

Lafarge Beočinska fabrika cementa

Baraković Ksenija RA27-2020
Stojković Nikola RA39-2020
Antić Lea RA64-2020





A.D. 1824 N° 5022.

Artificial Stone.

ASPDIN'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOSEPH ASPDIN, of Leeds, in the County of York, Bricklayer, send greeting.

WHEREAS His present most Excellent Majesty King George the Fourth, by His Letters Patent under the Great Seal of Great Britain, bearing date at 5 Westminster, the Twenty-first day of October, in the fifth year of His reign, did, for Himself, His heirs and successors, give and grant unto me, the said Joseph Aspdin, His especial license, that I, the said Joseph Aspdin, my executors, administrators, and assigns, or such others as I, the said Joseph Aspdin, my executors, administrators, and assigns, should at any time agree with, and no others, from time

10 to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, my Invention of "AN IMPROVEMENT IN THE MODES OF PRODUCING AN ARTIFICIAL STONE," in which said Letters Patent there is contained a proviso obliging me, the said Joseph Aspdin, by an instrument 15 in writing under my hand and seal, particularly to describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, and to cause the same to be enrolled in His Majesty's High Court of Chancery within two calendar months next and immediately after the date of the said in part recited Letters Patent (as in and by the same), reference 20 being thereto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Joseph Aspdin, do hereby declare the nature of my said Invention, and the manner in which the same is to be performed, are particularly described and ascertained in the following description thereof (that is to say):—

2

A.D. 1824.—N° 5022.

Aspdin's Improvement in the Modes of Producing an Artificial Stone.

My method of making a cement or artificial stone for stuccoing buildings, waterworks, cisterns, or any other purpose to which it may be applicable (and which I call Portland cement) is as follows:—I take a specific quantity of limestone, such as that generally used for making or repairing roads, and I take it from the roads after it is reduced to a puddle or powder; but if I 5 cannot procure a sufficient quantity of the above from the roads, I obtain the limestone itself, and I cause the puddle or powder, or the limestone, as the case may be, to be calcined. I then take a specific quantity of argillaceous earth or clay, and mix them with water to a state approaching impalpability, either by manual labour or machinery. After this proceeding I put the above mixture into a slip pan for evaporation, either by the heat of the sun or by submitting it to the action of fire or steam conveyed in flues or pipes under or near the pan till the water is entirely evaporated. Then I break the said mixture into suitable lumps, and calcine them in a furnace similar to a lime kiln till the carbonic acid is entirely expelled. The mixture so calcined is to 10 be ground, beat, or rolled to a fine powder, and is then in a fit state for making cement or artificial stone. This powder is to be mixed with a sufficient quantity of water to bring it into the consistency of mortar, and thus applied to the purposes wanted.

In witness whereof, I, the said Joseph Aspdin, have hereunto set my hand and seal, this Fifteenth day of December, in the year of our Lord One thousand eight hundred and twenty-four.

JOSEPH (s.s.) ASPDIN.

AND BE IT REMEMBERED, that on the Fifteenth day of December, in the year of our Lord 1824, the aforesaid Joseph Aspdin came before our said 25 Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

Enrolled the Eighteenth day of December, in the year of our Lord One 30 thousand eight hundred and twenty-four.

LONDON:

Printed by GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1867.

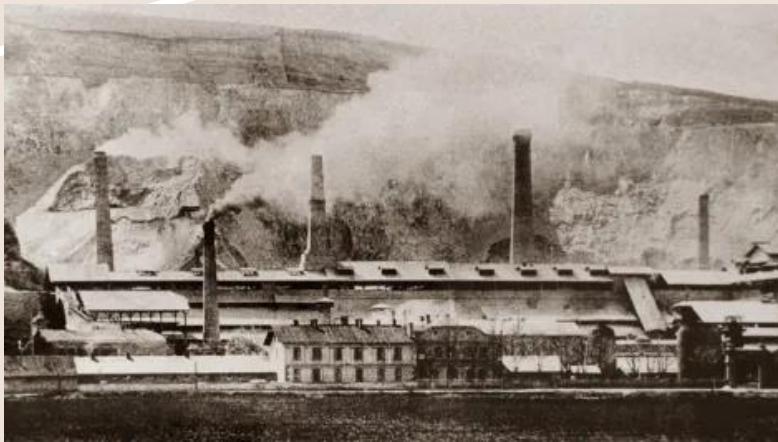




Фото: Ђоле



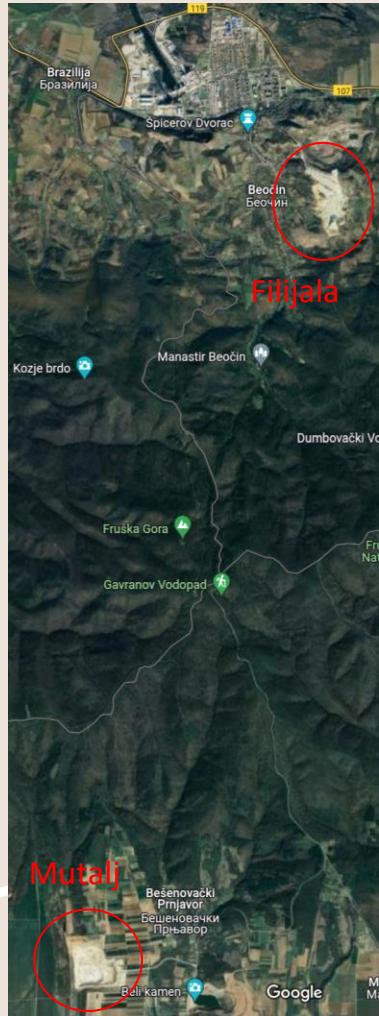
Proces dobijanja i skladištenja materijala

Kopovi

Mesta na kojima se vrši ekstrakcija laporanja i krečnjaka.

Pored kopova koji se nalaze u blizini fabrike u Beočinu, materijal i premise se donose i sa udaljenih kopova.





Krečnjak



Lapor

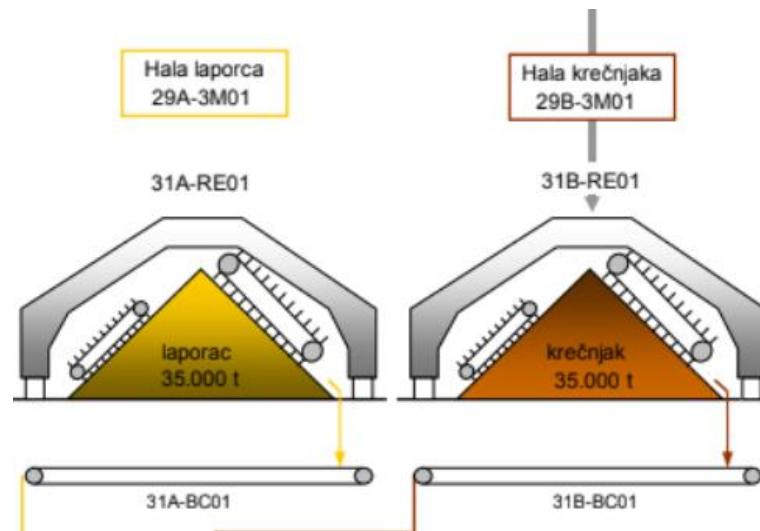


Skladištenje materijala

Lapor sa kopa Filijala se donosi putem pokretnih traka do hala.

Lapor i krečnjak se skladište u različitim halama jer se koriste u različitim odnosima.

U ovoj fazi materijal je krupan.



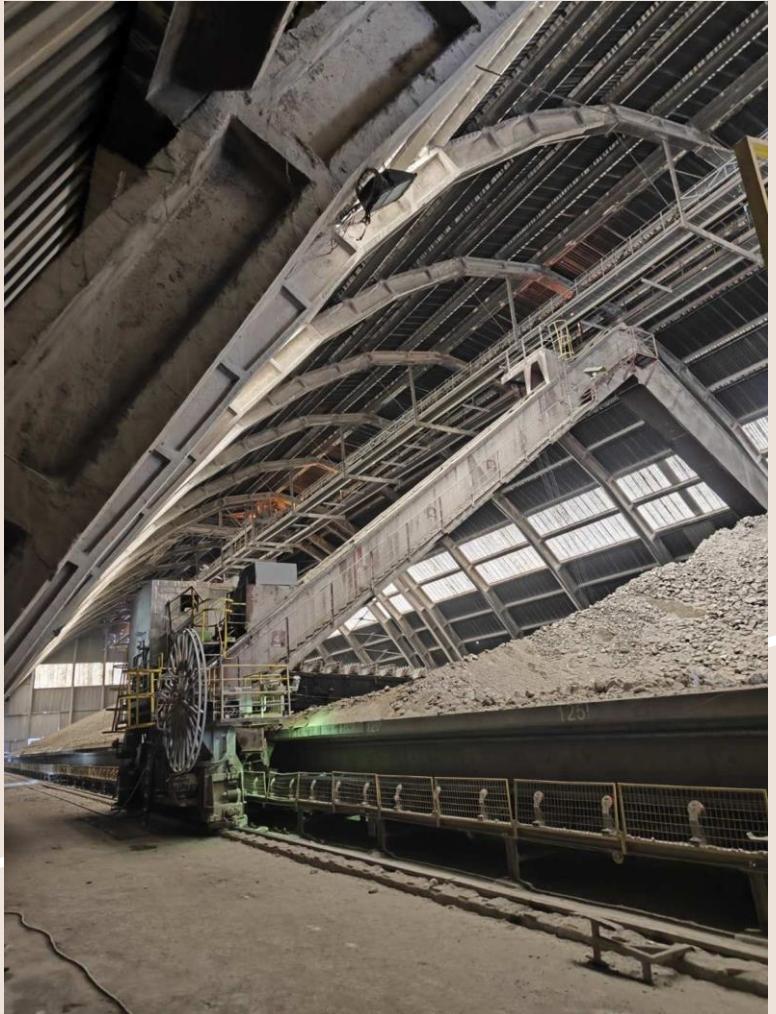
Prenos materijala iz skladišta do fabrike

Kracer (strugač) - pokretna traka koja svlači ili navlači materijal na gomilu u hali.

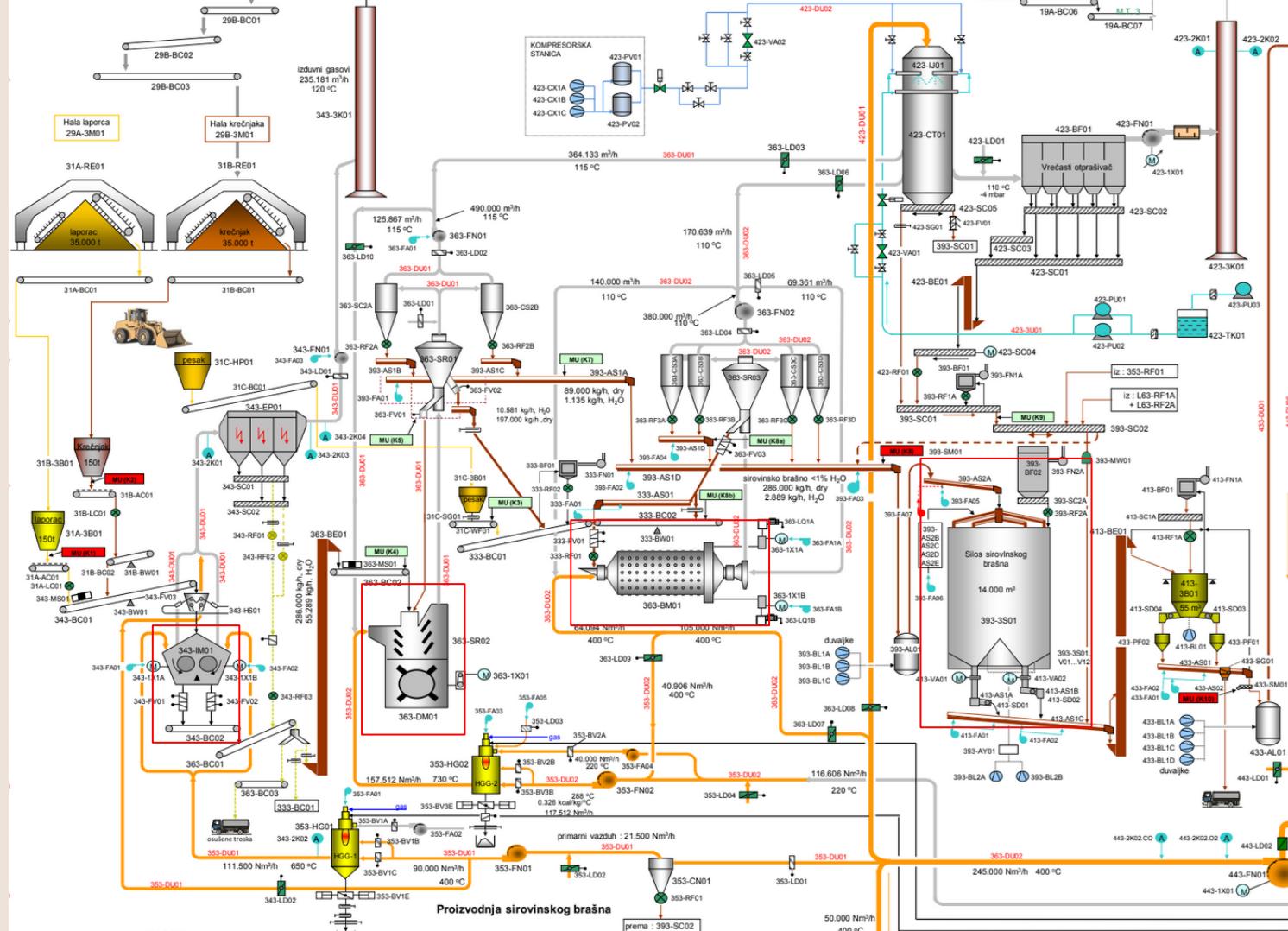
Pokretne trake prenose lapor i krečnjak u bunker.

U bunkeru se određuje njihov odnos u materijalu koji ulazi u proces pripreme.





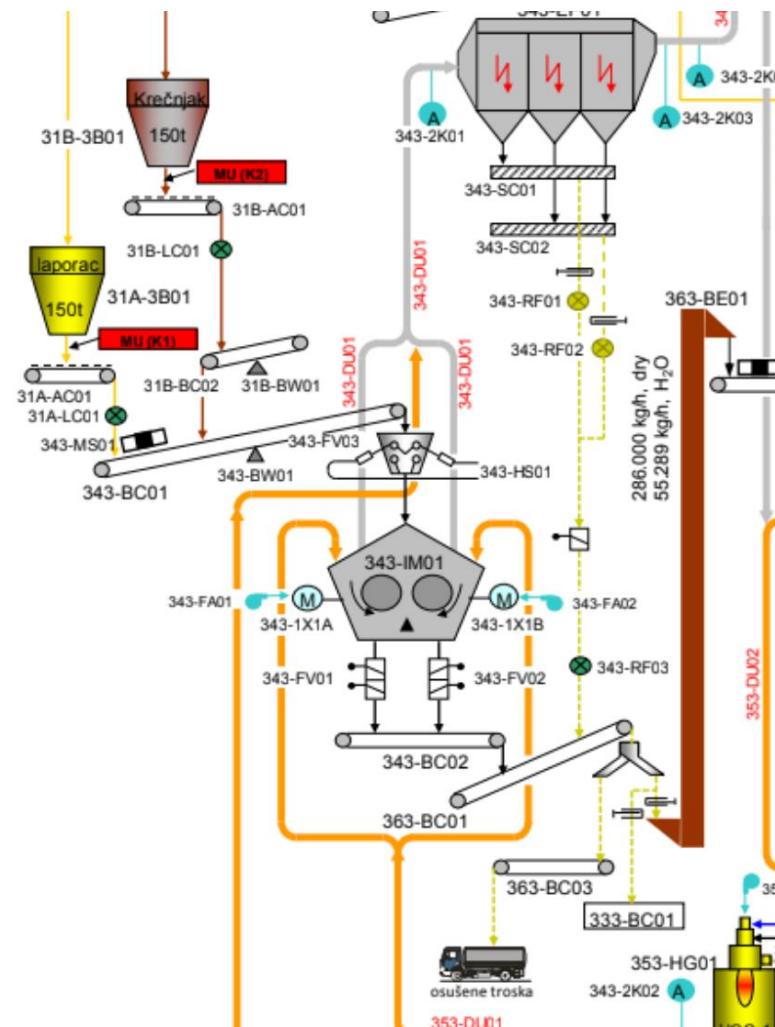
Proces priprema materijala



Udarni mlin

Lapor i krečnjak se mešaju i zajedno usitnjavaju.

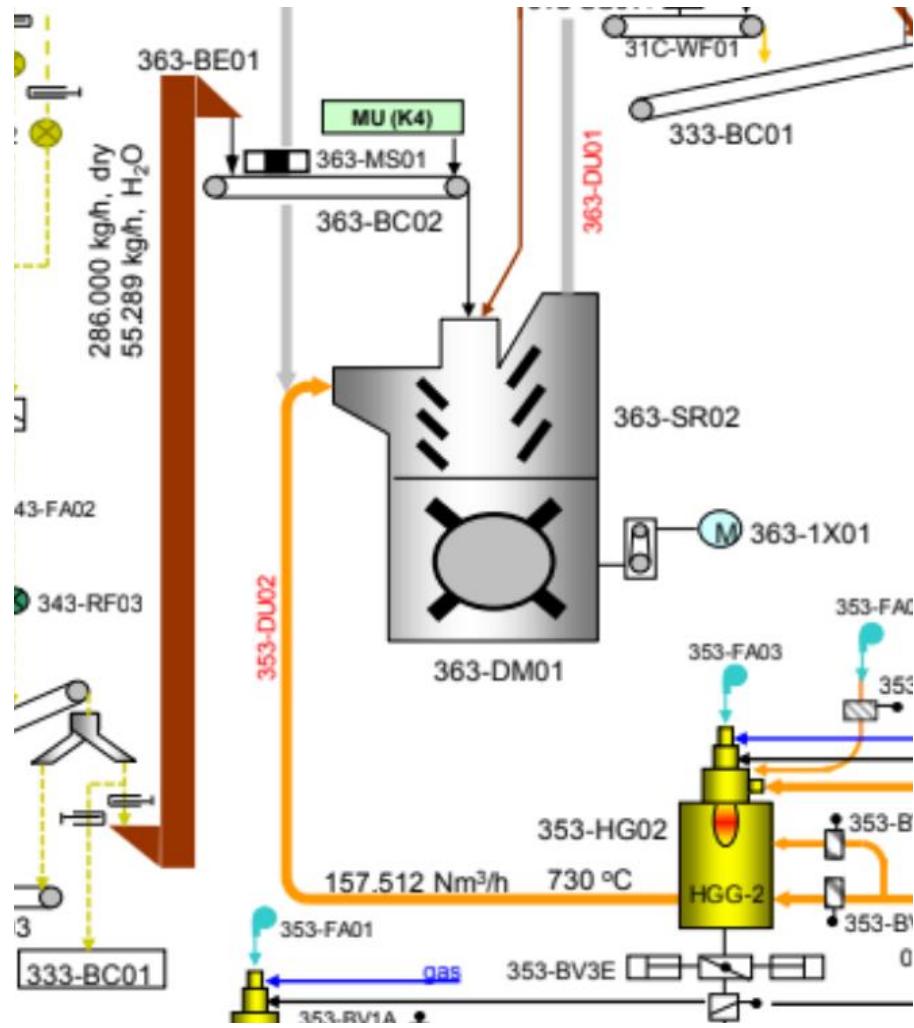
Prašina se vazduhom podiže do elektro-filtera koji izdvajaju sitnije delove laporanja i krečnjaka i vraćaju ih u proces.



Sušara

Usitnjeni materijal se dalje suši rotacijom.

Iz prašine u sušari se tokom celog procesa sušenja izdvajaju krupnije čestice iz vazduha i prenose do sledeće faze procesa.

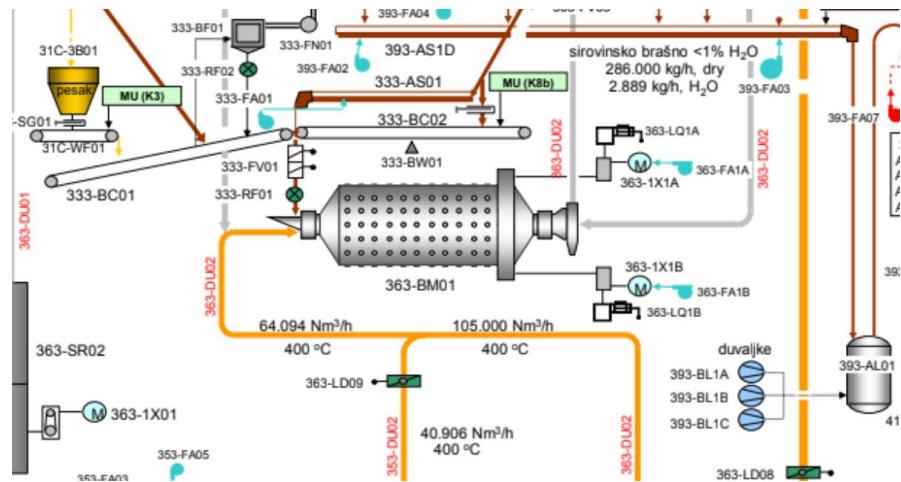


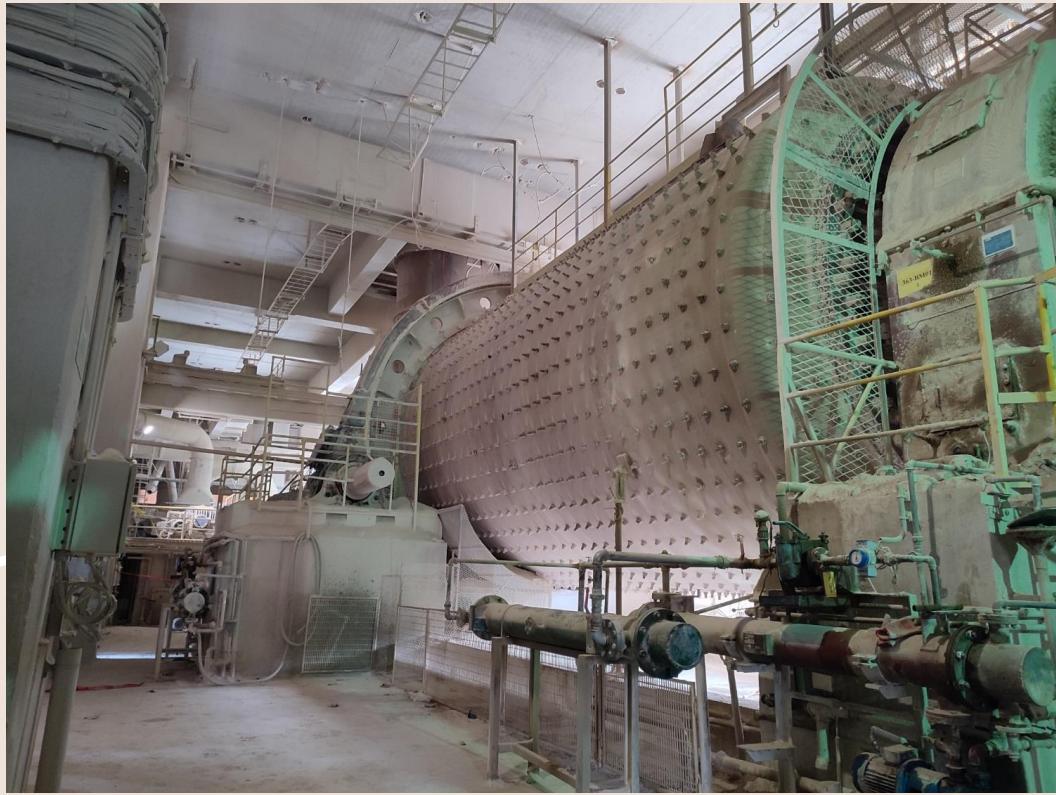
Kuglični mlin

Na ulazu u kuglični mlin se dodaje pesak u polu-izdrobljen materijal.

Metalne kugle se u cilindru rotiraju zajedno sa osušenim materijalom.

Vazduhom se izduvava izdrobljen materijal iz mlina, dok se krupan materijal vraća nazad na ulaz mlina kako bi se ponovo drobio.

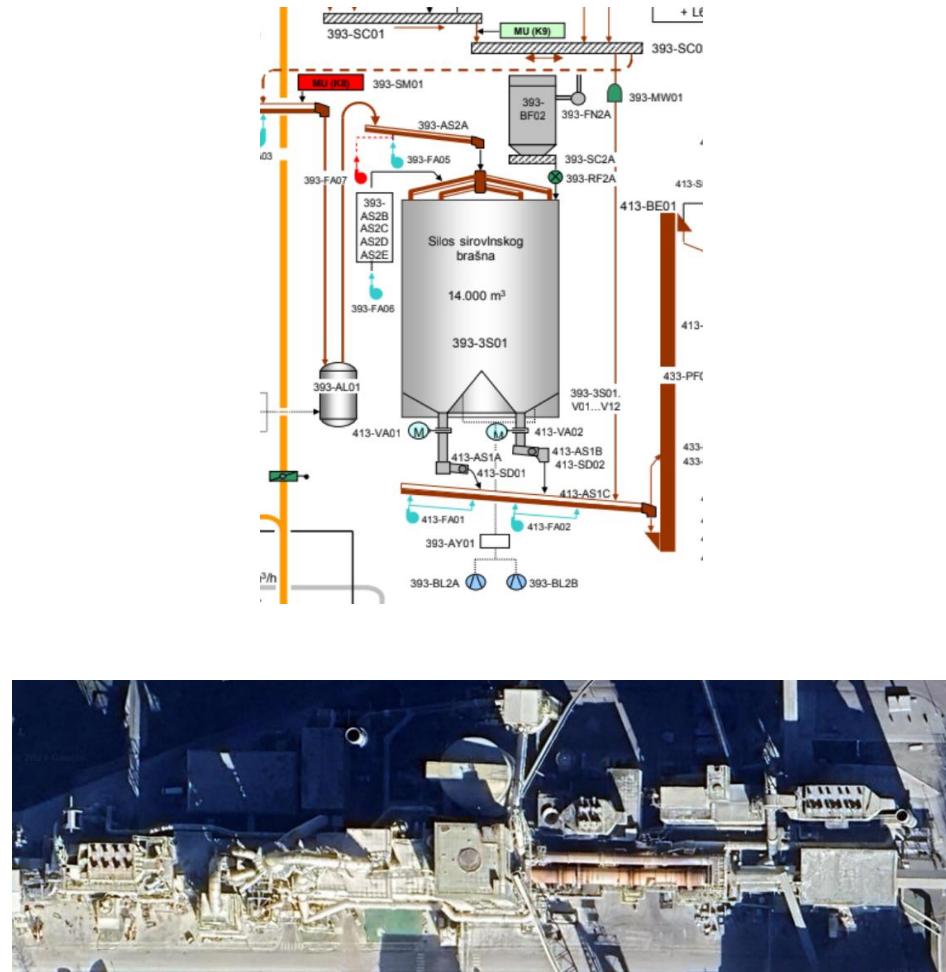




Silos homogenizacije

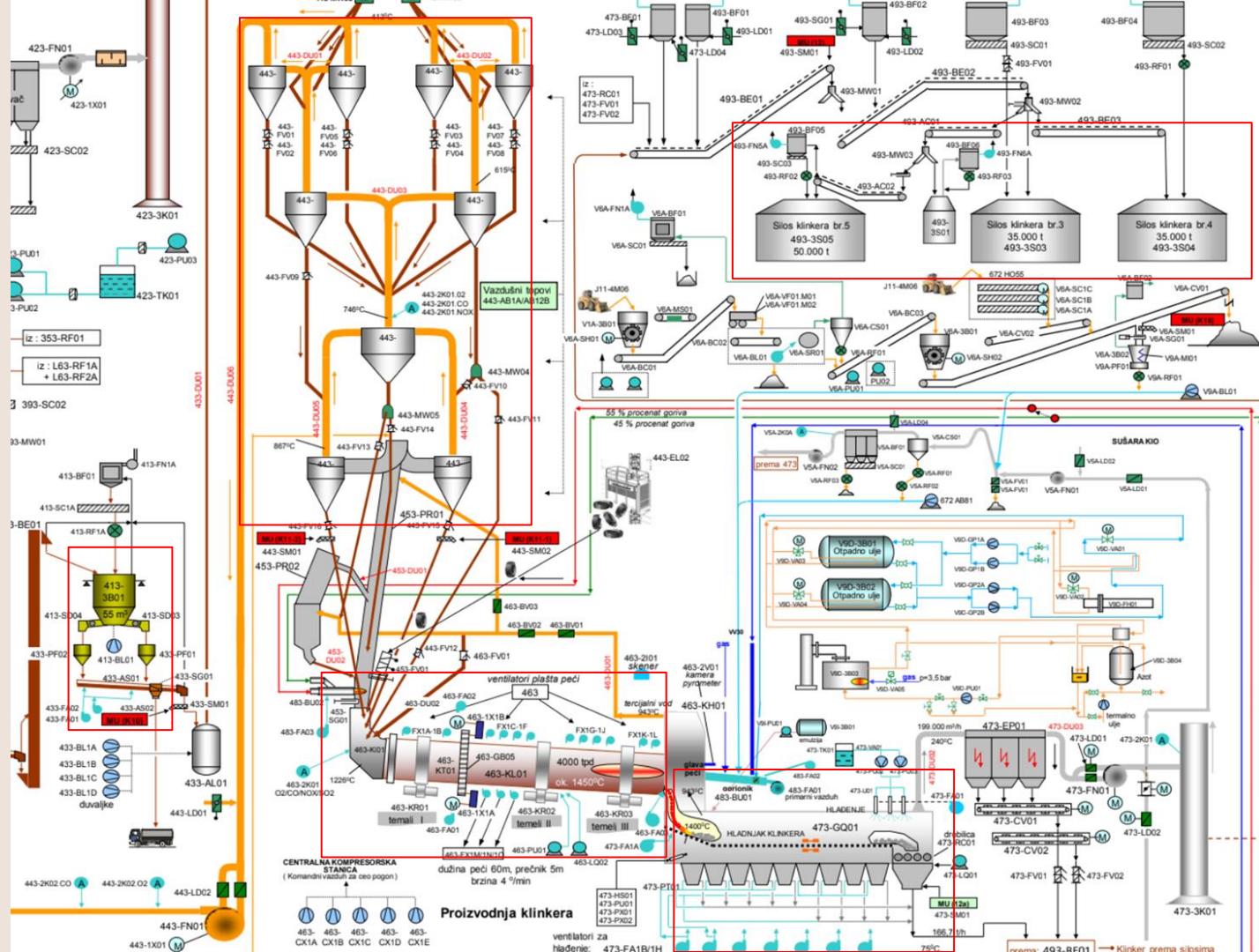
Izdrobljen materijal i isfiltrirana prašina se jednim imenom nazivaju sirovinsko brašno.

U silosu homogenizacije se privremeno čuva sirovinsko brašno dok ne počne sledeći ciklus pečenja materijala.





Proces pečenja materijala

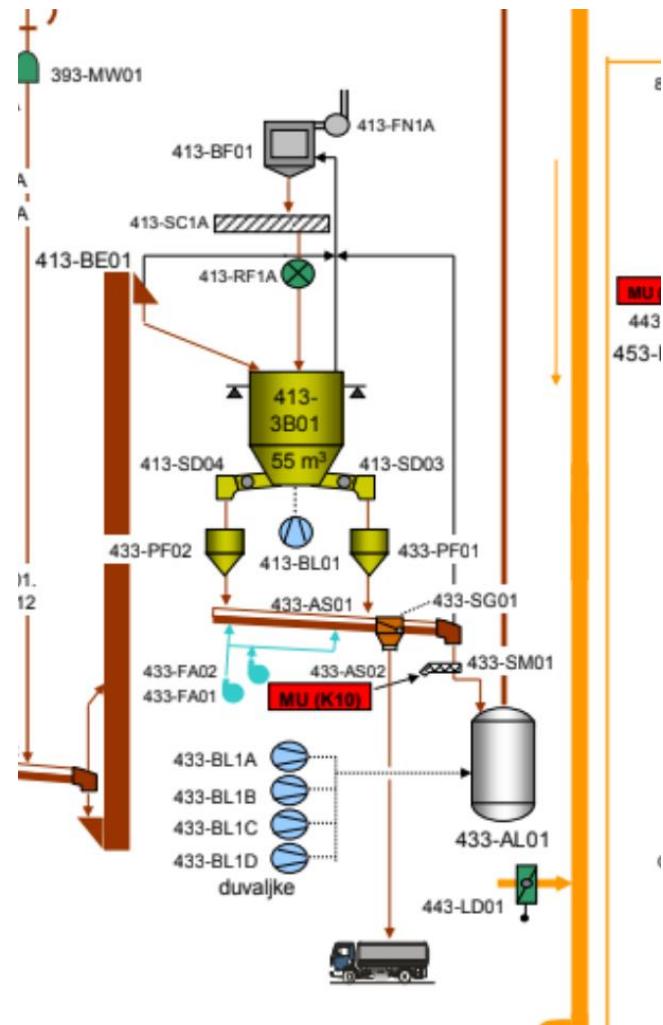


Doziranje materijala

Materijal se dozira iz silosa sirovinskog brašna.

Aeropol - vazdušni lift - služi za podizanje sirovinskog brašna do dopol tornja, koji se nalazi na najvišoj tački.

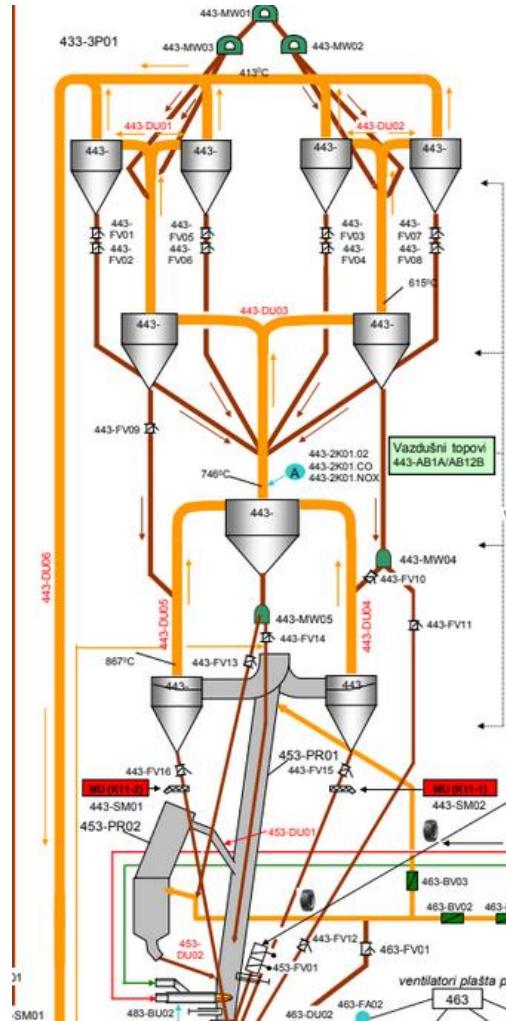
Duvaljke duvaju vazduh, a sirovinsko brašno se ubacuje u njihovu struju.



Dopol toranj

Dopol toranj se nalazi iznad ulaza u peć kako bi topao vazduh iz peći predgreao sirovinsko brašno dok prolazi kroz toranj.

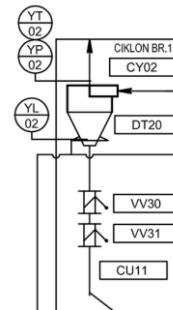
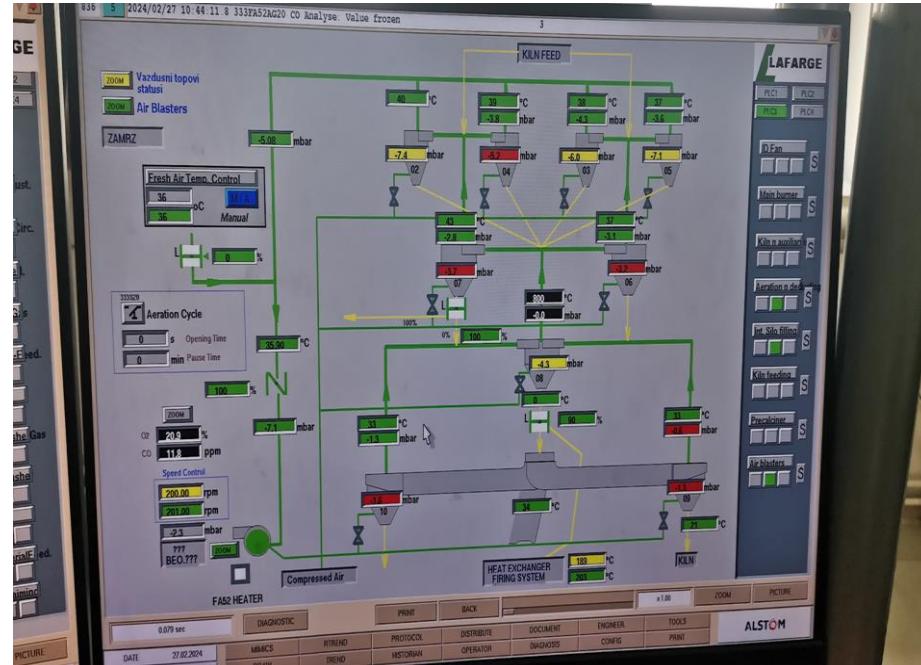
Takodje, vrši funkciju razdvajanja sirovinskog brašna kako bi dodavanje u peć moglo da se vrši preciznije.



Dopol toranj

Cikloni omogućavaju doziranje. Sirovinsko brašno se u njima taloži u različitim trenucima, a zatim se određenim redosledom ili po potrebi ispušta u peć.

Vazdušni topovi u ciklonima obezbeđuju da ne ostanu naslage, i da ne dodje do sužavanja protoka.



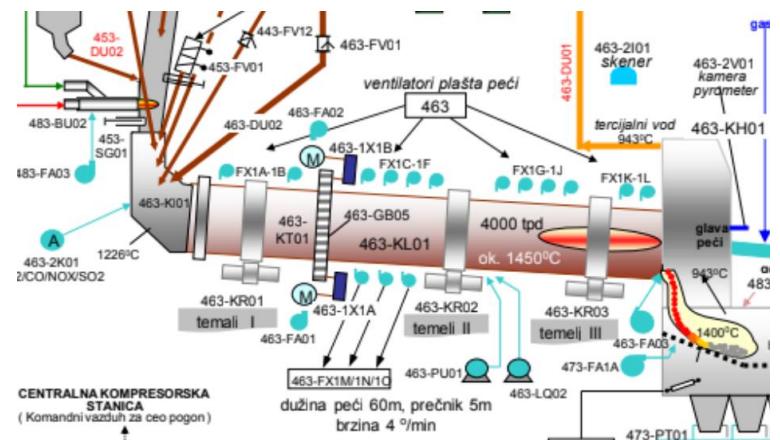


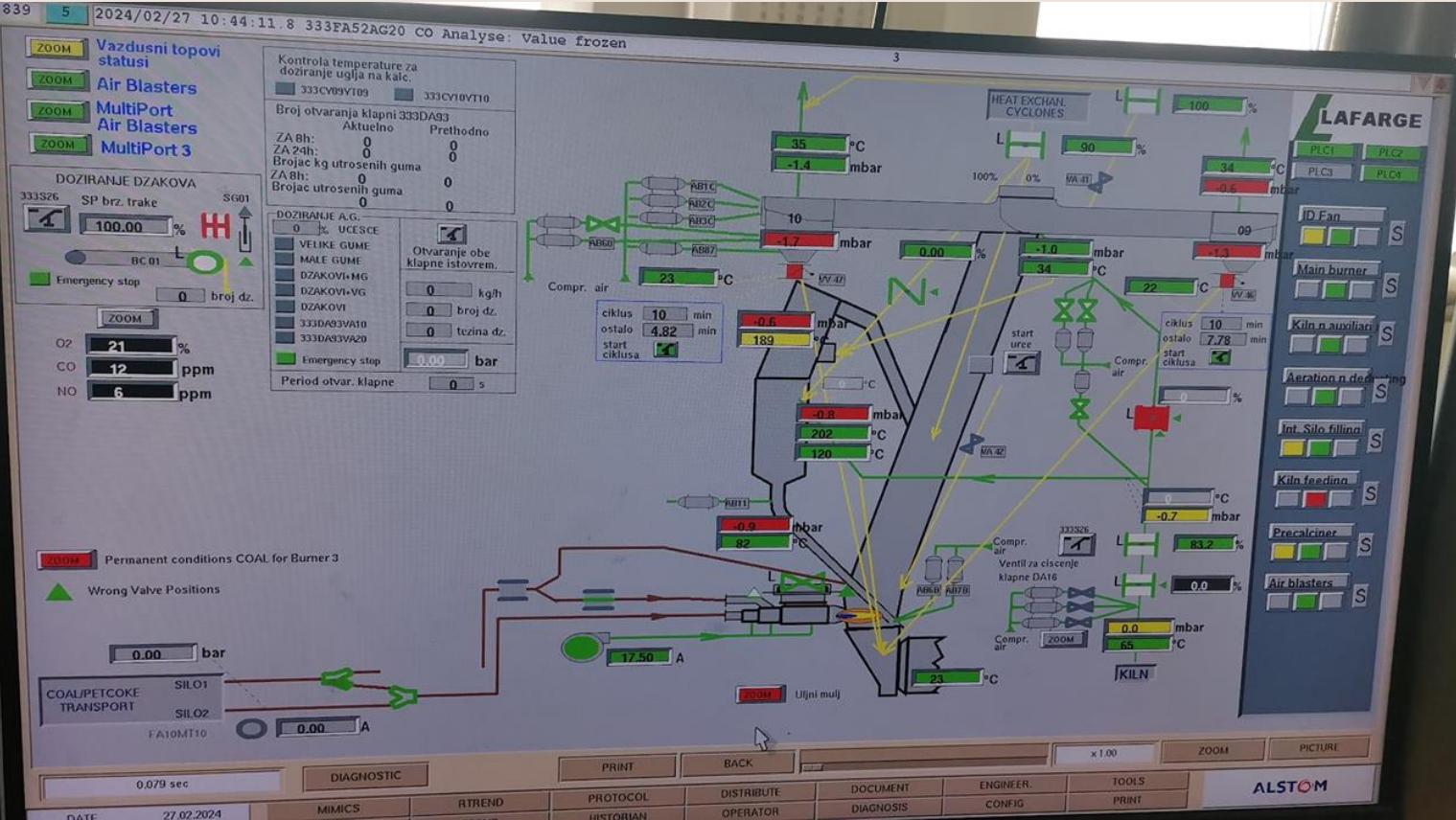
Peć

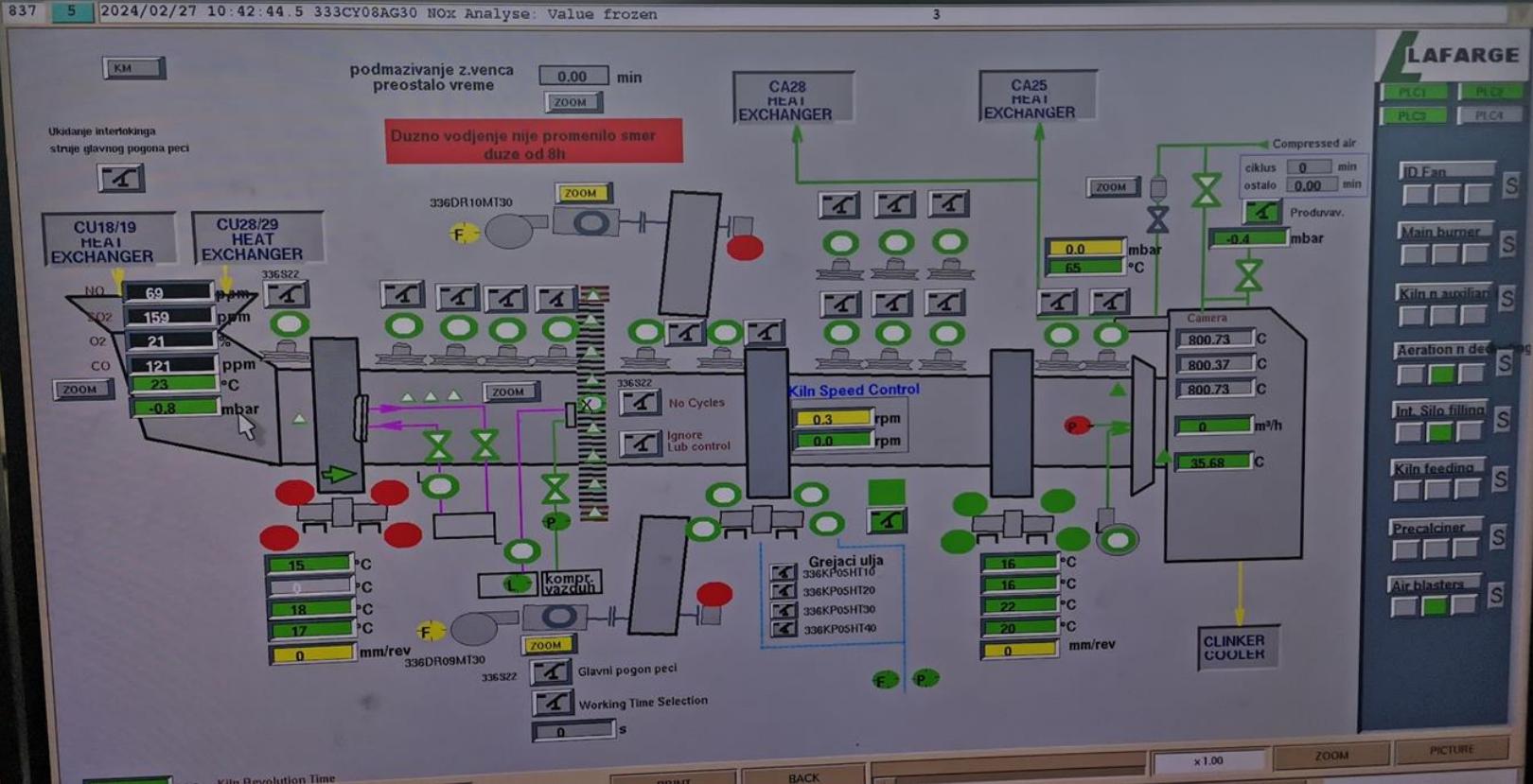
Peć čini ogromna cev koja je nagnuta za 3° i koja se okreće dok materijal prolazi kroz nju - obezbeđuje da se materijal nikada ne zalepi za zidove.

Radna temperatura peći je 1400°C.

Oko 15 minuta je potrebno da jedna tura materijala prođe kroz peć, pri čemu se na izlazu pojavljuje materijal u tečnom stanju.





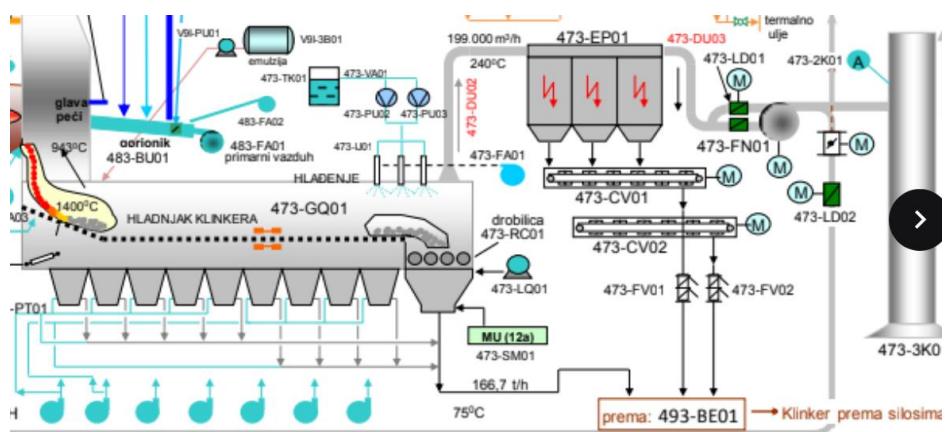


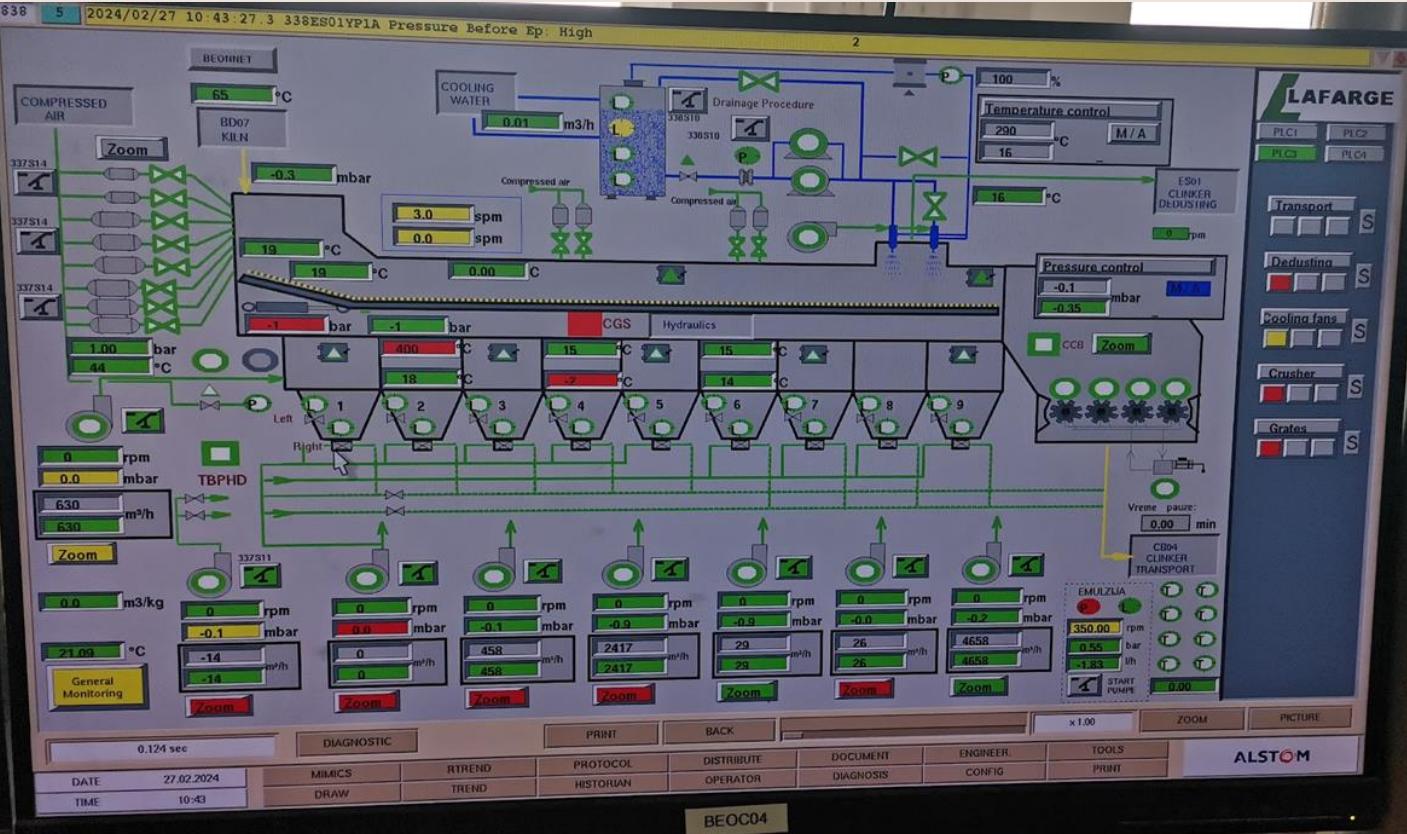
Hlađenje

Niz ventilatora na izlazu iz peći mora brzo da ohladi istopljeno sirovinsko brašno koje se kreće na pokretnoj traci.

Na kraju trake se nalazi drobilica koja usitnjava veće komade koji su se spojili topljenjem - usitnjeno i istopljeno sirovinsko brašno se naziva klinker.

Elektro-filteri izdvajaju klinker u obliku prašine iz vazduha.

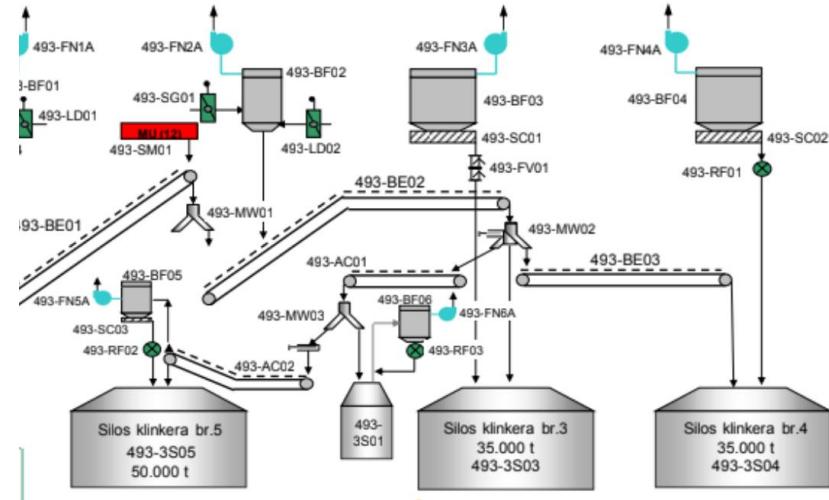




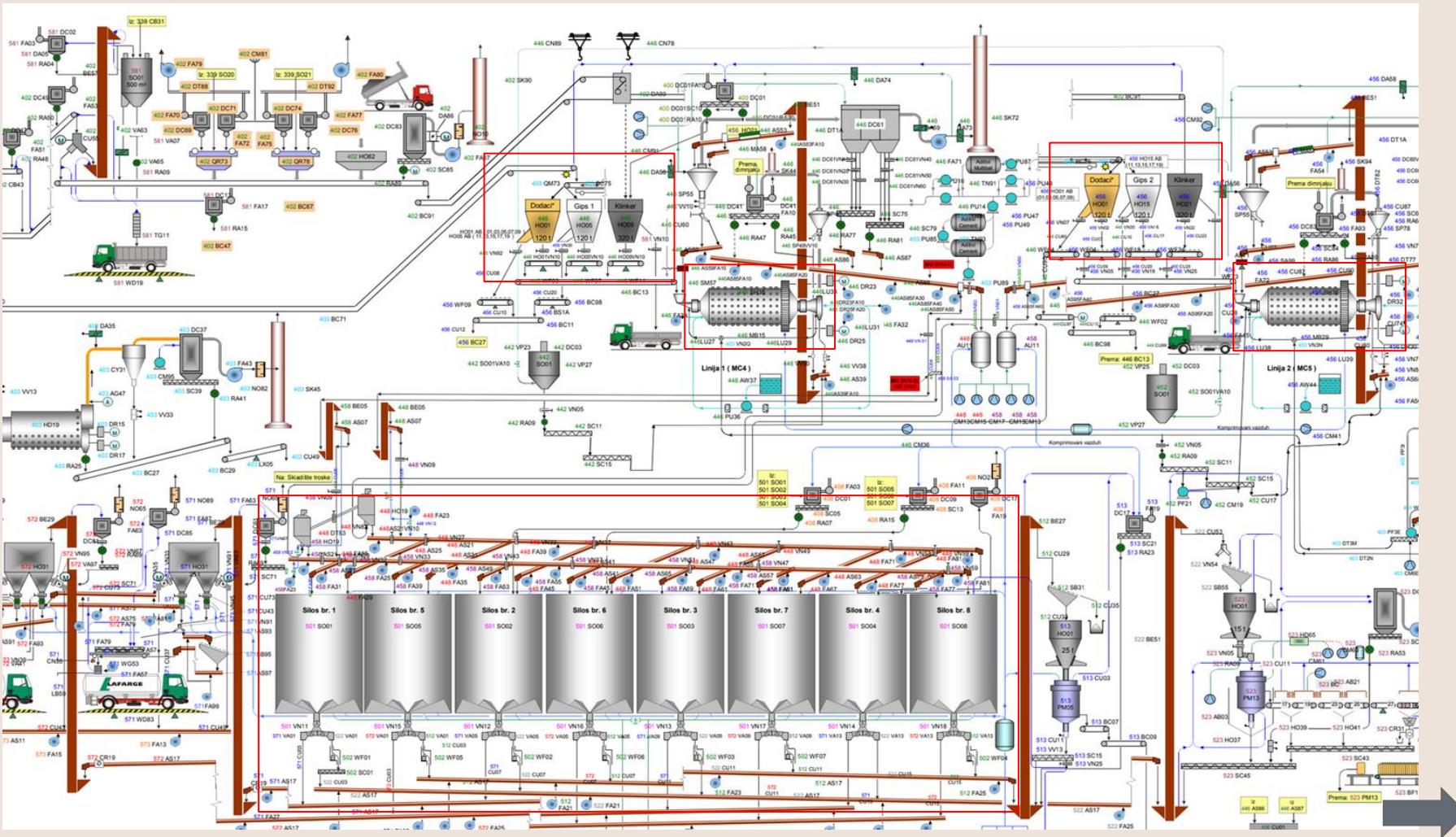
Silosi klinkera

Klinker u komadima i u prašini se spajaju i prenose u silos klinkera.

Iz silosa klinkera se uzima materijal po potrebi. Kada dođe na red za pakovanje prelazi u sledeću fazu.



Proces dobijanja cementa

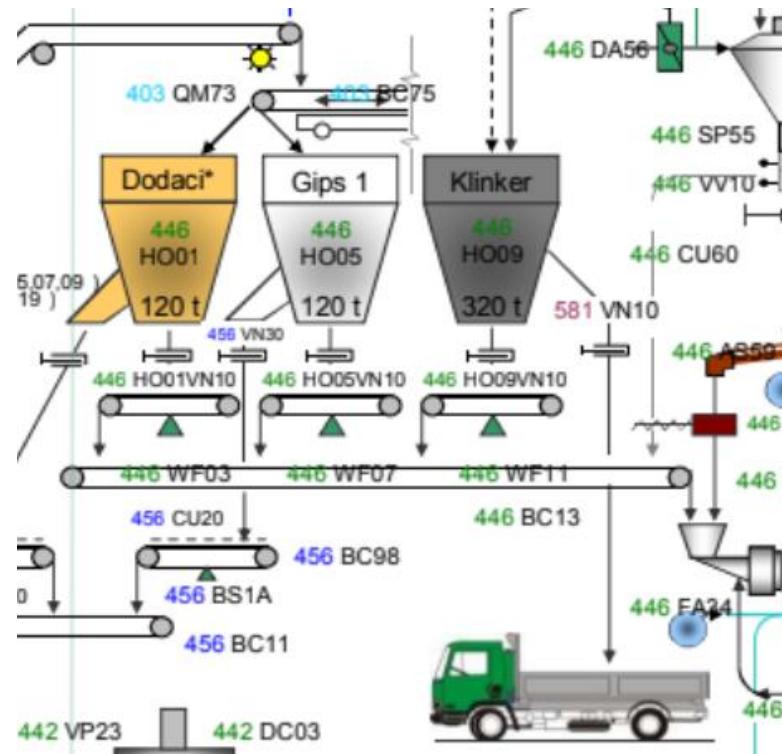


Doziranje klinkera i primesa

Finalni proizvod pored klinkera čine i dodaci kao što su pepeo, aktivni ugalj i gips.

Doziranjem svih komponenti dobija se krupan materijal koji je ponovo potrebno usitniti.

Doziranje se vrši u dve faze.

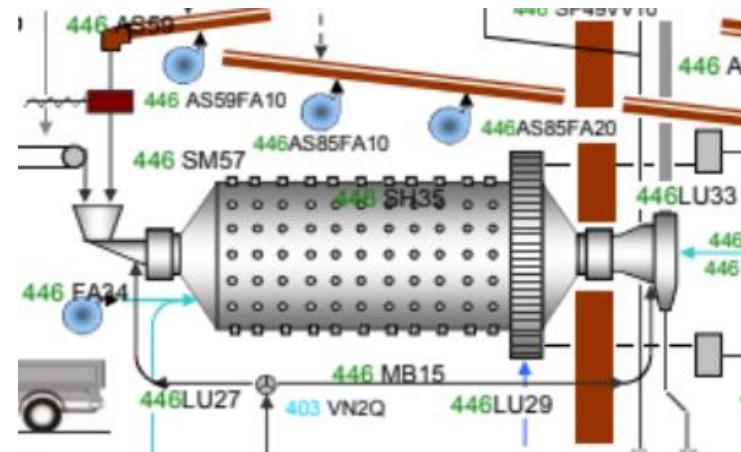


Postrojenje za odvojeno mlevenje cementa

Takođe u dve faze vrši se mlevenje krupne smese.

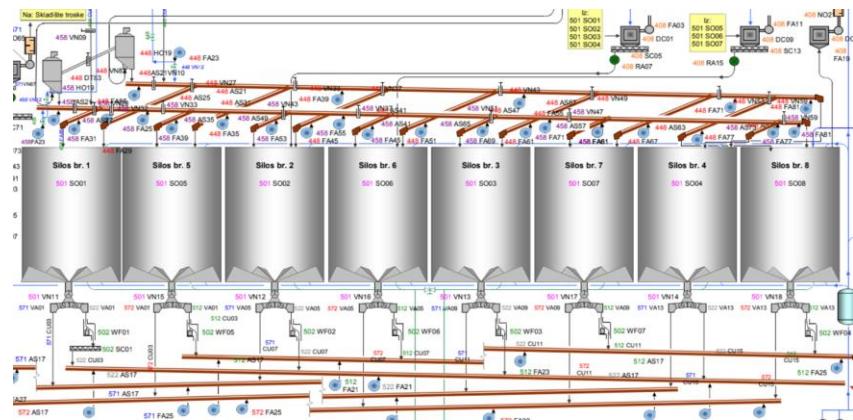
Dva kuglična mlina obezbeđuju bolju kontrolu nad veličinom završnog proizvoda od čega zavisi tip cementa koji će biti proizveden.

Samlevena smesa se naziva cement.



Silosi cementa

Cement se skladišti u silosima dok se ne pojavi potreba za pakovanjem ili direktnim kamionskim prevozom na gradilište.





V

MCC

Motor Control Center

Jedan MCC je odgovoran za kontrolu napajanja i upravljanja za jedan deo procesa.

U celoj fabrici ima oko 15 MCC.



Kasetno postrojenje

Kasetno postrojenje upravlja napajanjem aktuatora.

Svaki aktuator ima svoju kasetu koja uključuje/isključuje njegovo napajanje.

Na kasetama se vrši LOTOTO



Ormar automatike

Ormar automatike čini skup PLC-ova i razvoda napajanja za kasetno postrojenje tog MCC-a.

Digitalni i analogni signali su podeljeni na dva različita ormana automatike.



Frekventni regulatori

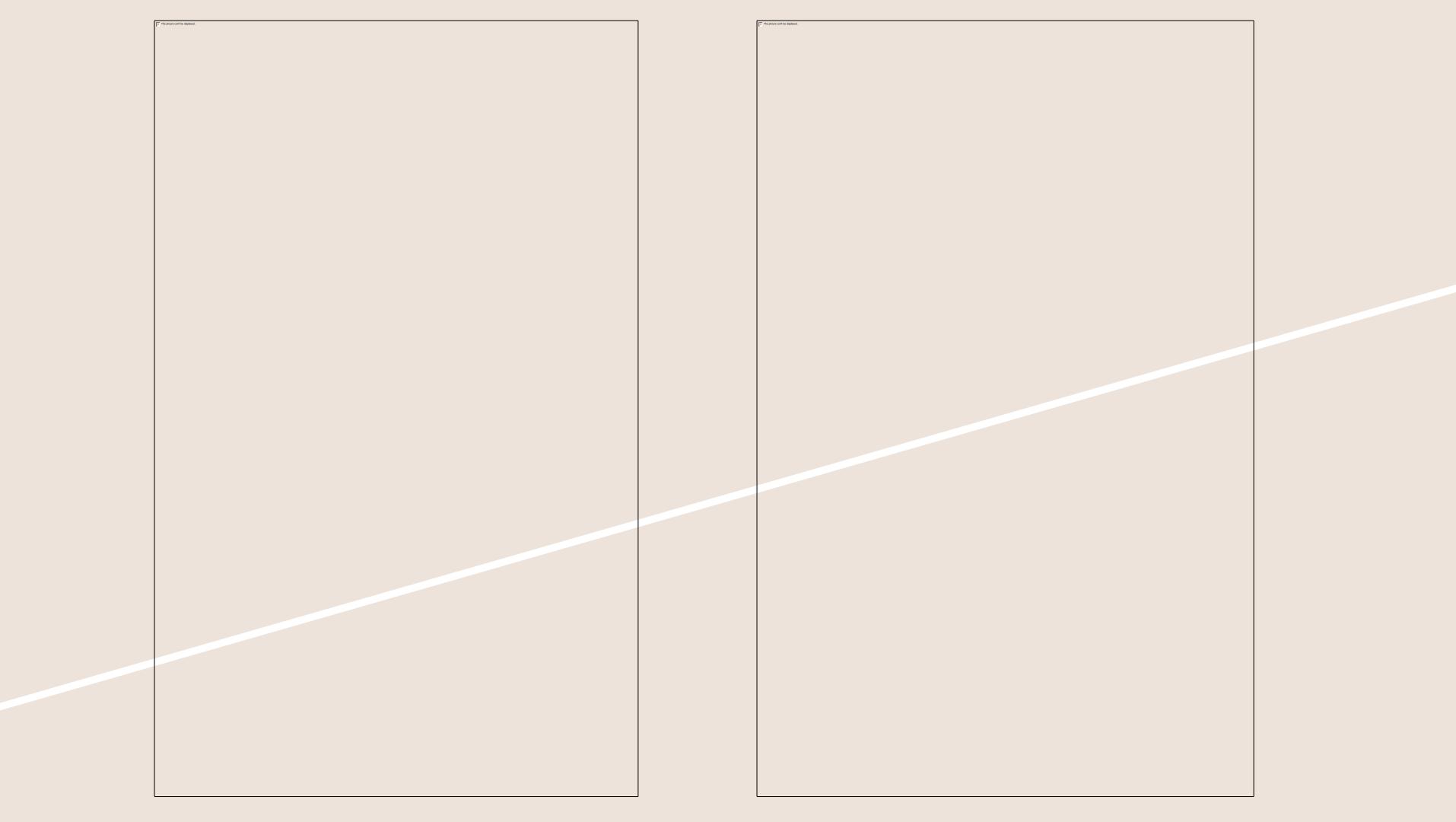
Jedna kasetna iz kasetnog postrojenja napaja jedan frekventni regulator za odgovarajući aktuator.

Jedan PLC iz analognog ormara automatike je zadužen za upravljanje više frekventnih regulatora - upravljačkih signala.

Jedan PLC iz digitalnog ormara automatike je zadužen za davanje dozvola rada za više frekventnih regulatora.



Bezbednost i zaštita na radu



Lična zaštitna oprema

Šlem sa podbratkom, zaštitne naočare, radno odelo visoke vidljivosti, zaštitne cipele.

Potrebno je nositi LZO u pogonu.

U delovima pogona je potrebna dodatna zaštitna oprema (čepići za uši, bubble rukavice, izolacione rukavice, ...).



LOTOTO

Lock Out, Tag Out, Try Out

Bezbednosni sistem koji obezbeđuje prekid napajanja za aktuator nad kojim se vrše radovi.

Napajanje se isključi polugom i ona se katancem drži u isključenoj poziciji.

Postoje tri vrste katanaca: Lični,
Supervizorski i Sektorski.



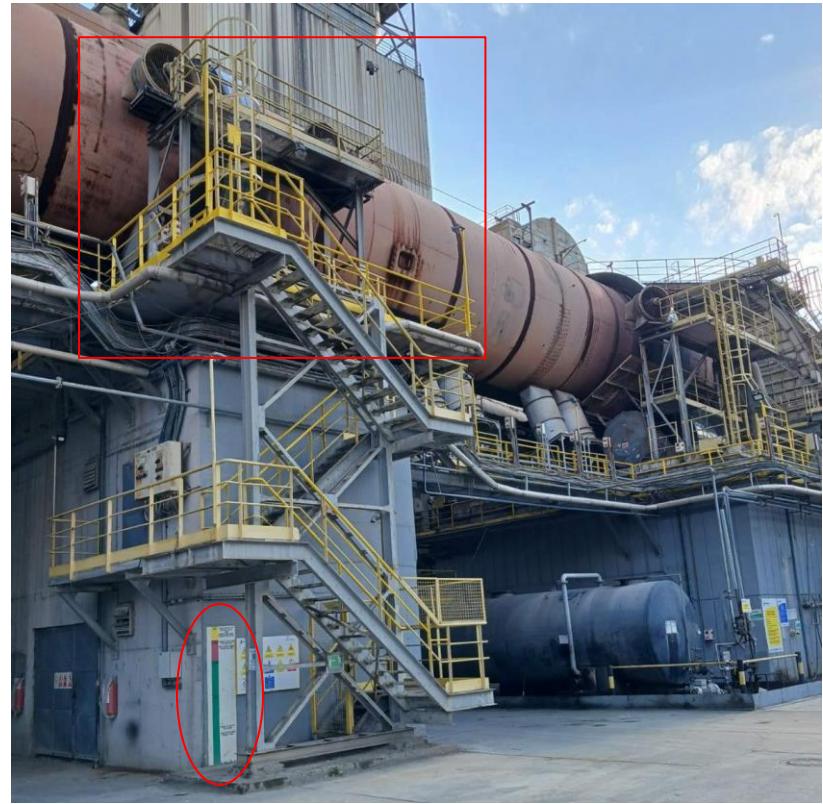
Ostalo

Za rad na visini je potrebna dozvola.

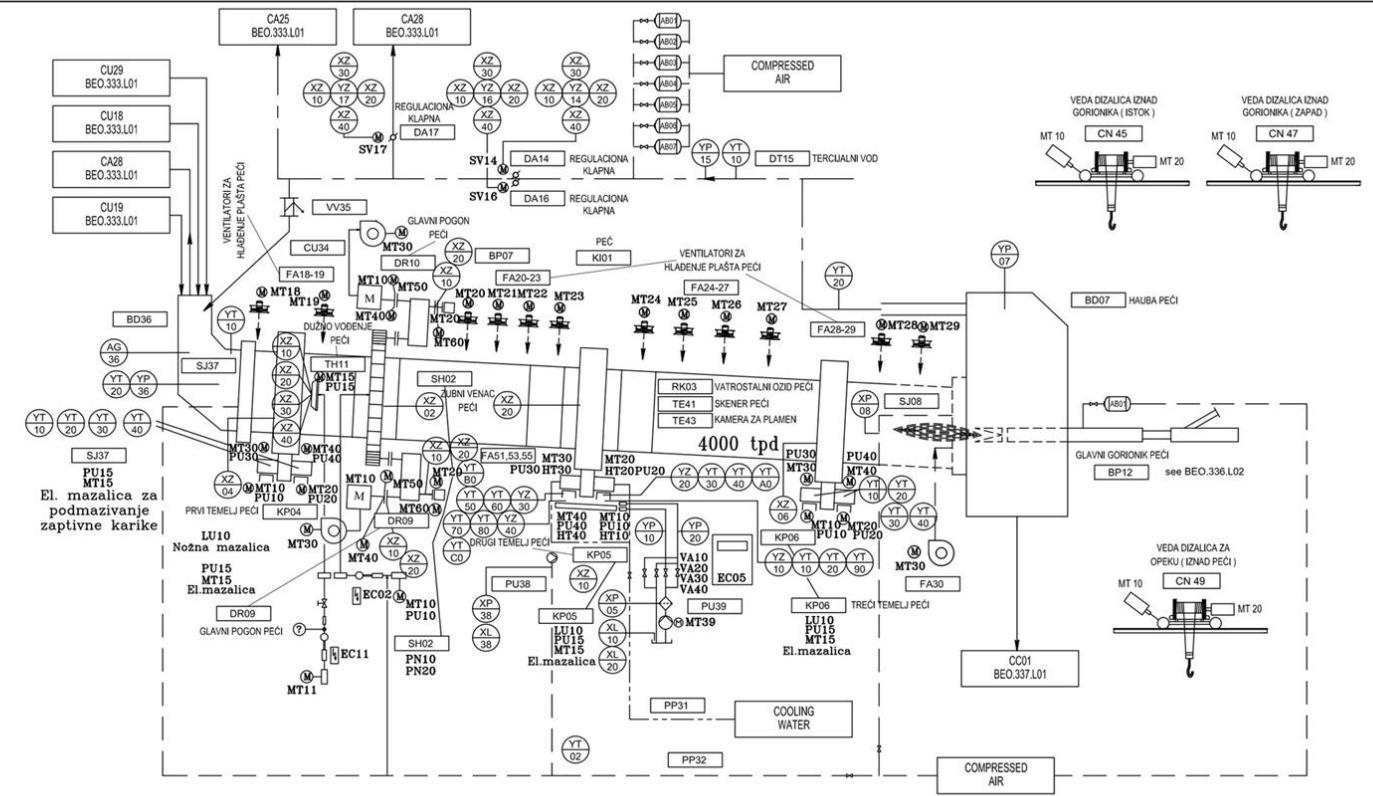
Stepeništa i staze na visini su obavezno ogradjeni.

Pokretni delovi su ograđeni i trake poseduju zatezne sajle.

Vatrogasna stanica Beočina ima direktni prilaz fabrici.



Ulazi i izlazi

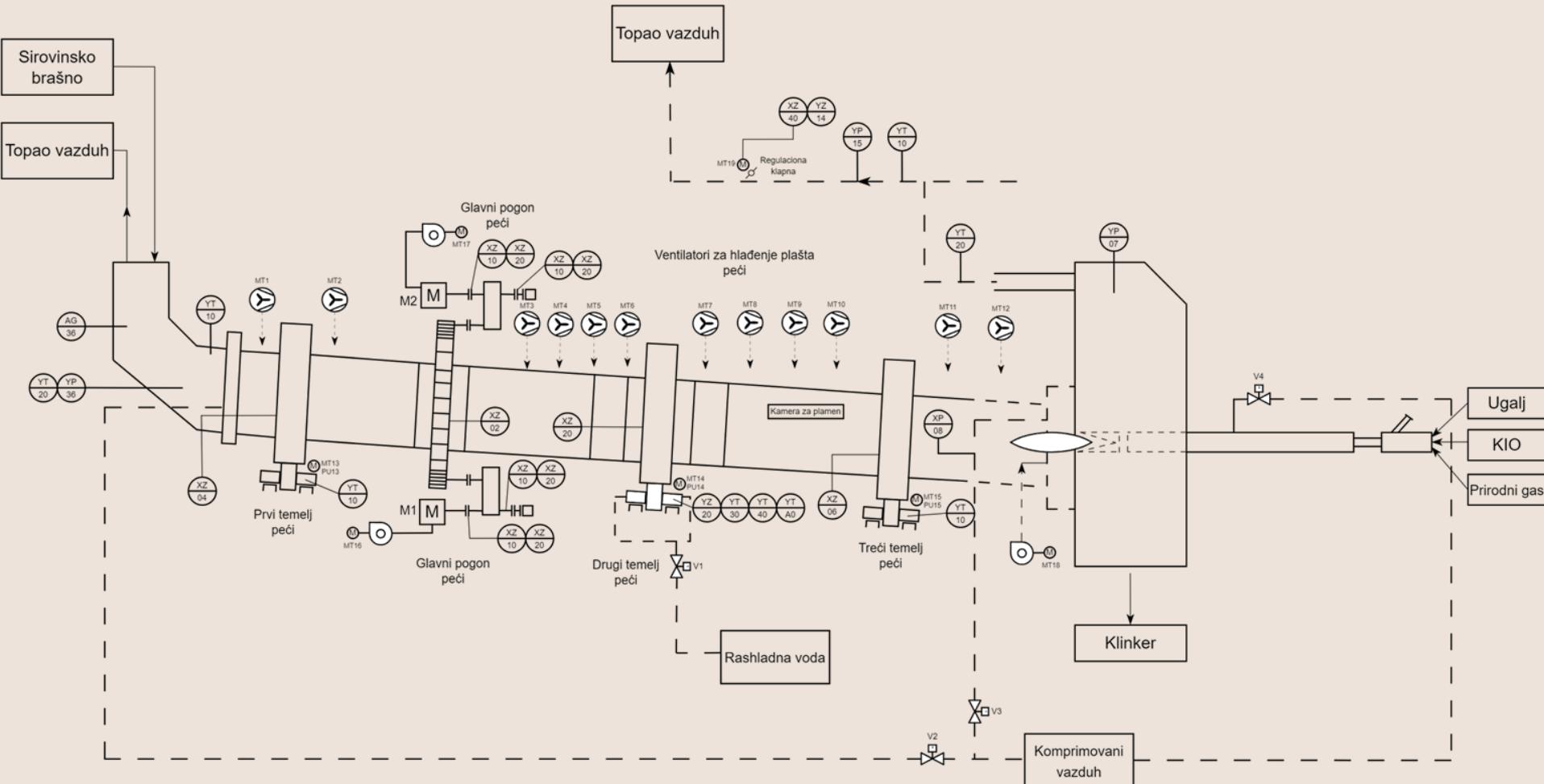


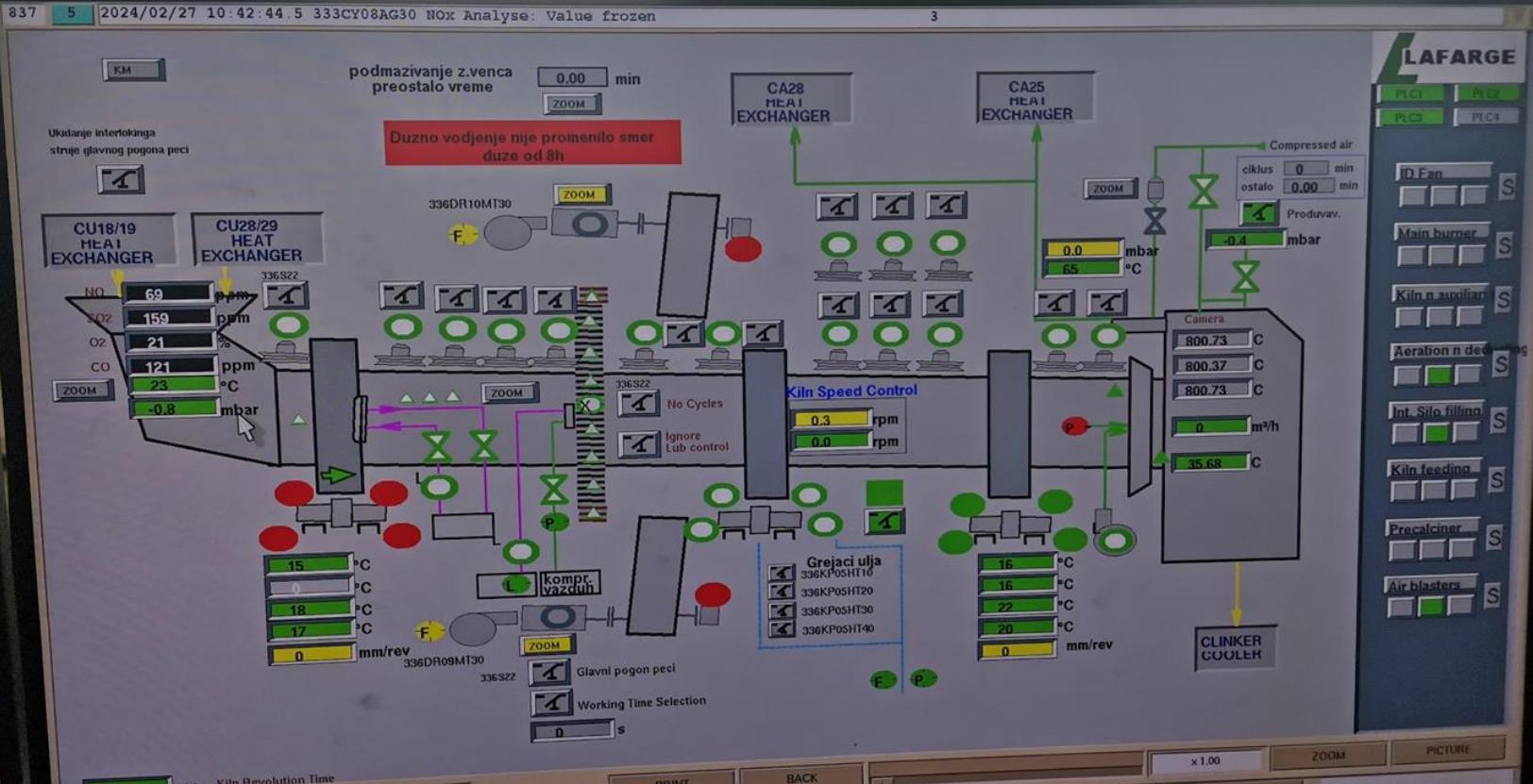
LAFARGE (Flow chart)
Coding_level5 (LAFARGE ITEM)
Coding_level6.1 (Motor)
Coding_level6.2 (Instrumentation)
CONSTRUCTOR (ITEM)

TITLE : KILN	
COUNTRY : SERBIA	CODE : BEO - PKC
SITE : BEOCIN	<small>(This drawing is property of CTED 2000 and may not be copied, modified or distributed without the written consent of CTED 2000)</small>
DESIGNED 19.6.03 NEVARIL	DWG.NO.: BEO.336.L01
CHECKED 19.6.03 BENES	

CAFARGE
BRUSSELS EUROPE CENTRE

Poz.	Naziv - oblik i veličine		Materijal	Kom.	Standard Oznaka crteža	Masa (kg)	P R I M E D B A
Veza - pripadnost:	Tolerancije slobodnih mera		Površine - klasa kvaliteta hrapavosti	Razmera:	Masa (kg/kom.):		
				Sirovina (poluproizvod - materijal - stanje):			
			Datum Ime	Pogon: 336			
			Obradil:	02.04.2008. K. Ugrešić	Naziv - oblik i veličina:	TEHNOLOŠKA ŠEMΑ PEĆI ZA PEĆENJE KLINJERA	
			Crtao:	02.04.2008. K. Ugrešić			
			Površina:	02.04.2008. G. Mosurović			
			Održio:	02.04.2008. D. Marković			
					Deo pogna: 336 PEĆI ZA PEĆENJE KLINJERA		
					Oznaka dokumenta:	BEO.336.L01	List: Listova:
					Izv. dokument:	Zamena za:	
			LAFARGE BFC B e o c i n				
st. i	Izmjena	Datum	Ime				

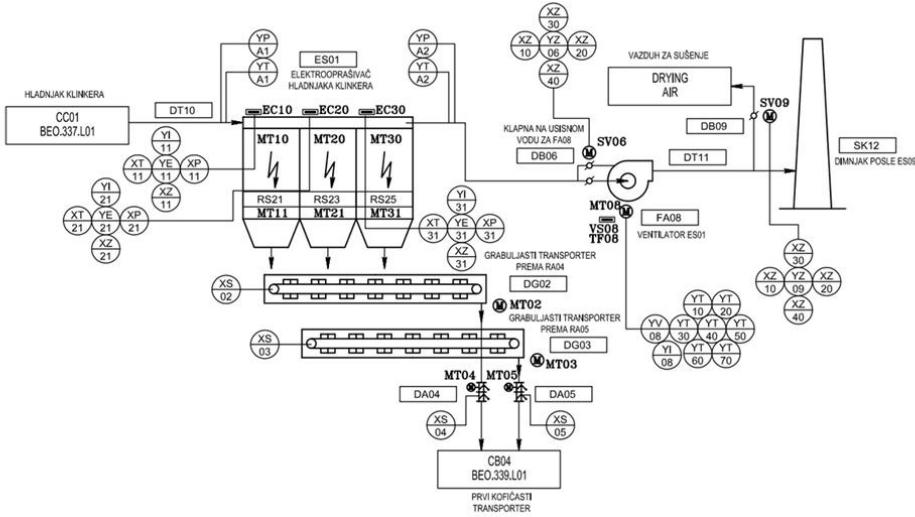




DI	DO	DI	DO	DI	DO
MT1_kvar	MT1_rad	MT1_H/A	V1	XZ_prvi_temelj	
...	XZ_pogon	
MT19_kvar	MT19_rad	MT19_H/A	V4	XZ_drugi_temelj	
M1_FT_kvar	M1_FT_rad	M1_FT_H/A		XZ_treći_temelj	
M2_FT_kvar	M2_FT_rad	M2_FT_H/A		XZ_regulacione_klapne	
				XZ_prirubnice_M1	
				XZ_prirubnice_M2	
				XP_ulaza_gorionika	

AI	AO	AI	AO
YZ_reg_klap	MT16_upravljanje	YT_ulja_temelja3	
YZ_ležaja_temelja2	...	YP_gorionika	
YT_ulja_temelja1	MT19_upravljanje	YT_izlaznih_gasova_gorionika	
YT_ulja_temelja2	M1_FR_upravljanje	YT_ulaza_peć	
YT_ležaja_temelja2	M2_FR_upravljanje	YP_ulaza_peći	
YP_izlaza_gorionika			

Posebno izdvajamo



Poz.	Naziv - oblik i veličine		Materijal		Kom.	Standard Oznaka crteža	Masa (kg)	P R I M E D B A
Veza - pripadnost:	Tolerancije slobodnih mera		Površine - klasa kvaliteta hrapavost		Razmjer:		Masa (kg/kom.):	
					Sirovina (poluproizvod - materijal - stanje):			
					Datum	Ime		
					Obradio	21.11.2007	K. Ugrešić	
					Crtao	21.11.2007	K. Ugrešić	
					Provjero	21.11.2007	G. Mosurović	
					Odobrio	21.11.2007	D. Marković	
					Pogon:	338		
					Naziv - oblik i veličina:	TEHNOLOŠKA ŠEMA OTPRAŠIVANJA SISTEMA ZA HLADENJE KLINKERA		
						Deo pogona: 338 ES01 OTPRAŠIVANJE SISTEM ZA HLADENJE KLINKERA		
					Oznaka dokumenta:	BEO.338.L01	List:	
							Listova:	
					Izv. dokument:		Zamena za:	

LAFARGE (flow chart)	
Code: BEO.338.L01	(LAFARGE ITEM)
Coding_level.1 (Motor)	
Coding_level.2 (Instrumentation)	
CONSTRUCTOR (ITEM)	

TITLE : CLINKER COOLER DUST COLLECTOR

COUNTRY : SERBIA CODE : BEO - PKC

SITE : BEOCIN DWG.NO.: BEO.338.L01

DESIGNED 5.6.03 CHECKED 5.6.03

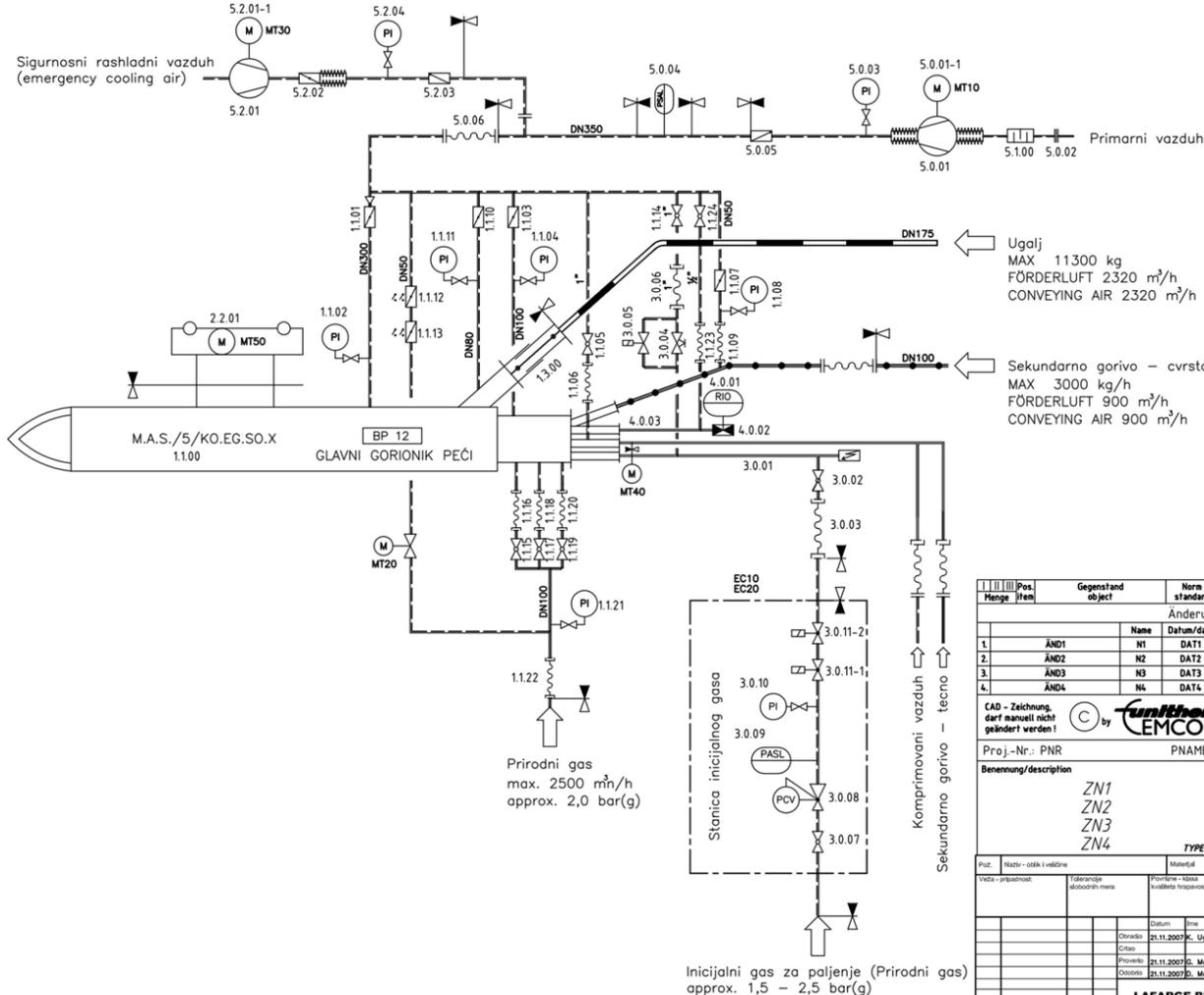
REVISIONS

Rev A

LAFARGE CENTRE TECHNIQUE EUROPE CENTRAL

A-1000 Belgrade, Serbia
TEL: (011) 46-4190
FAX: (011) 46-4199

LAFARGE BFC
Beočin



CAD - Zeichnung,
darf manuell nicht
geändert werden!



Unitherm Cemcon ? Feuerungsanlagen, Gesellschaft
A-1110 Wien, 1., Wiedner Hauptstrasse 17-19
Tel.: +43 1 74041-0, Fax: +43 1 74041-100
E-Mail: design@unitherm.co.at Internet: <http://www.unitherm.co.at>

Proj.-Nr.: PNR PNAME Maßstab/scale Name / name Datum / date

MS Gez./drawn NAME DATUM

Benennung/description

ZN1 **Dept / CHECK** **Freimarktanzug** **entstanden aus** **Erneut für**

ZNZ	FT	NR	NR
2010			

ANSWER

ZNR

ENVY **TYPE**

Poz. Naziv - oblik i veličine Materijal Kom. Oznaka crteža Težina (kg) PRIMEDBA

Veza - pripadnost: Tolerančne slobodnosti mesta Površine - käsä Razmera: Masa (kg/kom.):

Sirovina (poluproizvod - materijal - stanje):

For more information about the NIST Privacy Framework, visit www.nist.gov/privacy-framework.

Datum: 01.06.2018 Pogon: 336

Obradio 21.11.2007. K. Ugrešić Naziv - oblik i vrednost: TEHNOLOSKA SEMA

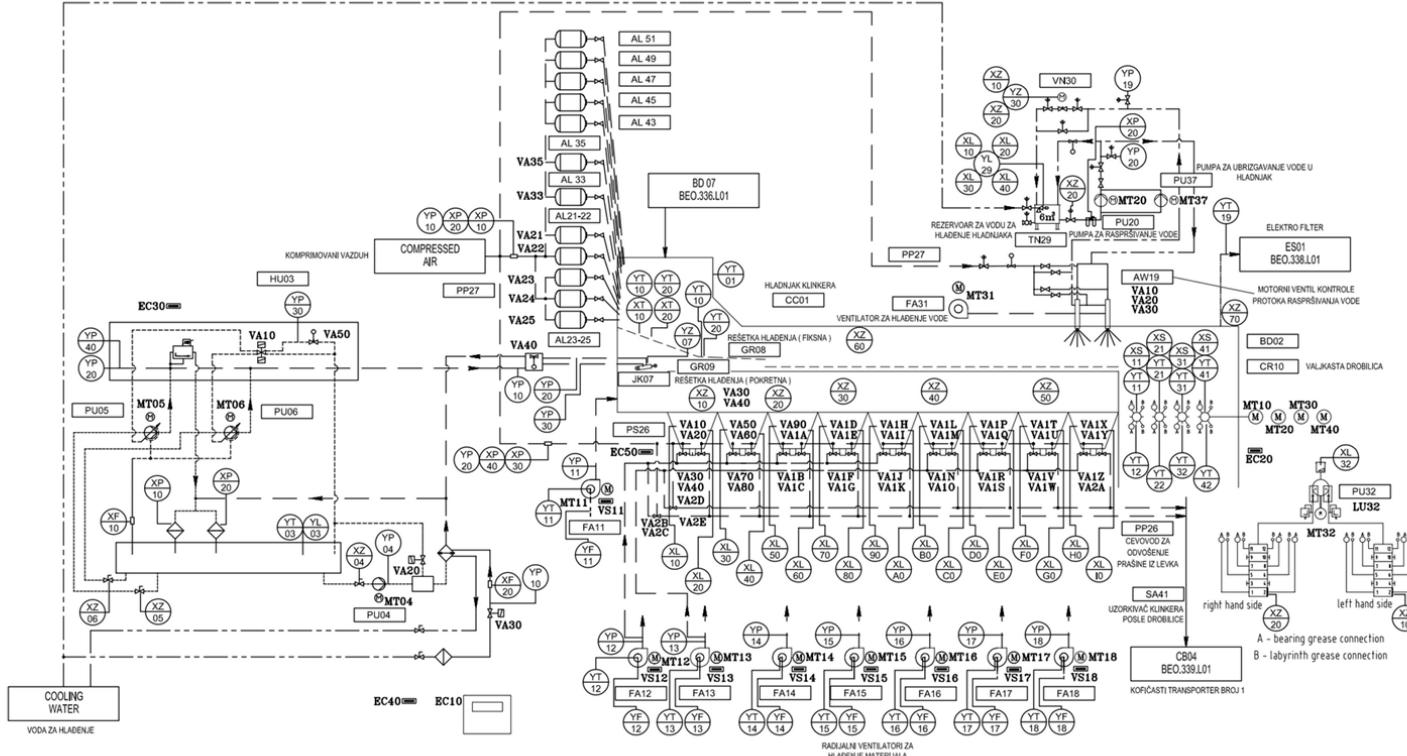
GLAVNOG GORIONIKA PE

Proverbo 21.11.2007 G. Misorovic
GLAVNIK GORIČKOG PETRINCIJA

Ugovor 21.11.2007 D. Marković **Ured pogona:** ZŠB BFTZ GLAVNI GORNJARIK PEGI

Lafarge BFC dokumenta: BFO 336 | 02

DEO.350.E02



LAFARGE (Flow chart)	
Coding_level5 (LAFARGE ITEM)	
Coding_level8.1 (Motor)	
Coding_level8.2 (Instrumentation)	
CONSTRUCTOR (ITEM)	

TITLE :	CLINKER COOLER		
COUNTRY :	SERBIA	CODE :	BEO-PKC
SITE :	BEOCIN	The drawing is property of CECIC-B and must not be copied or reproduced without written permission according to number line.	
DESIGNED	19.6.03	NEVARIL	DWG.NO.: BEO337.L01
CHECKED	19.6.03	BENES	



BE0337.L01

Poz.	Naziv - oblik i velicina		Materijal		Kom.	Standard Oznaka crteza	Masa (kg)	P R I M E D B A
Veza - pripadnost:	Tolerancije slobodnih mera		Površine - klasa kvaliteta hrapavosj		Razmera:	Masa (kg/kom.);		
					Sirovina (poluproizvod - materijal - stanje);			
			Datum	Ime	Pogon: 337			
			Obrađio:	02.04.2008	Naziv - oblik i velicina: TEHNOLOŠKA ŠEMA HLAĐENJA KLINKERA			
			Crtao:	02.04.2008				
			Provadio:	02.04.2008	G. Mosurović			
			Odobrio:	02.04.2008	D. Marković			
					Deo pogona: 337 CC01 HLADNJAK KLINKERA			
					Oznaka dokumenta:	BEO.337.L01		List: Listova:
st. L	Izmena	Datum	Ime		Izv. dokument:	Zamena za:		
LAFARGE BFC B e o c l n								



28.2.2024.

Poseta studenata Fakulteta tehničkih nauka

U utorak, 27. februara, beočinsku fabriku cementa su posetili studenti Fakulteta tehničkih nauka iz Novog Sada, smer Računarstvo i automatika.

Dobrodošlicu im je poželeo Nikola Spasojević, Menadžer za obuku i razvoj zaposlenih, koji im je ujedno predstavio koje su to mogućnosti za razvoj u okviru kompanije bilo da se radi o stručnoj praksi, izradi diplomskih/master radova ili o stažiranju koje može da preraste u stalni radni odnos. Nešto više o električnoj energiji, izolaciji energije i održavanju studentima je približio Vladislav Valent, Upravnik elektro održavanja.

