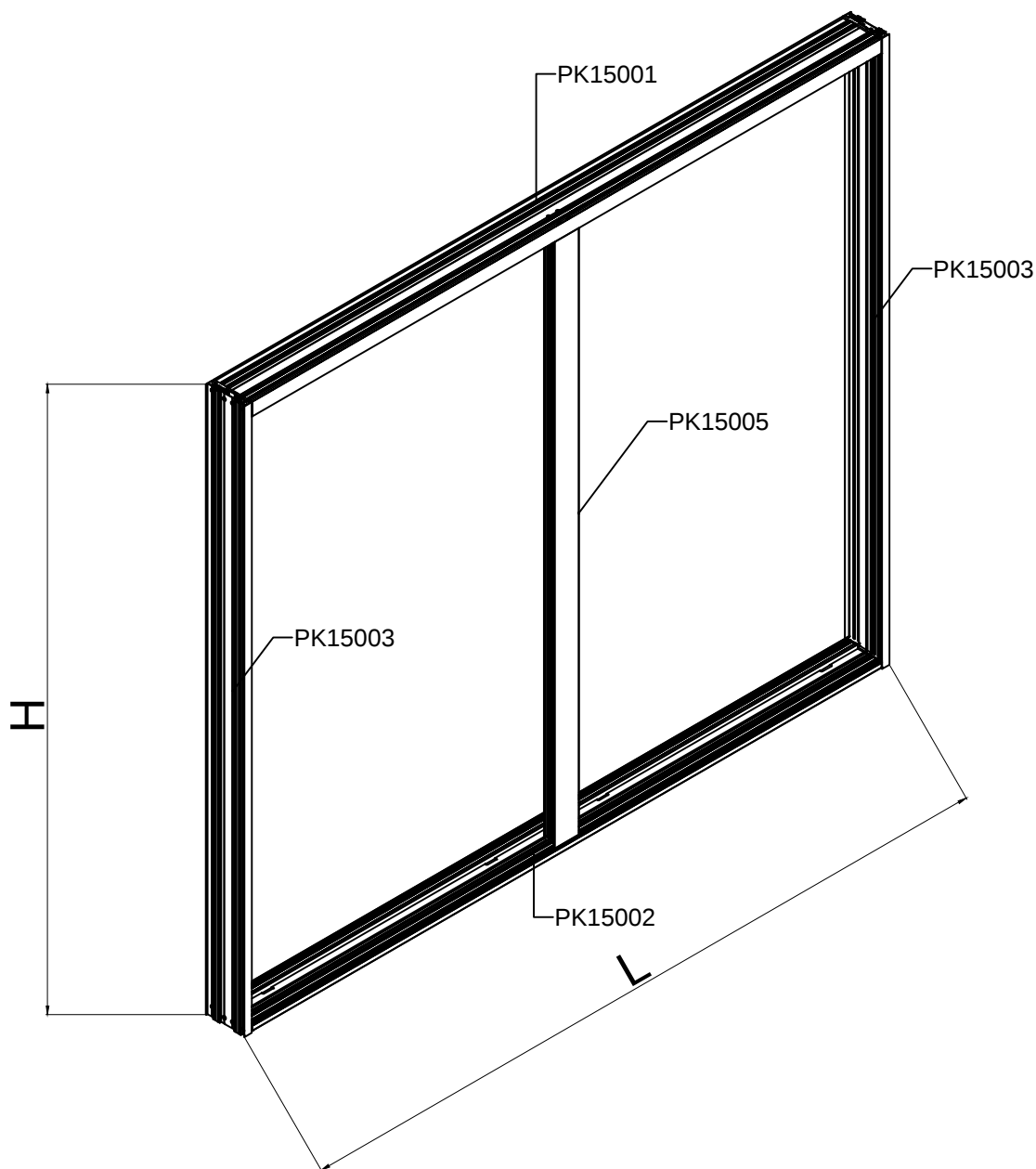
REZNE LISTE - FIKSNO + KLIZNO + KLIZNO + FIKSNO

KOD	PROFIL	BR. KOM	REZANJE	KOD	OKOVI	BR. KOM	NOTE
PK 15003	OKOMICA OKVIRA	2	H	0172	KUTNIK PORAVNANJA KRILA	8	
PK 15001	GORNJA VODORAVNICA OKVIRA	1	L-65,5	0092	BOLCNA ZA SPAJANJE 0172	16	
PK 15002	DONJA VODORAVNICA OKVIRA	1	L-65,5	PRA 02	KUTNIK PORAVNANJA KRILA	8	
PK 15004	OKOMICA KRILA	4	Hkr=H-75	TONALE 5011	KUTNIK KRILA	8	
PK 15004	VODORAVNICA KRILA	4	Lkr=L/4+59.5	VILM	VIJAK ZA KUTNIK 5011	16	
PK 15005	CENTRALNI "T" PROFIL	2	H-65,5	2019	KUTNIK PORAVNANJA KRILA	16	
PK 15007	GORNJI DODATAK OKVIRA	1	L-49.5	PRG 500	BRTVA OKVIRA	2	H
PK 15008	CENTRALNI PROFIL	1	H-75	PRG 501 -PR	CENTRALNA BRTVA	1	L/2+H
PK 0114	LAJSNA DONJA	1	L-65,5	PRG 505 -PR	BRTVA KRILA	4	2L + 2H
PK 0116	VODILICA	1	L-65,5	PRG 502	BRTVA OKVIRA	3	2L+H
PK 0131	DONJA POKLOPNA LAJSNA (VODORAVNA)	1	L3-119	PRG 503	BRTVA SPOJA	4	4H
PK 0127	POKLOPNA LAJSNA NA KRILU	2	Hkr	PRG 515	BRTVA DONJE LAJSNE	1	L3
PK 0127	POKLOPNA LAJSNA NA PREČKI	2	H-59.5	PRG -	VANJSKA BRTVA STAKLA	10	2L + 8H
PK 0130	POKLOPNA LAJSNA (GORNJA HORIZONTALNA)	1	L3-119	PRG -	UNUTARNJA BRTVA STAKLA	10	2L + 8H
PR 505--	VODORAVNA LAJSNA (KRILO)	4	Lkr-154	ČETKICA	ČETKICA	5	4H + L
PR 505--	OKOMITA LAJSNA (KRILO)	4	Hkr-198	PRG 507	PLASTIKA SREDNJA	4	Hkr
PR 50576	OKOMITA PROTUPROVALNA LAJSNA (FIKSNO)	2	H-81	PRG 510	GORNJI ČEP	1	-
PR 50574	OKOMITA LAJSNA (FIKSNO) ZA PRG507	2	H-59.5	PRG 511	DONJI ČEP	1	-
PR 50574	OKOMITA LAJSNA (FIKSNO)	4	H-103.3	PRG 512	SREDNJI ČEP	2	-
PR 50576	VODORAVNA PROTUPROVALNA LAJSNA (FIKSNO)	2	L1-101	PRG 504	BRTVENI BLOK(110mm)	2	-
PR 505--	VODORAVNA LAJSNA (FIKSNO)	4	L1-57	PRG-508	ČEP ZA POKLOPNU LAJSNU PK0127	2	-
PRG 506	PLASTIKA ZA POKLOPNU LAJSNU	1	L3-119	PRG 509	ČETKICA NA SPOJU(110mm)	2	-
				PRA 513	PLASTIKA ZA PRG 509	2	-
				PRA 514	PVC KONDEZN	-	
STAKLO FIKSNO		STAKLO KLIZNO					
(H-77,5) x (L1-75)	2	(Hkr-167.5) x (Lkr-167.5)	2				

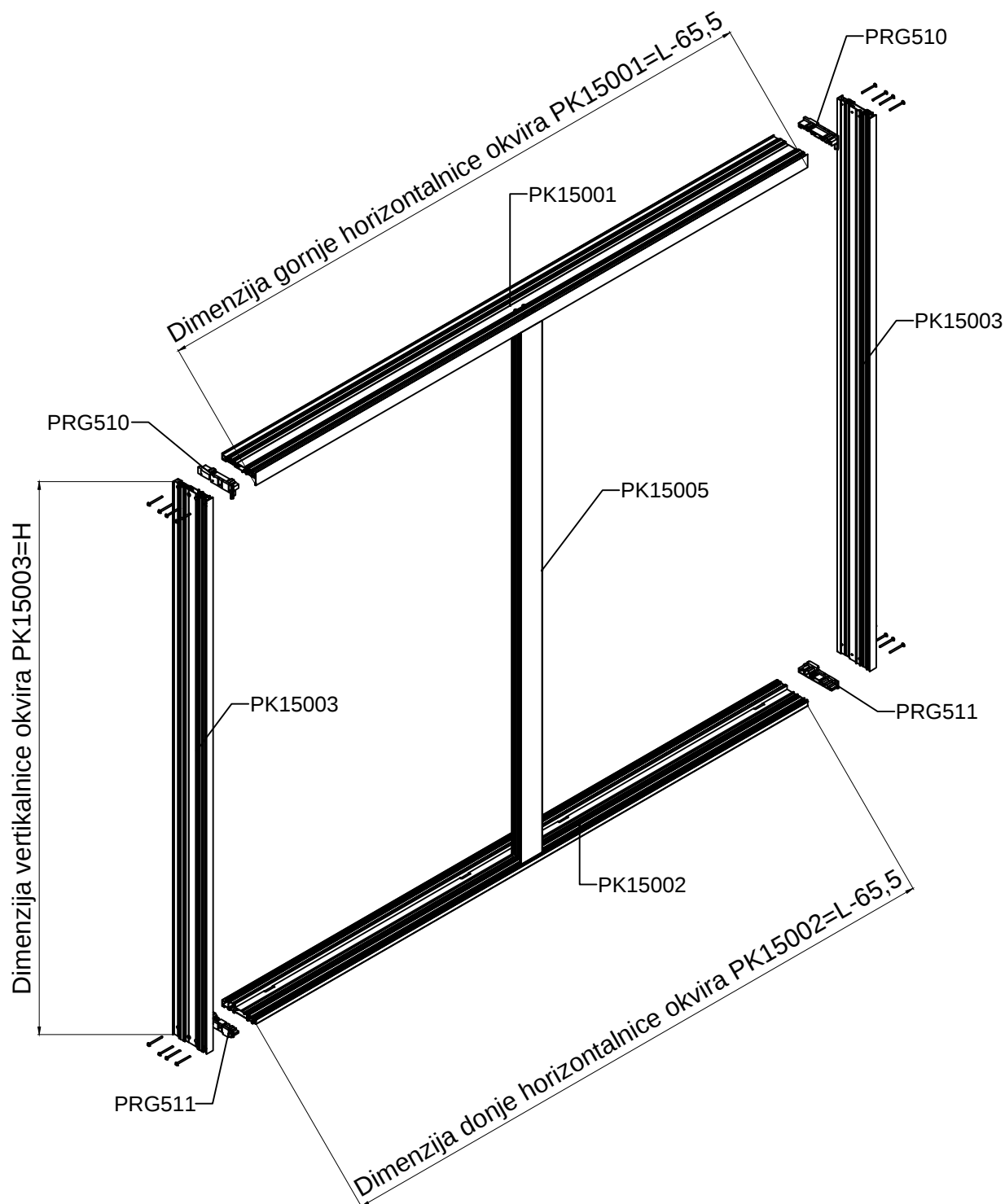
The drawing shows a four-pane window with a central mullion and transoms. The top elevation shows the window frame, panes, and mullion. The bottom elevation shows the window sill and transoms. Arrows indicate the direction of light or air flow.

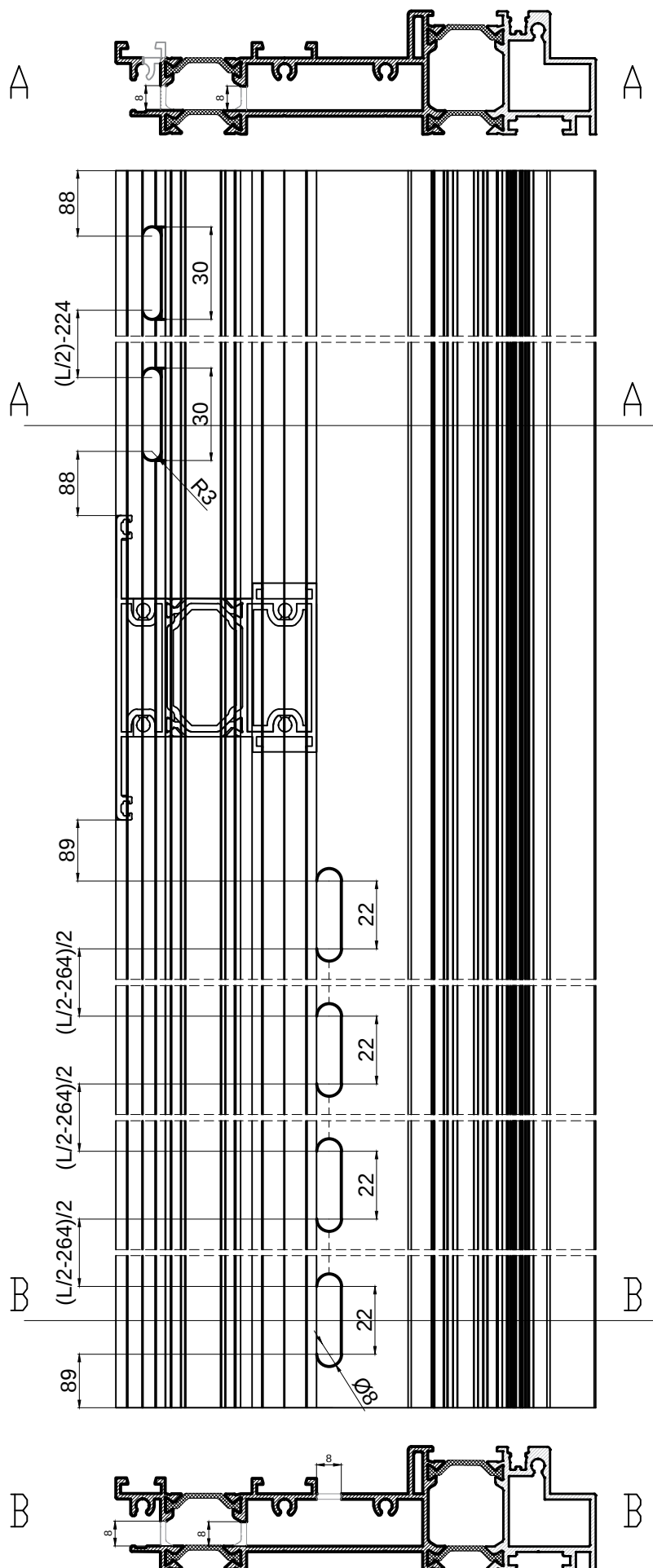
$$\begin{aligned} L1 &= (L/4) - 24.5 \\ L3 &= (L/2) + 49 \\ 2 * L1 + L3 &= L \end{aligned}$$





Dimenzija pilanja vertikalnice okvira PK15003 i horizontalnice okvira PK15001 i PK15002

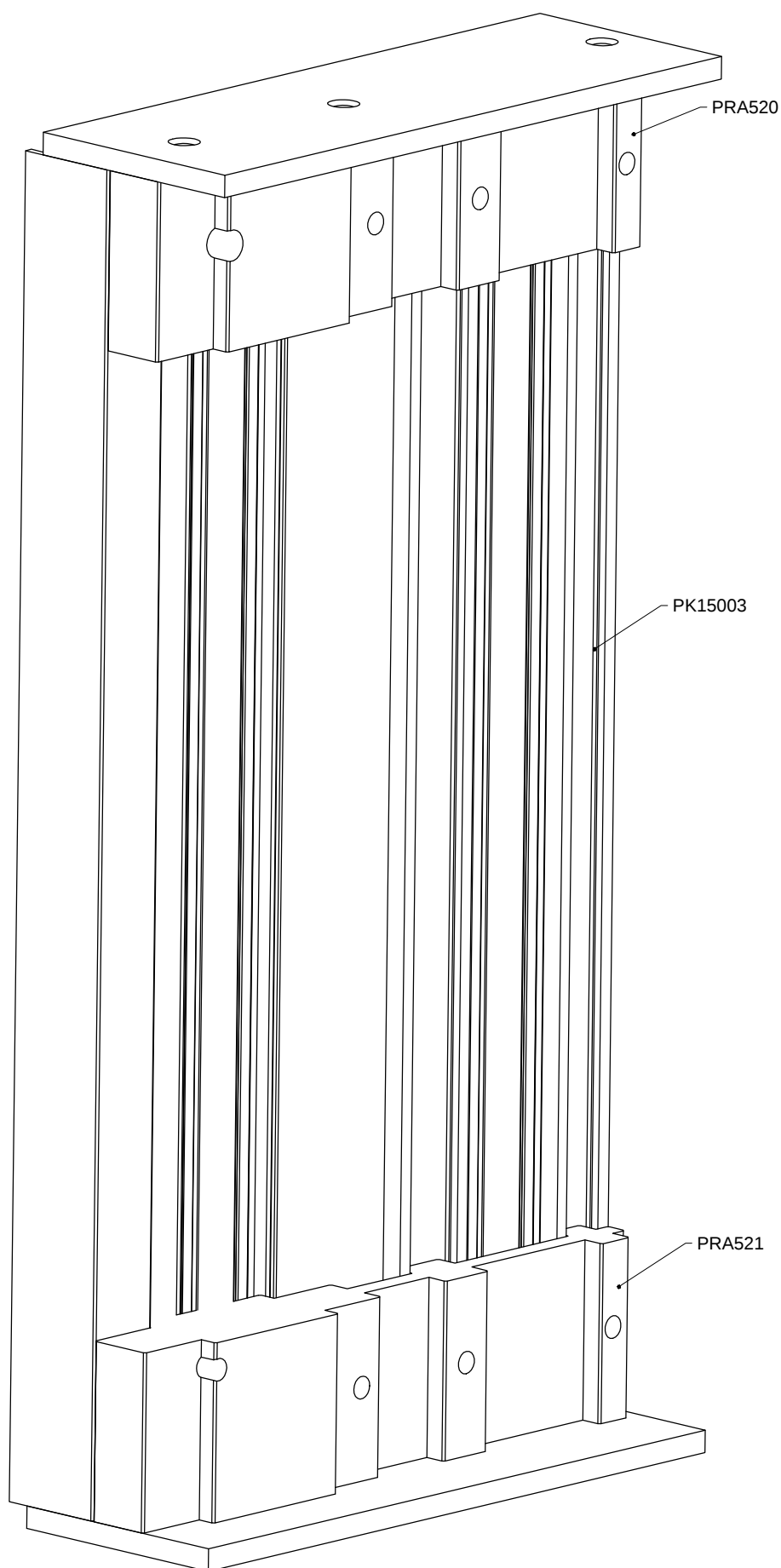


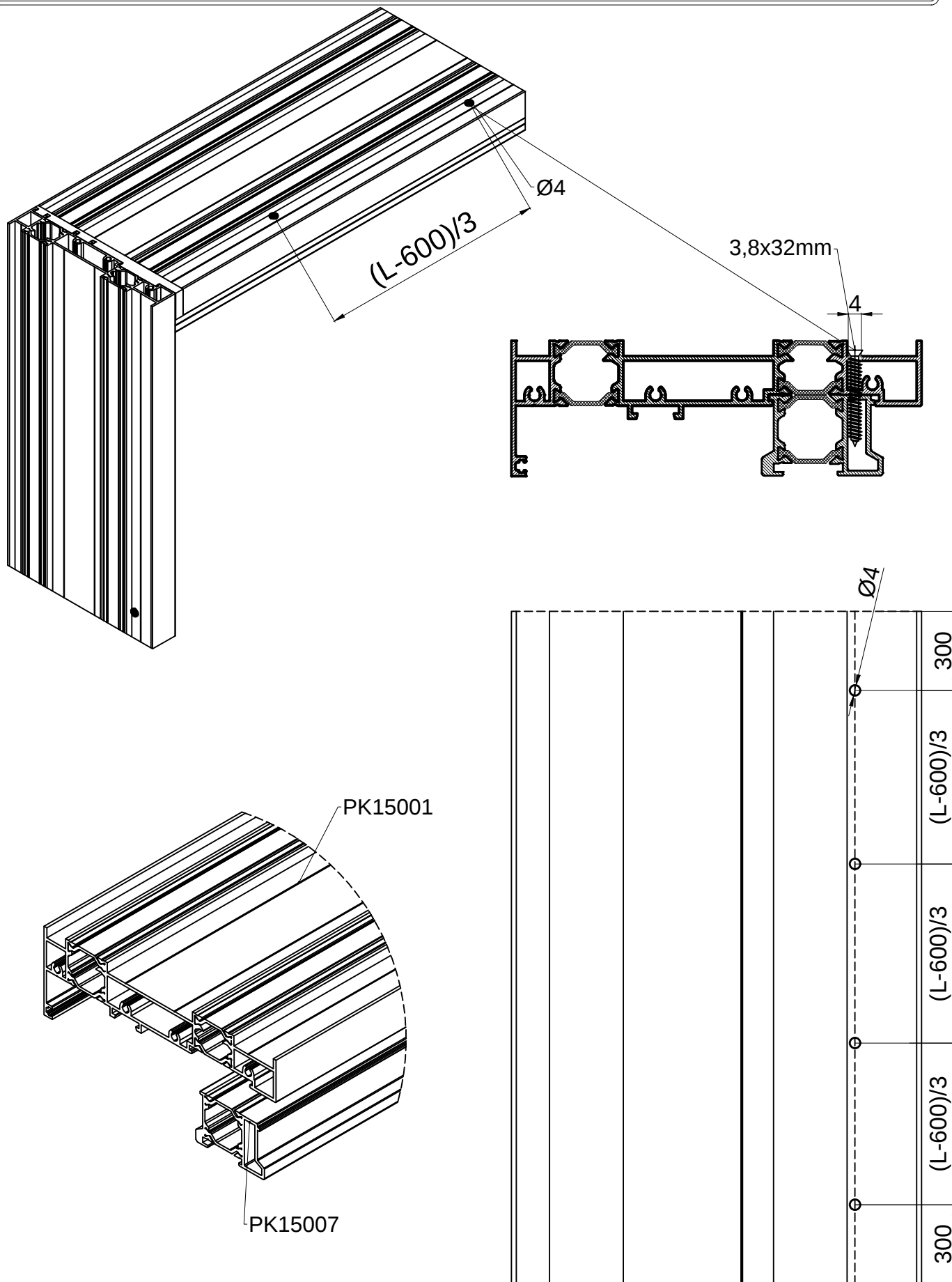


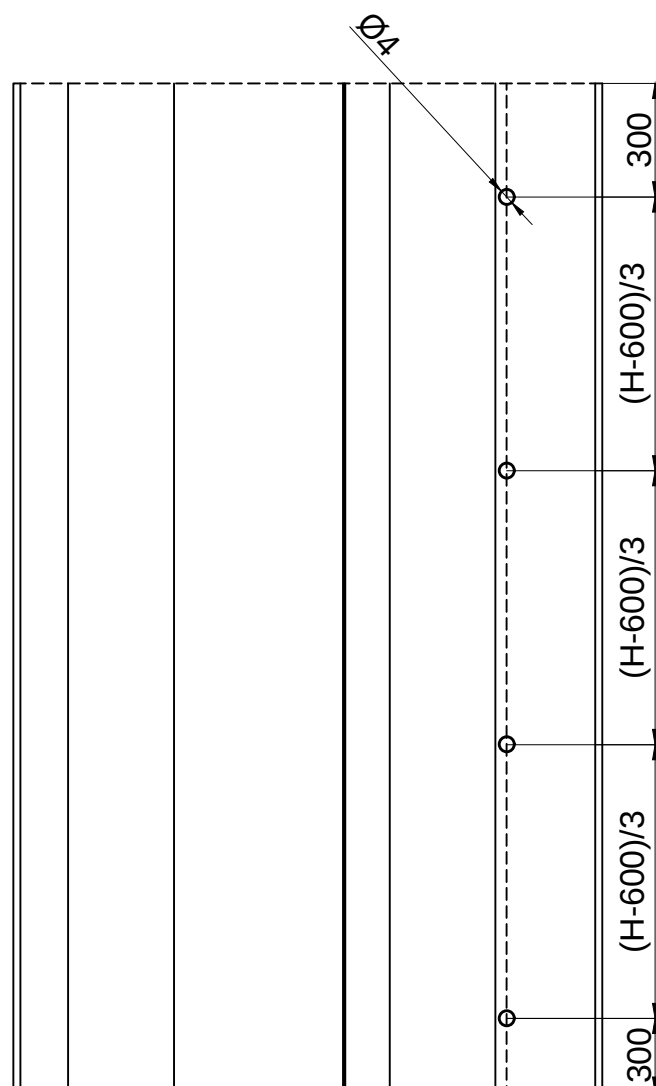
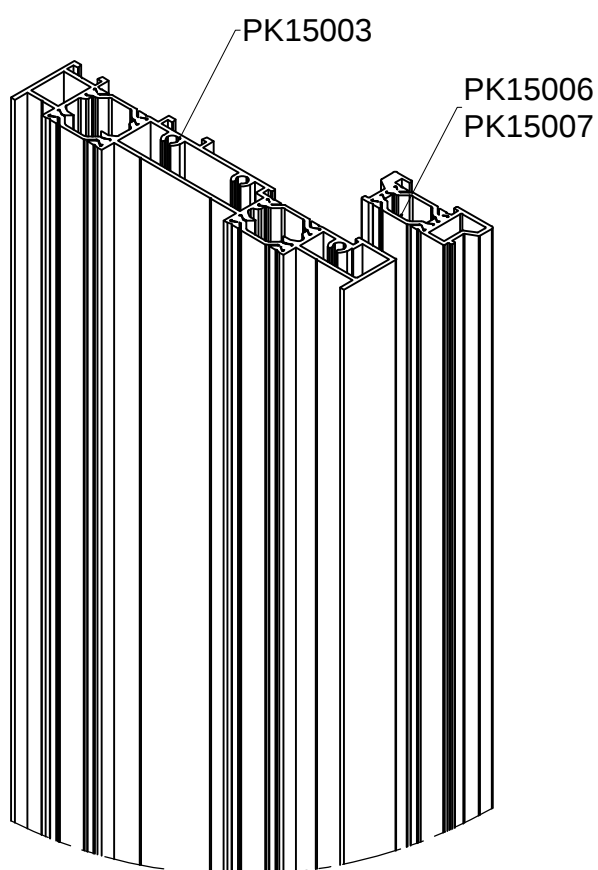
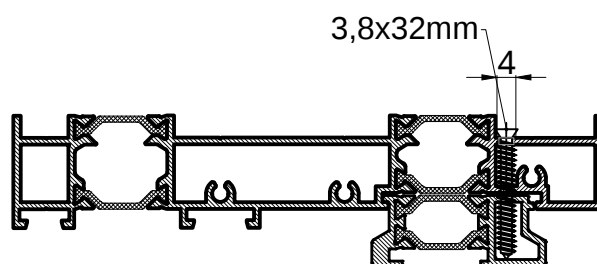
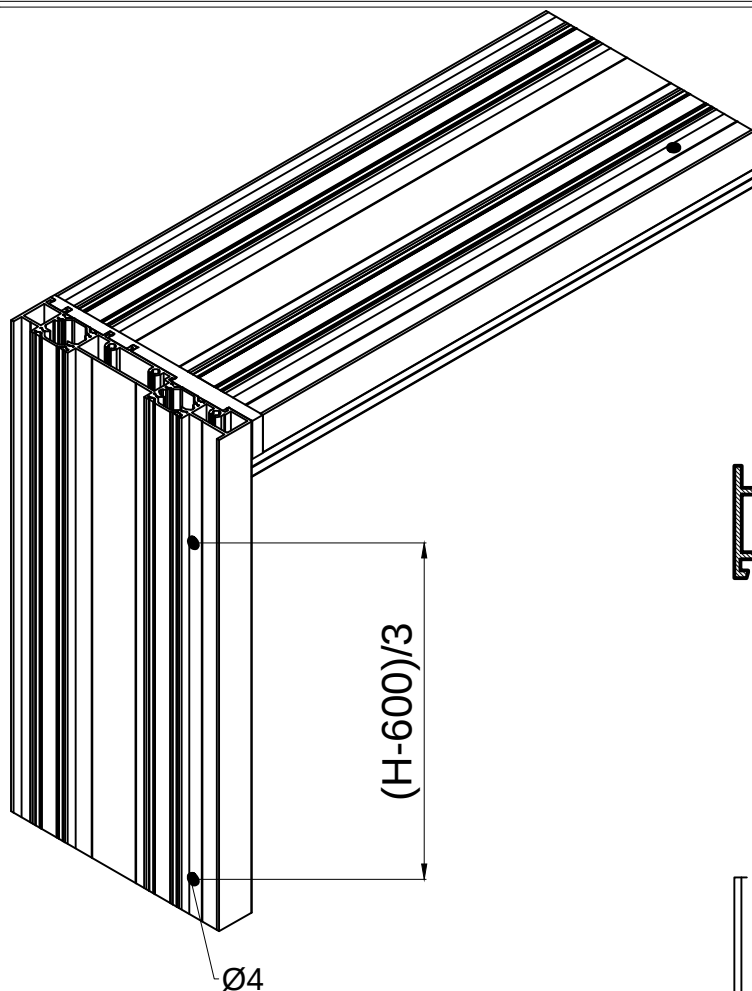
Presjek A-A - Fiksni dio

Presjek B-B - Klizni dio

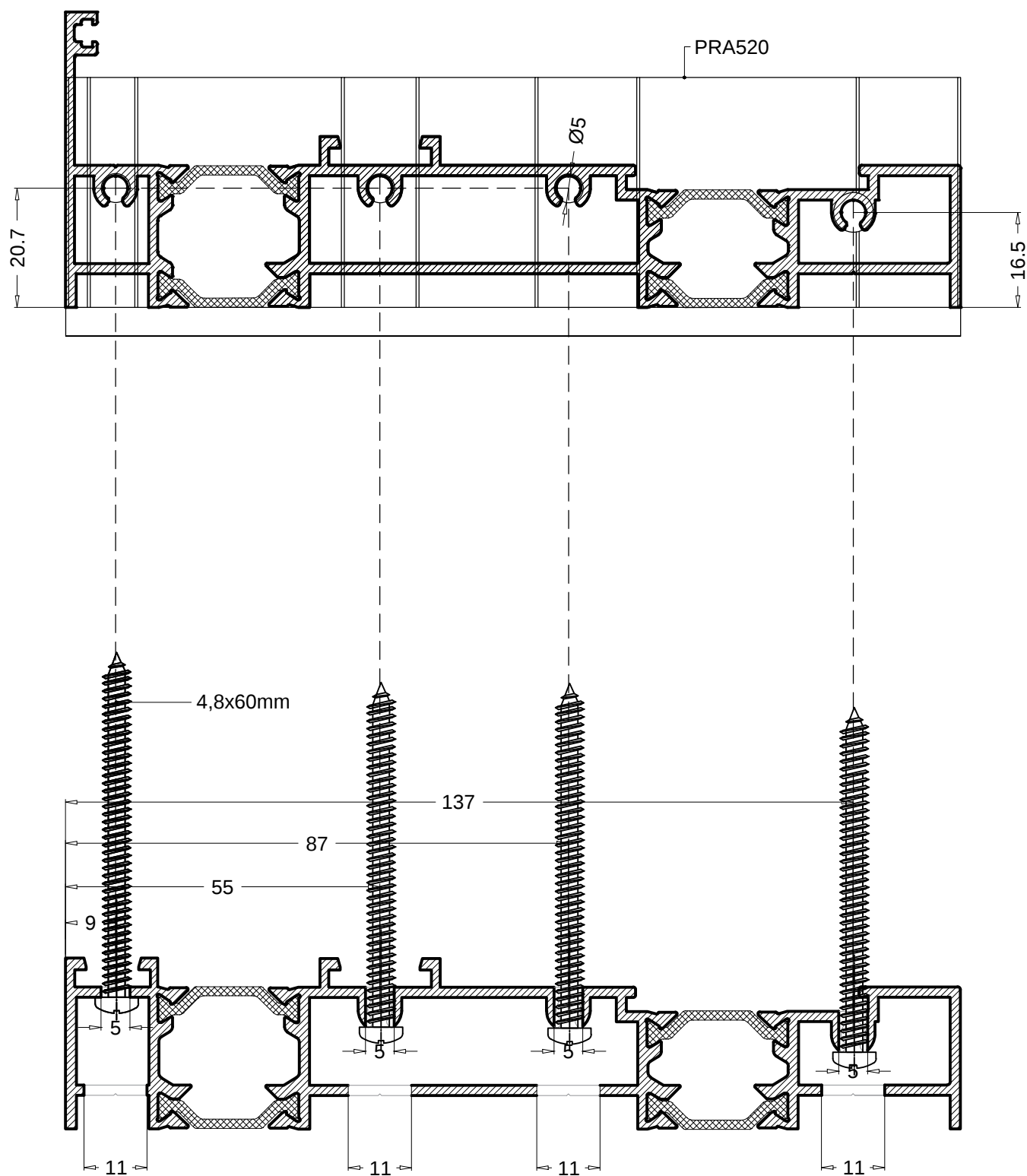
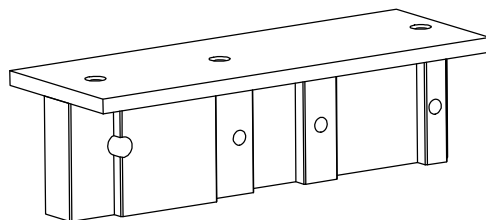
Gornji (PRA520) i donji kalup (PRA521) za spajanje okvira

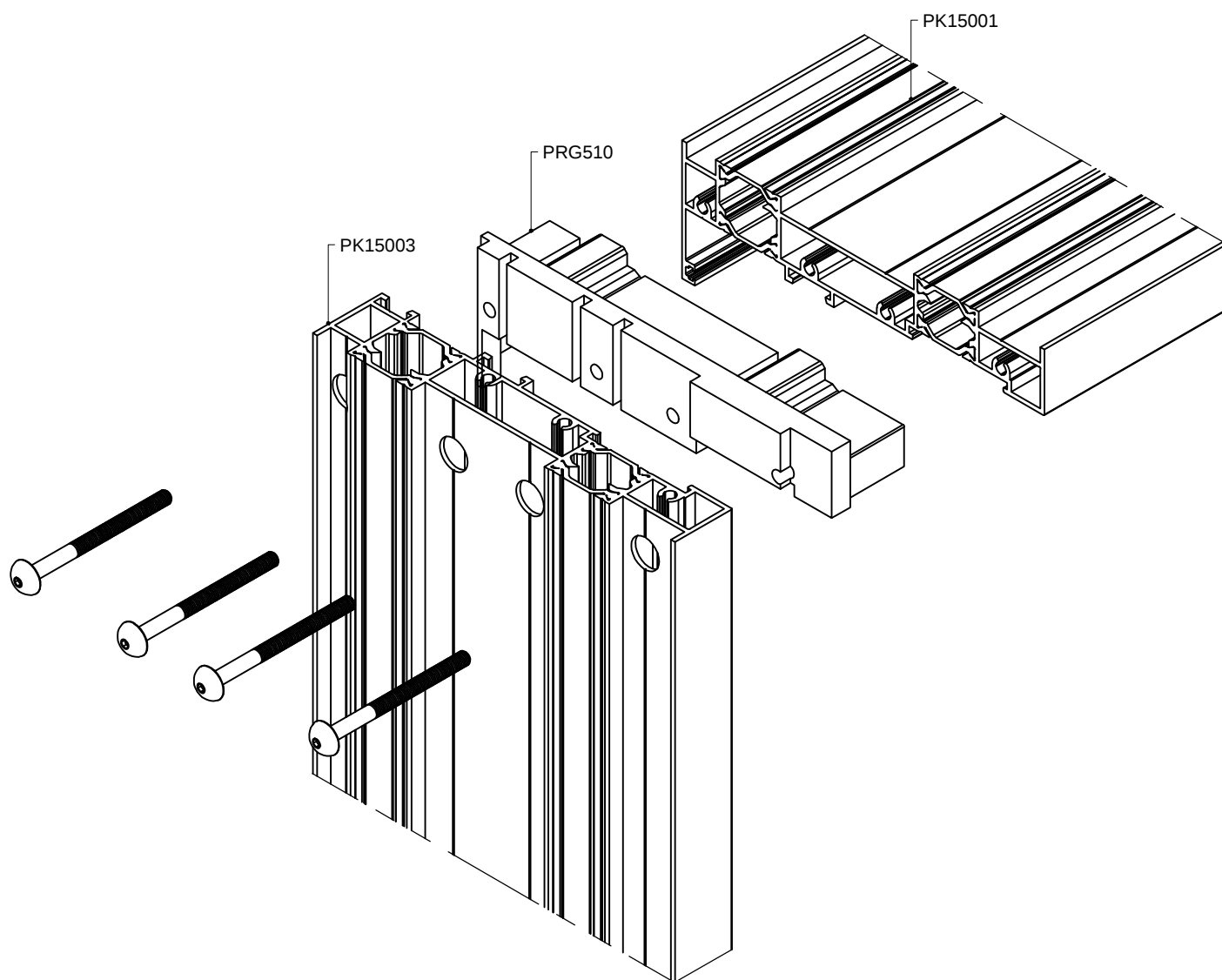






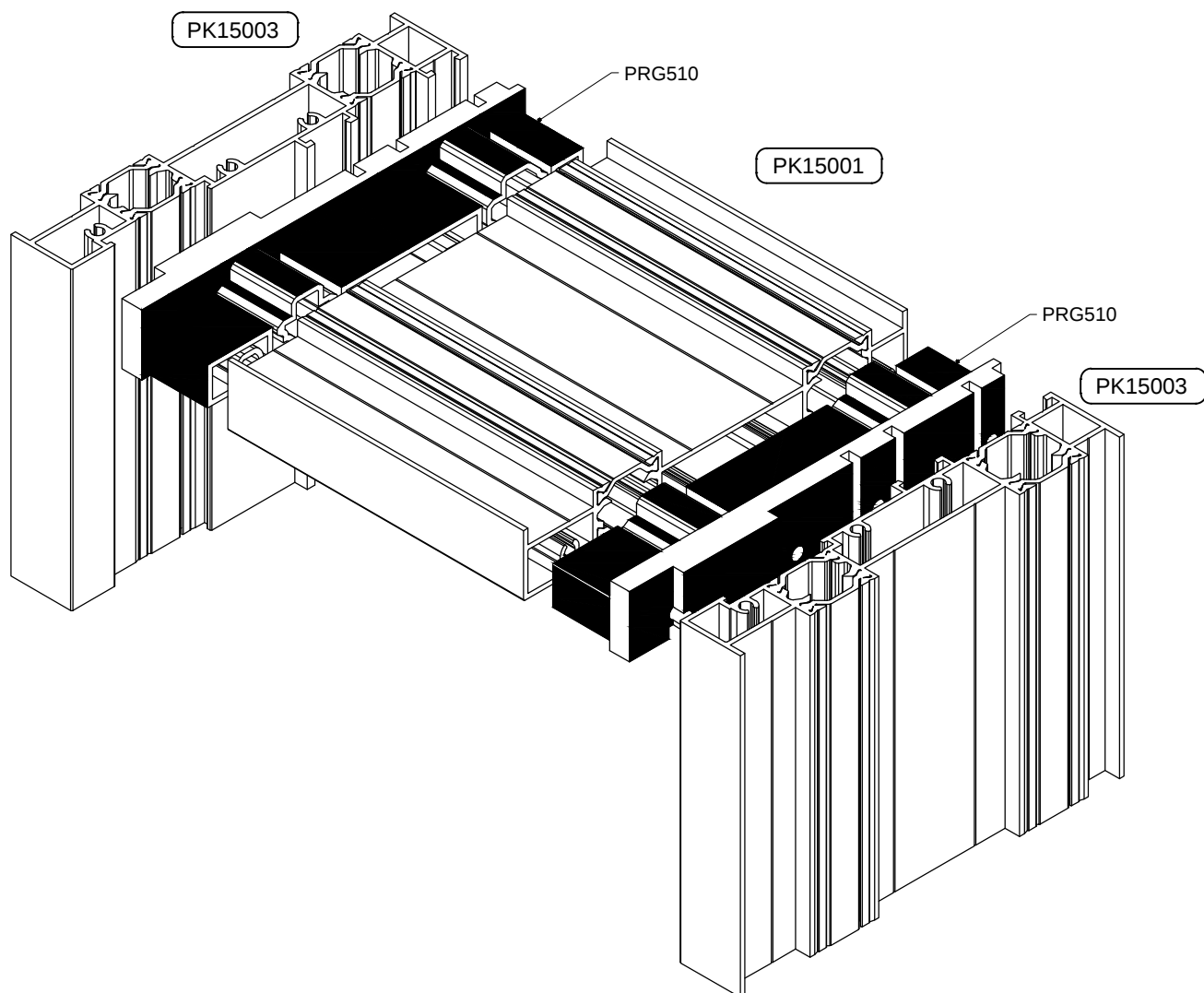
Gornji sklop



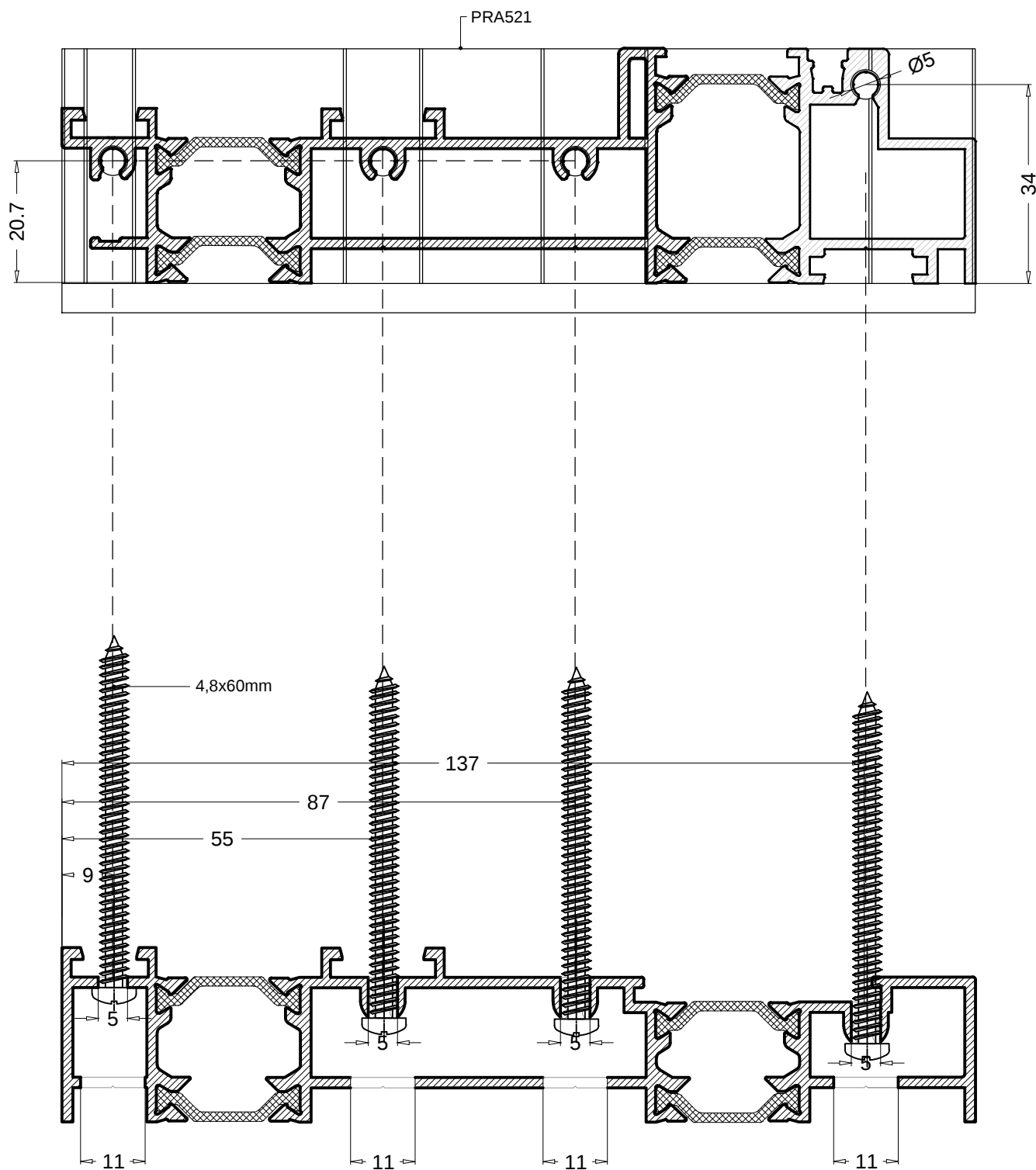
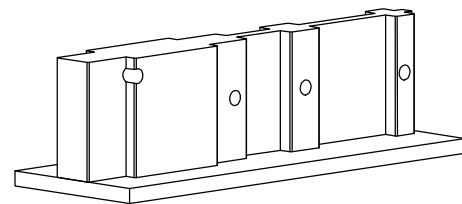


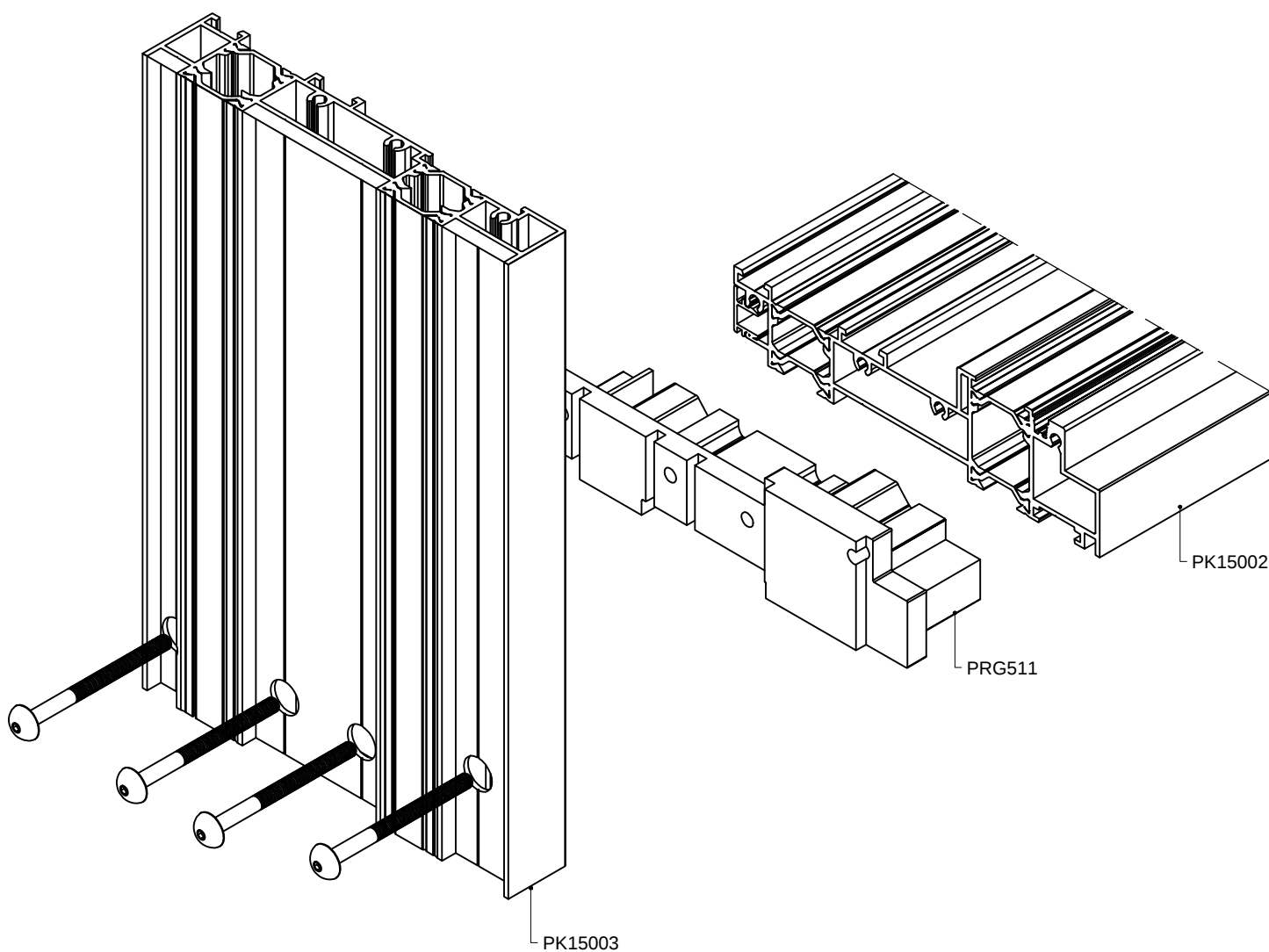
Gornji sklop okvira

SVI ČEPOVI MORAJU BITI ZABRTVLJENI
MASOM ZA BRTVLJENJE - SIKA FLEX 221



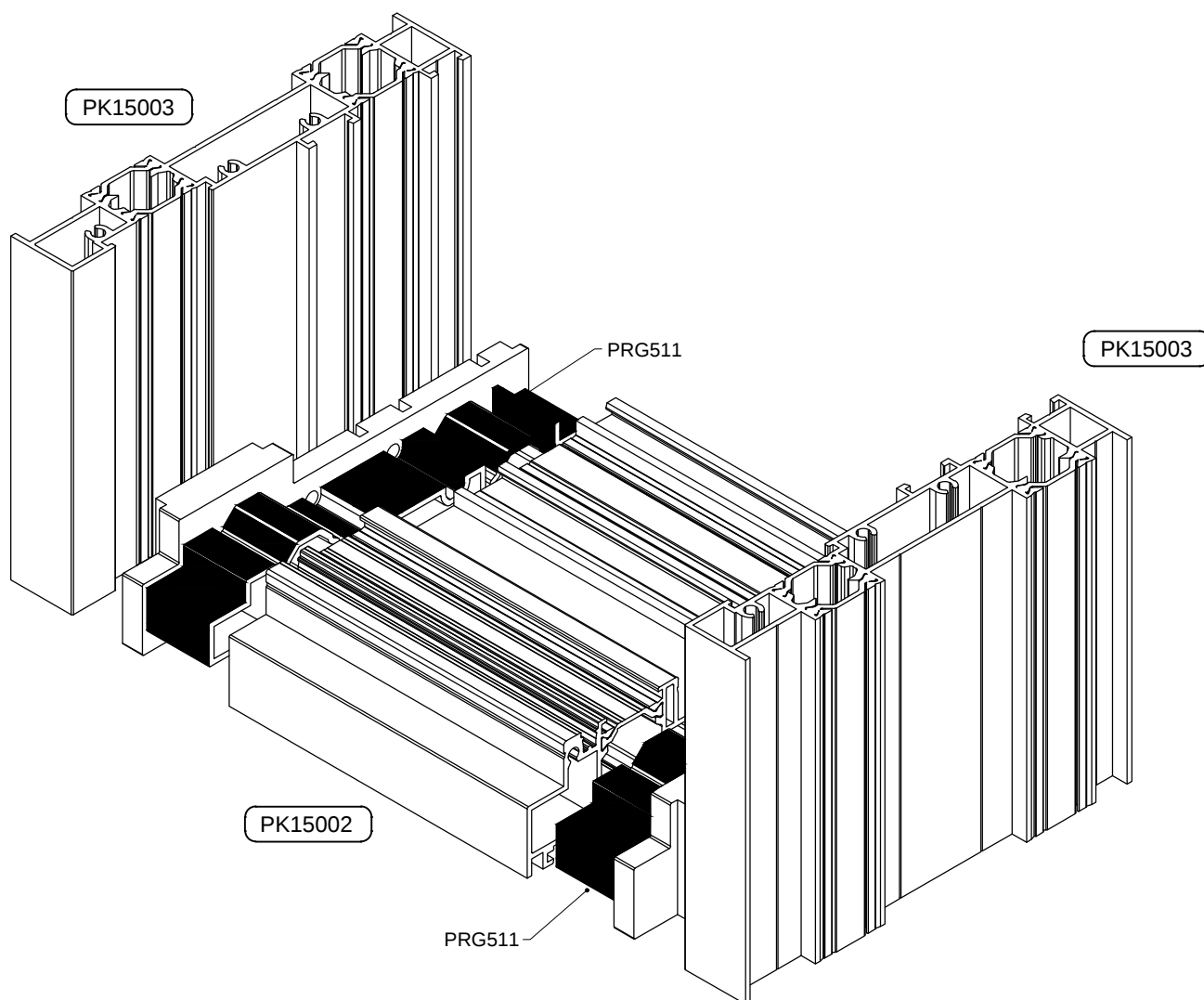
Donji sklop



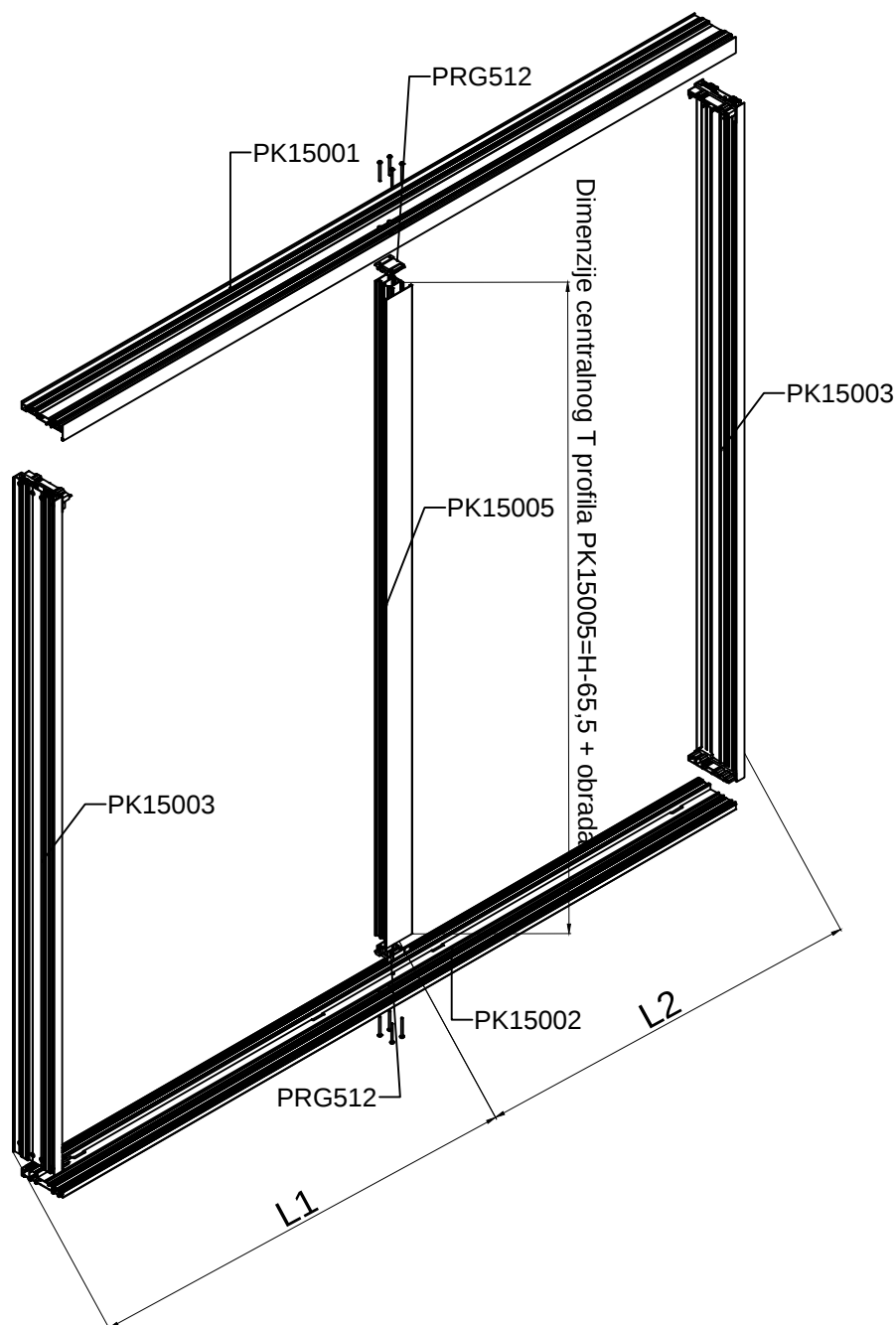


Donji sklop okvira

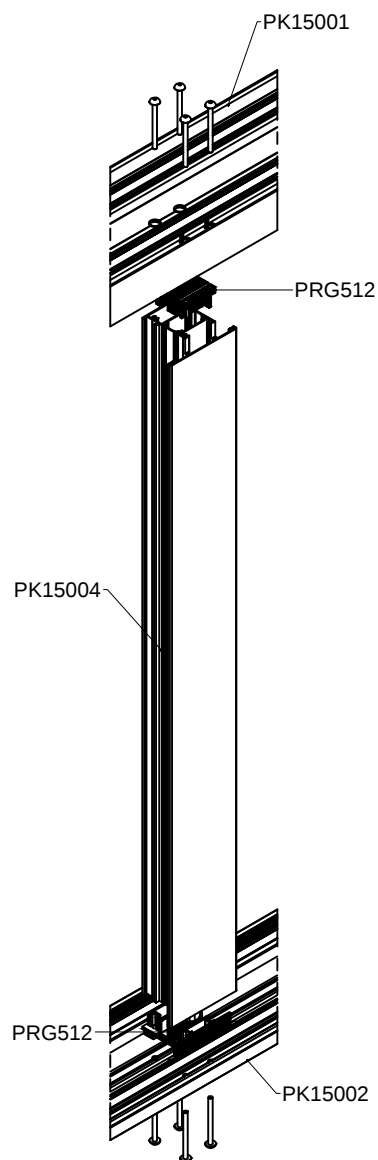
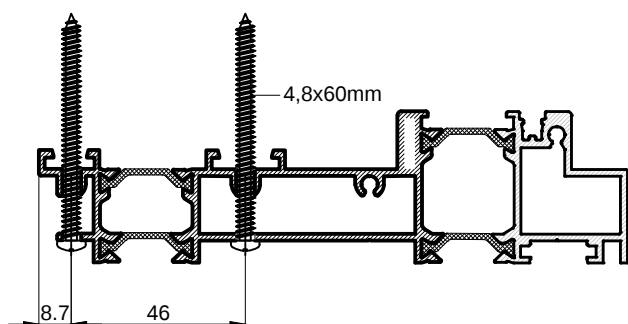
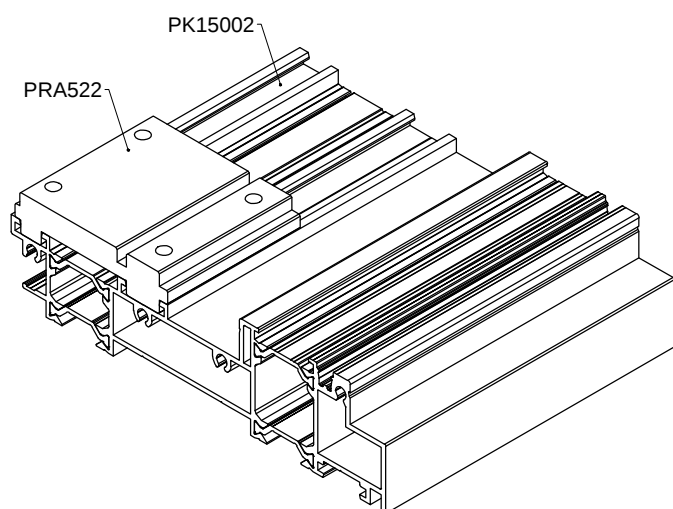
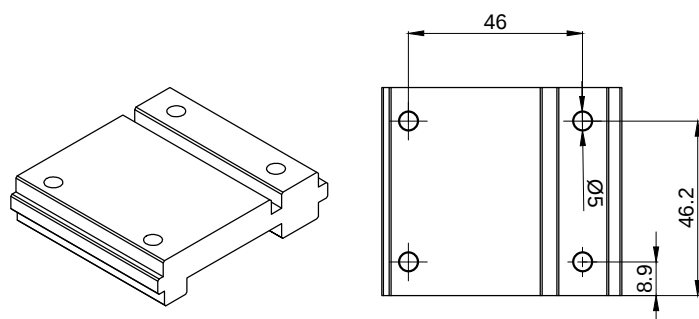
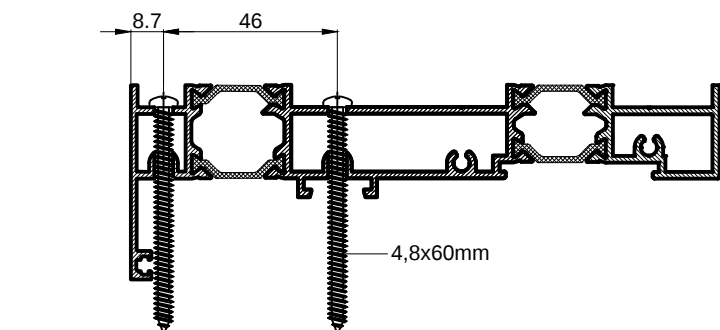
SVI ČEPOVI MORAJU BITI ZABRTVLJENI
MASOM ZA BRTVLJENJE - SIKA FLEX 221



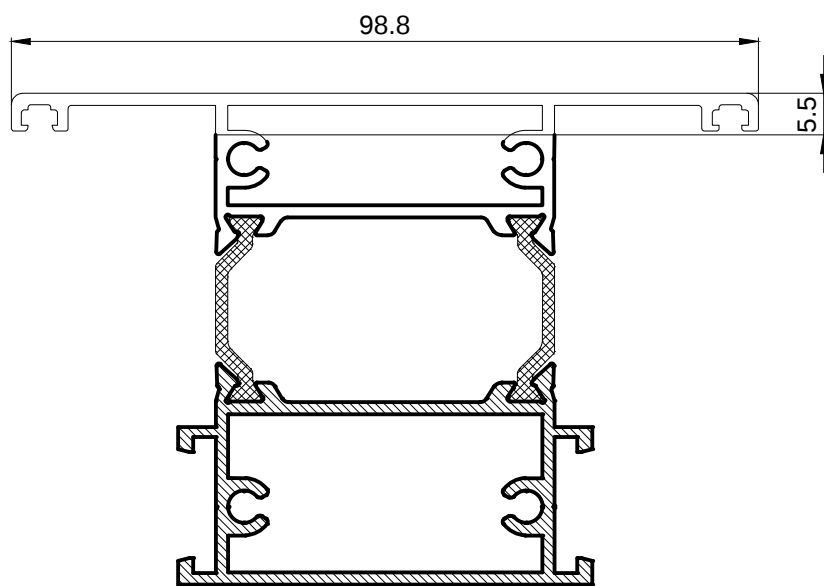
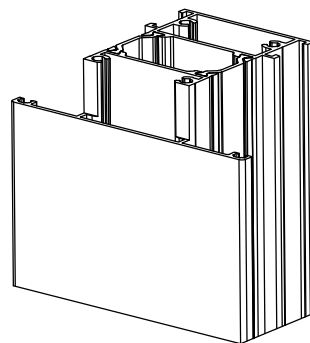
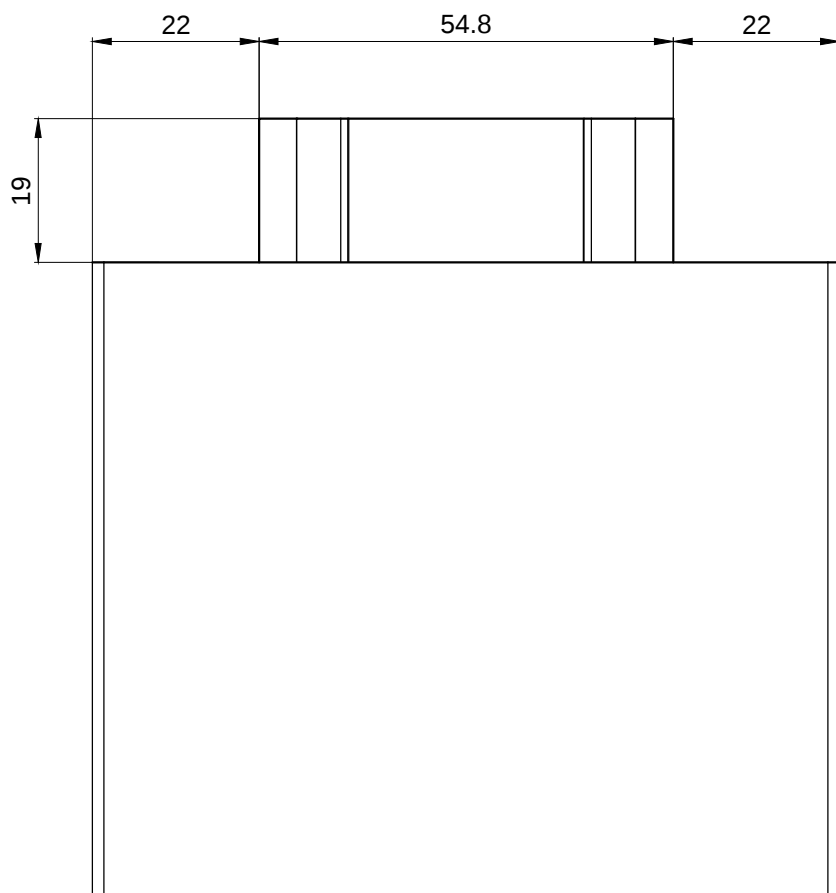
$L1=L2$



Obrada profila PK15001 i PK15002 kroz kalup za spajanje sa prečkom PK15005

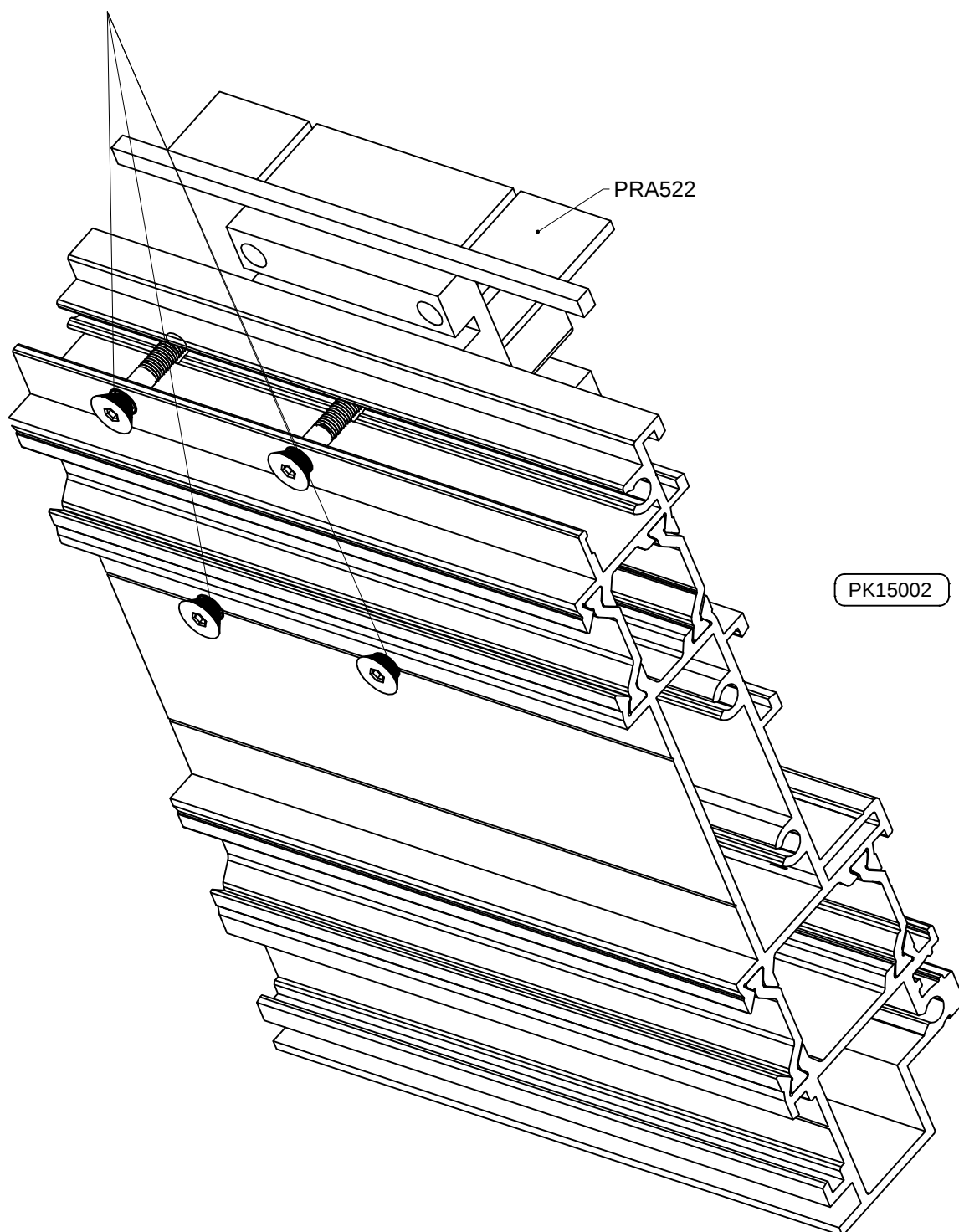


Obrada na profilu prečke PK15005 za spajanje na gornji okvir PK15001



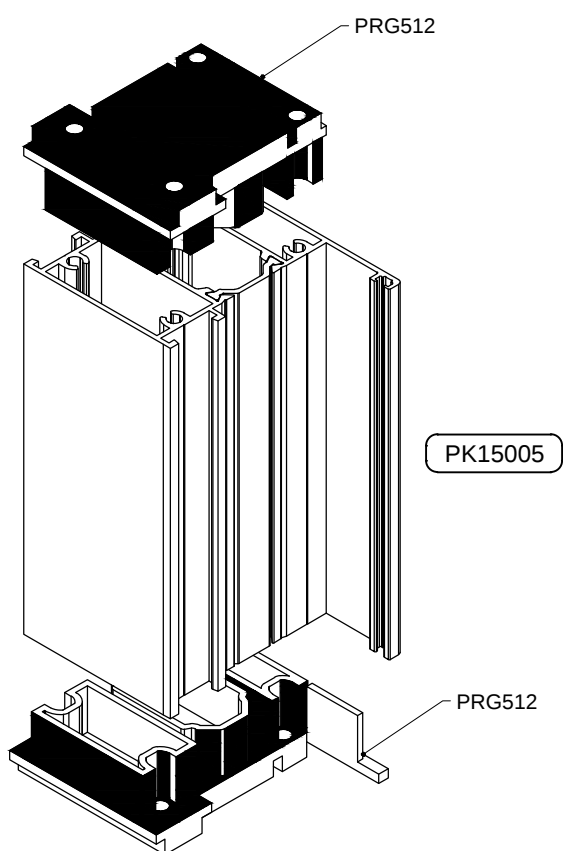
PK15005

BRTVLJENJE

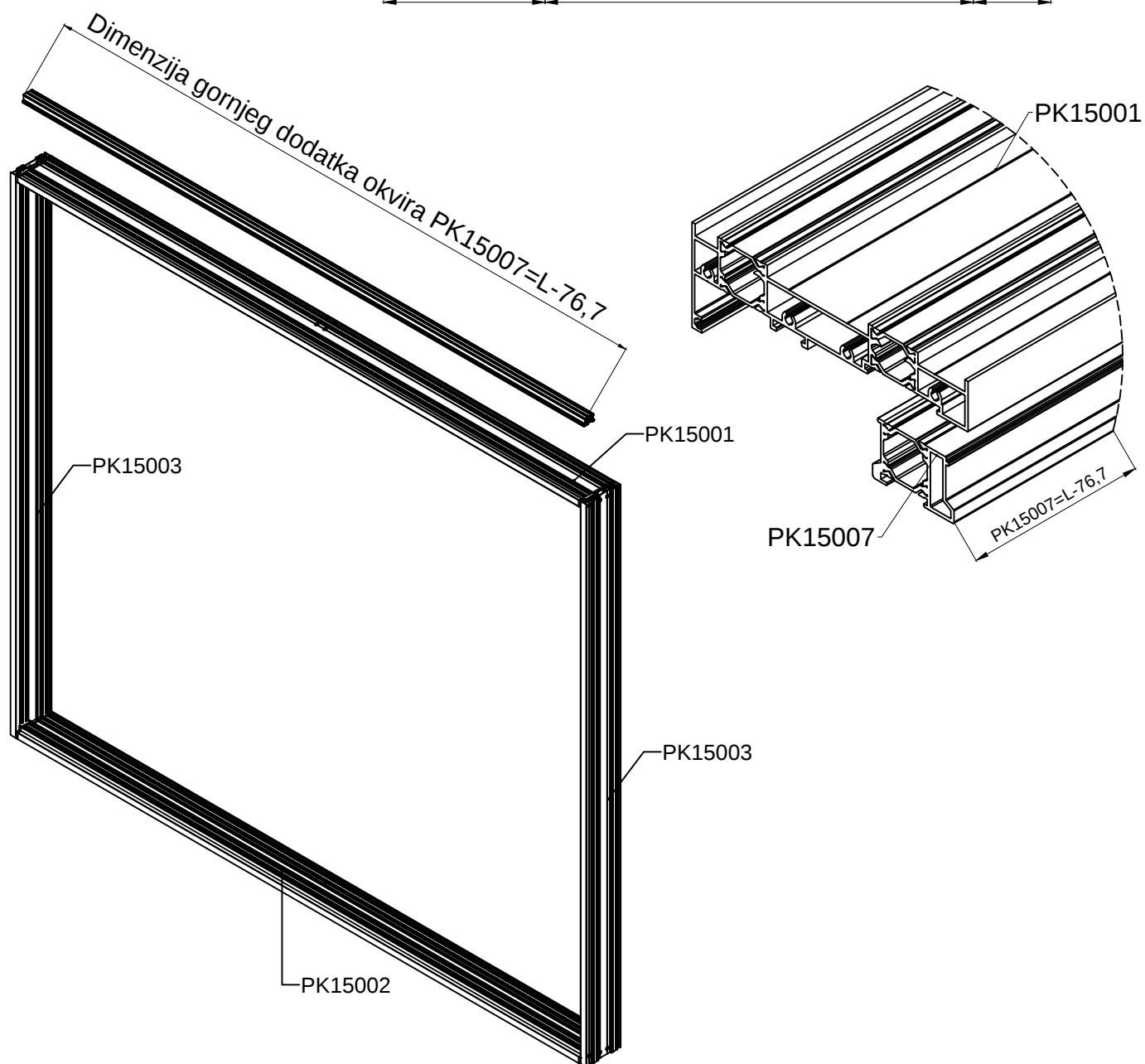
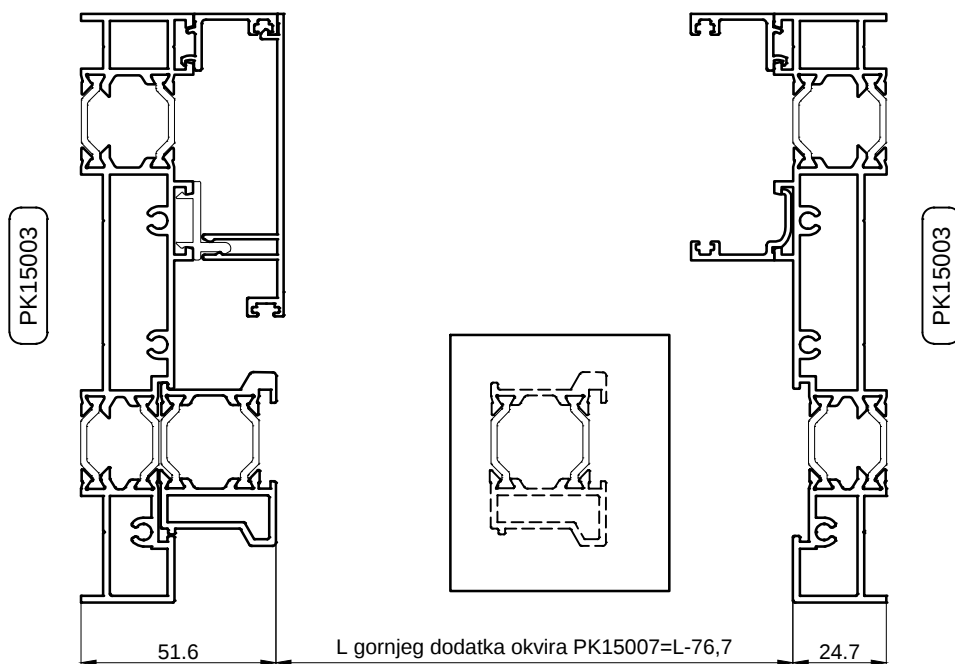


Srednji sklop okvira

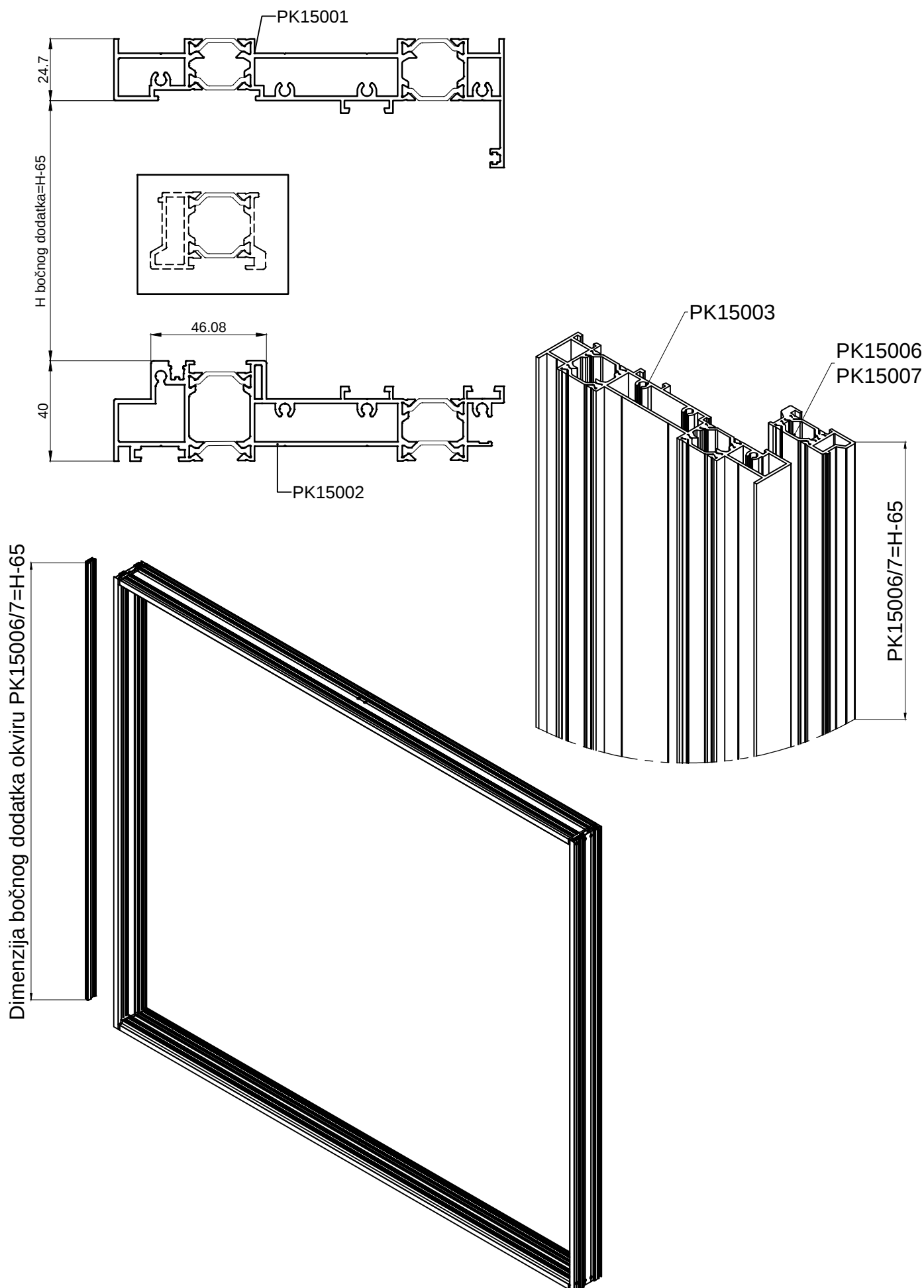
SVI ČEPOVI MORAJU BITI ZABRTVLJENI
MASOM ZA BRTVLJENJE - SIKA FLEX 221

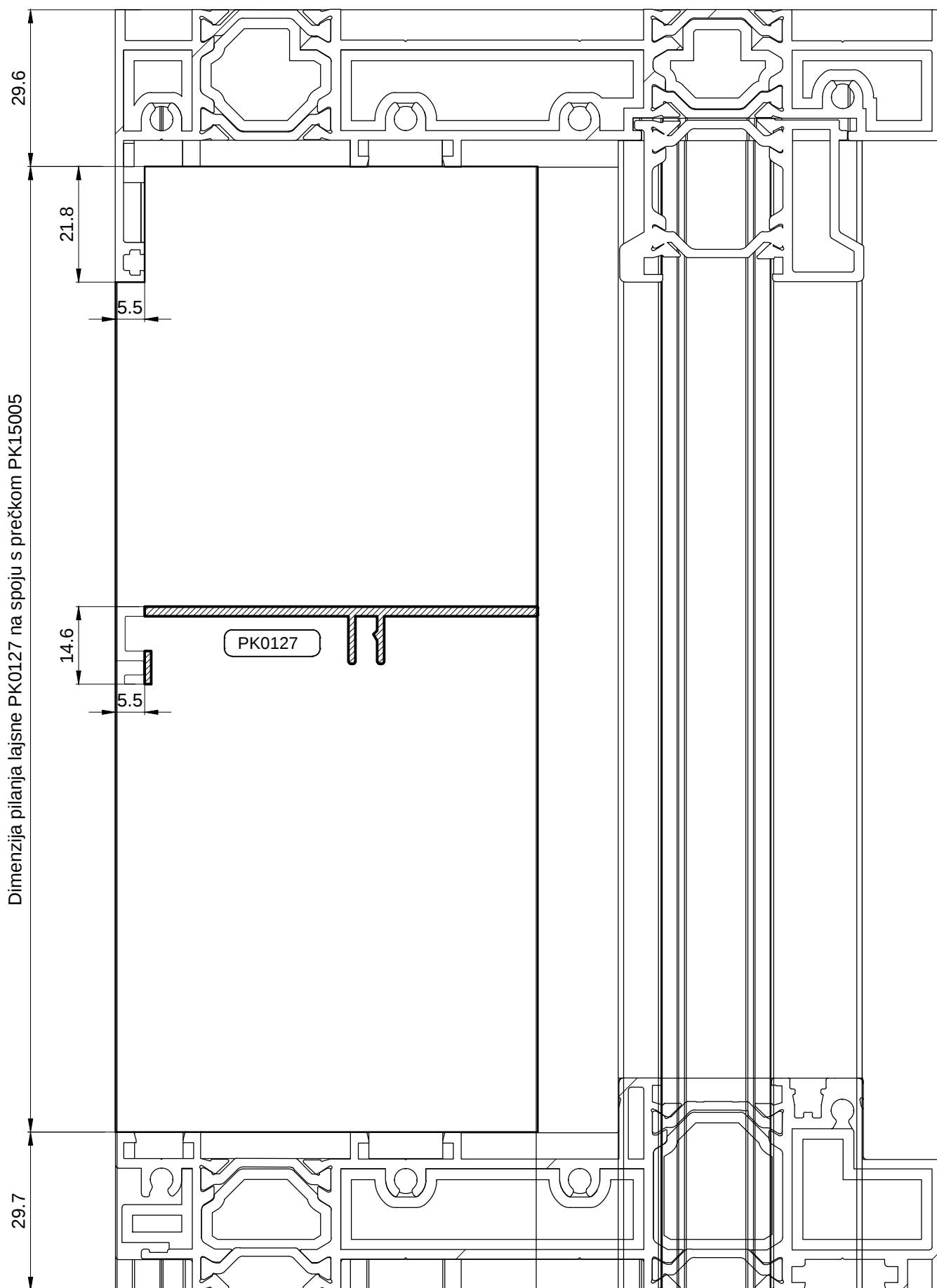


Dimenzija pilanja gornjeg dodatka okvira PK15007

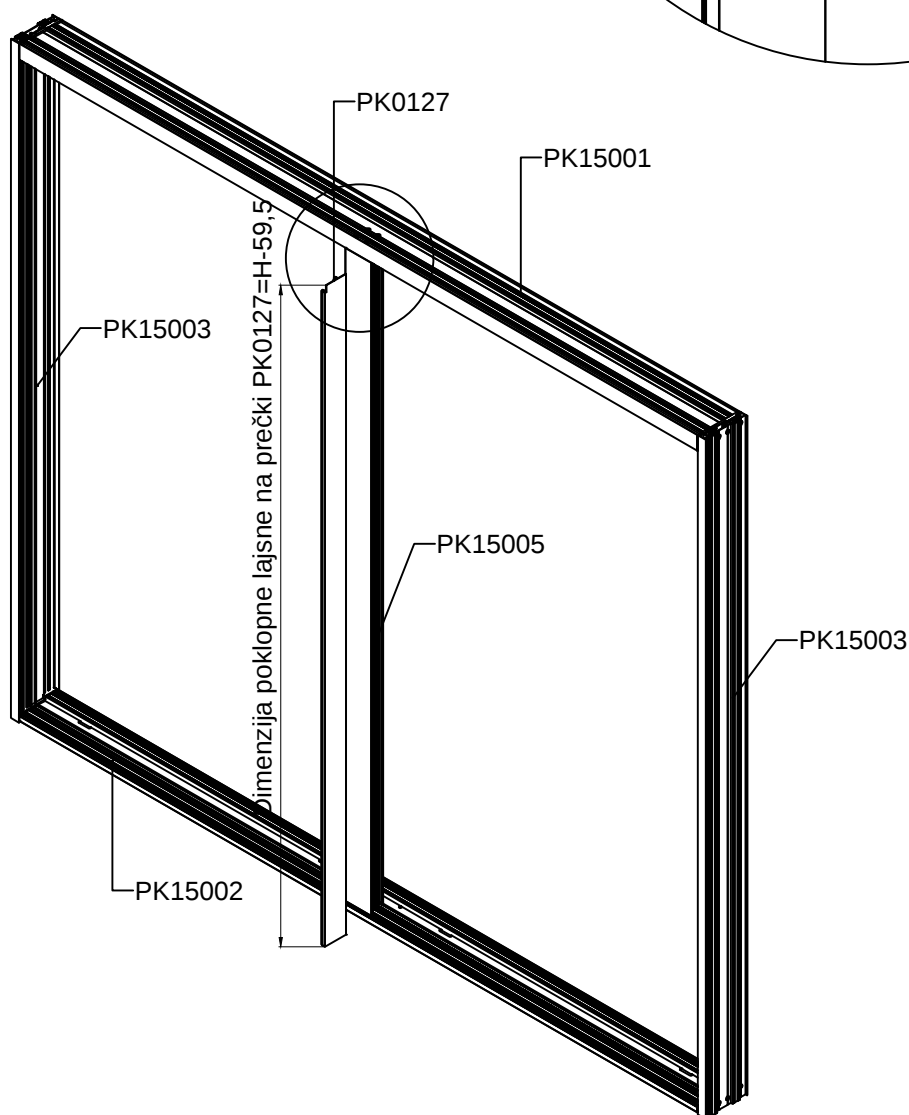
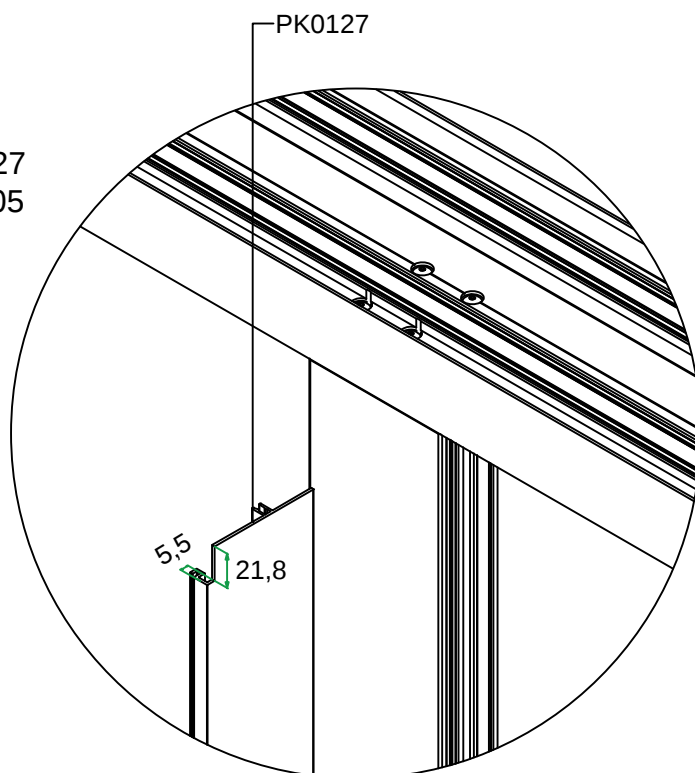


Dimenzija pilanja bočnog dodatka okvira PK15006/PK15007

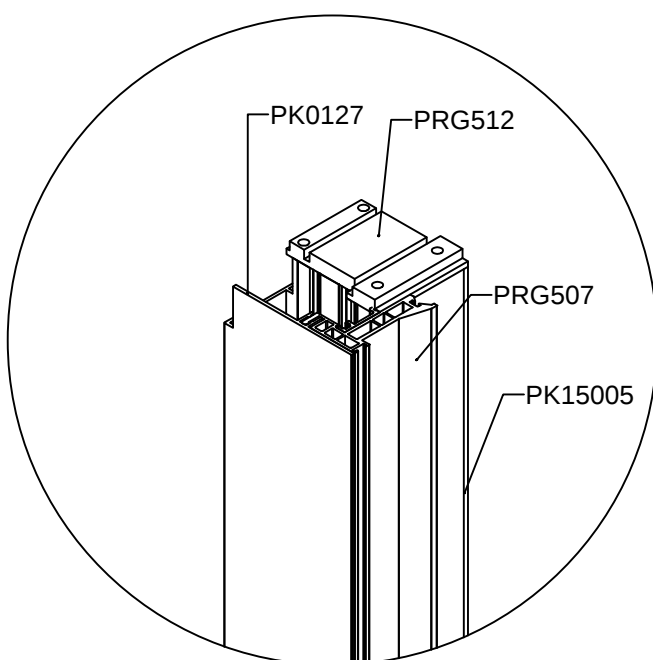
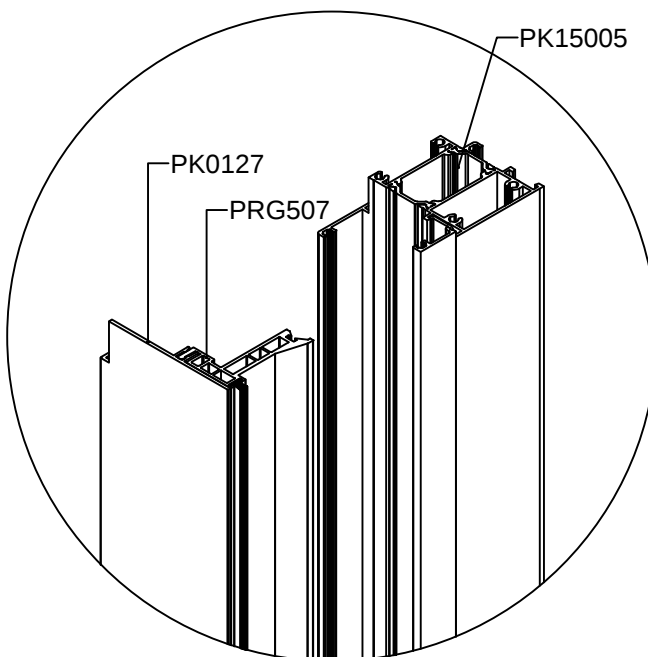
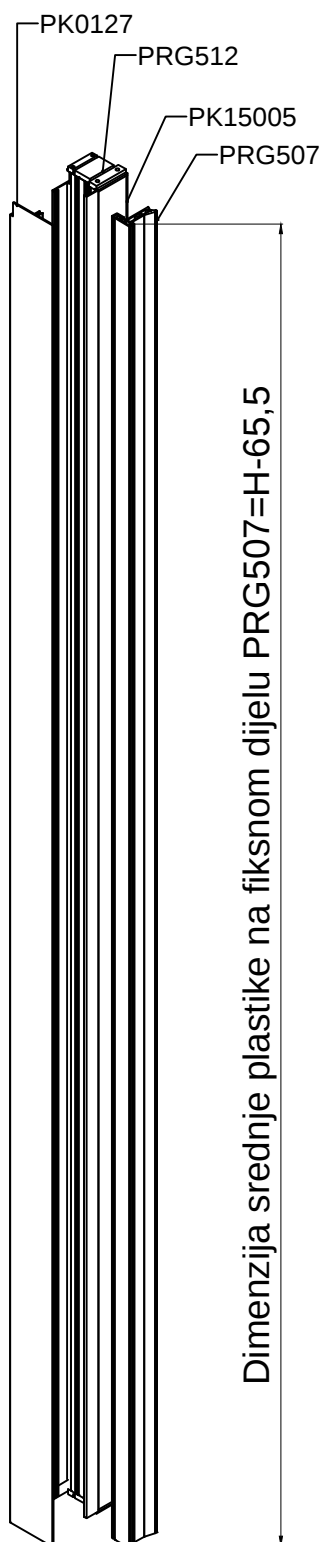


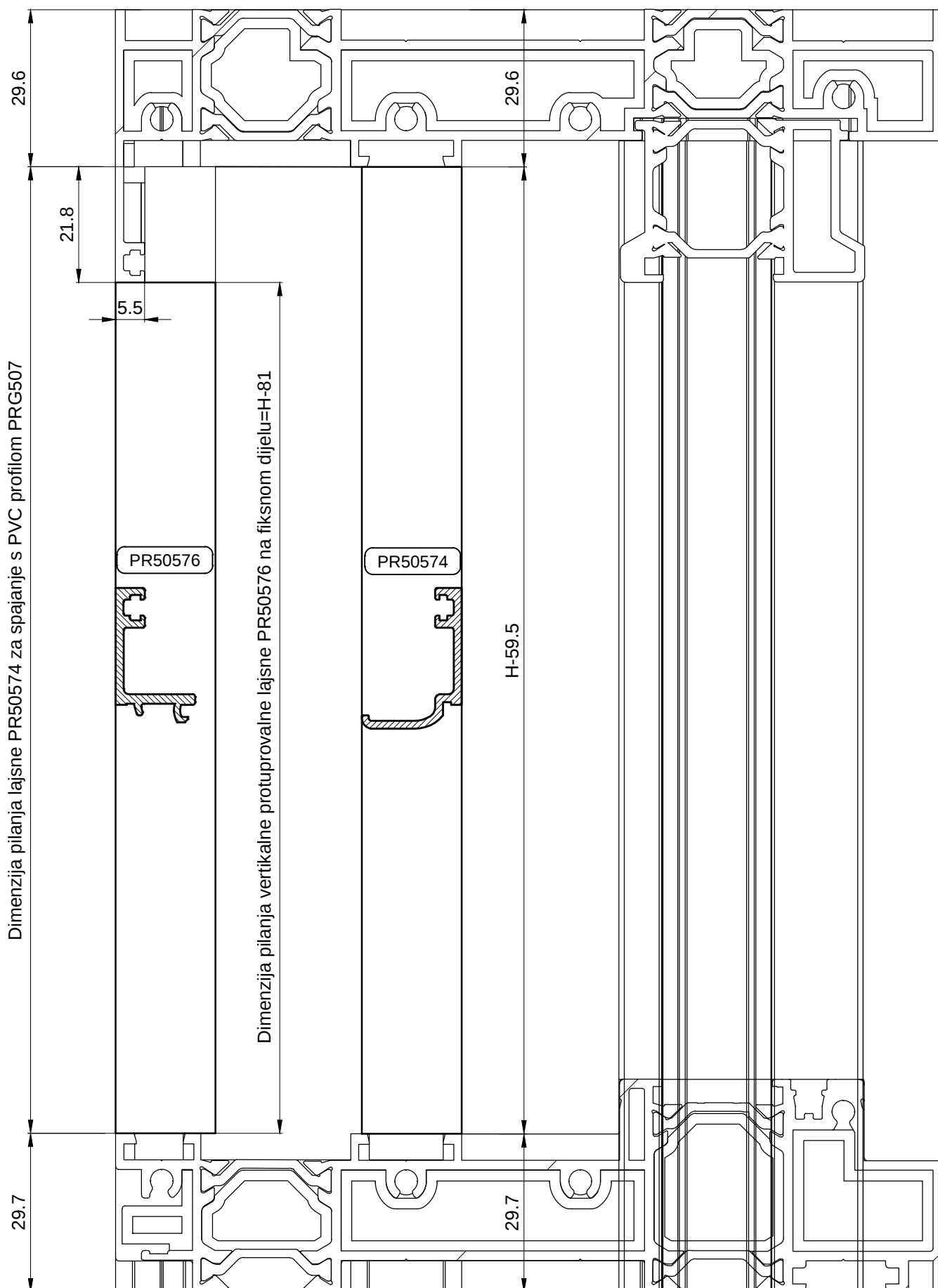


Obrada na profilu lajsne PK0127
za spajanje s prečkom PK15005

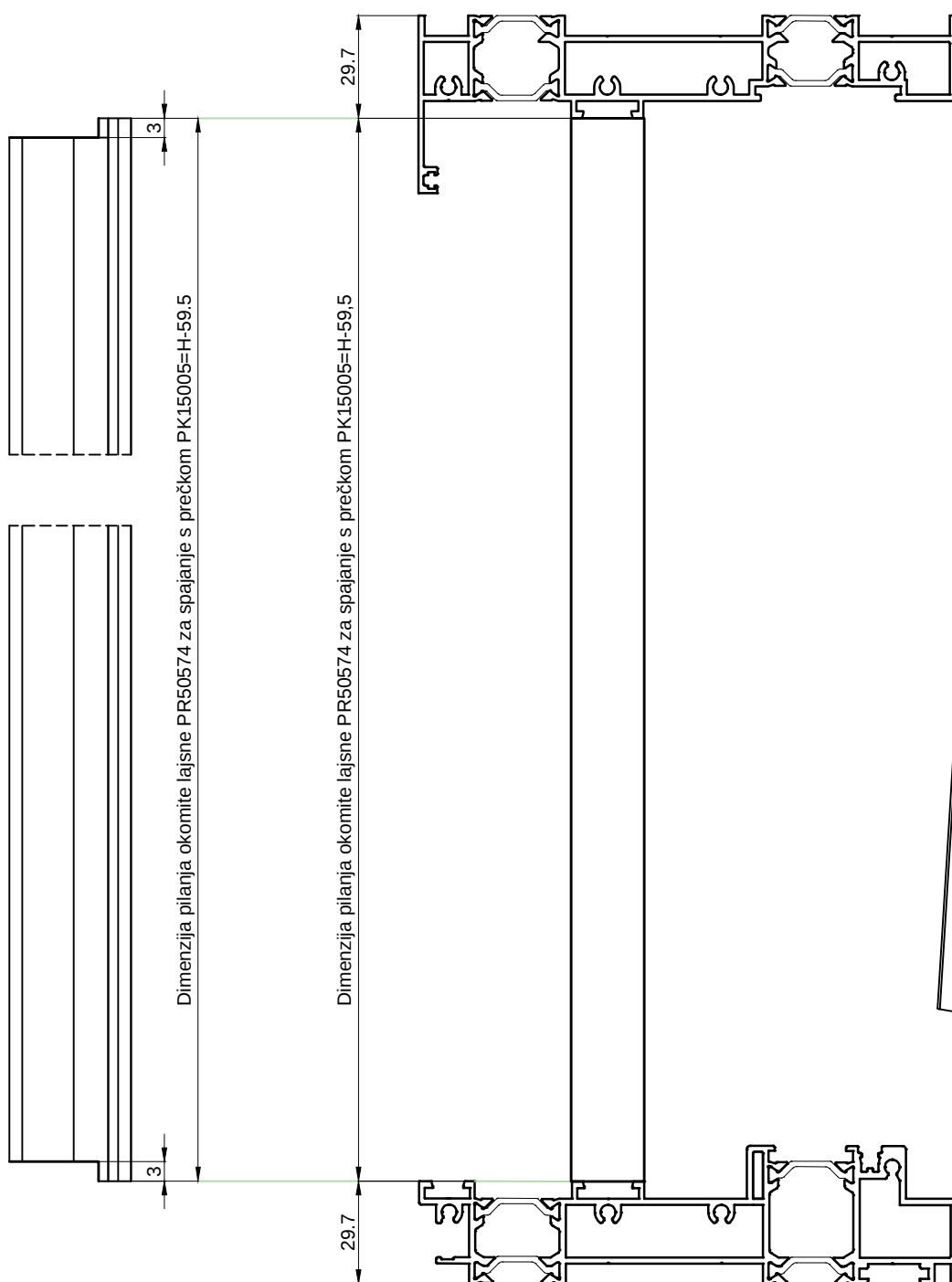
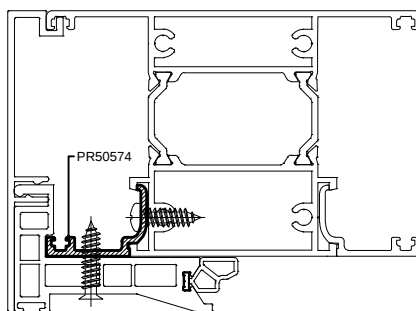
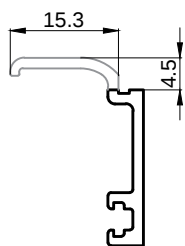


Središnji sklop profila - spajanje lajsne PK0127 i PVC profila PRG507 sa centralnom prečkom PK15005

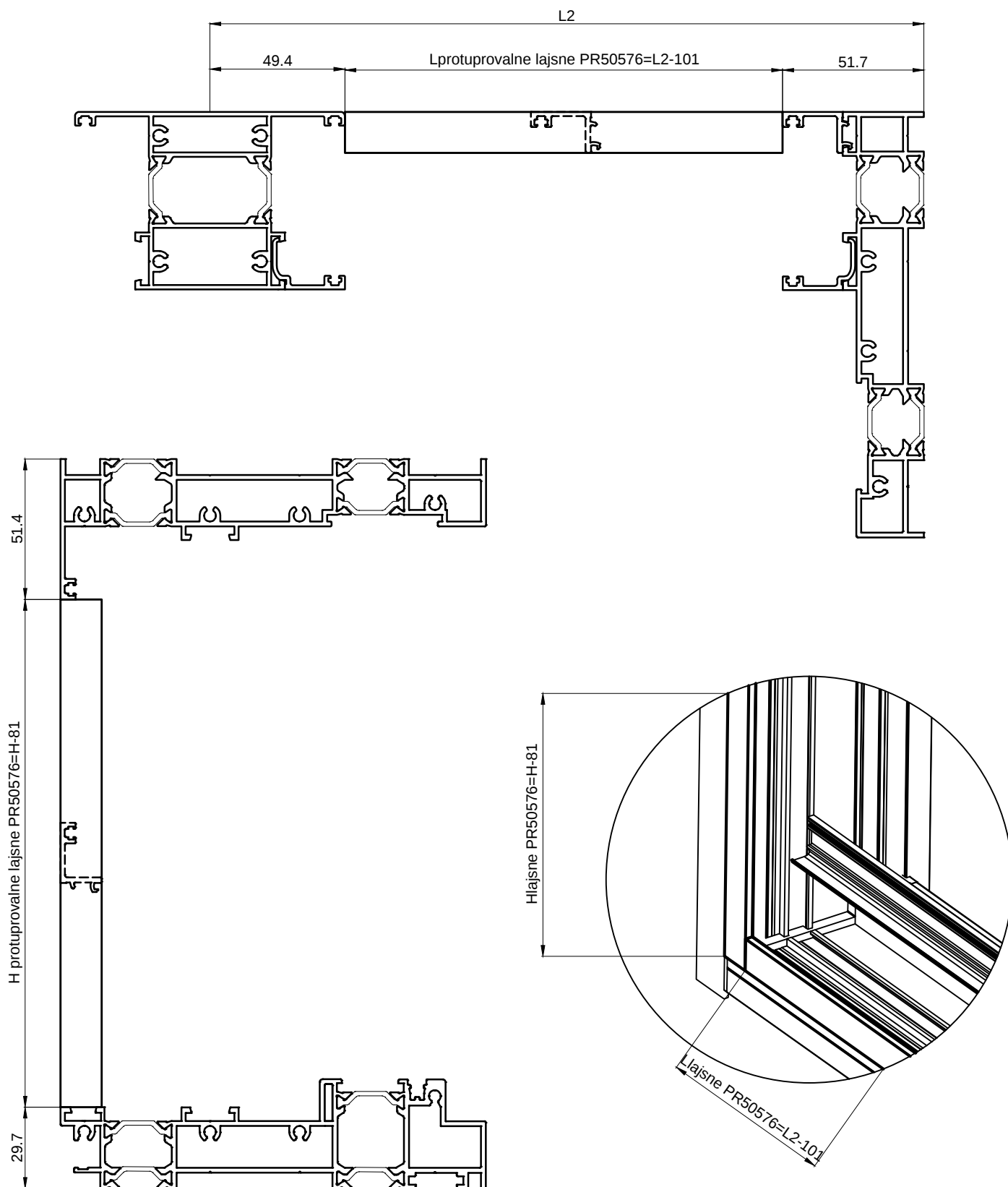




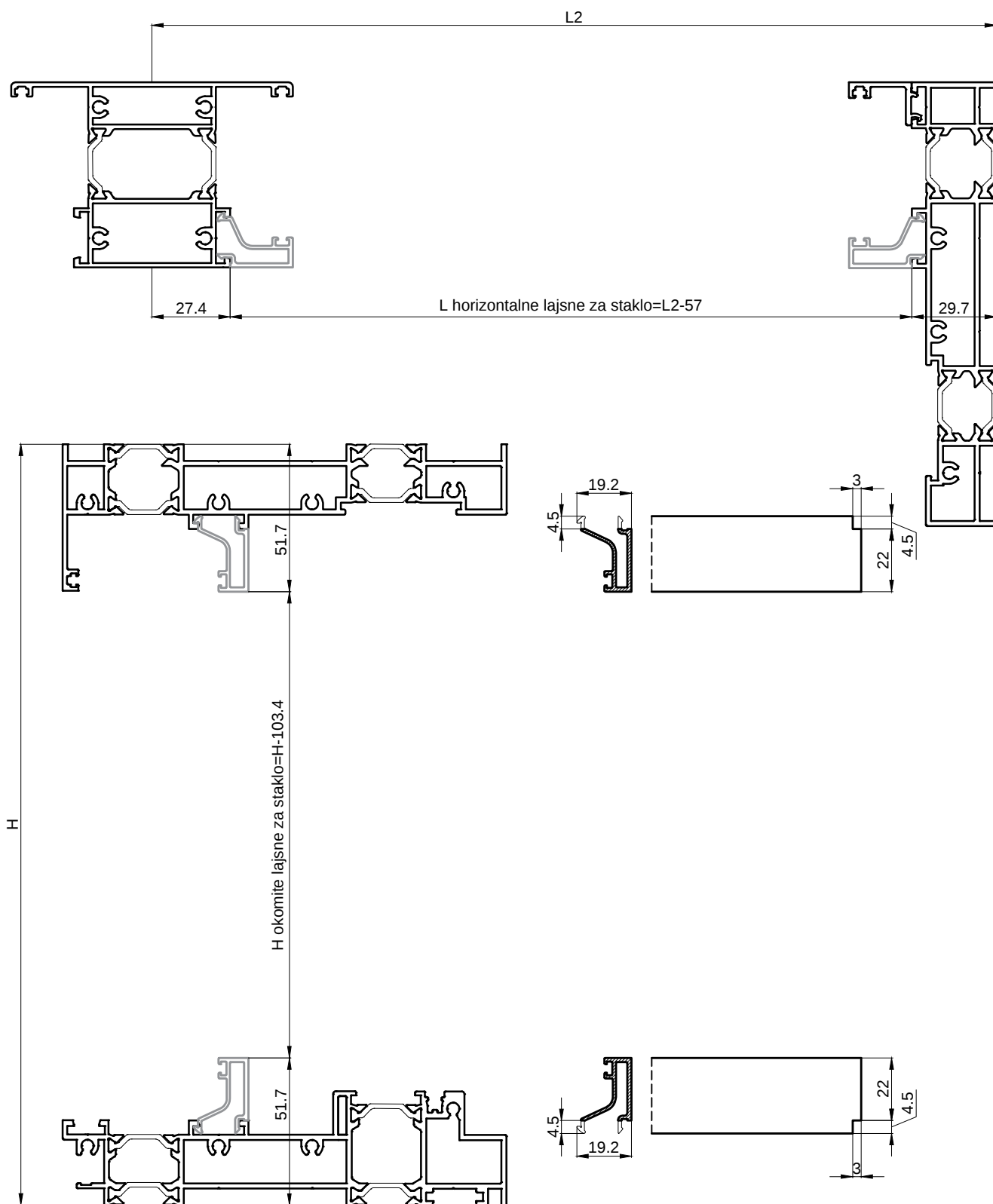
Obrada na profilu lajsne PR50574 za spajanje s PVC profilom PRG507 i prečkom PK15005



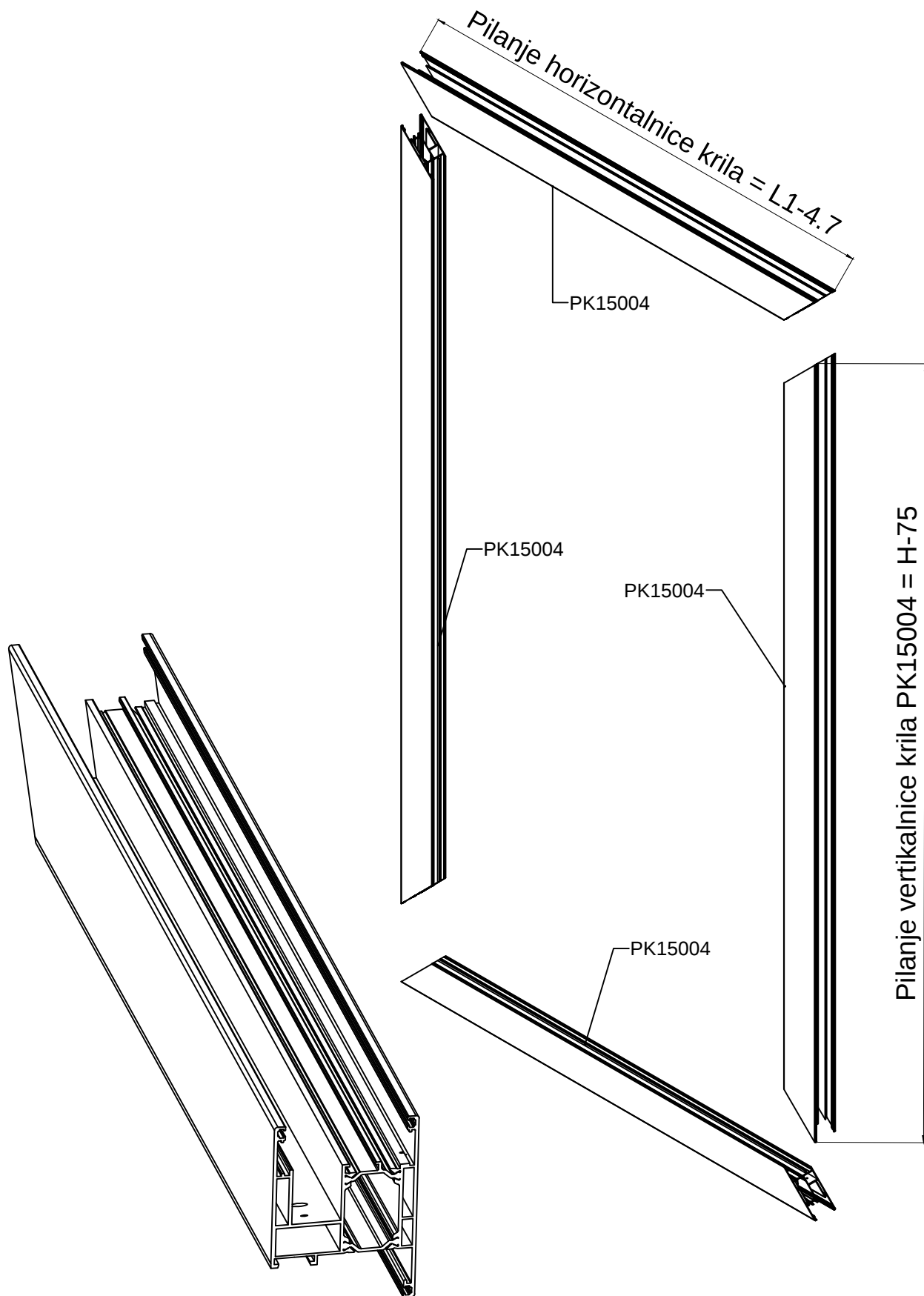
Dimenzija pilanja protuprovalne horizontalne lajsne PR50576 na fiksnom dijelu

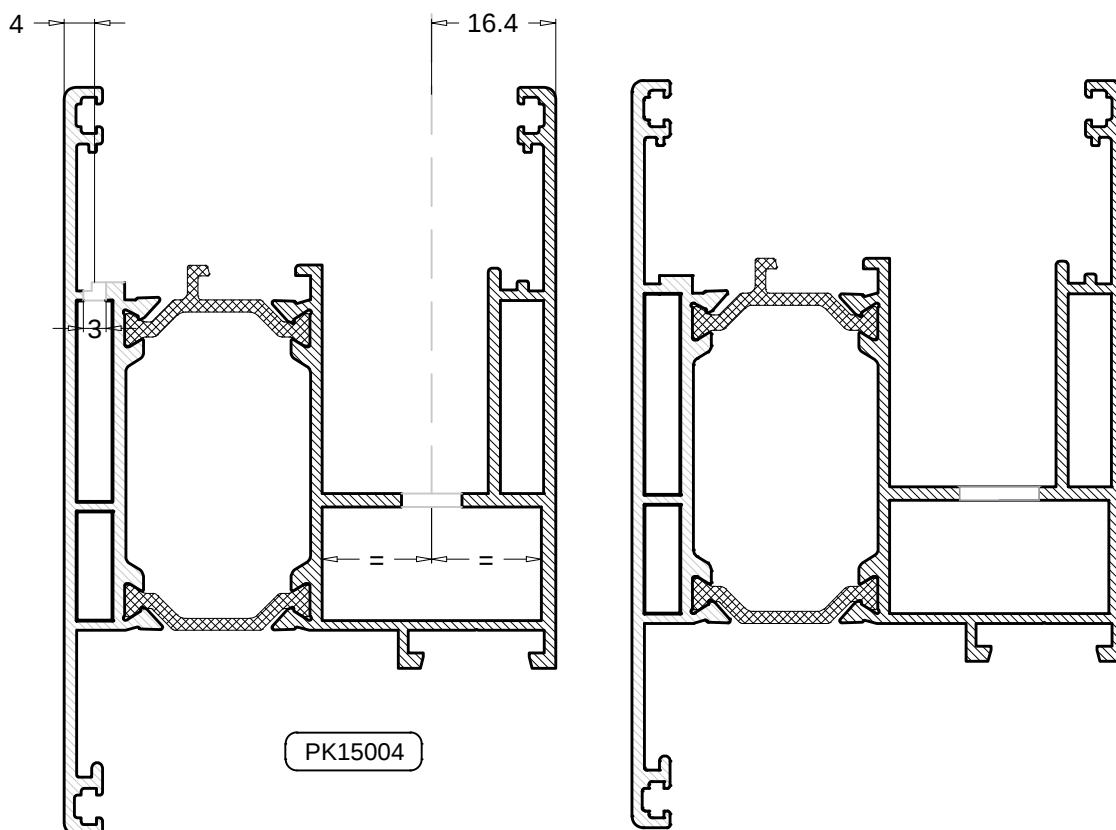
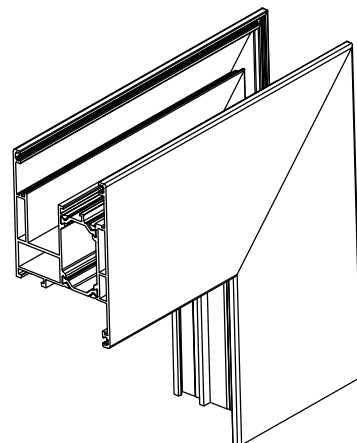
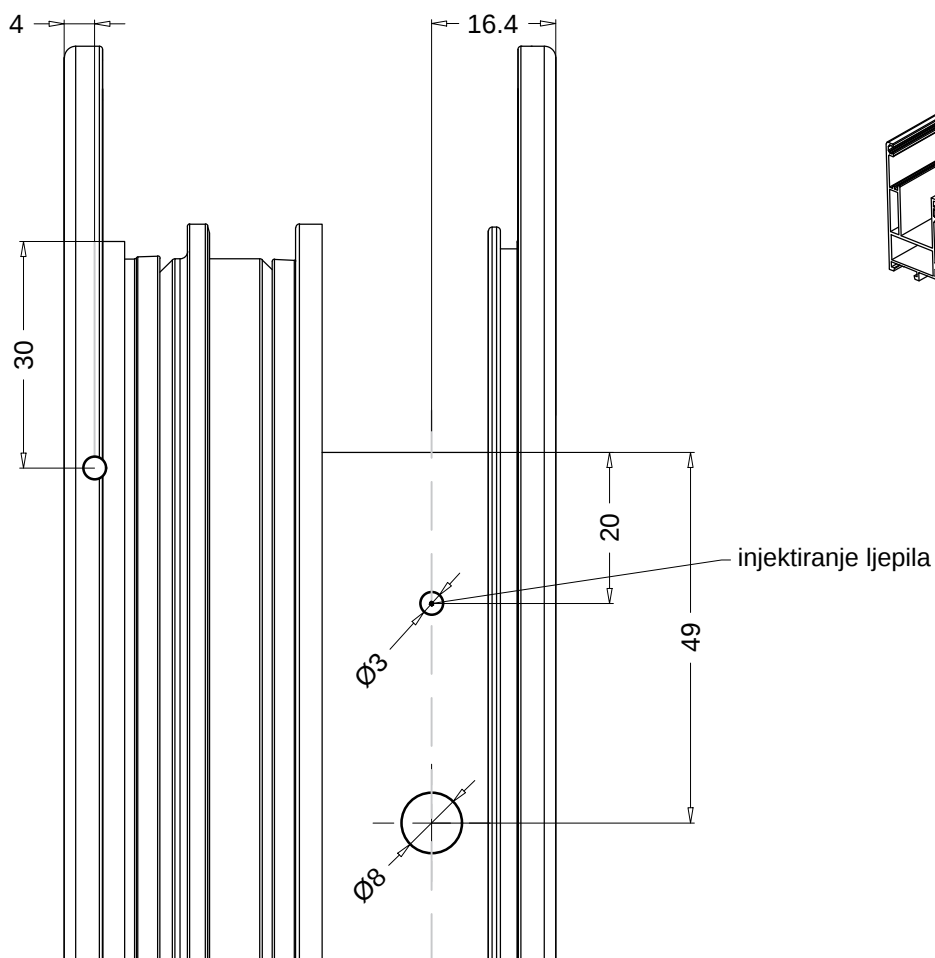


Dimenzija pilanja lajsni za staklo na fiksnom dijelu



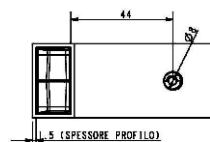
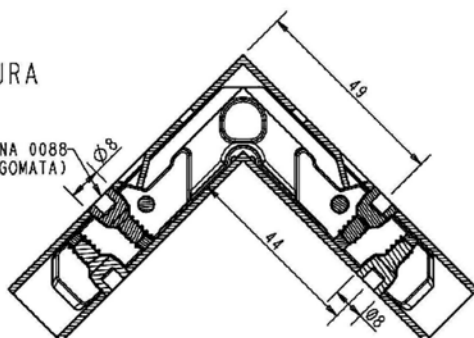
Dimenzije pilanja kliznog krila PK15004





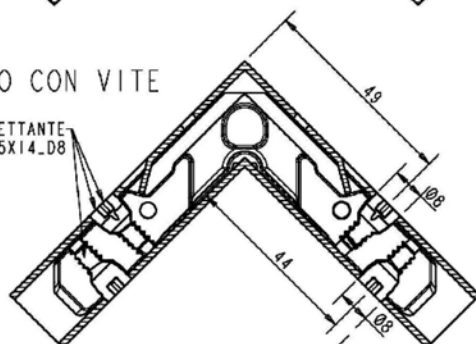
SPINATURA

SPINA 0088-
(Ø8x14 SAGOMATA)

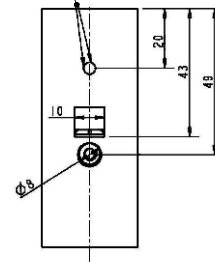
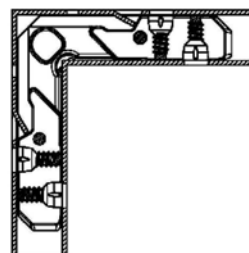


SERRAGGIO CON VITE

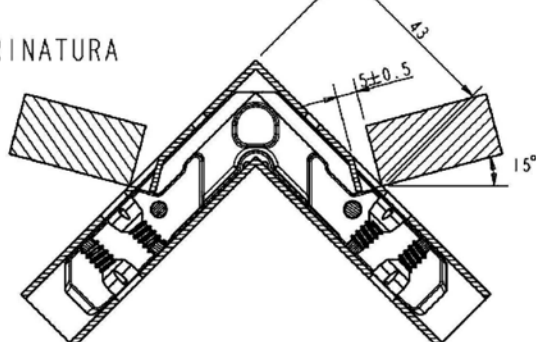
VITE AUTOFILETTANTE
VILM5X14_D8

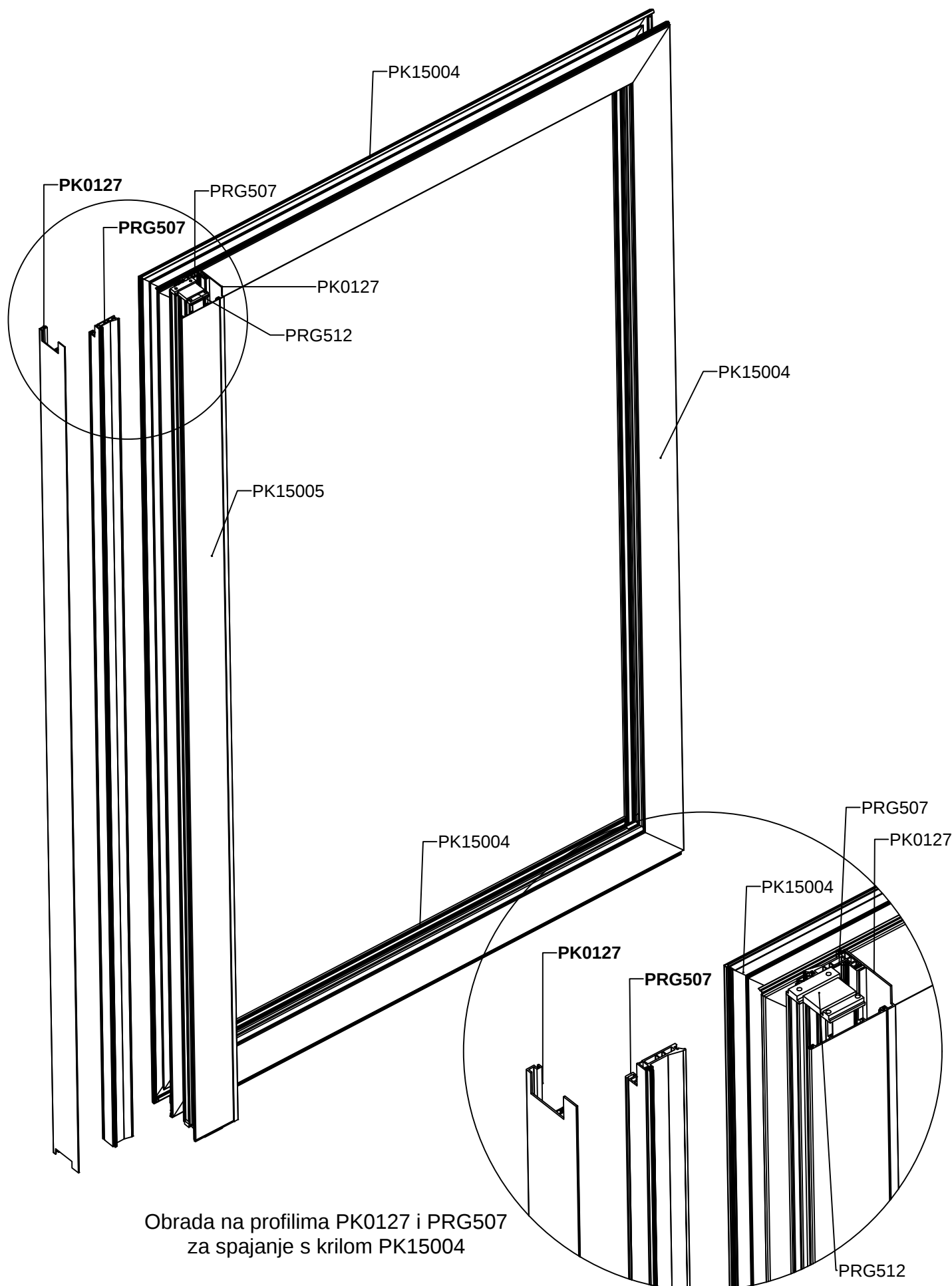


injektiranje ljepila

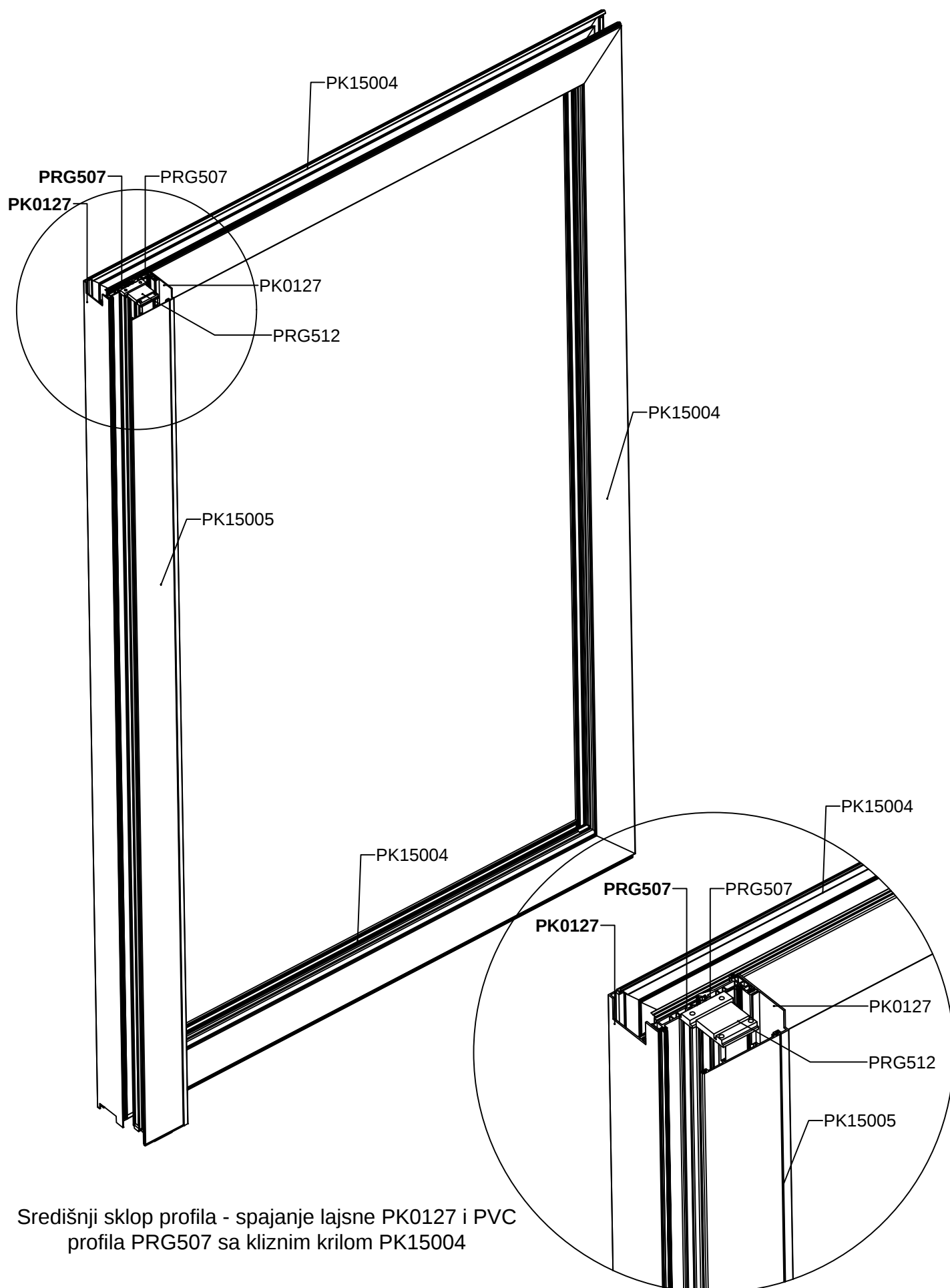


CIANFRINATURA



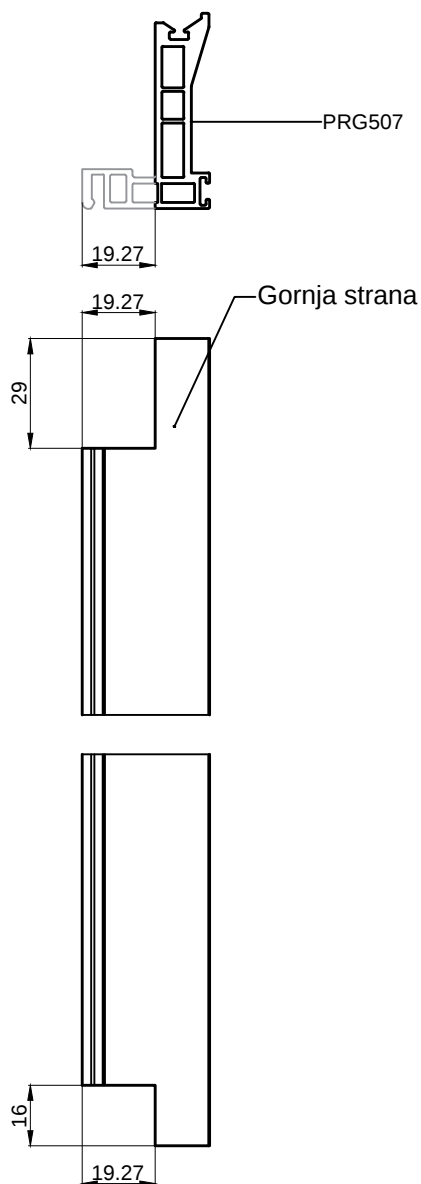


Obrada na profilima PK0127 i PRG507
za spajanje s krilom PK15004

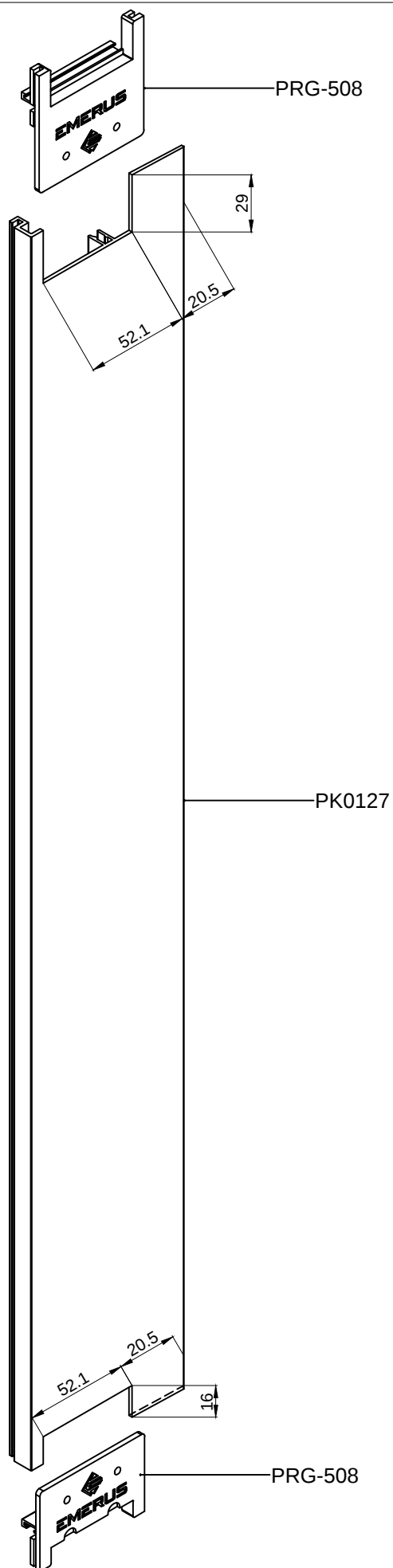


Središnji sklop profila - spajanje lajsne PK0127 i PVC profila PRG507 sa kliznim krilom PK15004

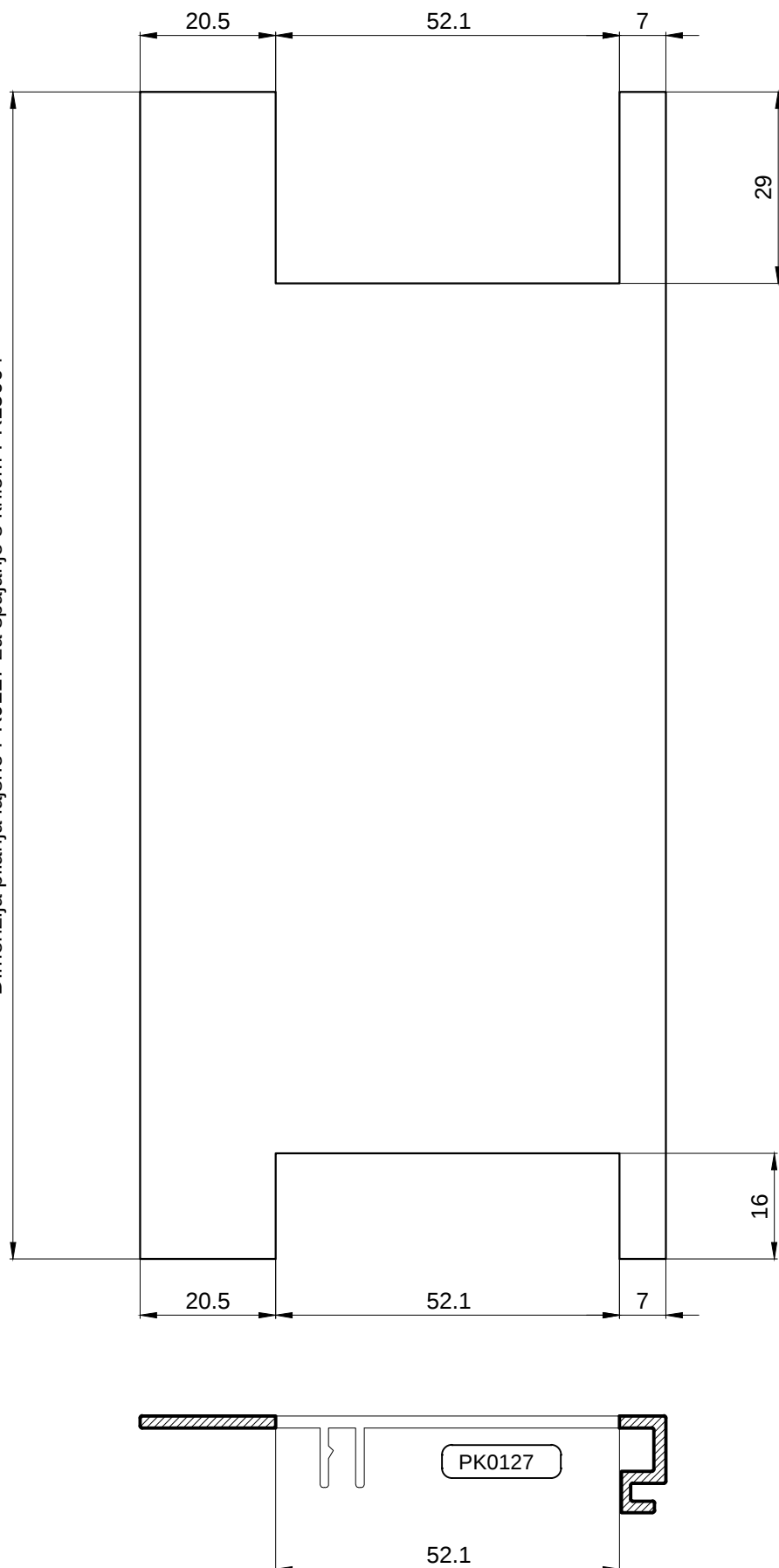
Obrada na PVC profilu PRG507 za spajanje s poklopnom lajsnom PK0127 na krilu



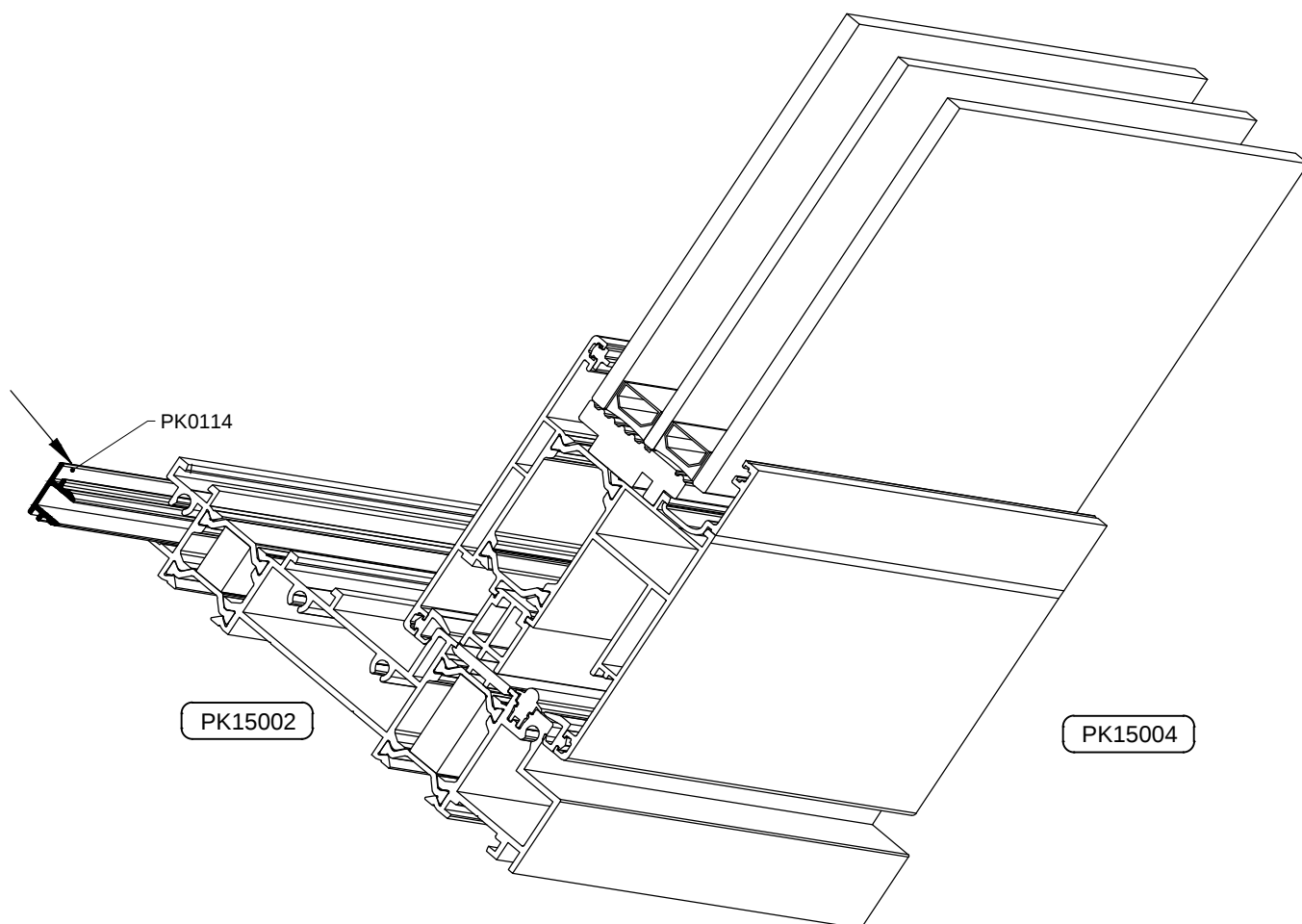
Obrada na profilu PK0127 za spajanje s krilom i umetanje čepa PRG-508



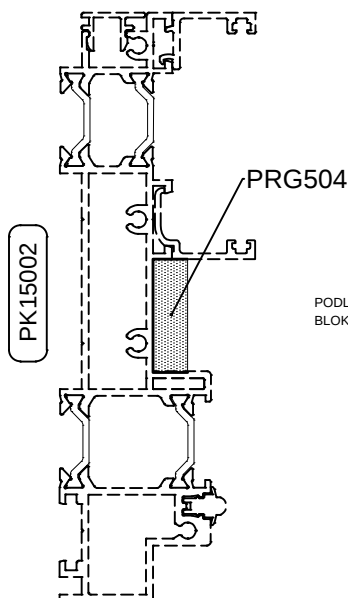
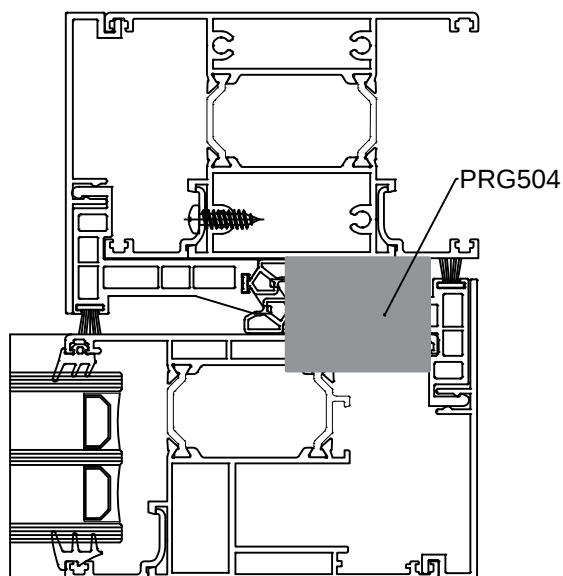
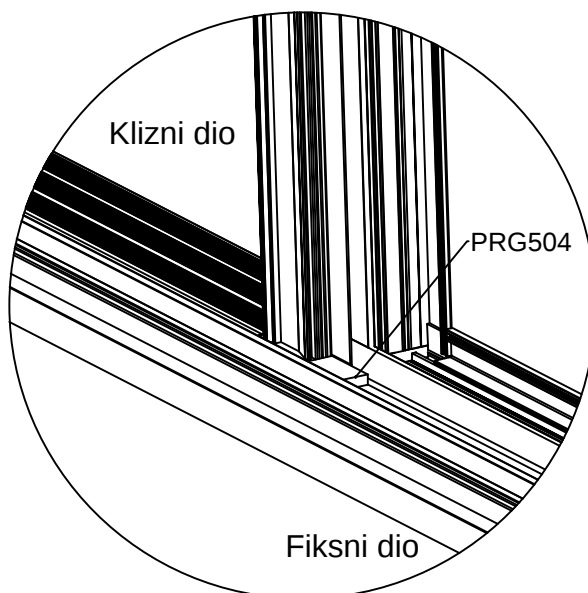
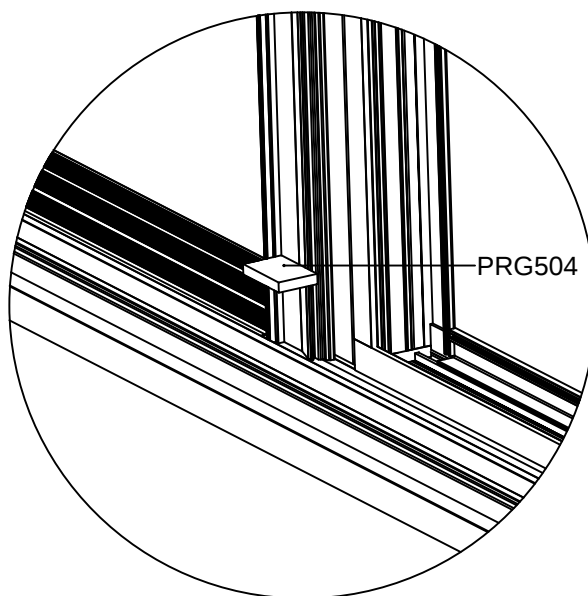
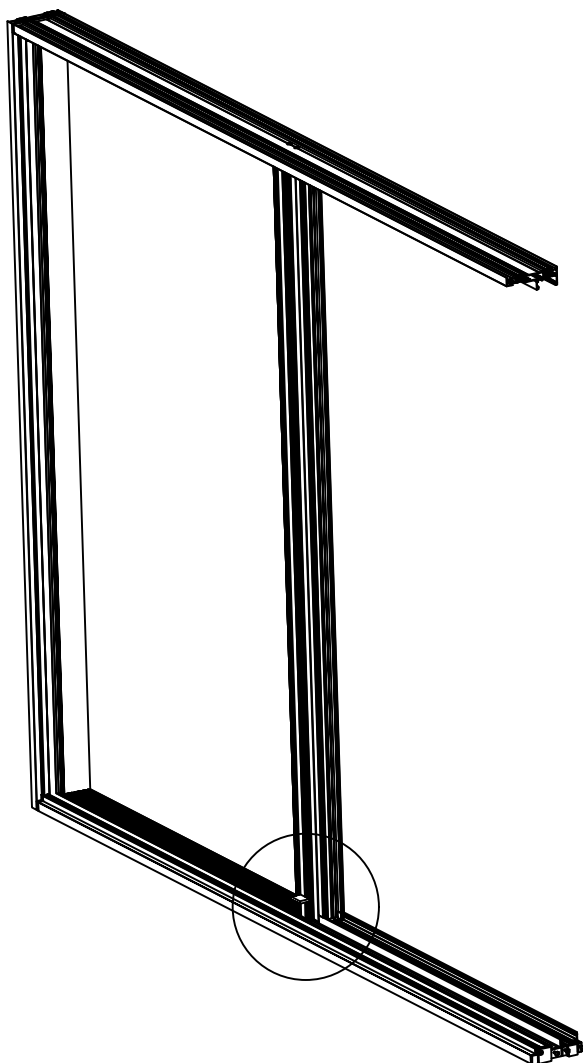
Dimenzija pilanja lajsne PK0127 za spajanje s krilom PK15004



Montaža profila PK0114 na okvir PK15002

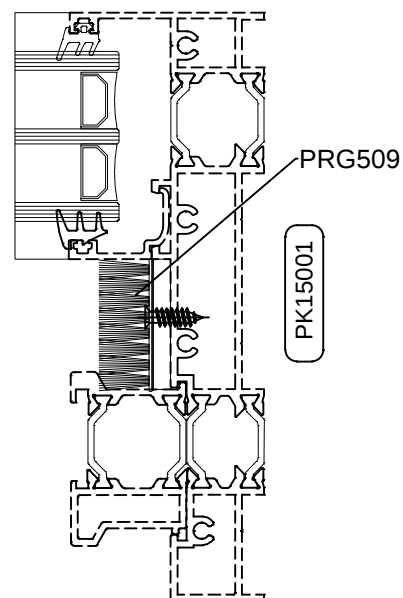
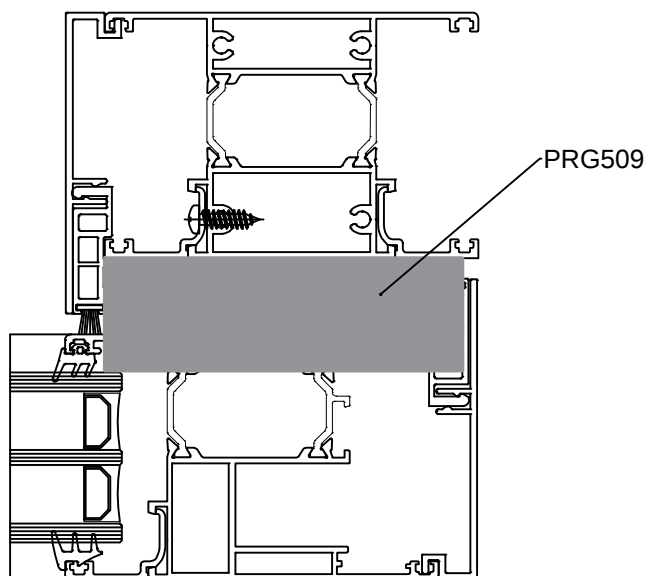
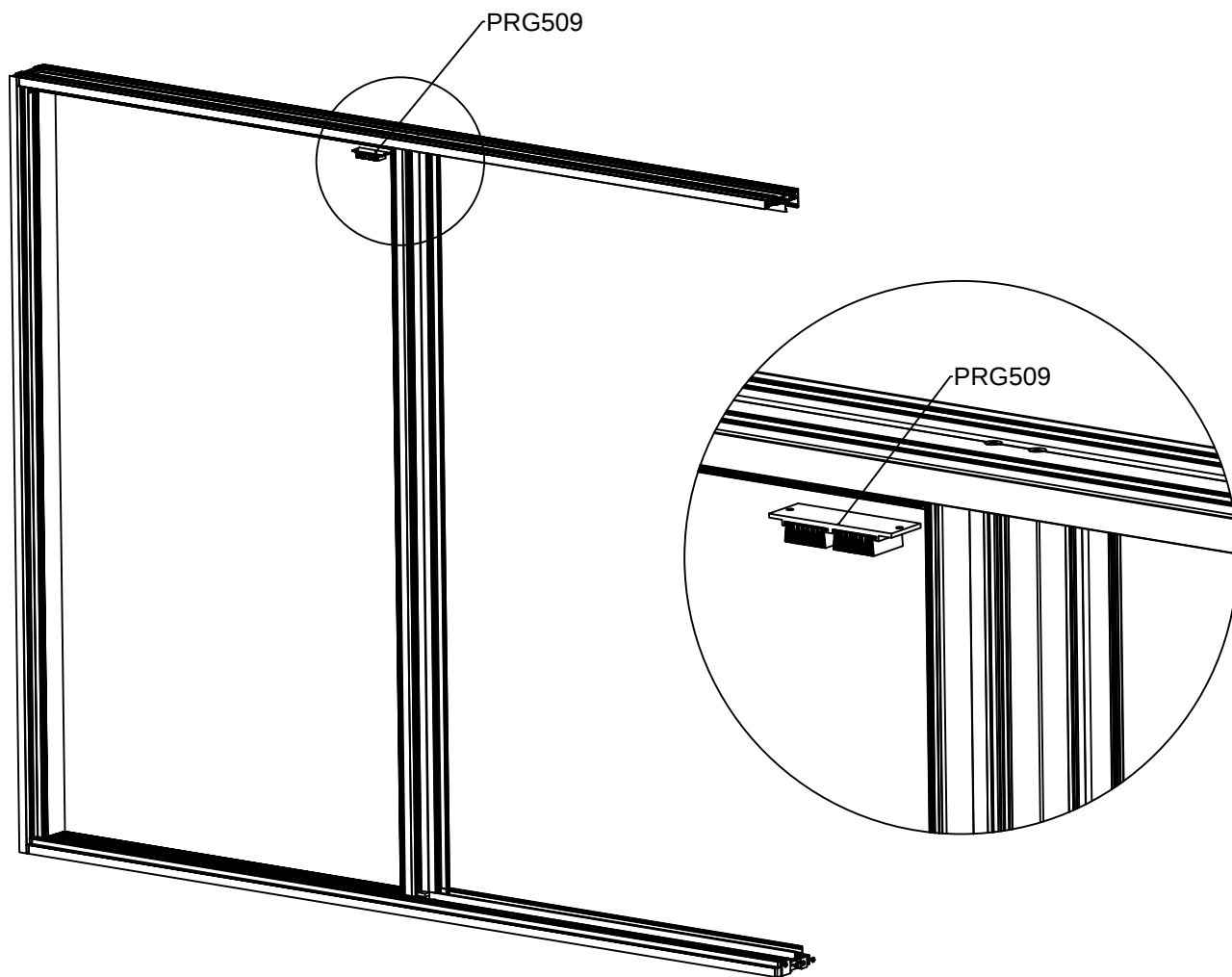


Pozicioniranje brtvenog bloka PRG504 između T profila PK15005 i profila krila PK15004

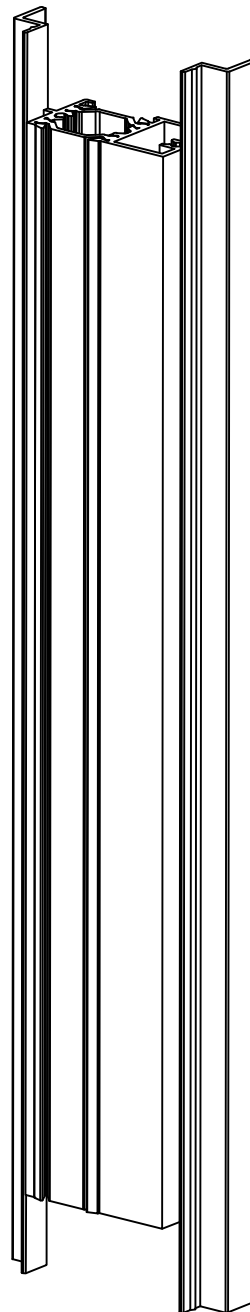
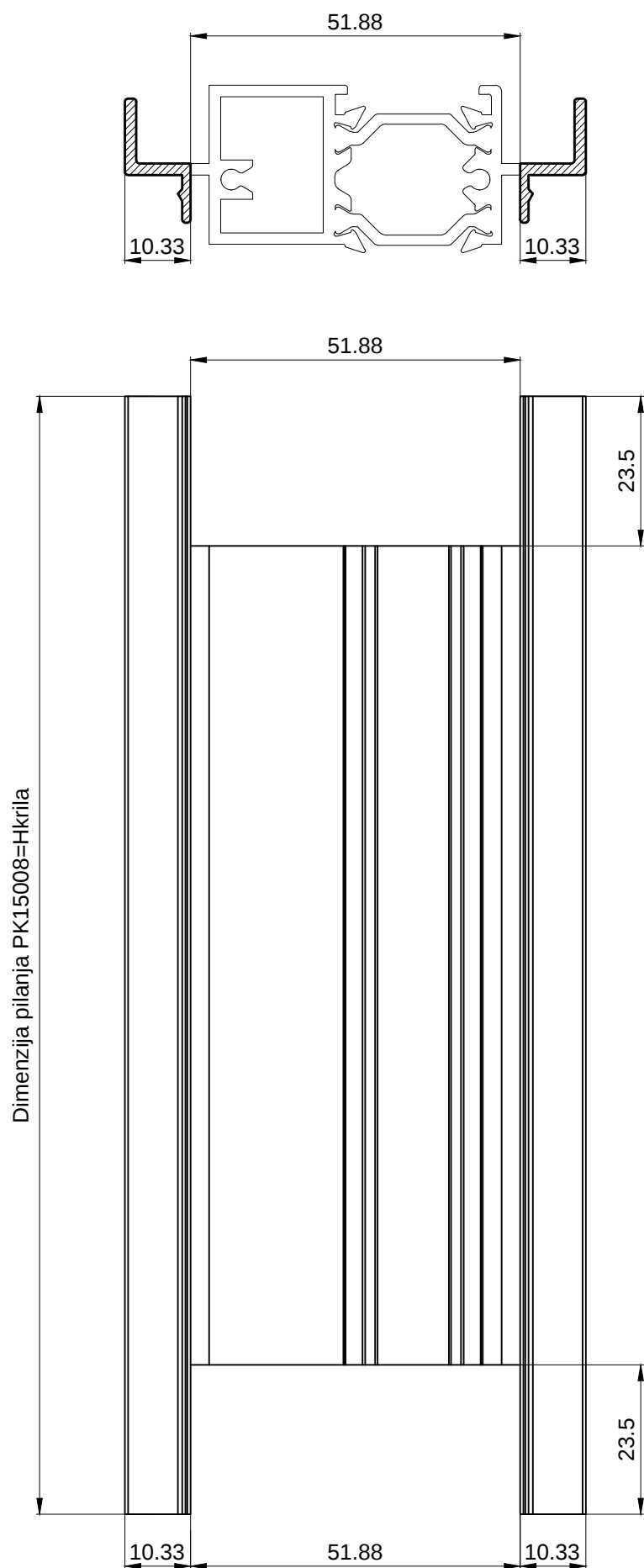


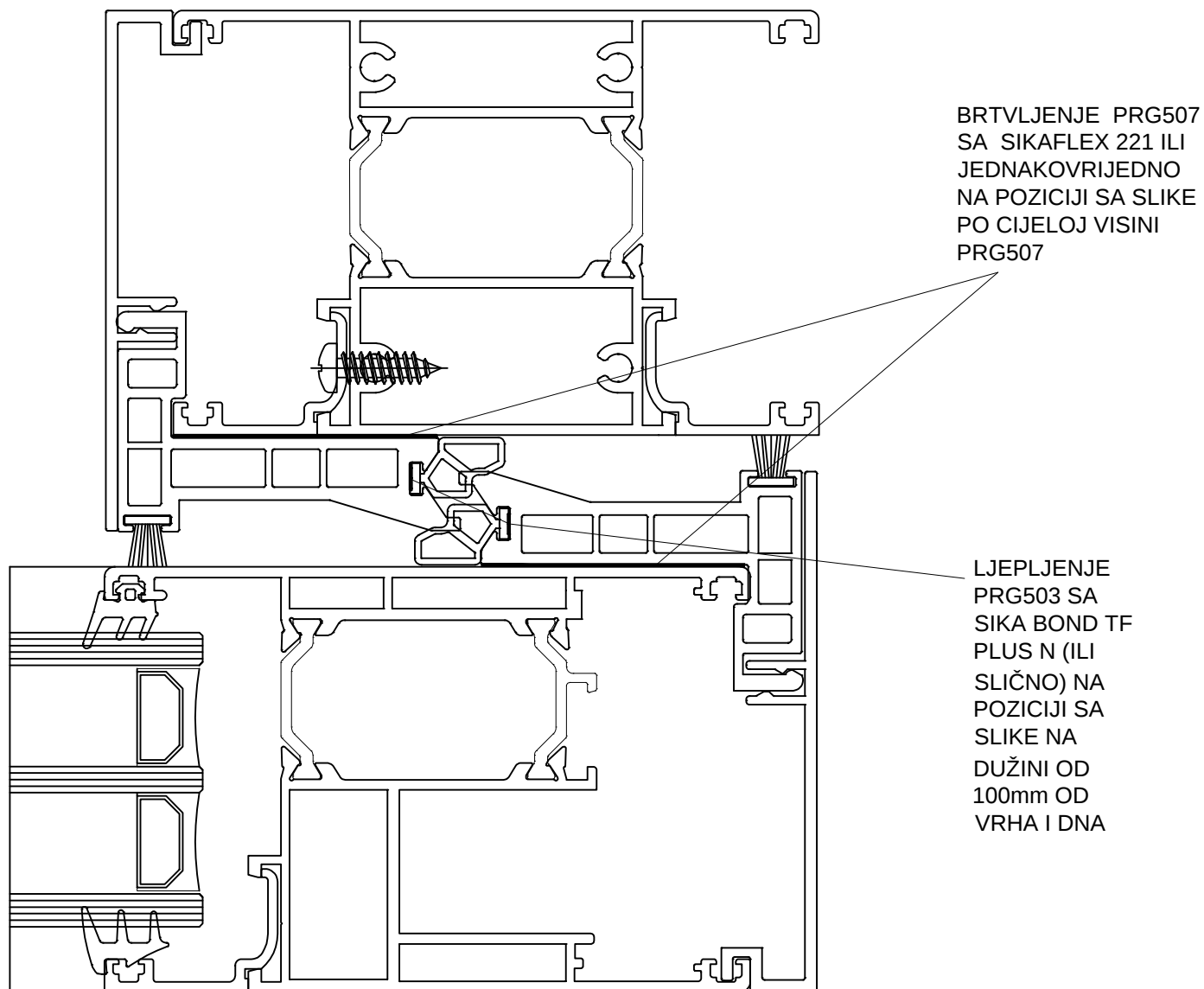
PODLJEVANJE I LJEPLJENJE BRTVENOG
BLOKA PRG504 SA SIKAFLEX 221 ILI SLIČNO.

Pozicioniranje četkastog bloka PRG509 između T profila PK15005 i profila krila PK15004

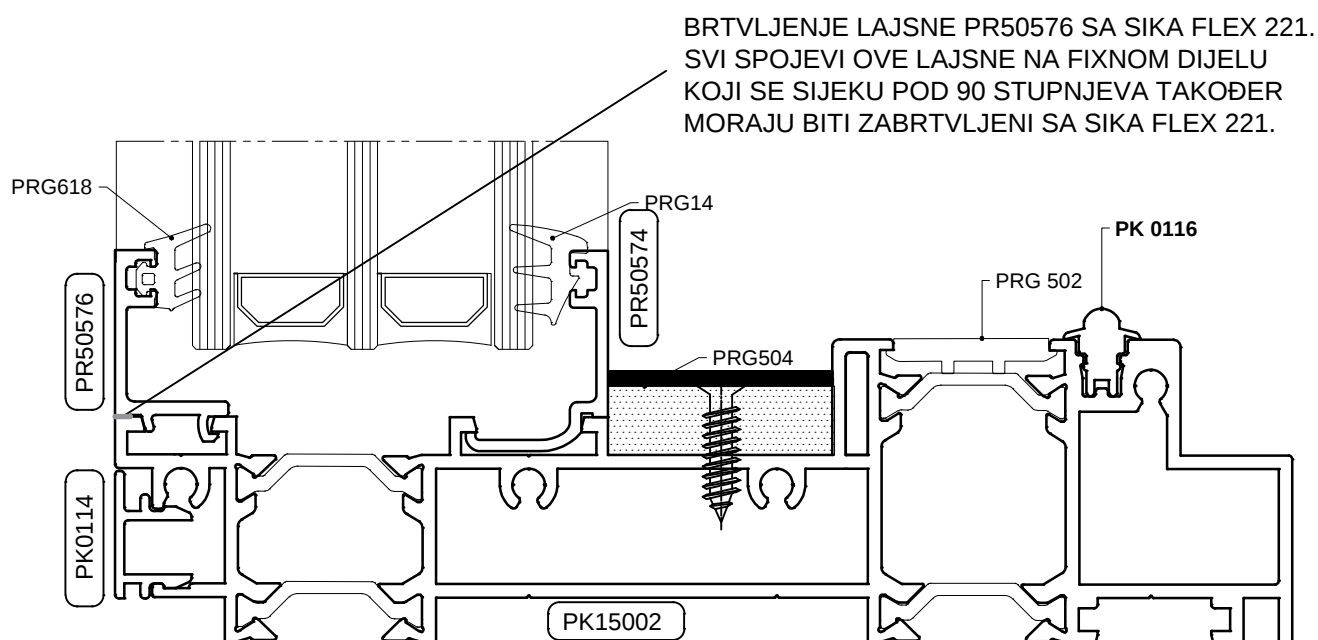


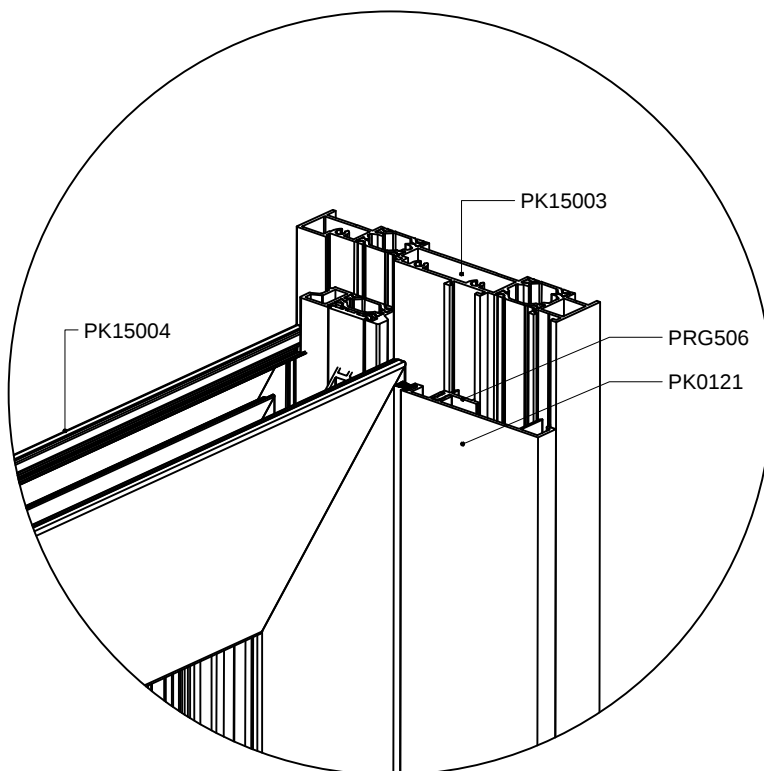
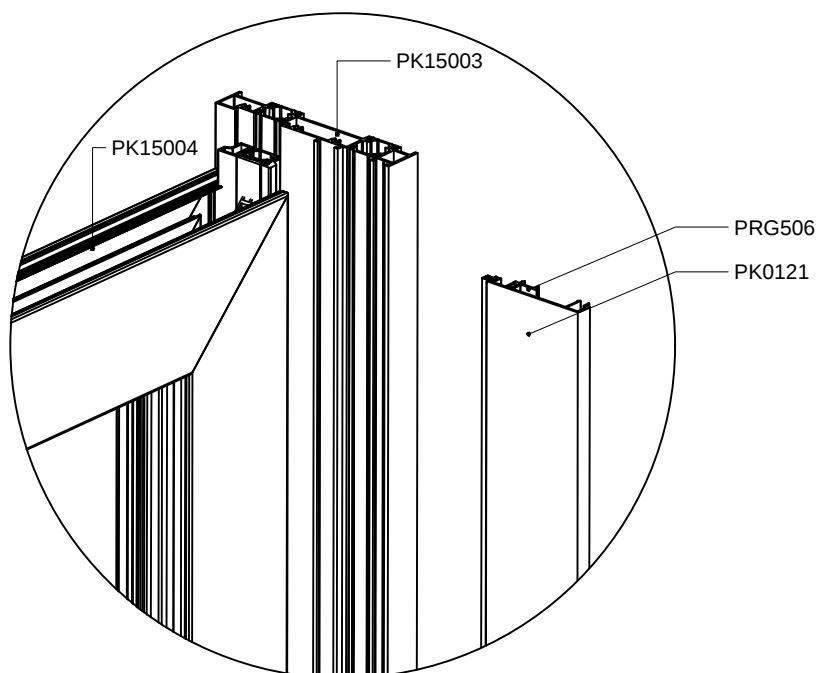
Obrada na profilu štulja PK15008

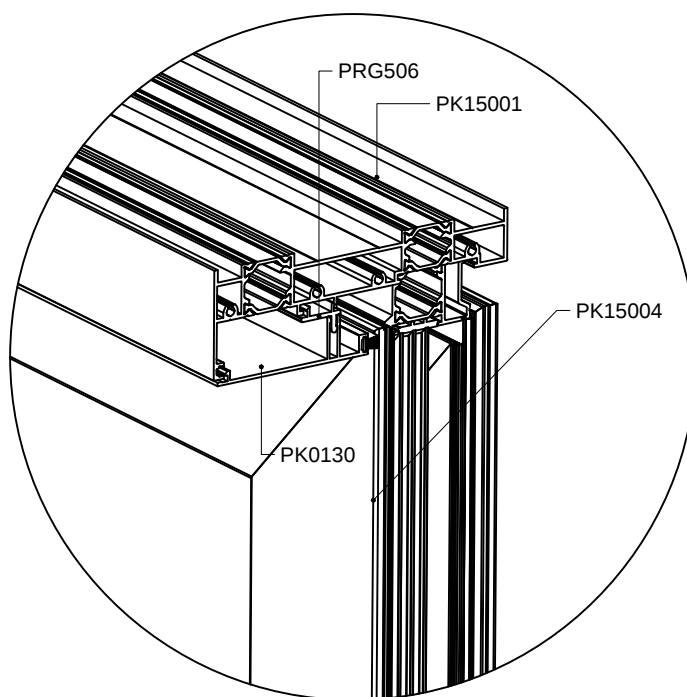
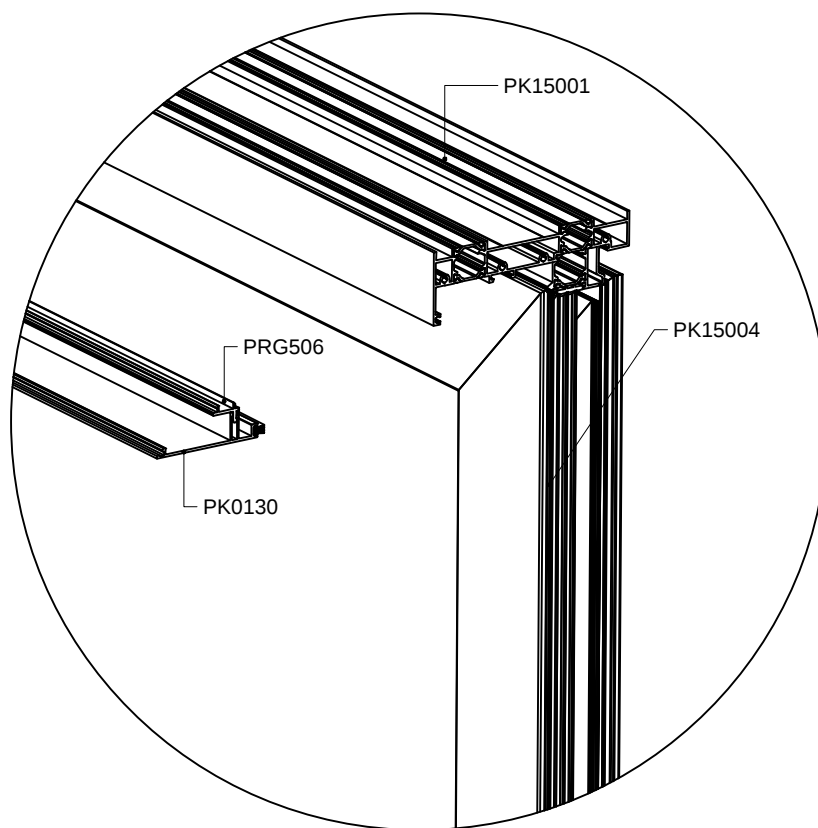




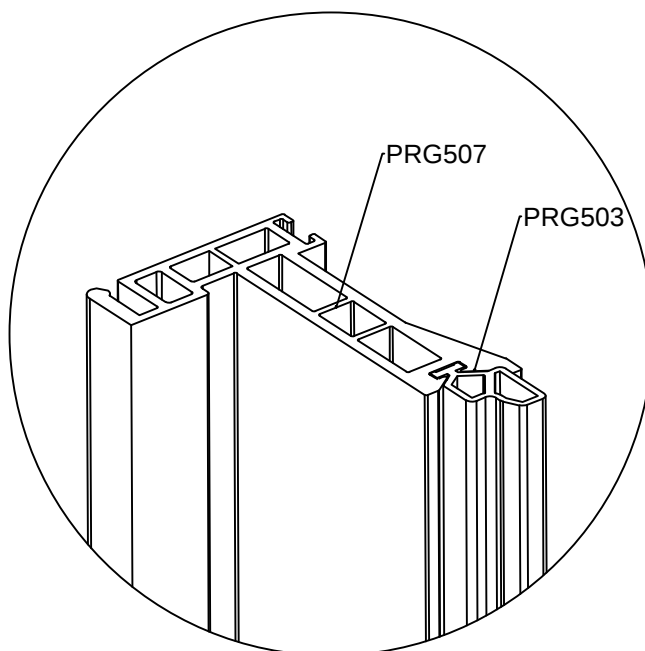
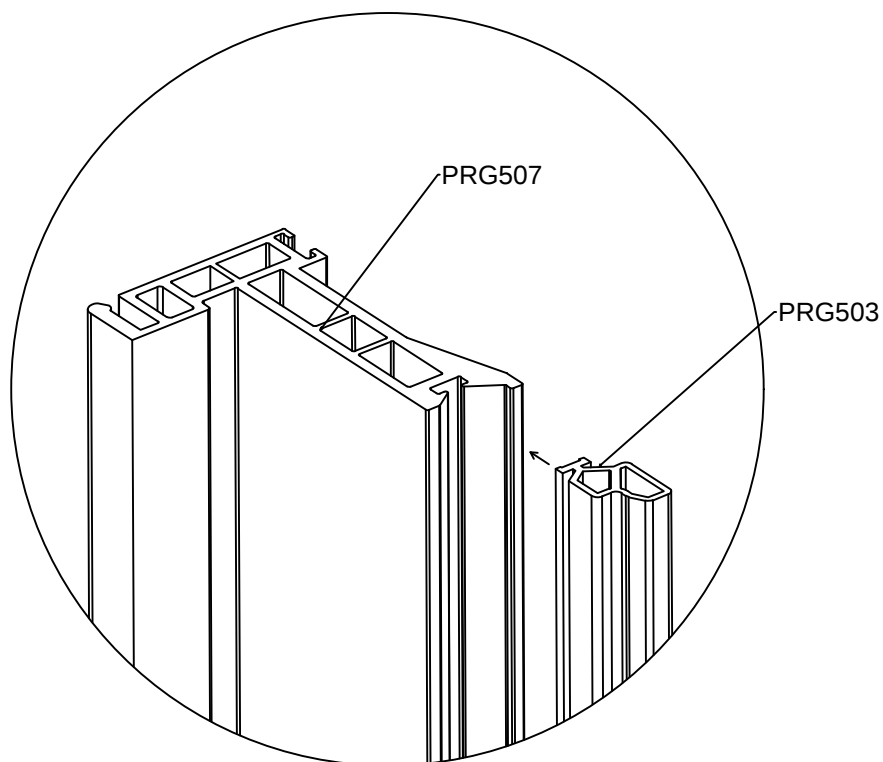
Silikoniranje protuprovalne lajsne PR50576 na fiksnom dijelu



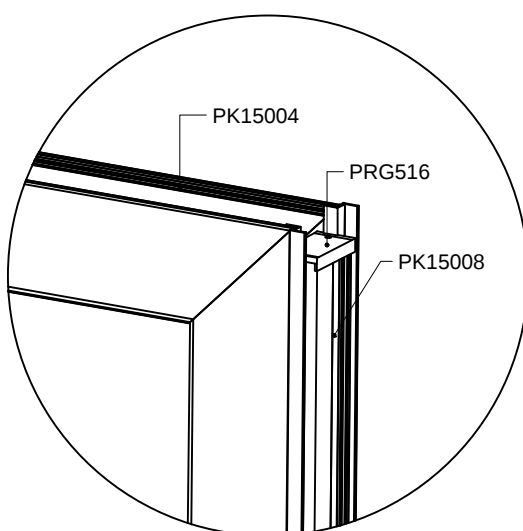
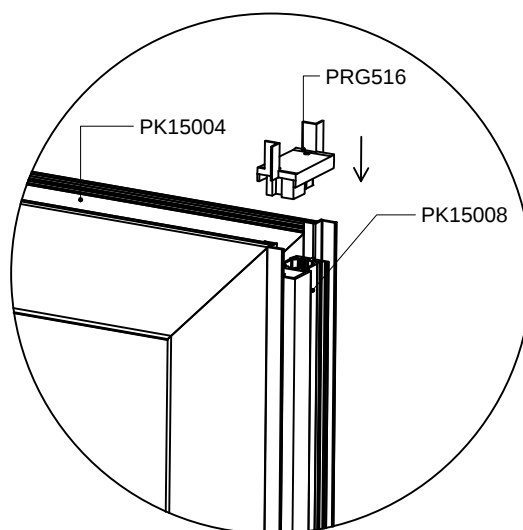




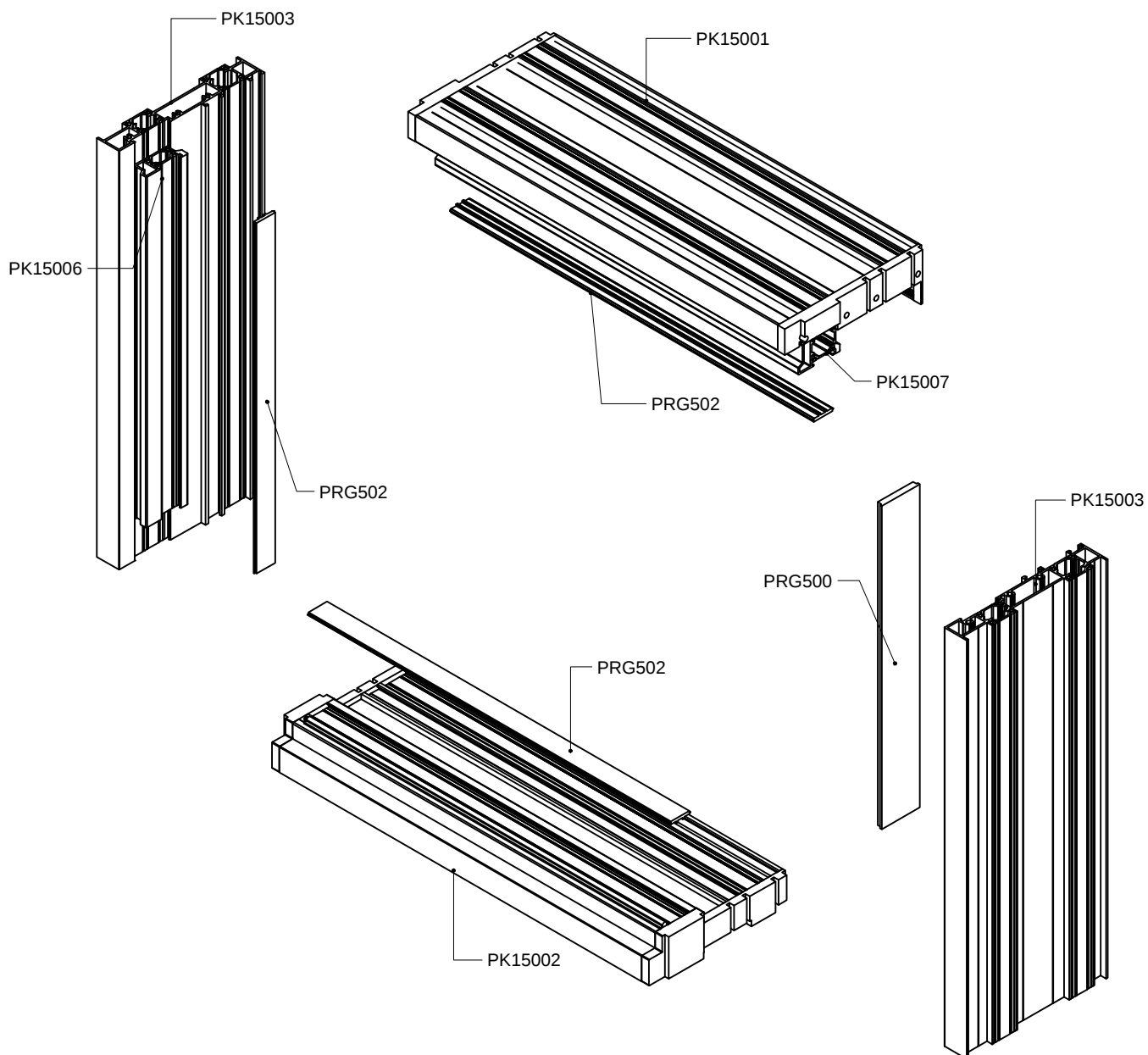
Montaža brtve PRG503 na PVC profil PRG507



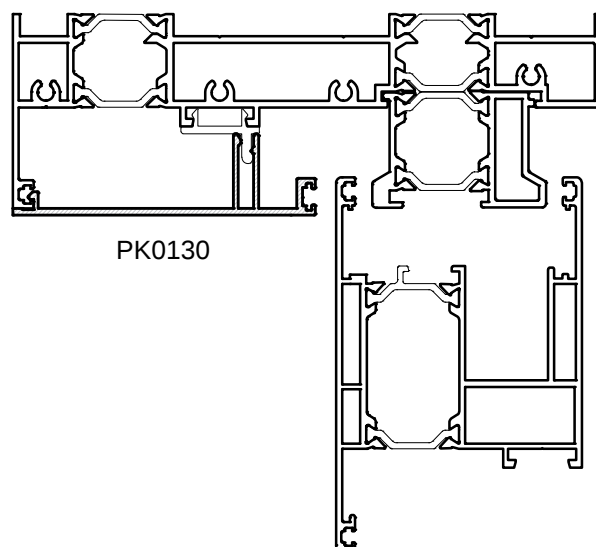
Montaža centralnog čepa PRG50X na profil štulpa PK15008



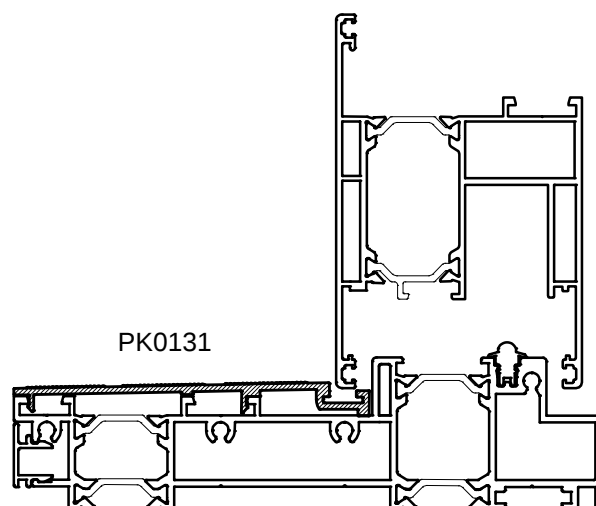
Montaža brtvi PRG500 i PRG502 na profile okvira



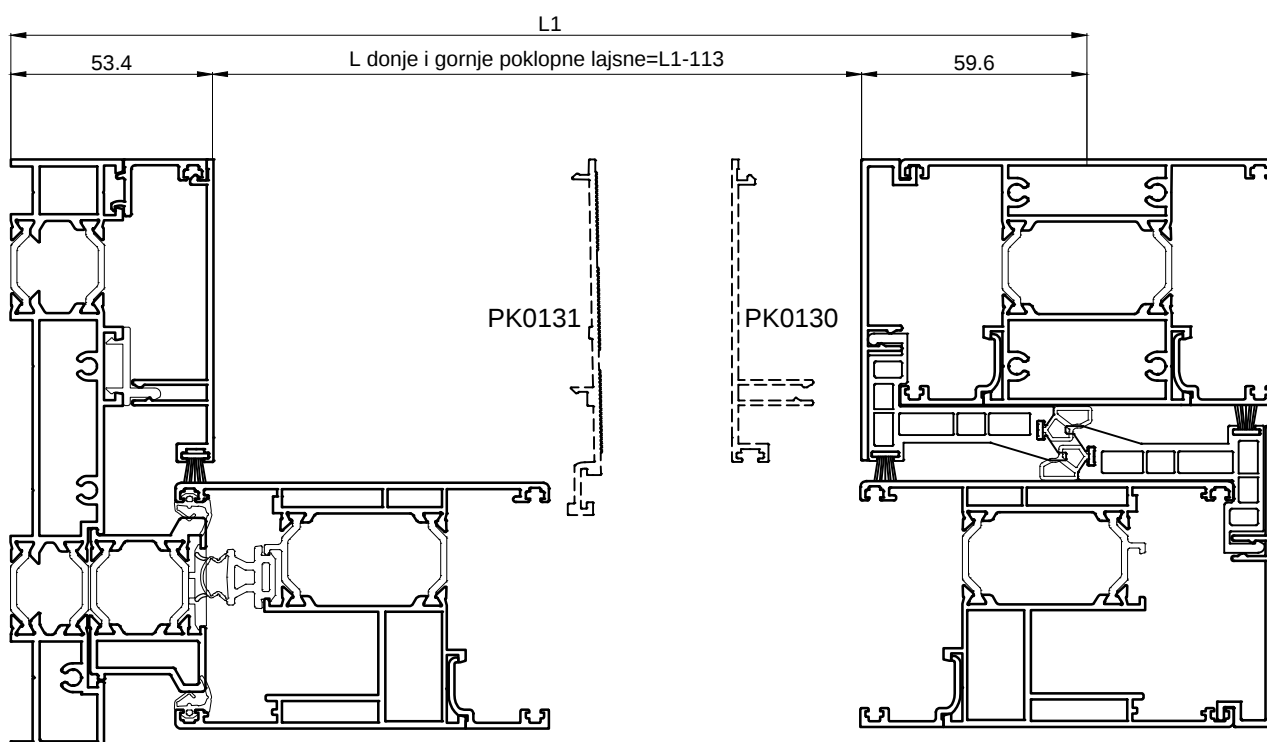
Dimenzija pilanja gornje/PK0130 i donje/PK0131 poklopne lajsne



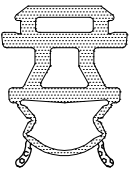
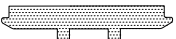
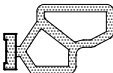
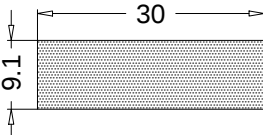
PK0130



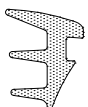
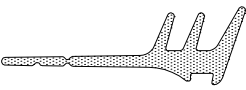
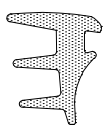
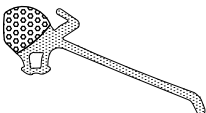
PK0131



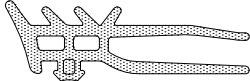
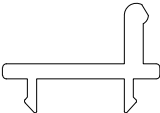
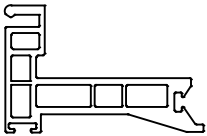
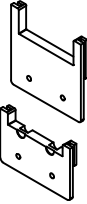
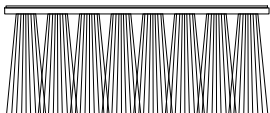
OKOV

KOD	OPIS		Komada po pakovanju			MATERIJAL
PRG500		Brtva okvira Frame gasket				EPDM
						PK150tt
PRG501 -PR		Centralna brtva Central gasket				EPDM
						PK150tt
PRG502		Brtva okvira Frame gasket				EPDM
						PK150tt
PRG503		Brtva spoja Joint gasket				EPDM
						PK150tt
PRG504		Brtva spoja(110mm) Joint gasket (110mm)				EPDM
						PK150tt
PRG505 -PR		Brtva krila Sash gasket				EPDM
						PK150tt
UP2		Unutarnja brtva za staklo,2mm Internal glass gasket,2mm				EPDM
				E50	E50tt	PR65tt
PRG621		Unutarnja brtva za staklo,2-3mm Internal glass gasket,2-3mm				EPDM
				E50	E50tt	PR65tt
						EPDM
				E50	E50tt	PR65tt

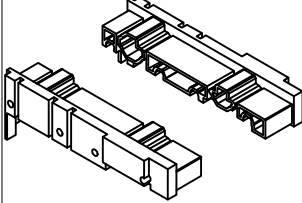
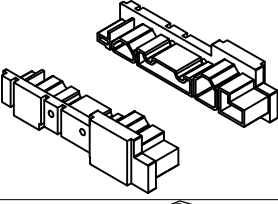
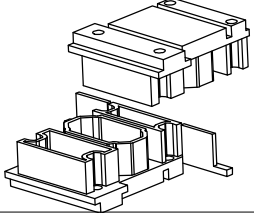
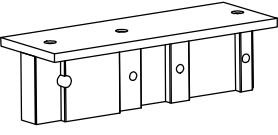
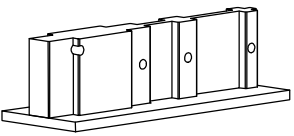
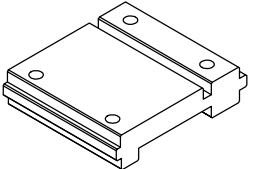
OKOV

KOD	OPIS		Komada po pakovanju		MATERIJAL	
UP4		Unutarnja brtva za staklo,4mm Internal glass gasket,4mm			EPDM	
				E50	E50tt	PR65tt PE85tt PK150tt
PRG14		Unutarnja brtva za staklo, 4-5mm Internal glass gasket, 4-5 mm			EPDM	
				E50	E50tt	PR65tt PE85tt PK150tt
PRG705		Unutarnja brtva za staklo, 4-5 mm Internal glass gasket, 4-5 mm			EPDM	
				E50	E50tt	PR65tt PE85tt PK150tt
PRG17		Unutarnja brtva za staklo, 6-7 mm Internal glass gasket, 6-7 mm			EPDM	
				E50	E50tt	PR65tt PE85tt PK150tt
PRG602		Vanjska koekstrudirana brtva za staklo,2 mm External coextruded glass gasket, 2 mm			EPDM+ ESPANSO	
				E50	E50tt	PR65tt PE85tt PK150tt
PRG603		Vanjska koekstrudirana brtva za staklo,3 mm External coextruded glass gasket, 3 mm			EPDM+ ESPANSO	
				E50	E50tt	PR65tt PE85tt PK150tt
PRG604		Vanjska koekstrudirana brtva za staklo,3 mm External coextruded glass gasket,3 mm			EPDM+ ESPANSO	
				E50	E50tt	PR65tt PE85tt PK150tt
PRG610		Vanjska koekstrudirana brtva za staklo,3 mm External coextruded glass gasket,3 mm			EPDM+ ESPANSO	
				E50	E50tt	PR65tt PE85tt PK150tt

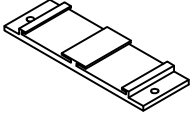
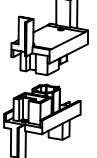
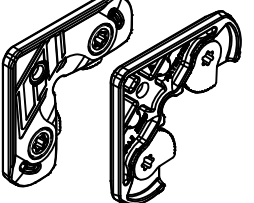
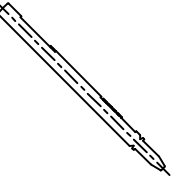
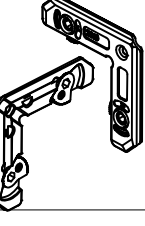
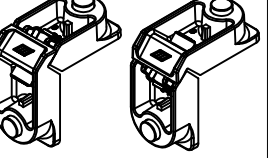
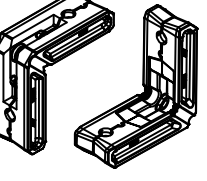
OKOV

KOD	OPIS		Komada po pakovanju		MATERIJAL	
PRG616		Vanjska brtva za staklo, 2-3 mm External glass gasket, 2-3 mm			EPDM	
PRG617		Vanjska brtva za staklo, 3-4 mm External glass gasket, 3-4 mm			EPDM	
PRG618		Vanjska brtva za staklo, 4-5 mm External glass gasket, 4-5 mm			EPDM	
PRG620		Vanjska brtva za staklo, 5 mm External glass gasket, 5 mm			EPDM	
PRG506		Plastika za okvir PVC profile for frame			PVC	
PRG507		Centralna plastika Central PVC profil			PVC	
PRG-508		Čep za lajsnu PK0127 Cover plug for PK0127			PVC	
PRG509		Četkica na srednjem spoju(110mm) Brushgasket on the central part (110mm)			Polipropilen	

OKOV

KOD	OPIS	Komada po pakovanju	MATERIJAL
PRG510	 Gornji čep za PK15001 Top plug for PK15001		EPDM
PRG511	 Donji čep za PK15002 Bottom plug for PK15002		EPDM
PRG512	 Srednji čep za PK15005 Bottom plug for PK15005		EPDM
24.049.050	 Četkica Brushgasket		
PRG515	 Brtna poklopne lajsne PK0131 Gasket for cover profile PK0131		
PRA520	 Gornji kalup za spajanje okvira Top mold for frame connection		ČELIK
PRA521	 Donji kalup za spajanje okvira Bottom mold for frame connection		ČELIK
PRA522	 Srednji kalup za spajanje okvira i prečke Middle mold for mullion and frame connection		ČELIK

OKOV

KOD	OPIS		Komada po pakovanju			MATERIJAL
PRA513		Plastika za četkicu PRG509 PVC part for brushgasket PRG509				PVC
						PK150tt
PRG516		Čep centralnog profila PK15008 Central plug for PK15008				TPU
						PK150tt
PRA02		Kutnik poravnanja 2200 4.8mm x 17.4 mm Alignment corner joint 2200 4.8mm x 17.4 mm				Aluminijski odlivak
						PK150tt
0092		Bolcna za spajanje 0092 Connecting pin 0092				Aluminijski odlivak
						PK150tt
2019		Kutnik poravnanja 2019 2 mm x 19.4 mm Alignment corner joint 2019 2 mm x 19.4 mm				Aluminijski odlivak
						PK150tt
PRA200		Glavni kutnik krila 0409 28.5 x 14.5 mm Corner joint on button 0409 28.5 x 14.5 mm				Aluminijski odlivak
						PK150tt
5011		Glavni kutnik krila 5011 28.5 x 14.5 mm Corner joint on screw 0409 28.5 x 14.5 mm				Aluminijski odlivak
						PK150tt
VILM 5x14_D8		Vijak za kutnike PRA204,5011,5034 i 5043 Screw for corners PRA204,5011,5034 and 5043				
				PR65tt	PE85tt	PE85N PK150tt

OKOV

[illegible]

Napomene / Notes



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