REFRAKTER KATALOĞU

SELKO

SELKO ATEŞ TUĞLA SANAYİ ve TİCARET A. Ş.

K-Q TSE-ISO-EN 9000

TS EN ISO 9001:2000

www.selko.com.tr

5443

KALİTE YÖNETİM SİSTEMİ BELGESİ

QUALITY MANAGEMENT SYSTEM CERTIFICATE

TSE

TÜRK STANDARDLARI ENSTİTÜSÜ

bu belge ile

SELKO ATEŞ TUĞLA SANAYİ VE TİC. A.Ş.
ORGANİZE SAN. BÖL. 7.CAD. KURTKÖY/BARTIN BARTIN / TÜRKİYE

TURKISH STANDARDS INSTITUTION

hereby certifies that the organisation

SELKO ATEŞ TUĞLA SANAYİ VE TİC. A.Ş.
located in
ORGANİZE SAN. BÖL. 7.CAD. KURTKÖY/BARTIN BARTIN / TÜRKİYE

K - Q
TSE-ISO-EN
9000

kurduğunu TS EN ISO 9001:2000 şartlarına uygun bir KALİTE YÖNETİM SİSTEMİNE sahip olduğunu onaylar.

has a QUALITY MANAGEMENT SYSTEM which fulfills the requirements of the TS EN ISO 9001:2000

Belge kapsamı Ek'te verilmiştir.

Scope of the certificate is given in appendix.

TÜRK STANDARDLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION

TSE GENEL SEKRETERİ
Secretary General of TSE

Mustafa OĞUŞ

TSE BAŞKANI
President of TSE

Kemal MALATYALI

Belge No / Certificate No
KY-4632/06
Belge Tarihi / Date of Certificate
22/08/2006
Geçerlilik Tarihi / Valid Until
22/08/2009

Türk Standardları Enstitüsü, Türk ... tarafından akredite edilmiştir.
Turkish Standards Institution, has been ... by the Accreditation Agency TÜRKAK.

Bu belge belgelendirme şartlarına uygunluk sağlandığı sürece geçerlidir. This certificate is valid provided that compliance with the certification requirement is maintained.

SELKO

6374

KALİTE YÖNETİM SİSTEMİ BELGESİ

QUALITY MANAGEMENT SYSTEM CERTIFICATE

TSE

EK / APPENDIX

Belge No / Certificate No: KY-4632/06

Belge Tarihi / Date of Certificate : 22/08/2006

Belgeli Kuruluş Adı, Adresi

Name and Address of the certified organisation

SELKO ATEŞ TUĞLA SANAYİ VE TİC. A.Ş.
ORGANİZE SAN. BÖL. 7.CAD. KURTKÖY/BARTIN BARTIN / TÜRKİYE

K - Q
TSE-ISO-EN
9000

Belge Kapsamı:

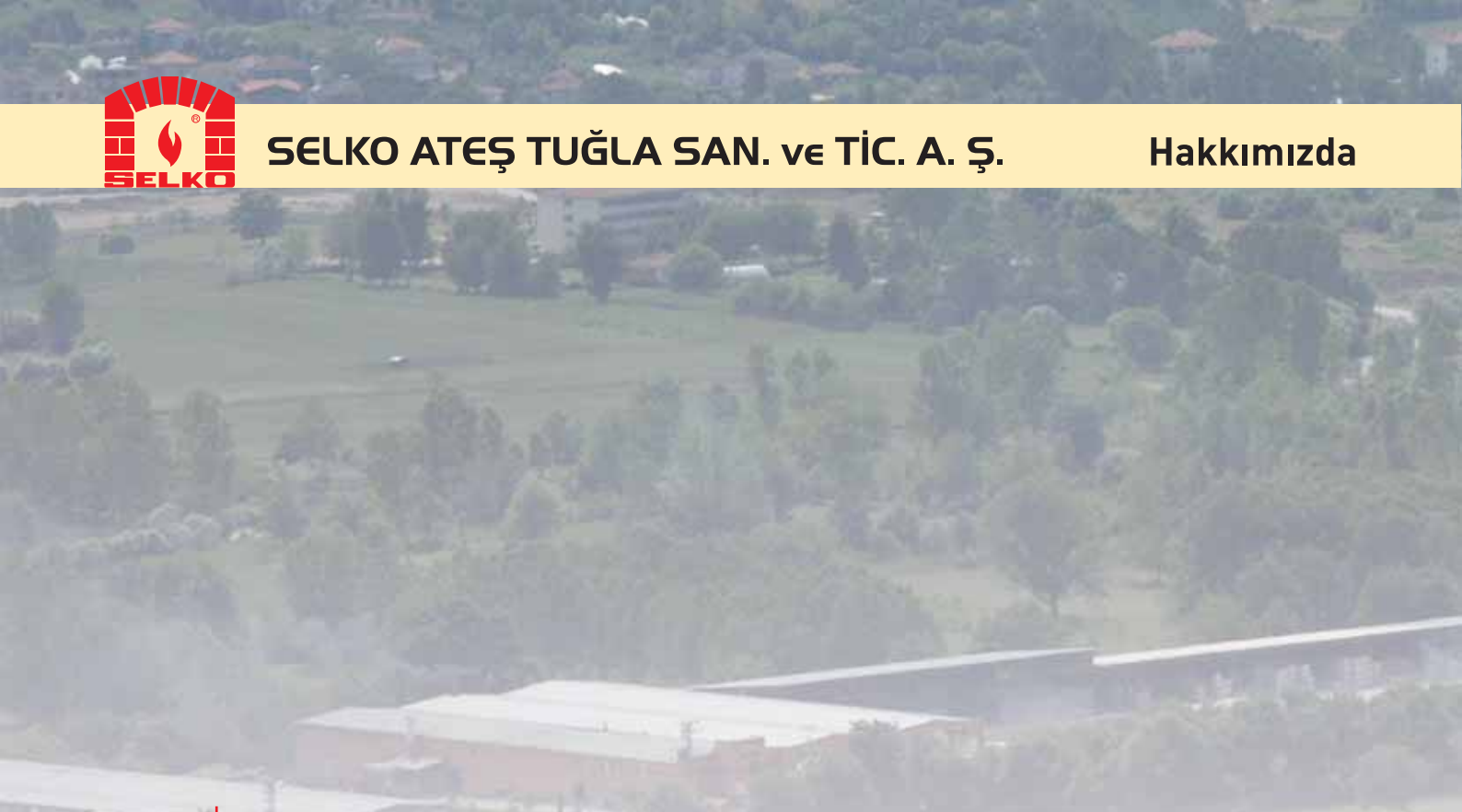
TS EN ISO 9001:2000
ATEŞ TUĞLA ÜRETİMİ

Scope of the Certificate :

TS EN ISO 9001:2000
PRODUCTION OF FIREBRICKS

İçindekiler / Contents

	Sayfa No / Page No
Hakkımızda / About Us	2 - 3
Fabrikamızın İmalat, Kalite Kontrol, Sevkiyat vb. Fotoğrafları / Our production, Quality Control and Shipping Photographes	4 - 5
Spesifikasyonlar / Tuğlalar / Specifications / Bricks	6 - 7
Spesifikasyonlar / Monolitik Refrakterler / Specifications / Monolithic Refractories	8 - 9
Spesifikasyonlar / Örgü Harçları / Specifications / Lining Mortars	10
Harç Kullanım Talimatı / Plaster Using Instruction	11
Monolitik Refrakterlerin Kullanım Talimatları / Using Instructions of Monolithic Refractories	12 - 19
Tuğla Şekilleri / Brick Forms	20 - 47
Tuğla Kullanım Yerleri / Places of Use	48 - 55
Elektrik Ark Ocağı / Electric Arc Furnace	48
Haddehane Fırını / Rolling Furnace	49
Çelik Döküm Potası / Steel Casting Ladle	50
Siemens Martin / Siemens Martin Furnace	51
Pik Demir Mikseri / Pig Iron Mixer	51
İndüksiyon Ocağı / Induction Furnace	52
Çimento Döner Fırını / Cement Rotary Kiln	52
Kireç Fırını / Lime Furnace	53
Bakır Flaş Fırını / Flash Smelter (Copper)	53
Bakır Rafine Fırını / Copper Refining Furnace	54
Cam Eritme Fırını ve Rejeneratör / Glass Melting Furnace and Regenerator	54
Torpedo Arabası / Torpedo Car	55
Alüminyum Ergitme Fırını / Aluminum Melting Furnace	55
Teknik Bilgiler / Technical Data	56-62
Amasra Manzaraları / Landscapes of Amasra	63



1987 Yılında Bartın Küçük Sanayi Sitesinde Kizelgur izole ve Şamot izole üretimi amacıyla Selahattin Kalaycı tarafından kurulan firmamız kısa süre içinde gelen talepler doğrultusunda üretimine Şamot tuğlalar, yüksek alüminalı tuğlalar ve harçlarını da katmıştır.

1993 yılında anonim şirket olan firmamız, o yıllardan itibaren gerek kalite olarak gerekse de kapasite olarak kendini hızla geliştirmiştir. 2003 yılında da Bartın Organize Sanayi Bölgesindeki 5000 m^2 si kapalı alan olmak üzere toplam 19000 m^2 alana kurulu yıllık 12,000 ton kapasiteli bugünkü modern tesisine kavuşmuştur.

Alümina silika esaslı şekilli ve şekilsiz her türlü refrakter malzeme üretimi yapan firmamızın yüksek kalite anlayışı gereği, hammaddenin girişinden itibaren ve üretimin her safhasında modern laboratuvarlarımızda kalite kontrolü yapılmakta ve maksimum müşteri memnuniyeti hedeflenmektedir.

Our company has been established by Selahattin Kalaycı in 1987 in Bartın Small Industry Site for producing isolated kizelgur and fireclay bricks. In a short time depending on demand requirements it is added to product list fireclay brick, high alumina brick and castables.

In 1993, it is changed its organization profile to incorporation company. The company has improved itself due to quality and capacity since that time rapidly. In 2003, it has started its production life in his modern settlement that have including 5,000 m^2 closed area and totally 19 000 m^2 area in Organized Industrial Area of Bartın with teh production rate of 12,000 tons / year.

According to the our quality management policy, produced all kinds of shaped and / or unshaped alumina silicate based refractory materials are strictly controlled during all the production stages by starting from raw materials to the finished product in our modern labrotories to execute the required maksimum customer pleasure concept.

Yüksek Alüminalı Tuğlalar

Ürün Adı Brand Name	KİMYASAL ÖZELLİKLER - CHEMICAL ANALYSIS				
	Al_2O_3 %	Fe_2O_3 %	TiO_2 % max.	$Na_2O + K_2O$ % max.	CaO + MgO % max.
SEL.85	80 - 85	1,5 - 2,0	3,2	1,0	1,0
SEL.80	75 - 80	1,5 - 2,0	3,2	1,0	1,0
SEL.75	70 - 75	1,5 - 2,0	2,9	1,0	1,0
SEL.70	65 - 70	1,5 - 2,0	2,6	1,0	1,0
SEL.65	60 - 65	1,5 - 2,0	2,2	1,0	1,0
SEL.60	55 - 60	1,5 - 2,0	1,9	1,0	1,0
SEL.55	50 - 55	1,5 - 2,0	1,6	1,0	1,0
SEL.50	46 - 50	1,5 - 2,0	1,3	1,0	1,0

Şamot Tuğlalar

Ürün Adı Brand Name	KİMYASAL ÖZELLİKLER - CHEMICAL ANALYSIS				
	Al_2O_3 %	Fe_2O_3 %	TiO_2 % max.	$Na_2O + K_2O$ % max.	CaO + MgO % max.
SEL.46	42 - 46	1,5 - 2,0	1,0	1,0	1,0
SEL.42	39 - 42	1,5 - 2,5	1,0	1,0	1,0
SEL.39	36 - 39	2,5 - 3,0	1,0	1,2	1,2
SEL.36	26 - 36	2,5 - 3,5	1,0	1,5	1,5
SEL.ASID	25 - 35	1,5 - 2,0	1,0	2,0	2,0

* Not : SEL.ASID İçin Su Emme (Water Absorption) : % 4 - 7, Asitte Çözünürlük (Acid Solubility): % 2 - 5 dir.

İzole Tuğlalar

Ürün Adı Brand Name	KİMYASAL ÖZELLİKLER - CHEMICAL ANALYSIS			
	Al_2O_3 %	Fe_2O_3 %	$Na_2O + K_2O$ % max.	CaO + MgO % max.
SEL.ŞİZ.1,0	30 - 40	2,5 - 3,0	1,5	1,5
SEL.ŞİZ.1,2	30 - 40	2,5 - 3,0	1,5	1,5
SEL.ŞİZ.1,3	30 - 40	2,5 - 3,0	1,5	1,5
SEL.KİZ.0,6	15 - 20	2,5 - 3,0	1,0	1,0
SEL.KİZ.0,8	15 - 20	2,5 - 3,0	1,0	1,0
SEL.KİZ.0,9	15 - 20	2,5 - 3,0	1,0	1,0

TS EN ISO 9001:2000

High Alumina Bricks

FİZİKSEL ÖZELLİKLER - PHYSICAL PROPERTIES							
Hacim Ağr. B. Density gr/cm³	Görünür Porozite Apparent Porosity %	S.B.D. C.C.S. kg/cm² min	Y.A.R. R.U.L. (°C T_a)	Refrakterlik Refractoriness S.K.	Ter. Şok Ther. Shock 950 °C Water min.	Ter. İlet. Ther. Con. Kcal / M °C.h 1000 °C min.	Ter. Lin. Gen. Ther. Lin. Exp. %1200 °C min.
2,65 - 2,80	19 -23	600	1550	39 - 40	30	1,8 - 1,9	0,85 - 0,95
2,60 - 2,75	18 - 23	600	1530	38 - 39	30	1,8 - 1,9	0,85 - 0,95
2,50 - 2,70	17 - 22	600	1500	37 - 38	25	1,7 - 1,8	0,80 - 0,90
2,50 - 2,65	18 - 21	550	1480	36 - 37	25	1,6 - 1,7	0,75 - 0,85
2,40 - 2,60	17 - 21	550	1470	35 - 36	25	1,5 - 1,6	0,70 - 0,80
2,40 - 2,55	18 - 20	500	1460	34 - 35	25	1,3 - 1,4	0,65 - 0,75
2,35 - 2,50	18 - 20	500	1450	34 - 35	20	1,2 - 1,3	0,60 - 0,70
2,20 - 2,45	17 - 19	450	1435	33 - 34	20	1,1 - 1,2	0,55 - 0,65

Fireclay Bricks

FİZİKSEL ÖZELLİKLER - PHYSICAL PROPERTIES							
Hacim Ağr. B. Density gr/cm³	Görünür Porozite Apparent Porosity %	S.B.D. C.C.S. kg/cm² min	Y.A.R. R.U.L. (°C T_a)	Refrakterlik Refractoriness S.K.	Ter. Şok Ther. Shock 950 °C Water min.	Ter. İlet. Ther. Con. Kcal / M °C.h 1000 °C min.	Ter. Lin. Gen. Ther. Lin. Exp. %1200 °C min.
2,20 - 2,35	16 - 18	450	1420	32 - 33	20	1,0 - 1,1	0,5 - 0,6
2,15 - 2,30	18 - 20	400	1405	31 - 32	20	1,0 - 1,1	0,5 - 0,6
2,05 - 2,20	20 - 22	300	1330	30 - 31	15	1,0 - 1,1	0,5 - 0,6
2,00 - 2,20	20 - 22	300	1300	29 - 30	15	1,0 - 1,1	0,5 - 0,6
2,10 - 2,20	10 - 16	500	1280	26 - 28	15	1,0 - 1,1	0,5 - 0,6

Insulating Bricks

FİZİKSEL ÖZELLİKLER - PHYSICAL PROPERTIES							
Hacim Ağr. B. Density gr/cm³	Görünür Porozite Apparent Porosity %	S.B.D. C.C.S. kg/cm² min	Refrakterlik Refractoriness S.K.	Termal İletkenlik Thermal Conductivity Kcal / M °C.h			
				400	600	800	1000
0,9-1,1	55-60	30-70	20-30	0,37	0,38	0,42	0,45
1,1-1,3	50-55	40-80	25-30	0,40	0,43	0,47	0,50
1,2-1,4	45-50	50-90	25-35	0,45	0,50	0,54	0,60
0,5-0,7	65-70	10-20	15-20	0,20	0,21	0,23	0,25
0,7-0,9	60-65	15-30	15-25	0,25	0,26	0,28	0,30
0,8-1,0	55-60	20-40	15-30	0,28	0,30	0,31	0,32

Döküm ve Sıva Harçları

Ürün Adı Brand Name	KİMYASAL ÖZELLİKLER - CHEMICAL ANALYSIS		
	$Al_2O_3 + TiO_2$ %	Fe_2O_3 %	CaO %
SELCAST.85	80 - 85	1,5 - 2,0	3 - 4
SELCAST.80	75 - 80	1,5 - 2,0	3 - 4
SELCAST.75	70 - 75	1,5 - 2,0	4 - 5
SELCAST.70	65 - 70	1,5 - 2,0	5 - 7
SELCAST.65	60 - 65	1,5 - 2,0	5 - 7
SELCAST.60	55 - 60	1,5 - 2,0	5 - 7
SELCAST.55	50 - 55	1,5 - 2,0	7 - 8
SELCAST.50	45 - 50	1,5 - 2,0	7 - 8
SELCAST.45	40 - 45	1,5 - 2,0	7 - 8
SELCAST.40	30 - 40	3,0 - 5,0	8 - 10
SELCAST.ASID	25 - 35	3,0 - 5,0	8 - 10

* Not : Bütün döküm harçları hidrolik bağlıdır. Teknik değerler uygun standart testlerle belirlenmiş tipik değerlerdir ve bağlayıcı değildir. İsteğe bağlı olarak değişik değerlerde üretim yapılabilir.

All of the castables are hydraulic bonded.The stated specifications are average values obtained from laboratory tests conducted in accordance with testing standards. The values are typical and can not be considered as binding specifications. Production can also be realized according to the customer's requirements.

SELCAST.ASID sıcaklığın yüksek olmadığı (max 1000 °C kadar) yerlerde kullanılan sürtünmeye ve aşınmaya son derece mukavim dökme refrakterdir.

SELCAST.ASID Highly resistant to abrasion and corrosion at low temperature (around 1000 °C)

İzole Döküm Harçlar

Ürün Adı Brand Name	KİMYASAL ÖZELLİKLER - CHEMICAL ANALYSIS		
	$Al_2O_3 + TiO_2$ %	Fe_2O_3 %	CaO %
SEL.IZOCAST.40	35 - 40	2,5 - 3,0	10 - 12
SEL.IZOCAST.35	30 - 35	2,5 - 3,0	10 - 12
SEL.IZOCAST.30	25 - 30	2,5 - 3,0	10 - 12

Düşük Çimentolu Harçlar

Ürün Adı Brand Name	KİMYASAL ÖZELLİKLER - CHEMICAL ANALYSIS		
	$Al_2O_3 + TiO_2$ %	Fe_2O_3 %	CaO %
SEL.85.LCC	80 - 85	0,5 - 1,2	2,1 - 2,8
SEL.80.LCC	75 - 80	0,6 - 1,3	2,1 - 2,8
SEL.75.LCC	70 - 75	0,7 - 1,4	1,5 - 2,0
SEL.70.LCC	65 - 70	0,8- 1,5	1,5 - 2,0
SEL.65.LCC	60 - 65	1,0 - 1,6	1,5 - 2,0
SEL.60.LCC	55 - 60	1,1 - 1,7	1,5 - 2,0
SEL.85(SiC)LCC	80 - 85	1,2 - 2,0	2,2
SEL.80(SiC)LCC	75 - 80	1,5 - 2,2	2,0

TS EN ISO 9001:2000

Castables

FİZİKSEL ÖZELLİKLER - PHYSICAL PROPERTIES								
Hacim Ağr. B. Density (110 °C) gr/cm³	S.B.D. C.C.S. kg/cm² min		Refrakterlik Refractori ness S.K.	Tane Boyutu Grain Size mm	Çalışma Sıc. Working Tem. °C	Ter. İlet. Ther. Con. Kcal / M °C.h 1000 °C min.	Ter. Lin. Gen. Ther. Lin. Exp. % 1000 °C min.	Karışım Suyu Water Req. %
	(110 °C)	(1000 °C)						
2,40 - 2,50	450	450	36	0 - 5	1700	1,6 - 1,7	0,85 - 0,95	7,0 - 9,0
2,35 - 2,45	400	300	35	0 - 5	1650	1,5 - 1,6	0,85 - 0,95	7,5 - 9,0
2,30 - 2,40	400	300	34	0 - 5	1600	1,4 - 1,5	0,80 - 0,90	8,0- 10,0
2,25 - 2,35	350	300	33	0 - 5	1550	1,3 - 1,4	0,75 - 0,85	8,5- 10,5
2,20 - 2,30	350	300	32	0 - 5	1500	1,2 - 1,3	0,70 - 0,80	9,0- 11,0
2,15 - 2,25	300	250	30	0 - 5	1450	1,1 - 1,2	0,65 - 0,75	9,5- 11,5
2,10 - 2,20	300	250	25	0 - 5	1400	1,0 - 1,1	0,60 - 0,70	10,0 - 12,0
2,05 - 2,15	250	200	20	0 - 5	1350	0,9 - 1,0	0,55 - 0,65	10,5 - 12,5
2,00 - 2,10	250	200	15	0 - 5	1300	0,8 - 0,9	0,50 - 0,60	11,0 - 13,0
2,00 - 2,10	200	150	14	0 - 5	1100	0,8 - 0,9	0,50 - 0,60	11,0 - 13,0
2,20 - 2,30	400	250	7	0 - 5	1000	0,8 - 1,0	0,50 - 0,70	10,0 - 12,0

Insulating Refractory Castables

FİZİKSEL ÖZELLİKLER - PHYSICAL PROPERTIES								
Hacim Ağr. B. Density (110 °C) gr/cm³	S.B.D. C.C.S. kg/cm² min		Refrakterlik Refractori ness S.K.	Tane Boyutu Grain Size mm	Çalışma Sıc. Working Tem. °C	Ter. İlet. Ther. Con. Kcal / M °C.h 1000 °C min.	Ter. Lin. Gen. Ther. Lin. Exp. % 1000 °C min.	Karışım Suyu Water Req. %
	(110 °C)	(1000 °C)						
0,9 - 1,0	30	20	12	0,5	1200	0,5 - 0,6	0,45 - 0,55	30 - 40
0,8 - 0,9	25	15	11	0-5	1100	0,4 - 0,5	0,40 - 0,50	30 - 40
0,7 - 0,8	20	10	10	0-5	1000	0,3 - 0,4	0,35 - 0,45	30 - 40

Low Cement Castables

FİZİKSEL ÖZELLİKLER - PHYSICAL PROPERTIES								
Hacim Ağr. B. Density (110 °C) gr/cm³	S.B.D. C.C.S. kg/cm² min		Refrakterlik Refractori ness S.K.	Tane Boyutu Grain Size mm	Çalışma Sıc. Working Tem. °C	Ter. İlet. Ther. Con. Kcal / M °C.h 1000 °C min.	Ter. Lin. Gen. Ther. Lin. Exp. % 1000 °C min.	Karışım Suyu Water Req. %
	(110 °C)	(1000 °C)						
2,5 - 2,8	450	400	39	0 -5	1800	1,9 - 2,1	0,95 - 1,2	5 - 7
2,5 - 2,8	450	400	39	0 -5	1800	1,9 - 2,1	0,95 - 1,2	5 - 7
2,5 - 2,8	500	350	38	0 -5	1800	1,9 - 2,0	0,95 - 1,1	5 - 8
2,5 - 2,8	700	800	38	0 -5	1800	1,9 - 2,0	0,95 - 1,1	4 - 6
2,4 - 2,7	600	900	37	0 -5	1800	1,8 - 1,9	0,95 - 1,1	4 - 6
2,3 - 2,7	950	500	37	0 -5	1750	1,8 - 1,9	0,95 - 1,1	4 - 6
2,6 - 2,8	1300	520	36	0 -5	1750	1,7 - 1,8	0,95 - 1,0	6 - 9
2,5 - 2,7	500	500	36	0 -5	1700	1,6 - 1,7	0,85 - 0,95	5 - 7

Ürün Adı Brand Name	KİMYASAL ÖZELLİKLER - CHEMICAL PROPERTIES				FİZİKSEL ÖZELLİKLER PHYSICAL PROPERTIES	
	$Al_2O_3 + TiO_2$ %	Fe_2O_3 %	$Na_2O + K_2O$ % max.	CaO + MgO % max.	Refrakterlik Refractoriness S.K.	Tane Boyutu Grain Size mm
Yüksek Alüminalı Harçlar						**High Alumina Mortars**
SELMOR.80	75 - 80	1,5 - 2,0	1,0	1,0	39 - 40	0 - 0,5
SELMOR.75	70 - 75	1,5 - 2,0	1,0	1,0	38 - 39	0 - 0,5
SELMOR.70	65 - 70	1,5 - 2,0	1,0	1,0	37 - 38	0 - 0,5
SELMOR.65	60 - 65	1,5 - 2,0	1,0	1,0	36 - 37	0 - 0,5
SELMOR.60	55 - 60	1,5 - 2,0	1,0	1,0	35 - 36	0 - 0,7
SELMOR.55	50 - 55	1,5 - 2,0	1,0	1,0	34 - 35	0 - 0,7
SELMOR.50	46 - 50	1,5 - 2,0	1,0	1,0	34 - 35	0 - 0,7
SELMOR.46	42 - 46	1,5 - 2,0	1,0	1,5	34 - 35	0 - 1,0
Şamot ve İzole Harçlar						**Fireclay and Insulation Mortars**
SELMOR.42	39 - 42	1,5 - 2,0	1,0	1,0	32 - 33	0 - 1,0
SELMOR.39	36 - 39	1,5 - 2,0	1,0	1,0	31 - 32	0 - 1,0
SELMOR.36	26 - 36	3,0 - 3,5	1,5	1,5	28 - 29	0 - 1,0
SELMOR.ASİD	25 - 35	2,0 - 2,5	2,0	2,0	20 - 25	0 - 1,0
SELMOR.ŞİZ	30 - 40	2,5 - 3,0	1,5	2,0	20 - 35	0 - 1,0
SELMOR.KİZ	15 - 20	2,0 - 2,5	1,5	1,5	15 - 20	0 - 1,0

TS EN ISO 9001:2000

ALÜMİNA SİLİKAT REFRAKTERLERİN ÖRÜMÜNDE KULLANILAN ÖRGÜ HARÇLARININ KULLANMA TALİMATLARI

Örgü Harçlarının Üretim Teknolojisi;Pudra kalınlığındaki sinterlenmiş refrakter malzemenin içine bağlayıcı özelliği olan refrakter kilin ilavesi şeklindedir. 25 veya 50 Kg'lık kraft kağıtlı torbalarda kullanılmaya hazır şekilde ambalajlanırlar.

THE USING INSTRUCTION FOR LAYING THE PAVING PLASTERS

That are used during paving of Alumina Silicate Refractors. The production technology of plasters: Is provided by adding the refractory clay that has binding qualification on the refractory material that is ground in powder grade. It is packed in craft paper bags with volumes 25 or 50 kg.

KULLANIMDA DİKKAT EDİLECEK HUSUSLAR:

* Su ilavesinden önce kuru olarak iyice karıştırılmalıdır.
* Max. 2 mm kalınlığında tuğla yüzeyine sürülecek olan harç, iki tuğlayı birbirine yapıştıracak kıvama gelinceye kadar yavaş yavaş su ilavesi yapılırken aynı zamanda da karıştırma işlemi devam etmelidir.

POINTS TO BE CONSIDERED DURING USE

* They must be mixed throughly before adding of water.
* The plaster that shall be paved over the brick up to the maximum thickness of 2 mm. Water shall gradually be added until it becomes sufficiently liquefied to stick to bricks into each other. The mixing procedure shall be continued during the interim.

UYGULAMA YÖNTEMLERİ:

Uygulaması en yaygın olan yöntemler;

APPLICATION METHODS:

The methods whose implementation is most widespread are as follows:

1. Mala Yöntemi:

Örülecek tuğlaların birine 2 mm kalınlığı geçmeyecek şekilde malayla harç sürülür,yapıştırılacak olan diğer tuğla hiç zaman kaybetmeden düzgün bir şekilde bu tuğlanın üzerine getirilerek yapıştırılması sağlanır.Bu yöntemde;

Karıştırılacak su oranı:

39 – 55 % Al_2O_3'da % 20 - 25 su,

55 - 80 % Al_2O_3'da % 35 - 40 su kullanılmalıdır.

Harçla birbirine yapıştırılmış olan tuğlalar kesinlikle oynatılmamalı,eğer oynatılması gerekiyorsa tamamen birbirinden ayırıp iyice temizlendikten sonra yapıştırma işlemi aynı şekilde tekrarlanmalıdır.

1. Hand Stock Method:

Plaster is stick on one of the bricks that shall be layed with a hand stock and not exceeding 2 mm thickness. The other brick that is requested to be stuck is placed into said brick carefully and regularly with no time delay and thereby they are securely stuck to each other. In this method.

The percentage of water that shall be added:

For 39 – 55% Al_2O_3 : 20 – 25% water;

For 55 – 80% Al_2O_3 : 35 – 40% water should be used.

The bricks that is stuck each other with plasters certainly must not dislodge. If necessary , sticking procedure must be repeated similarly after cleaning and separating well.

2. Daldırma Yöntemi:

Bu yöntemde de bir hazneye veya bir tekneye hazırlanan harcın içine, yapıştırlacak tuğlalardan bir tanesi daldırılıp,örülen duvarın üzerine yerleştirilerek yapışması sağlanmalıdır.

Bu yöntemde; Karıştırılacak su oranı:

39 - 55 % Al_2O_3'da %25 – 30 su,

55 - 80 % Al_2O_3'da % 45 – 50 su

Kullanılmalıdır.Bunda da yine derz aralıkları 2 mm 'yi geçmemelidir.

2. Layer Method:

In this method, one of the brick must be layered inside of plaster that is prepared in a tank and provide to stick on the wall which is been paved.

The percentage of water that shall be added:

For 39 – 55% Al_2O_3 : 25 – 25% water;

For 55 – 80% Al_2O_3 : 45 – 50% water should be used.

Again the widths of the sealings should not exceed 2 mm.

MONOLİTİK REFRAKTERLERİN KULLANMA TALİMATLARI

Sinter ve özel bağlayıcı malzemelerden oluşan karışım üretim sırasında çok iyi karıştırılarak torbalanır. Genellikle bağlayıcılarla katkı maddeleri aynı torba içinde yer alır.Torbalar 25 yada 50 kg 'lıktırlar.

Eğer,monolitik malzemeler (Hazır Ateş Betonu) uzun süre stoklanması gerekiyorsa; torba içinde karışımda yer alan maddelerin ortamdan etkilenmemesi için bağlayıcı ile sinter malzeme ayrı torbalarda ama iki ayrı torba bir başka torba içine konulmalıdır.Kullanma sırasında tek torbada olan ayrı iki torba çok iyi karıştırılarak harç yapılmasına dikkat edilmelidir.

HAZIRLANMASI

Dökme monolitik malzemelerin hazırlanması sırasında kullanılacak su miktarı malzemenin özelliklerine göre değişmektedir.

Kullanılacak su miktarı :

Kuru malzemenin ağırlıkça;

* Düşük çimentolarda (vibrasyonlularda) % 5-7 kadar,
* Normal çimentolularda % 7-14 kadar,
* İzole dökme refrakterlerde ise; % 35-42 kadardır.

Su; dökme refrakter malzemenin performansını direkt etkileyen en önemli faktörlerin başında gelir. Bu nedenle su oranını çok dikkatli ayarlamak gerekir.

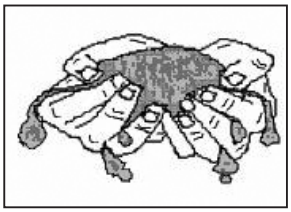
Su Miktarı Fazla Olan Karışım:

Gereğinden fazla su kullanılması; dökme refrakter malzemelerin priz alma ve donma sürelerini uzatacak,kurutma ve pişirme esnasında poroziteye ve dolayısıyla mukavemete çok olumsuz etkileri olacaktır.Bu olumsuzluklardan en önemlisi büyük çatlakların meydana gelecek olmasıdır.

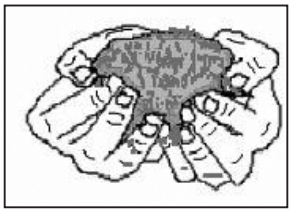
Su Miktarı Az Olan Karışım:

Suyun gerekenden daha az kullanılması durumunda ise;hem homojen bir karıştırma sağlanamayacak ve hem de erken donma başlayacaktır.

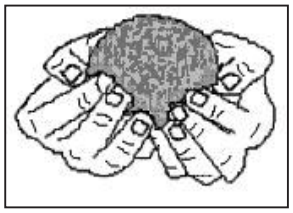
KARIŞIM GÖRÜNÜMLERİ



Su Miktarı Fazla



Uygun Kıvam



Su Miktarı Az

Monolitik malzemelerin (Ateş Betonlarının) hazırlanması sırasında su ilavesi yapılırken elle sürekli kontrol edilmeli,hem uygun kıvam yakalanmaya çalışılmalı ve hem de topaklanma olmamasına çok dikkat edilmelidir. Bu işlem 3-5 dakika içinde tamamlanmalı, aksi halde su ile çimentonun reaksiyonu neticesinde harç piriz alarak kısa zamanda donmaya başlar ve hem uygulama açısından zorluklar yaşanır ve hem de uygulandığı yerde refrakterden beklenen performansların alınamamasına neden olur.

TS EN ISO 9001:2000

THE USING INSTRUCTIONS OF MONOLITHIC REFRACTERS

The mixture that is formed by sinter and special binding materials should be thoroughly mixed before packed. In general the binding and additive substances are placed into the same bag. The weight capacities of the bags are either 25 kg or 50 kg.

If the monolithic materials (Ready Fire Concrete) is to be stocked for a long period of time, the binding and sinter materials should be put in different bags, but then, said two bags should be placed into a single bag. During use, the two bags that are placed into a single bag should be thoroughly mixed when plaster is prepared from them.

PREPARATION

The quantity of water that shall be used during preparation of bulk monolithic material depends upon the properties of the material.

The quantity of water that shall be used:

By weight of the dry material;

* In lower grade cements (having vibration): about 5-7%
* In normal grade cements : about 7-14%
* In insulation bulk refractors : about 35-42%

Water is the leading and one of the most important factors that affect the performance of bulk refractor material. Therefore it is very important to adjust the water rate.

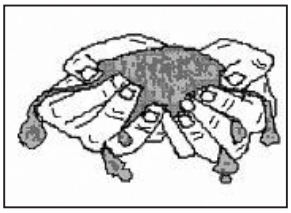
If the water rate is excessive:

This leads to delay in plug release and casting periods of the bulk refractor material and the material shall be porous and therefore weak during drying and cooking processes. The most important consequence of these liabilities shall be that large cracks shall be formed.

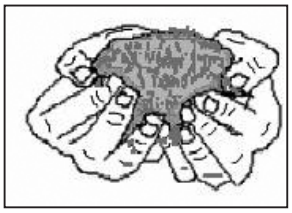
If the water rate is inadequate:

If the water content is lower than normal, then a homogenous mixture shall be yield and furthermore an earlier than normal casting shall occur.

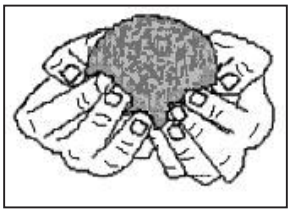
MIXTURE APPEARENCES



Excess Water content



Proper Mixture



Low Water content

The monolithic materials (fire concretes) should continuously controlled by hand when water is added to it. Both the proper grade should be tried to be captured and also due precaution should be spent to avoid clotting. Said procedure should be completed in 3-5 minutes time. If not then the plaster releases the plug and starts to cast in a short time as a result of the reaction between water and cement. This leads to difficulties both in application and it leads to a failure in the expected performance of the refractor at the point where it is applied.

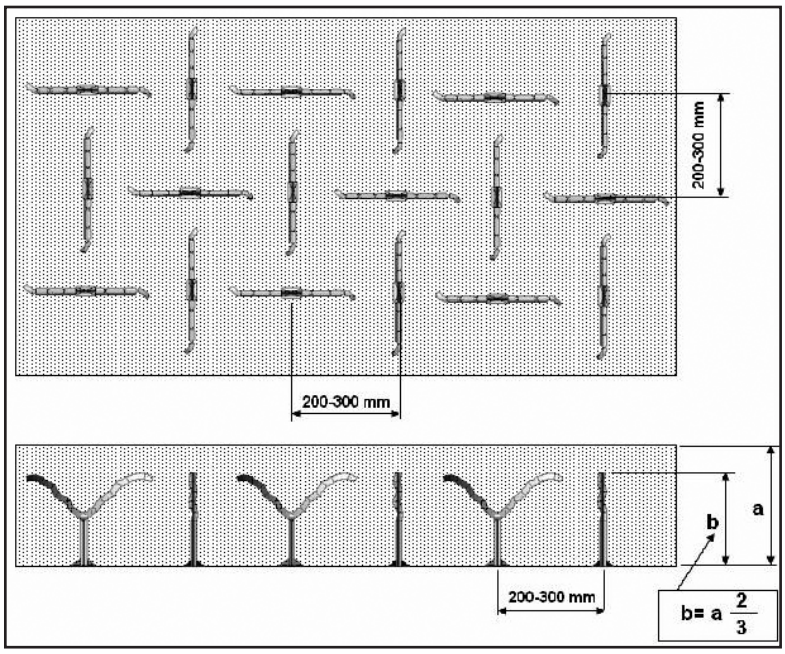
YERLEŞTİRİLMESİ

Karıştırma işlemi bittikten sonra monolitik malzeme uygulamaya hazır hale getirilmiş demektir.Uygulanacak yere göre hazırlanmış olan kalıplar ıslatıldıktan sonra monolitik malzeme (Ateş Betonu) bu kalıplara hızlı bir şekilde dökülür.

Uygulama şekline göre kalıp içine yerleştirilir.
Yerleştirilen malzemede;
3-5 dakika içinde reaksiyon,
3-5 saat içinde donma başlar,
24 saat süre ile min. % 95 bağlı nemde tutulmalıdır (35 oC' de). 24 saat üzerine naylon örtülerek muhafaza eidlmek suretiyle bu durum sağlanabilir.
Ya da; bu işlem malzeme üzerine spreyle su sıkmakla da yapılabilir.
Ancak; nemli tutulamaması durumunda reaksiyon sonucunda ısı meydana gelecek ve artan ısı betonun çatlamasına neden olacaktır.

ANKORAJ SİSTEMİ

Hareketli veya düz duvar veya zeminlerde betonun içinde kalacak şekilde ortama ve şekle uygun ankoraj sistemi uygulanmalıdır.Ankorajlar "paslanmaz çelik" 'den Y ve V şeklinde dizayn edilirler.Dökülecek betonun kalınlığının 2/3 'ü kadar boyları olur ve kalınlıkları da betonun durumuna göre 6,8,10,12, vs.. gibi çaplarda olabilir. Sıcaklığı daha düşük olan ortamlarda ankorajlar demirden de yapılabilirler. Her ankor arasında 200 ila 300 mm mesafe olup biri diğerinin tersi yönde ve birbirlerine şaşırtmalı duracak şekilde saç'a (mantoya) kaynaklarla veya civatalarla monte edilirler. Aşağıdaki resimde ankorajlama yöntemi gösterilmiştir.



TS EN ISO 9001:2000

INSERTION

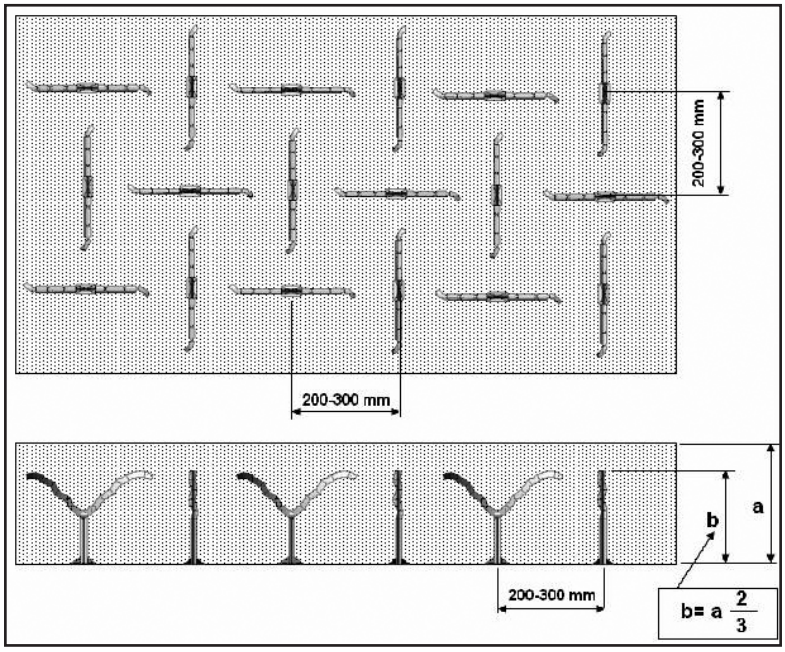
After the mixing procedure is completed, the monolithic material becomes ready to apply. After the molds that are prepared according to the point of application are watered, the monolithic material (fire concrete) is poured into these molds rapidly.

They are placed into the molds according to their place of application.
In the material that is inserted:
Reaction starts in 3-5 minutes time,
Casting starts in 3-5 minutes time,
The material should be kept in the minimum of 95% relative humidity. Said condition may be furnished by laying a nylon cover on it in order to keep it at 35°C for 24 hours.
Or said environment my be furnished by spraying water on the material.
However, if it is not kept as moist, then heat shall be produced because of the reaction and the increased heat shall lead to the cracking of the concrete.

ANCHORAGE SYSTEM

An appropriate anchorage system that is compatible to the environment and that shall be located within the concrete in mobile, plain walls or floor concrete should be applied. The anchorages are made by stainless steel and in Y or V designs. The thickness of the concrete that shall be cast is 2/3 of their lengths. Their thicknesses may be in diameters of 6, 8, 10. 12 etc according to the conditions of the concrete. For lower temperatures of applications, the anchorages may also be constructed by iron.

Anchors are placed in opposite and across each other with a distance of 200 and 300 mm from each other and they are attached and assembled into the iron plate either by welding or by screws. The anchorage method is illustrated in the picture below.

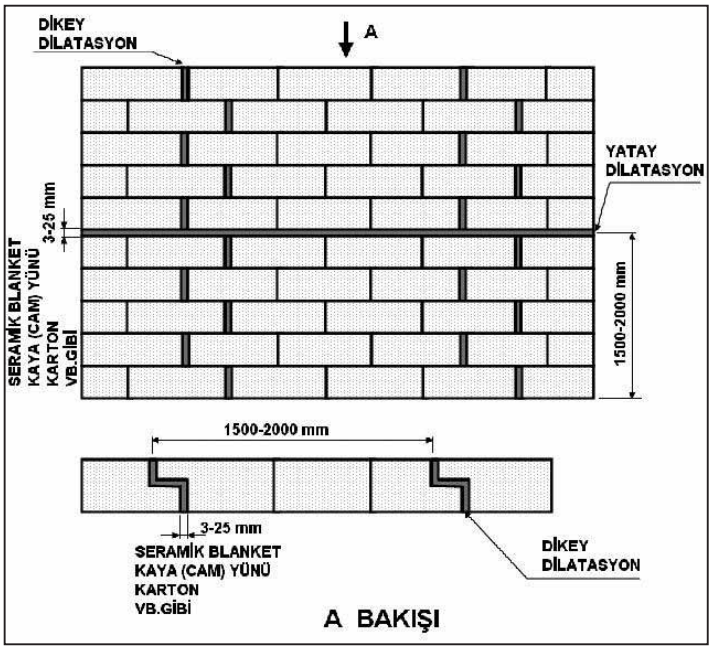


DİLATASYON

Monolitik malzemenin (Ateş Betonunun) dökülmesi sırasında yüksek ısıdan kaynaklanacak genleşmelerin kolay bir şekilde alınabilmesi için dilatasyon payı bırakılması gerekmektedir.1 ila 2 m^2 'lik bir uygulama alanı için 3 - 25 mm dilatasyon aralığı bırakmak gerekir.Bu aralığa da seramik blanketler,kaya yünleri,karton vs. gibi malzemeler konmalıdır.

KURUTMA VE PİŞİRME

Betonun tamamen sertleşmesi ve oluşmasından sonra kalıplar sökülür.
Kurutma ve kullanma sıcaklığına erişim programı aşağıdaki tabloda verilmiştir.



KURUTMA (110°C SICAKLIĞINDAN) → KULLANMA SICAKLIĞINA ÇIKIŞ TABLOSU						
Beton Kalınlığı k (mm)	110°C ile 200°C	200°C ile 500°C	500°C de Bekleme Süresi	600°C ile 1100°C	1100°C de Bekleme Süresi	1100°C >>
0-200	10-20 °C/h	25 °C/h	3 - 6 Saat	50 °C/h	4 - 6 Saat	100 - 200 °C/h
200 -400	10-20 °C/h	25 °C/h	6 - 9 Saat	50 °C/h	7 - 9 Saat	100 - 150 °C/h
k>400	10-20 °C/h	25 °C/h	9 -12 Saat	50 °C/h	10 -12 Saat	100 °C/h

NOT: 800 °C'nin üzerindeki sıcaklıklar için pişirme rejimi yükseltilebilir. Fakat; 400 °C/h üzerine çıkmak her zaman için çok risklidir.

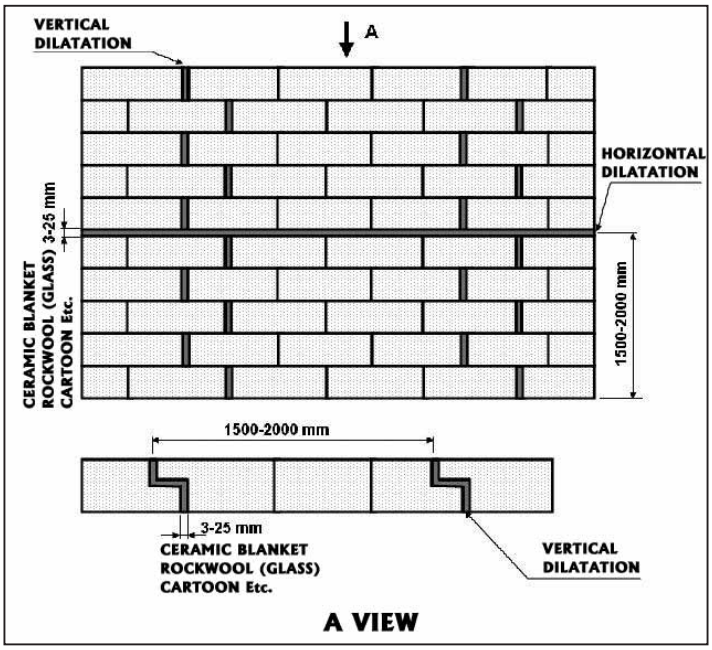
TS EN ISO 9001:2000

DILATATION

It is essential that a dilatation tolerance should be left during casting of monolithic material (fire concrete) in order to tolerate for the expansion stemming from high temperatures. It is essential that a dilatation tolerance of 3-25 mm should be given for an application of about 1 and 2 m². Ceramic blankets, rock wools, cartoon and etc materials should be put into said opening.

DRYING AND COOKING

Casts are poured after the concrete is entirely stiffened and formed.
The program during reaching to the drying and use temperature is shown in the below table.



FROM DRYING TEMPERATUTE (110°C) → TO PROCESS TEMPERATURE						
Concrete Thickness k (mm)	110°C between 200°C	200°C between 500°C	500°C Exposure Period	600°C between 1100°C	1100°C Exposure Period	1100°C >>
0-200	10-20 °C/h	25 °C/h	3 - 6 hour	50 °C/h	4 - 6 hour	100 - 200 °C/h
200 -400	10-20 °C/h	25 °C/h	6 - 9 hour	50 °C/h	7 - 9 hour	100 - 150 °C/h
k>400	10-20 °C/h	25 °C/h	9 -12 hour	50 °C/h	10 -12 hour	100 °C/h

NOTE: Cooking regime may be increased for temperatures that are over 800°C. But it is always very risky to raise above 400°C/h.

DÜŞÜK ÇİMENTOLU (LOW CEMENT CASTABLE) MONOLİTİK MALZEMELERİN KULLANMA TALİMATLARI

Low Cement Castables (Düşük Çimentolu) Monolitik Malzemeler vibrasyonla uygulanmak zorundadırlar. Dökme olarak uygulanmaları, içindeki düşük su oaranından ötürü çok zordur.

Vibrasyonlu Malzemelerin;
* Poroziteleri düşük,
* Mukavemetleri yüksek,
* Hacim Ağırlıkları yüksek olur ve dolayısıyla performansları da bir hayli yüksektir.

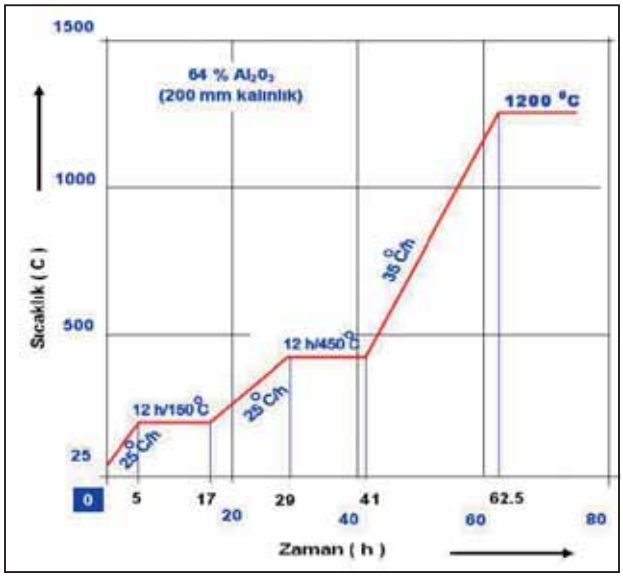
Kullanma durumlarına göre performansları daha da yükseltilebilir.Olumsuz koşullarda ise performans düşüklüğü meydana gelebilir.Bunun yaşanmaması için; karıştırma homojen olmalı,iyi bir karıştırıcı kullanılmalı ve karıştırıcılar çok temiz olmalıdır.Karıştırma süresi max. 4 dakika olmalıdır.Hazırlanan harçlar kuru ortamda stoklanmalı ve bu ortam suni olarak havalandırılmalıdır.

Kullanılan su çok temiz olmalı, hatta sıcaklığına da dikkat edilmeli ve sıcaklığı 5-25 oC olmalıdır.

Vibrasyon uygulanacak malzemelerde kullanılması gereken su oranı 5,5 - 6,5 % 'dir. Bu oranla karışım kuruya yakın kıvamda olur. Vibrasyon uygulanması sonucunda yüzeyde su toplanması olduğu takdirde diğer uygulamalarda su miktarında azaltılmaya gidilmelidir.

Vibrasyon uygulama süresi max. 5 dakika kadar olmalıdır. Uygulama sırasında kalıpta hava kabarcıkları görülürse vibrasyon hemen durdurulmalıdır.Fazla uzun vibrasyonlar da karışımın homojenliğini bozabilir. Daldırma usulü çalışan vibrasyonla uygulama yapılıyorsa vibrasyon aleti betonun içinden çok yavaş çekilmelidir,

Karıştırma işleminden 4 saat sonra donma başlar ve 48 saat sürer. Kalıp 12-14 saat sonra sökülmeli ve böylece betonun donma yada sertleşme işleminin devamı için havayla iyice teması sağlanmalıdır.



NOT: - Sıcaklık saatte 50 °C'den fazla arttırılmamalı
- Çalışma sıcaklığına çıkıncaya kadar beton yüzeyinin alevle teması önlenmelidir

TS EN ISO 9001:2000

USAGE INSTRUCTIONS OF LOW CEMENT CASTABLE MONOLITHIC MATERIALS

Low cement castables should be applied under vibration. It is very difficult to apply them in cast because of their low water content.

The vibration materials are:
* Low in porosity
* High in strength
* High in their volume weights.

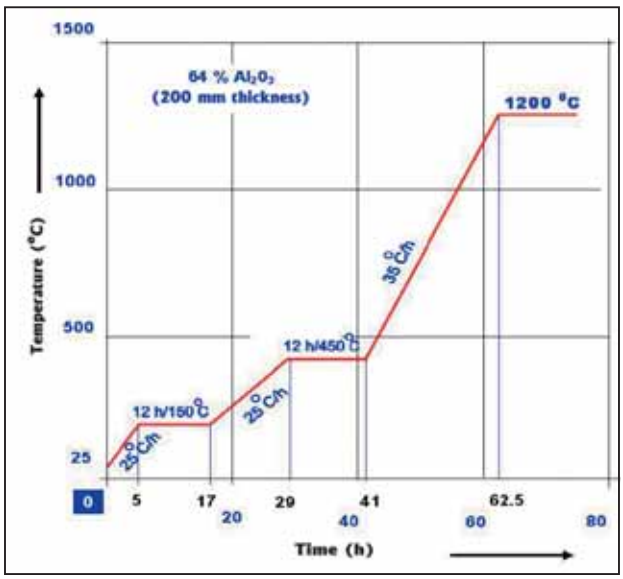
Therefore their performances are very high. Their performances may further be increased according to their conditions of use. However performance decrease may occur during unfavorable conditions. In order to avoid it the mixing should be homogenous, a good mixer should be used, and the mixers should be very clean. Mixing period should be the maximum, 4 minutes. The plasters that are prepared should be kept in dry conditions and said context should artificially be ventilated.

Water that is used should be very clean, furthermore its temperature should be considered and it should be between 5-25°C. The water content that must be used for vibration materials should is between 5.5 – 6.5%. A mixture in this grade is close to dry grade. If water is accumulated at the surface at the end of vibration, then the water contents should be decreased in preceding applications.

Vibration application period should be the maximum 5 minutes. If air bubbles are found in the mold during application, then vibration should immediately be stopped. Extra long vibrations may also distort the homogeneity of the mixture. If vibration is performed by plunging method, then the vibration devices should be pulled back from concrete very slowly.

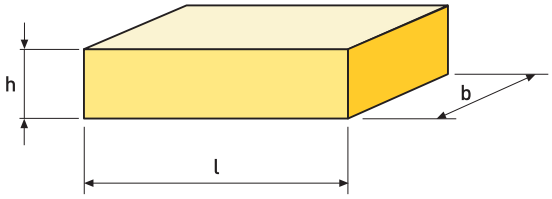
Casting starts about 4 hours after mixing and lasts for 48 hours. The cast should be removed about 12-14 hours later, thereby the concrete should contact with air substantially in order to continue to stiffening process.

HEATING REGIME DIAGRAM OF THE LOW CEMENT REFRACTOR CASTABLES (WITH VIBRATION)



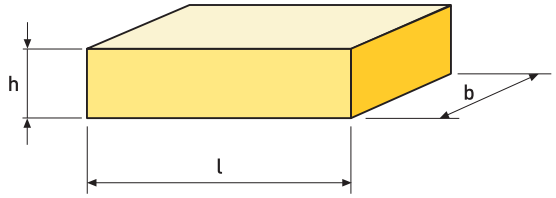
NOTE: - Temperature should not be raised faster than 50°C per hour.
- The concrete surface should not be contacted with flame until operation temperature is reached.

DİKDÖRTGEN TUĞLALAR
RECTANGULAR BRICKS



Poz Item	Boyutlar (mm) Dimensions (mm)			Hacim Volume V dm^3	Sınıflandırma Classification	
	l	b	h			
0 - 60	220	110	60	1,45	düz	straight
1 - 64	230	114	64	1,68	düz	straight
2 - 64	250	124	64	1,98	düz	straight
3 - 64	300	150	64	2,88	düz	straight
1 - 76	230	114	76	1,99	düz	straight
2 - 76	250	124	76	2,36	düz	straight
3 - 76	300	150	76	3,42	düz	straight
1B	230	172	64	2,53	bağlama	bonder
2B	250	187	64	2,99	bağlama	bonder
3B	300	225	64	4,32	bağlama	bonder
1B-76	230	172	76	3,01	bağlama	bonder
2B-76	250	187	76	3,55	bağlama	bonder
3B-76	300	225	76	5,13	bağlama	bonder
1D	230	230	64	3,39	çift düz	double straight
2D	250	250	64	4,00	çift düz	double straight
3D	300	300	64	5,76	çift düz	double straight
1D-76	230	230	76	4,02	çift düz	double straight
2D-76	250	250	76	4,75	çift düz	double straight
3D-76	300	300	76	6,84	çift düz	double straight
1L	345	114	64	2,52	gergi	whelp
2L	375	124	64	2,98	gergi	whelp
3L	450	150	64	4,32	gergi	whelp
1L -76	345	114	76	2,99	gergi	whelp
2L -76	375	124	76	3,53	gergi	whelp
3L -76	450	150	76	5,13	gergi	whelp
1LB-76	345	172	76	4,51	gergi	whelp
2LB-76	375	187	76	5,33	gergi	whelp
3LB-76	450	225	76	7,70	gergi	whelp
1K*	172	114	64	1,25	gergi	whelp
2K*	187	124	64	1,48	gergi	whelp
3K*	225	150	64	2,16	gergi	whelp
1K-76*	172	114	76	1,49	gergi	whelp
2K-76*	187	124	76	1,76	gergi	whelp
3K-76*	225	150	76	2,57	gergi	whelp
3205/100	230	150	100	3,45	taban (düz)	bottom (straight)
1-32	230	114	32	0,84	plaket	split
1-38	230	114	38	1,00	plaket	split
2-32	250	124	32	0,99	plaket	split
2-40	250	124	40	1,24	plaket	split
2-50	250	124	50	1,55	plaket	split
3-32	300	150	32	1,44	plaket	split
3-38	300	150	38	1,71	plaket	split

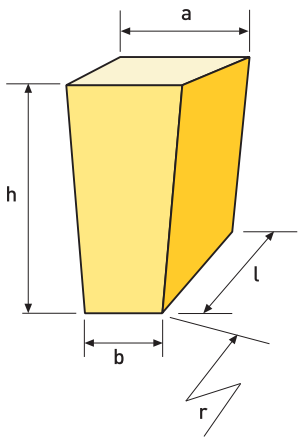
TS EN ISO 9001:2000



ÖZEL
SPECIAL

BACA-KAZAN-ŞÖMİNE-BARBEKÜ TUĞLALARI
FIRE-BARBECU-FUNNEL-CAULDRON BRICKS

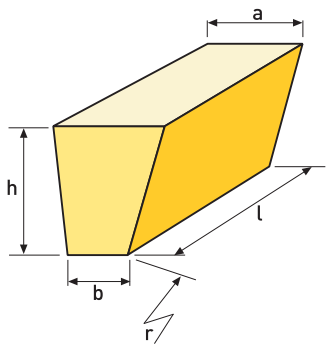
Poz Item	Boyutlar (mm) Dimensions in (mm)			Hacim Volume V dm^3	Sınıflandırma Classification	
	l	b	h			
E-60	200	100	60	1,20	düz	straight
E-50	200	100	50	1,00	düz	straight
E-40	200	100	40	0,80	düz	straight
E-30	200	100	30	0,60	düz	straight
E-20	200	100	20	0,40	düz	straight
ÇITA	200	50	30	0,30	düz	straight
4-60	220	110	60	1,45	düz	straight
4-50	220	110	50	1,21	düz	straight
4-40	220	110	40	0,97	düz	straight
4-30	220	110	30	0,73	düz	straight
4-20	220	110	20	0,48	düz	straight



ÖZEL
SPECIAL

TAM KEMER TUĞLALAR (Boyuna Konik)
WEDGE BRICKS (End Arches)

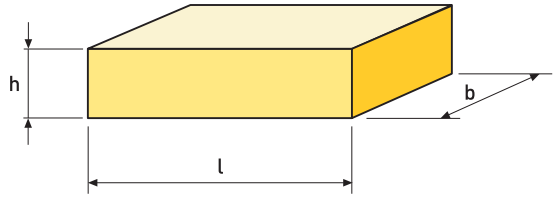
Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm	Dış çap Diameter 2R mm
	a	b	h	l				
EG6	63	57	200	100	1,20	1900	3800	4200
EG10	65	55	200	100	1,20	1100	2200	2600
EG16	68	52	200	100	1,20	650	1300	1700
EG24	72	48	200	100	1,20	400	800	1200
EG38	79	41	200	100	1,20	216	432	832
4G6	63	57	220	110	1,45	2090	4180	4620
4G10	65	55	220	110	1,45	1210	2420	2860
4G16	68	52	220	110	1,45	715	1430	1870
4G24	72	48	220	110	1,45	440	880	1320
4G38	79	41	220	110	1,45	237	475	915



ÖZEL
SPECIAL

YARIM KEMER TUĞLALAR (Enine Konik)
ARCH BRICKS (Side Arches)

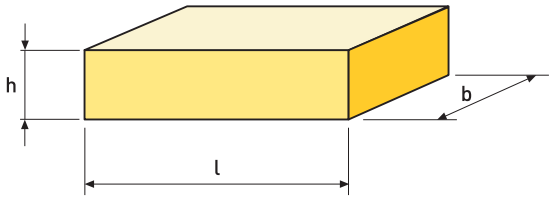
Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm	Dış çap Diameter 2R mm
	a	b	h	l				
EH6	63	57	100	200	1,20	950	1900	2100
EH10	65	55	100	200	1,20	550	1100	1300
EH16	68	52	100	200	1,20	325	650	850
EH24	72	48	100	200	1,20	200	400	600
EH38	79	41	100	200	1,20	107	216	416
4H6	63	57	110	220	1,45	1045	2090	2310
4H10	65	55	110	220	1,45	605	1210	1430
4H16	68	52	110	220	1,45	357	715	935
4H24	72	48	110	220	1,45	220	440	660
4H38	79	41	110	220	1,45	119	238	458



ÖZEL PLAKA TUĞLALARI
SPECIAL TILE BRICKS

Poz Item	Boyutlar (mm) Dimensions in (mm)			Hacim Volume
	l	b	h	V dm^3
22x22x6,4	220	220	64	3,10
22x22x6	220	220	60	2,90
22x22x5	220	220	50	2,42
22x22x3	220	220	30	1,45
23x23x6,4	230	230	64	3,39
23x23x6	230	230	60	3,17
23x23x5	230	230	50	2,65
23x23x3	230	230	30	1,59
25x25x6,4	250	250	64	4,00
25x25x6	250	250	60	3,75
25x25x5	250	250	50	3,13
25x25x3	250	250	30	1,88
30x15x6,4	300	150	64	2,88
30x15x6	300	150	60	2,70
30x15x5	300	150	50	2,25
30x15x3	300	150	30	1,35
30x30x6,4	300	300	64	5,76
30x30x6	300	300	60	5,40
30x30x5	300	300	50	4,50
30x30x3	300	300	30	2,70
40x40x6,4	400	400	64	10,24
40x40x6	400	400	60	9,60
40x40x5	400	400	50	8,00
40x40x3,5	400	400	35	5,60
50x25x10	500	250	100	12,50
50x25x6,4	500	250	64	8,00
50x25x6	500	250	60	7,50
50x25x5	500	250	50	6,25
50x25x3,5	500	250	35	4,38
50x50x10	500	500	100	25,00
50x50x6,4	500	500	64	16,00
60x30x10	600	300	100	18,00
60x30x6,4	600	300	64	11,52
60x60x10	600	600	100	36,00
70x35x10	700	350	100	24,50
70x70x10	700	700	100	49,00
100x50x10	1000	500	100	50,00
100x75x10	1000	750	100	75,00

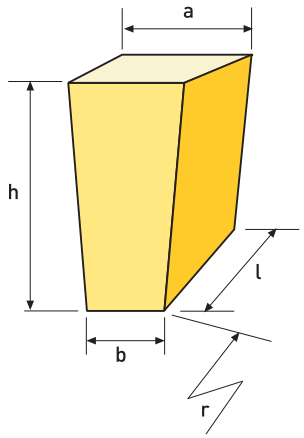
TS EN ISO 9001:2000



KAPAK TUĞLALARI
TILE BRICKS

Poz Item	Boyutlar (mm) Dimensions in (mm)			Hacim Volume
	l	b	h	V dm^3
P1	500	375	40	7,50
P2	625	500	40	12,50
P3	500	250	64	8,00
P4	375	250	64	6,00
P5	500	375	64	12,00
P6	500	500	64	16,00
P7	500	375	100	18,75
P8	750	375	100	28,13
P9	500	500	100	25,00
P10	750	500	100	37,50
P11	1000	500	100	50,00
P12	375	250	130	12,19
P13	400	400	65	10,40
55/15	500	500	150	37,50
55/20	500	500	200	50,00
66/10	600	600	100	36,00
66/15	600	600	150	54,00
66/20	600	600	200	72,00
77/10	700	700	100	49,00
77/15	700	700	150	73,50
77/20	700	700	200	98,00
88/20	800	800	200	128,00

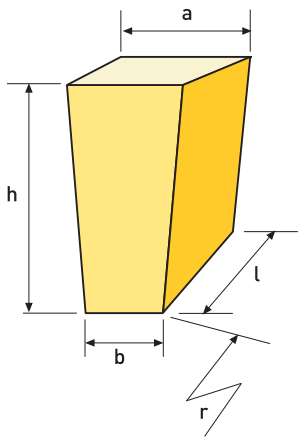
TAM KEMER TUĞLALAR (Boyuna Konik)
WEDGE BRICKS (End Arches)



Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V	Yarıçap Radius r	İç çap Inside Diameter	Dış çap Diameter 2R
	a	b	h	l	dm^3	mm	2r mm	mm
1G50	89	39				189	377	837
1G38	83	45				284	569	1029
1G24	76	52				518	1035	1495
1G16	72	56	230	114	1,68	834	1668	2128
1G10	69	59				1403	2806	3266
1G6	67	61				2415	4830	5290
1G4	66	62				3680	7360	7820
+1G50	101	51				244	488	948
+1G38	95	57				357	714	1174
+1G24	88	64				633	1265	1725
+1G16	84	68	230	114	1,99	1006	2013	2473
+1G10	81	71				1679	3358	3818
+1G4	78	74				4370	8740	9200
2G50	89	39				205	410	910
2G38	83	45				309	618	1118
2G24	76	52				563	1126	1626
2G16	72	56	250	124	1,98	906	1812	2312
2G10	69	59				1525	3050	3550
2G6	67	61				2625	5250	5750
2G4	66	62				4000	8000	8500
+2G50	101	51				265	530	1030
+2G24	88	64				688	1376	1876
+2G16	84	68	250	124	2,36	1094	2188	2688
+2G10	81	71				1825	3650	4150
+2G4	78	74				4750	9500	10000
G081	90	65			3,49	504	1008	1608
G11	85	65			3,38	1005	2010	2610
G21	75	65	300	150	3,15	2010	4020	4620
G31	71	65			3,06	3350	6700	7300
G51	69	65			3,02	5025	10050	10650
G1	79	75			3,47	5775	11550	12150
G1/83	83	75	300	150	3,56	2888	5776	6376
G1/87	87	75			3,65	1925	3850	4450
G082	96	65			4,53	435	870	870
G12	90	65			4,36	1005	2010	2760
G22	78	65	375	150	4,02	1933	3866	4616
G32	73	65			3,88	3141	6282	7032
G52	70	65			3,80	5025	10050	10800
G2	80	75			4,36	5775	11550	12300
G2/83	83	75	375	150	4,44	3609	7218	7968
G2/87	87	75			4,56	2406	4812	5562
G083	102	65	450	150	5,64	815	1630	2530
G33	75	65			4,73	301	602	1502

Not : İç yarıçap (r) 2mm'lik harç payına göre verilmiştir.
Note : Joint approx. 2 mm

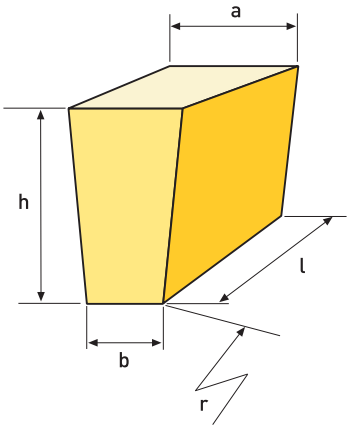
TS EN ISO 9001:2000



TAM KEMER TUĞLALAR (Boyuna Konik)
WEDGE BRICKS (End Arches)

Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V	Yarıçap Radius r	İç çap Inside Diameter	Dış çap Diameter 2R
	a	b	h	l	dm^3	mm	2r mm	mm
1GB50	89	39				189	378	838
1GB24	76	52				518	1036	1496
1GB16	72	56	230	172	2,53	834	1668	2128
1GB10	69	59				1403	2806	3266
1GB4	66	62				3680	7360	7820
+1GB50	101	51				244	488	948
+1GB24	88	64				633	1266	1726
+1GB16	84	68	230	172	3,01	1006	2012	2472
+1GB10	81	71				1679	3358	3818
+1GB4	78	74				4370	8740	9200
2GB50	89	39				205	410	910
2GB24	76	52				563	1126	1626
2GB16	72	56	250	187	2,99	906	1812	2312
2GB10	69	59				1525	3050	3550
2GB4	66	62				4000	8000	8500
+2GB50	101	51				265	530	1030
+2GB24	88	64				688	1376	1876
+2GB16	84	68	250	187	3,55	1094	2188	2688
+2GB10	81	71				1825	3650	4150
+2GB4	78	74				4750	9500	10000
GB081	90	65			5,23	504	1008	1608
GB11	85	65			5,06	1005	2010	2610
GB21	75	65	300	225	4,73	2010	4020	4620
GB31	71	65			4,59	3350	6700	7300
GB51	69	65			4,52	5025	10050	10650
GB1	79	75			3,47	5775	11550	12150
GB1/83	83	75	300	225	5,33	2888	5776	6376
GB1/87	87	75			5,47	1925	3850	4450
GB082	96	65			6,79	810	1620	2370
GB12	90	65			6,54	1005	2010	2760
GB22	78	65	375	225	6,03	1933	3866	4616
GB32	73	65			5,82	3141	6282	7032
GB52	70	65			5,70	5025	10050	10800
GB2	80	75			6,54	5775	11550	12300
GB2/83	83	75	375	225	6,67	3609	7218	7968
GB2/87	87	75			6,83	2406	4812	5562
GB083	102	65	450	225	8,45	815	1630	2530
GB33	75	65			7,09	3015	6030	6930

Not : İç yarıçap (r) 2mm'lik harç payına göre verilmiştir.
Note : Joint approx. 2 mm

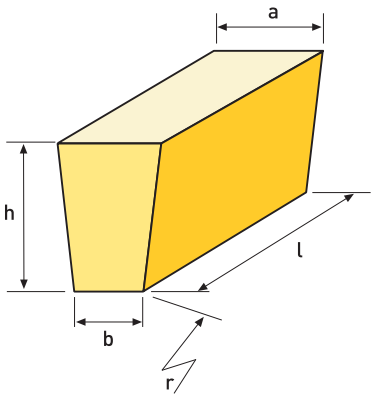


ÇİFT KEMER TUĞLALAR
DOUBLE SIZE WEDGE BRICKS

Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V	Yarıçap Radius r	İç çap Inside Diameter 2r	Dış çap Diameter 2R
	a	b	h	l		mm	mm	mm
1GG50	89	39				189	378	838
1GG24	76	52				518	1036	1496
1GG16	72	56	230	230	3,39	834	1668	2128
1GG10	69	59				1403	2806	3266
1GG4	66	62				3680	7360	7820
+1GG50	101	51				244	488	948
+1GG24	88	64				633	1266	1726
+1GG16	84	68	230	230	4,02	1006	2012	2472
+1GG10	81	71				1679	3358	3818
+1GG4	78	74				4370	8740	9200
2GG50	89	39				205	410	910
2GG24	76	52				563	1126	1626
2GG16	72	56	250	250	4,0	906	1812	2312
2GG10	69	59				1525	3050	3550
2GG4	66	62				4000	8000	8500
+2GG50	101	51				265	530	1030
+2GG24	88	64				688	1376	1876
+2GG16	84	68	250	250	4,75	1094	2188	2688
+2GG10	81	71				1825	3650	4150
+2GG4	78	74				4750	9500	10000

Not :İç yarıçap (r) 2mm'lik harç payına göre verilmiştir.
Note : Joint approx,2 mm

TS EN ISO 9001:2000

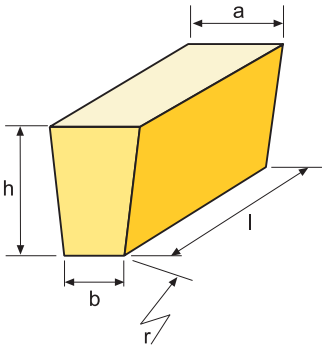


YARIM KEMER TUĞLALAR (Enine Konik)
ARCH BRICKS (Side Arches)

Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm	Dış çap Diameter 2R mm
	a	b	h	l				
1H 50	89	39				93	186	414
1H 24	76	52				257	514	742
1H 16	72	56	114	230	1,68	413	826	1054
1H 10	69	59				695	1390	1618
1H 6	67	61				1197	2394	2622
1H 4	66	62				1824	3648	3876
+1H 50	101	51				121	242	470
+1H 24	88	64				314	628	856
+1H 16	84	68	114	230	1,99	499	998	1226
+1H 10	81	71				832	1664	1892
+1H 6	79	73				1425	2850	3078
2H 50	89	39				102	204	452
2H 24	76	52	124	250	1,98	279	558	806
2H 16	72	56				450	900	1148
2H 10	69	59				756	1512	1760
2H 6	67	61				1302	2604	2852
2H 4	66	62				1984	3968	4216
+2H 50	101	51				131	262	510
+2H 24	88	64				341	682	930
+2H 16	84	68	124	250	2,36	543	1086	1334
+2H 10	81	71				905	1810	2058
+2H 6	79	73				1550	3100	3348
3H 50	89	39				123	246	546
3H 24	76	52				338	676	976
3H 16	72	56	150	300	2,88	544	1088	1388
3H 10	69	59				915	1830	2130
3H 6	67	61				1575	3150	3450
+3H 50	101	51				159	318	618
+3H 24	88	64				413	826	1126
+3H 16	84	68	150	300	3,42	656	1312	1612
+3H 10	81	71				1095	2190	2490
+3H 6	79	73				1875	3750	4050

Not : İç yarıçap (r) 2mm'lik harç payına göre verilmiştir.
Note : Joint approx. 2 mm

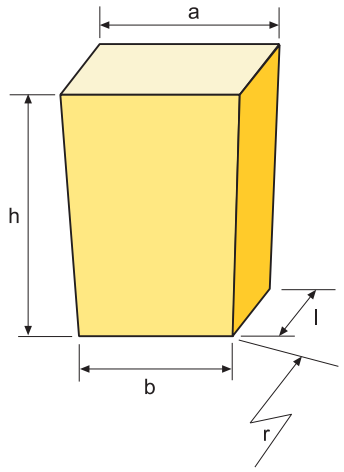
YARIM KEMER TUĞLALAR (Enine Konik)
ARCH BRICKS (Side Arches)



Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm	Dış çap Diameter 2R mm
	a	b	h	l				
1HL 50	89	39				93	186	414
1HL 24	76	52				257	514	742
1HL 16	72	56	114	345	2,52	413	826	1054
1HL 10	69	59				695	1390	1618
1HL 6	67	61				1197	2394	2622
1HL 4	66	62				1824	3648	3876
+1HL 50	101	51				121	242	470
+1HL 24	88	64				314	628	856
+1HL 16	84	68	114	345	2,99	499	998	1226
+1HL 10	81	71				832	1664	1892
+1HL 6	79	73				1425	2850	3078
2HL 50	89	39				102	204	452
2HL 24	76	52	124	375	2,98	279	558	806
2HL 16	72	56				450	900	1148
2HL 10	69	59				756	1512	1760
2HL 6	67	61				1302	2604	2852
2HL 4	66	62				1984	3968	4216
+2HL 50	101	51				131	262	510
+2HL 24	88	64				341	682	930
+2HL 16	84	68	124	375	3,53	543	1086	1334
+2HL 10	81	71				905	1810	2058
+2HL 6	79	73				1550	3100	3348
3HK 50	89	39				123	246	546
3HK 24	76	52				338	676	976
3HK 16	72	56	150	200	1,92	544	1088	1388
3HK 10	69	59				915	1830	2130
3HK 6	67	61				1575	3150	3450
+3HK 50	101	51				159	318	618
+3HK 24	88	64				413	826	1126
+3HK 16	84	68	150	200	2,28	656	1312	1612
+3HK 10	81	71				1095	2190	2490
+3HK 6	79	73				1875	3750	4050

Not : İç yarıçap (r) 2mm'lik harç payına göre verilmiştir.
Note : Joint approx,2 mm

TS EN ISO 9001:2000



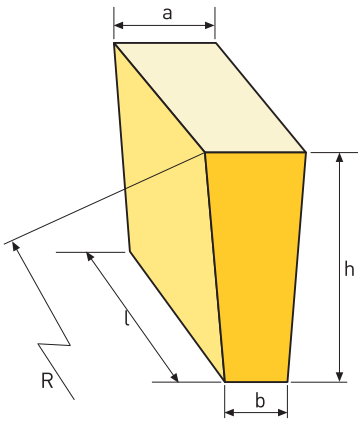
ENİNE KEMER TUĞLALAR
LARGE AND ARCH BRICKS

Poz Item	Boyutlar (mm) Dimensions in (mm)				Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm	Dış çap Diameter 2R mm
	a	b	h	l				
1Q50	139	89				419	838	1298
1Q28	128	100				838	1676	2136
1Q14	121	107	230		1,68	1791	3582	4042
1Q10	119	109		64		2553	5106	5566
1QB	179	165			2,53	2744	5488	5948
+1Q50	139	89				419	838	1298
+1Q28	128	100				838	1676	2136
+1Q14	121	107	230	76	1,99	1791	3582	4042
+1Q10	119	109				2553	5106	5566
+1QB	179	165			3,01	2744	5488	5948
2Q50	149	99				505	1010	1510
2Q28	138	110				1000	2000	2500
2Q14	131	117	250	64	1,98	2125	4250	4750
2Q10	129	119				3025	6050	6550
2QB	192	182			2,99	4600	9200	9700
+2Q50	149	99				505	1010	1510
+2Q28	138	110				1000	2000	2500
+2Q14	131	117	250	76	2,36	2125	4250	4750
+2Q10	129	119				3025	6050	6550
+2QB	192	182			3,55	4600	9200	9700
Q 081	152	110			2,52	800	1600	2200
Q 151	132	110			2,32	1527	3054	3654
Q 31	121	110			2,22	3055	6110	6710
Q 51	117	110	300	64	2,18	4800	9600	10200
Q 61	116	110			2,17	5600	11200	11800
Q 71	115	110			2,16	6720	13440	14040
Q B1	175	165			3,26	5010	10020	10620
+Q 081	152	110			2,99	800	1600	2200
+Q 151	132	110			2,76	1527	3054	3654
+Q 31	121	110			2,63	3055	6110	6710
+Q 51	117	110	300	76	2,59	4800	9600	10200
+Q 61	116	110			2,58	5600	11200	11800
+Q 71	115	110			2,57	6720	13440	14040
+Q B1	175	165			3,88	5010	10020	10620
Q 52	118	110			2,74	5250	10500	11250
Q 62	117	110	375	64	2,72	6000	12000	12750
Q 72	116	110			2,71	7000	14000	14750
Q B2	177	165			4,22	5219	10438	11188
+Q 52	118	110			3,25	5250	10500	11250
+Q 62	117	110	375	76	3,24	6000	12000	12750
+Q 72	116	110			3,22	7000	14000	14750
+Q B2	177	165			4,87	5219	10438	11188
Q 53	120	110			3,31	5040	10080	10980
Q 63	118	110	450	64	3,28	6300	12600	13500
Q 73	117	110			3,27	7200	14400	15300
Q B3	180	165			4,97	5010	10020	10920
+Q 53	120	110			3,93	5040	10080	10980
+Q 63	118	110	450	76	3,90	6300	12600	13500
+Q 73	117	110			3,88	7200	14400	15300
+Q B3	180	165			5,90	5010	10020	10920
E 08	158	110			3,00	817	1634	2334
E 15	136	110	350	64	2,76	1508	3016	3716
E 30	123	110			2,61	3015	6030	6730
+E 08	158	110			3,56	817	1634	2334
+E 15	136	110	350	76	3,27	1508	3016	3716
+E 30	123	110			3,10	3015	6030	6730

Not : İç yarıçap (r) 2mm'lik harç payına göre verilmiştir.
Note : Joint approx,2 mm

ÇİMENTO DÖNER FIRIN TUĞLALARI (ISO) -A Format

ROTARY KILN BRICKS (ISO) - A Format



Poz Item	Boyutlar (mm) Dimensions (mm) a	b	h	l	Hacim Volume V dm^3	Dış çap Diameter 2R mm	
216	103	86,0			2,99	1971	
316	103	92,0			3,09	3046	
416	103	94,5			3,13	3942	
516	103	96,5	160	198	3,16	5170	
616	103	97,5			3,18	6100	
716	103	98,3			3,19	7129	
P161	71	63,0			2,12	2920	Kilit Closing
P162	78	70,0	160	198	2,34	3200	Kilit Closing
P16	83	77,5			2,54	4945	Kilit Closing
P+16	93	87,5			2,86	5530	Kilit Closing
218	103	84,0			3,33	1984	
318	103	90,5			3,45	3015	
418	103	93,5	180	198	3,50	3968	
518	103	95,5			3,54	4940	
618	103	97,0			3,56	6300	
718	103	97,7			3,58	7112	
P181	71	65,0		198	2,42	4380	Kilit Closing
P182	78	71,0	180		2,66	4115	Kilit Closing
P18	83	77,0			2,85	5100	Kilit Closing
P+18	93	87,0			3,21	5700	Kilit Closing
220	103	82,0			3,66	1994	
320	103	89,0			3,80	2991	
420	103	92,5			3,87	3989	
520	103	94,5	200	198	3,91	4940	
620	103	96,2			3,94	6159	
720	103	97,0			3,96	7000	
820	103	97,8			3,98	8054	
N1	108	92,0		198	3,92	2750	
N2	108	101,0		198	4,14	6280	
P201	71	65,0			2,69	4870	Kilit Closing
P202	78	71,0	200	198	2,95	4570	Kilit Closing
P20	83	76,2			3,15	5000	Kilit Closing
P+20	93	86,2			3,55	5590	Kilit Closing
222	103	80,5			4,00	2055	
322	103	88,0			4,16	3071	
422	103	91,5			4,24	4006	
522	103	94,0			4,29	5130	
622	103	95,5	220	198	4,32	6142	
722	103	96,5			4,35	7100	
822	103	97,3			4,36	8082	
ÖZEL.K623	103	93,0			4,27	4620	
P221	71	65,0			2,96	5355	Kilit Closing
P222	78	71,0	220	198	3,25	5030	Kilit Closing
P22	83	75,5			3,45	4990	Kilit Closing
P+22	93	85,5			3,89	5575	Kilit Closing
225	103	77,5			4,47	2050	
325	103	85,5			4,67	3000	
425	103	90,0			4,78	4027	
525	103	92,5	250	198	4,84	5000	
625	103	94,5			4,89	6159	
725	103	95,5			4,92	7000	
825	103	96,5			4,94	8054	
P251	71	65,0			3,37	6085	Kilit Closing
P252	78	71,0	250	198	3,69	5715	Kilit Closing
P25	83	74,5			3,90	5000	Kilit Closing
P+25	93	84,5			4,39	5590	Kilit Closing

Not : Dış Çap (2R) 1,7 mm'lik harç payına göre verilmiştir.

Note : Joint approx,1.7 mm

TS EN ISO 9001:2000

ISO ŞEKİLLİ TUĞLALAR İLE, DEĞİŞİK FIRIN ÇAPLARINA GÖRE BİR RİNGİ ÇEVİRMEK İÇİN GEREKLİ TUĞLA SAYISI - A - FORMAT

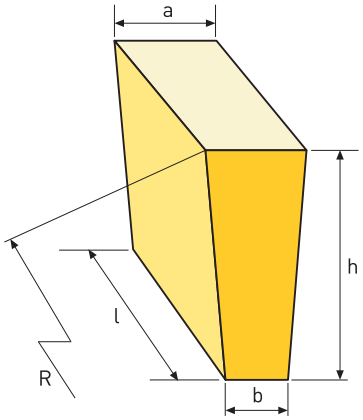
MIXING TABLE FOR ISO SHAPES - A -FORMAT

Kuru örgü — **Clench Joint (Dry,plateless)**

Fırın Çapı (mm) Inside diameter of kiln shell	Bir ring'deki tuğla sayısı Number per ring	A 216 218 220	A 316 318 320 322	A 416 418 420 422 425	A 620 622 625	A 418 820 822 825	A 416 718	A 716 218	A 216 418 220	A 416 A 420	A 320 322	318 620 622	A 316 718	A 716 A	A 420 422 425	A 820 822 825	A 220	218 620	A 216 718	A 716 A	A 320 322	A 820 822	A 220	820
		Karışım Oranları - Mixing Ratios																						
900																								
2000	61	57	4						58	3							59	2	59	2			59	2
100	64	51	13						56	8							57	7	58	6			58	6
200	68	45	23						52	16							56	12	57	11			57	11
300	71	39	32						49	22							54	17	55	16			56	15
400	74	34	40						46	28							53	21	54	20			55	19
500	77	28	49						43	34							52	25	53	24			54	23
600	80	22	58						40	40							50	30	52	28			53	27
700	83	16	67						37	46							49	34	51	32			52	31
800	86	11	75						34	52							48	38	50	36			51	35
900	89	5	84						31	58							46	43	48	41			50	39
3000	92		90	2					27	64	91	1	91	1			44	48	47	45	91	1	49	43
100	95		80	15					25	70	88	7	89	6			43	52	46	49	89	6	48	47
200	98		70	28					22	76	85	13	86	12			41	57	45	53	87	11	47	51
300	101		60	41					19	82	82	19	84	17			40	61	44	57	85	16	46	55
400	104		51	53					16	88	79	25	82	22			38	66	42	62	83	21	45	59
500	107		41	66					13	94	76	31	79	28			37	70	41	66	82	25	44	63
600	110		31	79					10	100	73	37	77	33			36	74	40	70	80	30	43	67
700	113		22	91					7	106	70	43	75	38			34	79	39	74	78	35	42	71
800	116		12	104					4	112	67	49	73	43			33	83	38	78	76	40	41	75
900	119		2	117					1	118	63	56	70	49			31	88	36	83	74	45	40	79
4000	122			115	7		117	5			61	61	68	54	117	5	30	92	35	87	72	50	39	83
100	125			110	15		113	12			58	67	66	59	114	11	28	97	34	91	70	55	38	87
200	129			104	25		109	20			55	74	64	65	111	18	27	102	33	96	69	60	37	92
300	132			98	34		105	27			52	80	61	71	108	24	25	107	32	100	67	65	36	96
400	135			93	42		101	34			49	86	59	76	105	30	24	111	31	104	65	70	35	100
500	138			87	52		97	41			46	92	57	81	102	36	23	115	29	109	63	75	34	104
600	141			82	59		93	48			43	98	54	87	99	42	21	120	28	113	61	80	33	108
700	144			76	68		89	55			40	104	52	92	96	48	20	124	27	117	59	85	32	112
800	147			70	77		86	61			37	110	50	97	93	54	18	129	26	121	58	89	31	116
900	150			65	85		82	68			34	116	48	102	90	60	17	133	25	125	56	94	30	120
5000	153			59	94		78	75			31	122	45	108	87	66	15	138	24	129	54	99	29	124
100	156			54	102		74	82			28	128	43	113	84	72	14	142	22	134	52	104	28	128
200	159			48	111		70	89			25	134	41	118	81	78	12	147	21	138	50	109	27	132
300	162			42	120		66	96			22	140	39	123	78	84	11	151	20	142	48	114	26	136
400	165			37	128		62	103			19	146	36	129	75	90	9	156	19	146	47	118	25	140
500	168			31	137		58	110			16	152	34	134	72	96	8	160	18	150	45	123	24	144
600	171			25	146		54	117			13	158	32	139	69	102	7	164	17	154	43	128	23	148
700	174			20	154		51	123			10	164	30	144	66	108	5	169	15	159	41	133	22	152
800	177			14	163		47	130			8	169	27	150	63	114	4	173	14	163	39	138	21	156
900	180			8	172		43	137			5	175	25	155	60	120	2	178	13	167	37	143	20	160
6000	183			3	180		39	144			2	181	23	160	57	126	1	181	12	171	36	147	19	164
100	186				180	6	35	151					21	165	54	132			11	175	34	152	18	168
200	190				170	20	31	159					18	172	52	138			9	181	32	158	17	173
300	193				160	33	27	166					16	177	49	144			8	185	30	163	16	177
400	196				150	46	23	173					14	182	46	150			7	189	28	168	15	181
500	199				140	59	20	179					12	187	43	156			6	193	26	173	14	185
600	202				131	71	16	186					9	193	40	162			5	197	25	177	13	189
700	205				121	84	12	193					7	198	37	168			4	201	23	182	12	193
800	208				111	97	8	200					5	203	34	174			2	206	21	187	11	197
900	211				101	110	4	207					2	209	31	180			1	210	19	192	10	201
7000	214				91	123		214						214	28	186				214	17	197	9	205
100	217				81	136									25	192					15	202	8	209
200	220				72	148									22	198					14	206	7	213
300	223				62	161									19	204					12	211	6	217
400	226				52	174									16	210					10	216	5	221
500	229				42	187									13	216					8	221	4	225
600	232				32	200									10	222					6	226	3	229
700	235				22	213									7	228					4	231	2	232
800	238				13	225									4	234					3	235	1	237
900	241				3	238									1	240					1	240		241

Tavsiye edilen pozlar
Recommended mixing range

ÇİMENTO DÖNER FIRIN TUĞLALARI (ISO) - B - Format
ROTARY KILN BRICKS (ISO) - B - Format



Poz Item	Boyutlar (mm) Dimensions (mm)				Hacim Volume V	Dış Çap Diameter 2R	
	a	b	h	l	dm^3	mm	
B216	78	65			2,27	1957	
B416	75	68	160	198	2,27	3497	
P160	95	85			2,85	3105	Kilit Closing
P161	71	63			2,12	2920	Kilit Closing
BP16	54	49	160	198	1,63	3585	Kilit Closing
BP+16	64	59			1,95	4225	Kilit Closing
B218	78	65				2202	
B318	76,5	66,5				2808	
B418	75	68	180	198	2,55	3934	
B518	74,5	68,5				4560	
B618	74	69				5436	
P180	95	86			3,23	3880	Kilit Closing
P181	71	65	180	198	2,42	4380	Kilit Closing
BP18	54	49			1,84	4035	Kilit Closing
BP+18	64	59			2,19	4755	Kilit Closing
B220	78	65				2426	
B320	76,5	66,5				3120	
B420	75	68	200	198	2,83	4371	
B520	74,5	68,5				5067	
B620	74	69				6040	
P200	95	87			3,60	4850	Kilit Closing
P201	71	65	200	198	2,69	4870	Kilit Closing
BP20	54	49			2,04	4480	Kilit Closing
BP+20	64	59			2,44	5280	Kilit Closing
B222	78	65				2691	
B322	76,5	66,5				3432	
B422	75	68	220	198	3,12	4809	
B522	74,5	68,5				5574	
B622	74	69				6664	
P220	95	87			3,96	5335	Kilit Closing
P221	71	65	220	198	2,96	5355	Kilit Closing
BP22	54	49			2,24	4930	Kilit Closing
BP+22	64	59			2,68	5810	Kilit Closing
B325	78	65				3058	
B425	76,5	66,5				3900	
B525	75	68	250	198	3,54	5464	
B625	74,5	68,5				6333	
B725	74	69				7550	
P250	95	86			4,48	5390	Kilit Closing
P251	71	65	250	198	3,37	6085	Kilit Closing
BP25	54	49			2,55	5600	Kilit Closing
BP+25	64	59			3,04	6600	Kilit Closing

Not : Dış Çap (2R) 1,7 mm'lik harç payına göre verilmiştir.

Note : Joint approx,1.7 mm

TS EN ISO 9001:2000

VDZ ŞEKİLLİ TUĞLALAR İLE,DEĞİŞİK FIRIN ÇAPLARINA GÖRE BİR RİNGİ ÇEVİRMEK İÇİN GEREKLİ TUĞLA SAYISI - B - FORMAT

Mixing table for VDZ shapes - B - Format

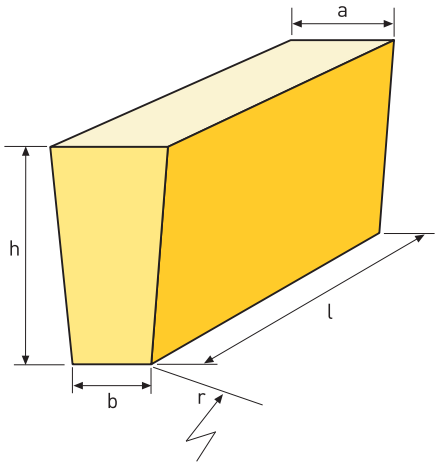
Kuru örgü — **Clench Joint (Dry,plateless)**

Karışım Oranları - Mixing Ratios

Fırın Çapı (mm) Inside diameter of kiln shell	Bir ring'deki tuğla sayısı Number per ring	B/B 216	B/B 416	Bir ring'deki tuğla sayısı Number per ring	B/B 218	B/B 418	B/B 618	B/B 218	B/B 618	Bir ring'deki tuğla sayısı Number per ring	B/B 220	B/B 420	B/B 620	B/B 220	B/B 620	Bir ring'deki tuğla sayısı Number per ring	B/B 222	B/B 422	B/B 622	B/B 222	B/B 622	Bir ring'deki tuğla sayısı Number per ring	B/B 325	B/B 525	B/B 725	B/B 325	B/B 725
900	77	77																									
2000	81	73	8																								
100	85	68	17																								
200	90	63	27	89	85	4		86	3																		
300	94	58	36	93	80	13		83	10																		
400	99	53	46	98	75	23		80	18	97	97			97													
500	103	47	56	102	70	32		78	24	101	92	9		94	7												
600	107	42	65	107	65	42		75	32	106	86	20		91	15												
700	112	37	75	111	59	52		72	39	110	81	29		88	22	110	104	6		105	5						
800	116	32	84	115	54	61		70	45	114	76	38		86	28	114	98	16		102	12						
900	121	27	94	120	49	71		67	53	119	71	48		83	26	118	93	25		99	19						
3000	125	22	103	124	44	80		64	60	123	66	57		80	43	123	88	35		97	26	121	121			121	
100	129	17	112	129	39	90		61	68	128	61	67		77	51	127	83	44		94	33	125	115	10		118	7
200	134	12	122	133	34	99		59	74	132	56	76		75	57	131	78	53		91	40	130	110	20		115	15
300	138	6	132	137	29	108		56	81	136	50	86		72	64	136	73	63		88	48	134	105	29		112	22
400	143	1	142	142	23	119		53	89	141	45	96		69	72	140	68	72		86	54	139	100	39		110	29
500				146	18	128		50	96	145	40	105		66	79	145	63	82		83	62	143	95	48		107	36
600				151	13	138		48	103	150	35	115		64	86	149	57	92		80	69	147	90	57		104	43
700				155	8	147		45	110	154	30	124		61	93	153	52	101		77	76	152	85	67		101	51
800				159	3	156		42	117	158	25	133		58	100	158	47	111		75	83	156	80	76		99	57
900				164		157	7	39	125	163	20	143		56	107	162	42	120		72	90	161	75	86		95	65
4000				168		146	22	37	131	167	15	152		53	114	167	37	130		69	98	165	70	95		93	72
100				172		135	37	34	138	172	10	162		50	122	171	32	139		66	105	169	64	105		90	79
200				177		124	53	31	146	176	4	172		47	129	175	27	148		64	111	174	59	115		88	86
300				181		113	68	28	153	180		178	2	45	135	180	22	158		61	119	178	54	124		85	93
400				186		102	84	26	160	185		167	18	42	143	184	16	168		58	126	183	49	134		82	101
500				190		91	99	23	167	189		156	33	39	150	188	11	177		55	133	187	44	143		80	107
600				194		80	114	20	174	194		145	49	36	158	193	6	187		53	140	191	39	152		77	114
700				199		69	130	17	182	198		134	64	34	164	197	1	196		50	147	196	34	162		74	122
800				203		58	145	15	188	202		123	79	31	171	202		188	14	47	155	200	28	172		71	129
900				208		47	161	12	196	207		112	95	28	179	206		177	29	44	162	205	23	182		69	136
5000				212		36	176	9	203	211		101	110	25	186	210		166	44	42	168	209	18	191		66	143
100				216		25	191	6	210	216		90	126	23	193	215		155	60	39	176	213	13	200		63	150
200				221		14	207	4	217	220		79	141	20	200	219		144	75	36	183	218	8	210		60	158
300				225		3	222	1	224	224		68	156	17	207	223		133	90	33	190	222	3	219		58	164
400										229		57	172	14	215	228		122	106	31	197	227		220	7	55	172
500										233		46	187	12	221	232		111	121	28	204	231		209	22	52	179
600										238		35	203	9	229	237		100	137	25	212	235		198	37	49	186
700										242		24	218	6	236	241		89	152	22	219	240		187	53	47	193
800										246		13	233	3	243	245		78	167	20	225	244		176	68	44	200
900										251		2	249	1	250	250		67	183	17	233	249		165	84	41	208
6000																254		57	197	14	240	253		154	99	38	215
100																259		45	214	11	248	257		143	114	36	221
200																263		34	229	9	254	262		132	130	33	229
300																267		23	244	6	261	266		121	145	30	236
400																272		12	260	3	269	270		110	160	27	243
500																277		1	276		277	275		99	176	25	250
600																						279		88	191	22	257
700																						284		77	207	19	265
800																						288		66	222	16	272
900																						293		55	238	14	279
7000																						297		44	253	11	286
100																						301		33	268	8	293
200																						306		22	284	6	300
300																						310		11	299	3	307
400																						314			314		314

Tavsiye edilen pozlar
Recommended mixing range

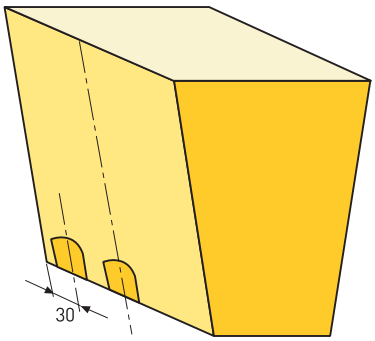
DÖNER FIRIN ÖZEL KİLİT TUĞLALARI
ROTARY KILN SPECIAL CLOSING BRICKS



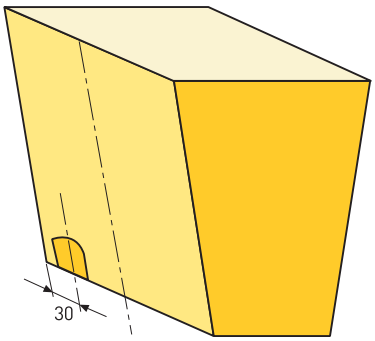
Poz Item	Boyutlar (mm) Dimensions (mm)				Hacim Volume V dm^3
	a	b	h	l	
18 / 1	79	74	180	198	2,73
18 / 2	84	79			2,90
18 / 3	89	84			3,08
18 / 4	94	89			3,26
20 /1	79	74	200	198	3,02
20 / 2	84	79			3,23
20 / 3	89	84			3,43
20 / 4	94	89			3,62
22 / 1	79	74	220	198	3,33
22 /2	84	79			3,55
22 / 3	89	84			3,77
22 / 4	94	89			3,98
25 / 1	79	74	250	198	3,78
25 / 2	84	79			4,03
25 / 3	89	84			4,28
25 / 4	94	89			4,52

TS EN ISO 9001:2000

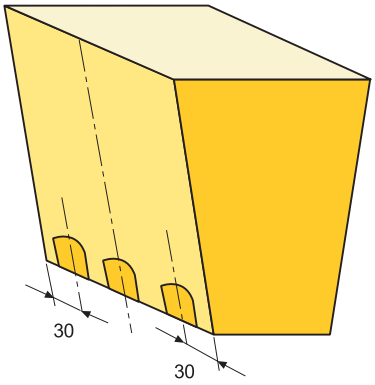
İSO (A - FORMAT) ve VDZ (B - FORMAT) STANDARTLARI İÇİN İŞARETLER
ISO (A - FORMAT) and VDZ (B - FORMAT) FOR STANDARDS SYMBOLS



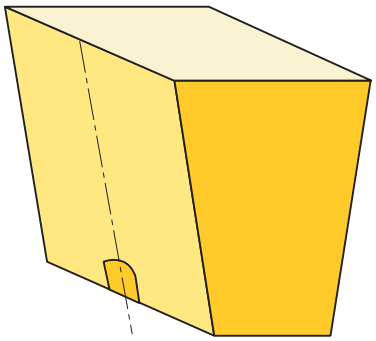
Ø Dış Çap : 2 metre
Ø Diameter : 2 meter
216
218
220
222
225



Ø Dış Çap : 4 metre
Ø Diameter : 4 meter
416
418
420
422
425

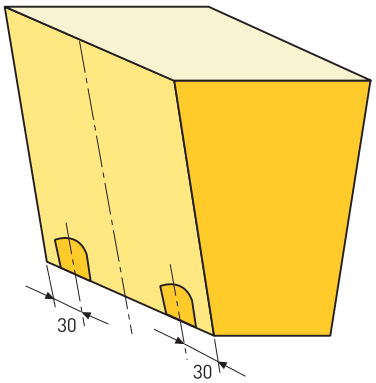


Ø Dış Çap : 3 metre
Ø Diameter : 3 meter
316
318
320
322
325



Ø Dış Çap : 5-6 metre
Ø Diameter : 5-6 meter

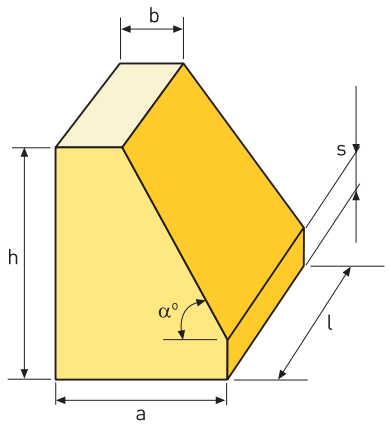
516	616
518	618
520	620
522	622
525	625



Ø Dış Çap : 7-8 metre
Ø Diameter : 7-8 meter

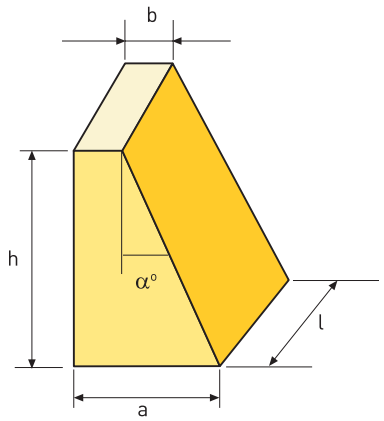
716	816
718	818
720	820
722	822
725	825

TAM YASTIK TUĞLASI
SKEW BRICKS



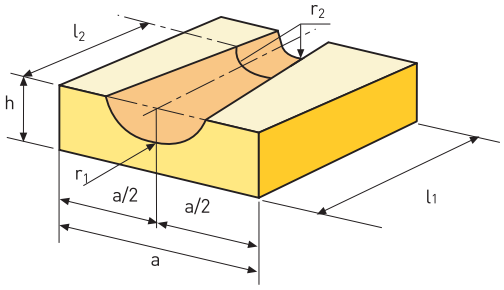
Poz Item	Boyutlar (mm) Dimensions (mm)					α°	Hacim Volume V dm³
	a	b	h	l	s		
FW 1	250	112,5	260	64	51	56° 36'	3,24
FW 2	250	112,5	260	124	51	56° 36'	6,28
FW 1A	250	154	260	64	29	67° 23'	3,45
FW 2A	250	154	260	124	29	67° 23'	6,69
FW 2/SEL	250	154	270	124	39	67° 43'	7,00
WK 1-64	250	135	233	64	33	60°	2,99
WK 1-76	250	135	233	76	33	60°	3,55
WK 2-64	250	50	233	64	33	45°	2,45
WK 2-76	250	50	233	76	33	45°	2,91
FW2/FİL	250	154	267	124	41	70°	6,93

YARIM YASTIK TUĞLASI
FEATHER ENDS PILLAR CORNER BRICKS



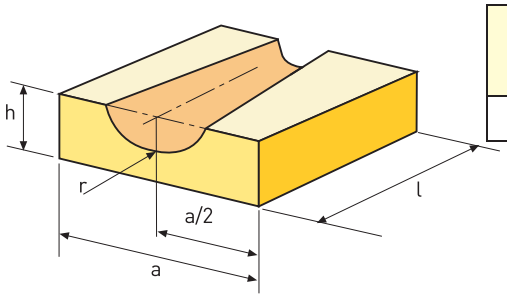
Poz Item	Boyutlar (mm) Dimensions (mm)					α°	Hacim Volume V dm³
	a	b	h	l	s		
FW 3	124	38	130	250	-	33° 24'	2,63
FW 4	187	101	130	250	-	33° 24'	4,68
FW 3A	124	70	130	250	-	22° 37'	3,15
FW 4A	187	133	130	250	-	22° 37'	5,20
V1B-64	172	110	230	64	-	15°	2,08
V1B-76	172	110	230	76	-	15°	2,46
V1L-64	230	137	345	64	-	15°	4,05
V1L-76	230	137	345	76	-	15°	4,81
V2B-64	187	120	250	64	-	15°	2,46
V2B-76	187	120	250	76	-	15°	2,92
V2L-64	250	150	375	64	-	15°	4,80
V2L-76	250	150	375	76	-	15°	5,70

TS EN ISO 9001:2000



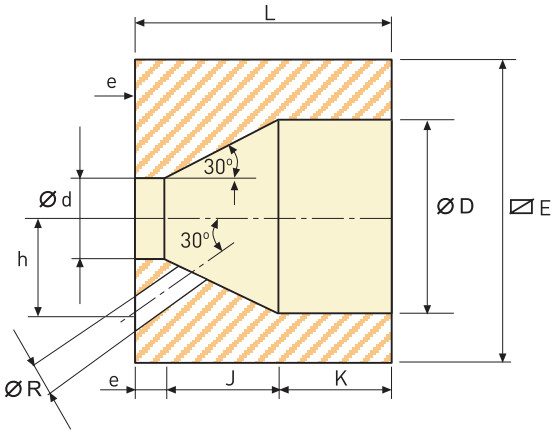
KONTROL DELİĞİ TUĞLASI
MEASURING HOLE BRICKS

Poz Item	a	h	l_1	l_2	r_1	r_2	Hacim Volume dm^3
FE 2	187	98	250	200	55	30	3,93



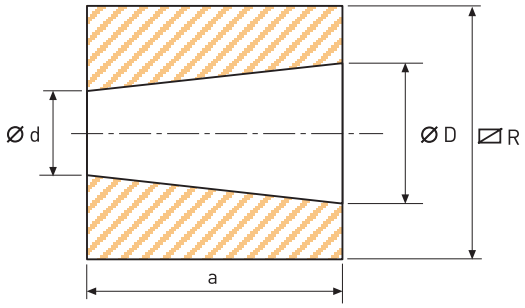
KONTROL DELİĞİ TUĞLASI
MEASURING HOLE BRICKS

Poz Item	a	h	l	r	Hacim Volume dm^3
FE 3	124	64	250	20	1,83



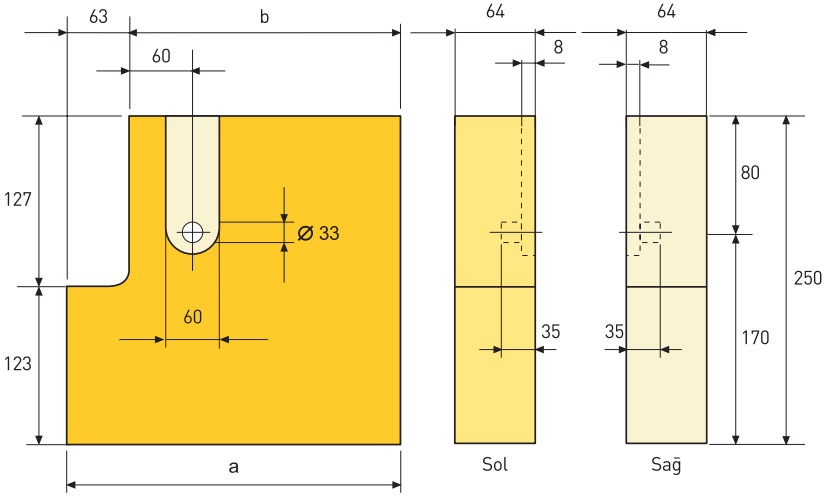
BEK TUĞLALARI
GAS BURNER BRICKS

Poz Item	Ø d	e	Ø D	E	L	h	& R	J	K	Hacim Volume dm^3
780	65	26	192	318	268	102	44	110	132	14.00
781	90	26	230	356	345	130	44	143	176	25.15
782	115	32	254	432	382	152	44	120,4	230	43.62
783	115	50	280	432	382	152	44	143	189	42.17
784	115	50	310	490	450	165	44	169	231	65.25
785	150	55	310	490	450	165	44	138,6	256	64.09



BEK TUĞLALARI
GAS BURNER BRICKS

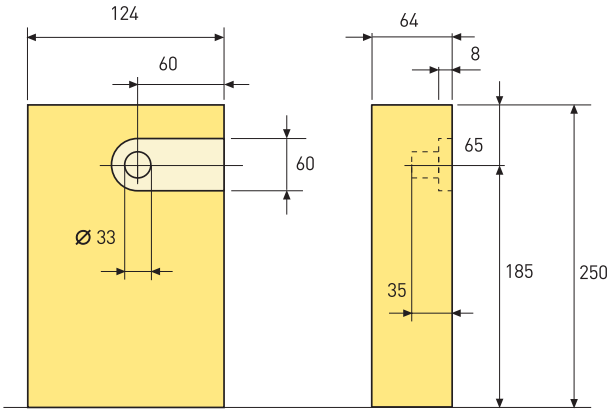
Poz Item	a	Ø d	Ø D	R	Hacim Volume dm^3
BR - 26	250	120	160	260	13.05
BR - 30	250	120	200	300	17.45

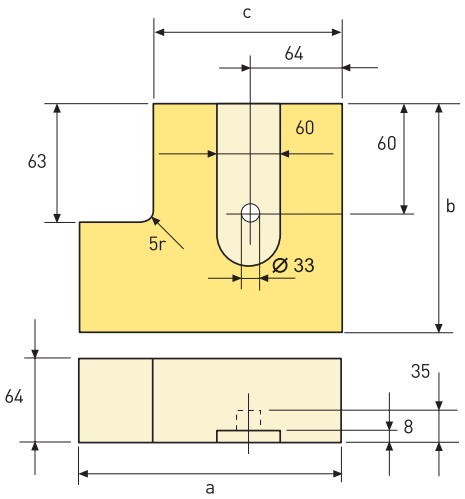


DUVAR TESPİT TUĞLALARI
ANCHOR BRICKS FOR

Poz Item	a	b	Hacim Volume dm^3
FE 6	250	187	3,47
FE 7	187	124	2,44

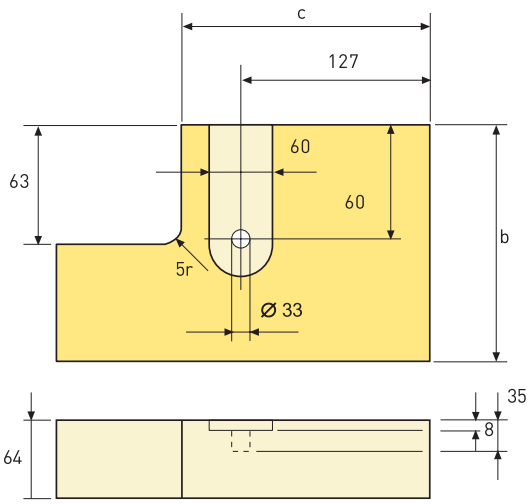
Poz Item	Hacim Volume dm^3
FE 8	1,94



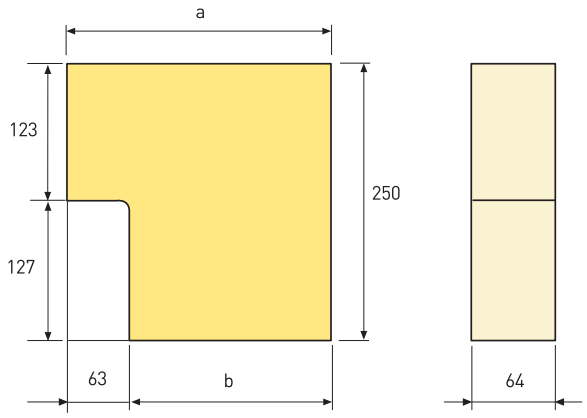


Poz Item	a	b	c	Hacim Volume dm^3
FE 11	187	124	124	1,16

Poz Item	a	b	c	Hacim Volume dm^3
FE 12	250	124	187	1,66

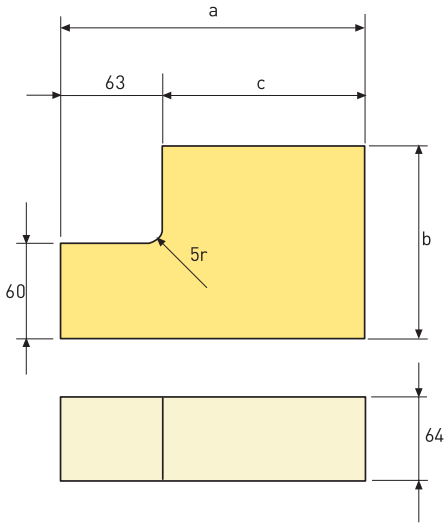


TS EN ISO 9001:2000



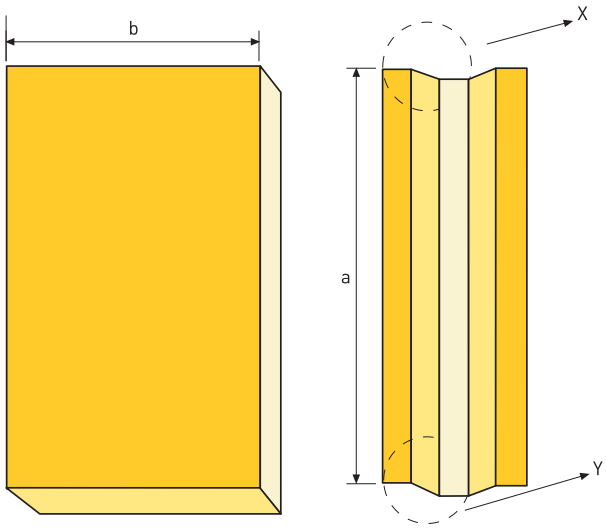
DİLATASYON TUĞLALARI
EXPANSION JOINT

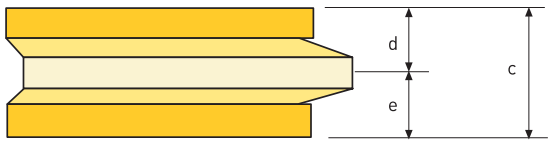
Poz Item	a	b	Hacim Volume dm^3
FE 4	250	187	3,55
FE 5	18	124	2,52



DİLİTASYON TUĞLALARI
EXPANSION JOINT

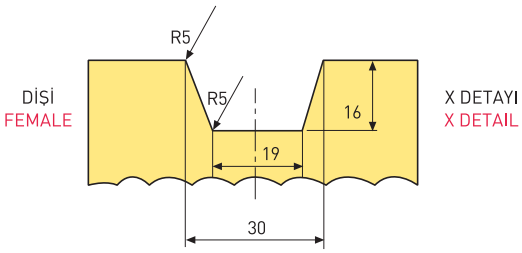
Poz Item	a	b	c	Hacim Volume dm^3
FE 9	187	123	124	1,24
FE 10	250	123	187	1,74

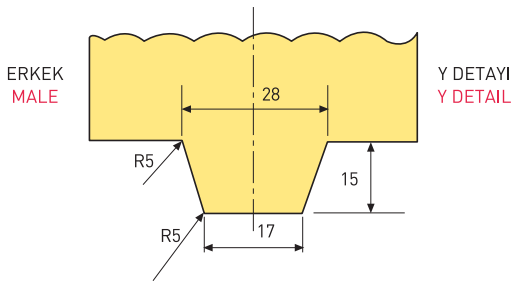


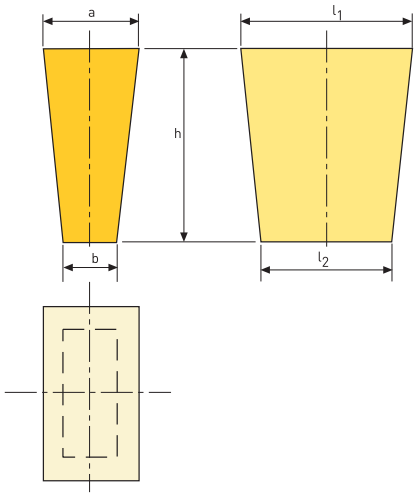


GEÇMELİ DUVAR TUĞLALARI
WALL BRICKS

Poz Item	Boyutlar (mm) Dimensions (mm)					Hacim Volume dm^3
	a	b	c	d	e	
6N	295	133	64	32	32	2,51
6V	145	133	64	32	32	1,23
9N	295	133	90	32	58	3,53
9V	145	133	90	32	58	1,74
12N	295	133	120	32	88	4,71
12V	145	133	120	32	88	2,31

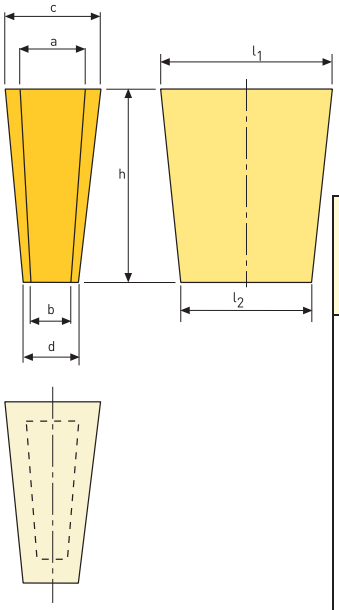






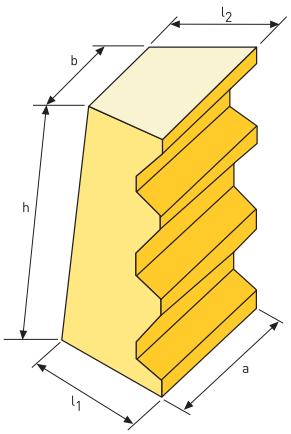
ARK OCAĞI KAPAK TUĞLALARI
DOME BRICKS (ARC FURNACE)

Poz Item	Boyutlar (mm) Dimensions (mm)					Hacim Volume V dm^3	Yarıçap Radius r mm	Inside Diameter 2r mm
	a	b	l_1	l_2	h			
R20	82,5	75	132	120	200	1,99	2000	4000
R30	80	75	128	120	200	1,92	3000	6000
R32	81	75	130	120	250	2,44	3000	6000
R42	80	75	128	120	250	2,40	4000	8000
R43	81	75	129	120	300	2,92	4000	8000
R52	79	75	126	120	250	2,37	5000	10000
R53	80	75	127	120	300	2,87	5000	10000
R62	78,5	75	125	120	250	2,35	6000	12000
R63	79	75	126	120	300	2,84	6000	12000
R72	78	75	124,5	120	250	2,34	7000	14000
R73	78	75	125	120	300	2,81	7000	14000
R93	77,5	75	124	120	300	2,79	9000	18000



ARK OCAĞI KAPAK TUĞLALARI
DOME BRICKS (ARC FURNACE)

Poz Item	Boyutlar (mm) Dimensions (mm)							Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm
	a	b	c	d	l_1	l_2	h			
KR20	71	65	93	85	132	120	200	1,98	2000	4000
KR30	71,5	67	89	83	128	120	200	1,93	3000	6000
KR32	72,5	67	90,5	83,5	130	120	250	2,45	3000	6000
KR42	72	68	87	82	128	120	250	2,40	4000	8000
KR43	73	68	88	82	129	120	300	2,91	4000	8000
KR52	72	68	86	82	126	120	250	2,37	5000	10000
KR53	72	68	87	82	127	120	300	2,86	5000	10000
KR62	71	68	85,5	82	125	120	250	2,35	6000	12000
KR63	71,5	68	86	82	126	120	300	2,84	6000	12000
KR72	71	68	85	82	124,5	120	250	2,34	7000	14000
KR73	71	68	85,5	82	125	120	300	2,82	7000	14000
KR93	70,5	68	85	82	124	120	300	2,80	9000	18000

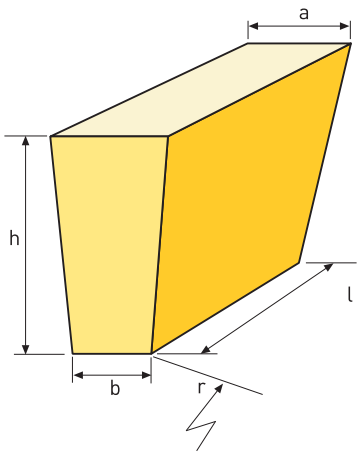


ELEKTROT ÇEVRESİ TUĞLALAR
ELEKTRODE BLOCKS

Poz Item	Boyutlar (mm) Dimensions (mm)								Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm
	a	b	l_1	l_2	h	n	o	p			
D1N	81	29,5	115	95	260	2	60	60	1,31	70	140
D2N	74,5	40	115	95	260	2	60	60	1,42	140	280
D3N	118,5	45	140	130	320	3	55	55	3,18	90	180
D4N	90	53	140	130	320	3	55	55	2,85	210	420
D5N	111	64	150	140	375	4	50	45	4,34	210	420
D6N	94	63	150	140	375	4	50	45	3,95	310	620
D7N	108	67,5	180	170	450	5	50	50	6,42	310	620
D8N	92	65,5	180	170	450	5	50	50	5,80	450	900
D9N	92	72	180	170	450	5	50	50	6,07	650	1300
D6NS	89	68	150	140	375	4	50	45	4,17	500	1000
D6NSA	86,6	70,4	150	140	375	4	50	45	4,17	650	1300

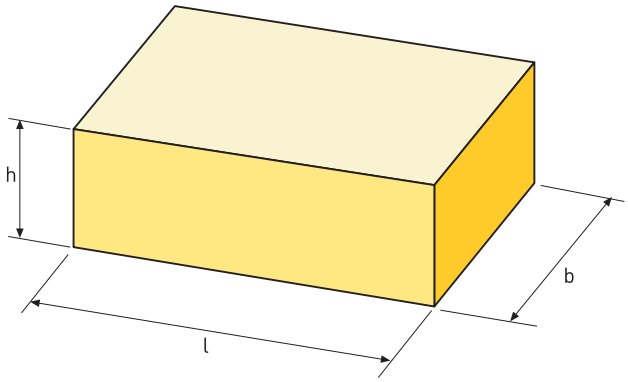
TS EN ISO 9001:2000

POTA TUĞLALARI
LADLE BRICKS



Poz Item	Boyutlar (mm) Dimensions (mm)				Hacim Volume V dm^3	Yarıçap Radius r mm	İç çap Inside Diameter 2r mm	Dış çap Diameter 2R mm
	a	b	h	l				
1P37	143	106	90	250	2,80	263	526	706
1P26	138	112	90	250	2,81	395	790	970
1P18	134	116	90	250	2,81	590	1180	1360
1P8	129	121	90	250	2,81	1384	2768	2948
2P36	143	143	124	250	3,88	375	750	998
2P24	137	137	124	250	3,88	594	1188	1436
2P10	130	130	124	250	3,88	1513	3026	3274
3P26	113	113	155	250	3,88	531	1062	1372
3P20	110	110	155	250	3,88	713	1426	1736
3P10	105	105	155	250	3,88	1504	3008	3318
4P22	111	111	187	250	4,68	774	1548	1922
4P12	106	106	187	250	4,68	1496	2992	3366
4P8	104	104	187	250	4,68	2291	4582	4956
5P22	111	111	220	250	5,50	910	1820	2260
5P16	108	108	220	250	5,50	1293	2586	3026
5P10	105	105	220	250	5,50	2134	4268	4708
5P8	104	104	220	250	5,50	2695	5390	5830
6P26	113	113	250	250	6,25	856	1712	2212
6P18	109	109	250	250	6,25	1292	2584	3084
6P10	105	105	250	250	6,25	2425	4850	5350
7P18	109	109	280	250	7,00	1447	2894	3454
7P12	106	106	280	250	7,00	2240	4480	5040

Not : İç yarıçap (r) 2mm'lik harç payına göre verilmiştir
Note : Joint approx,2 mm



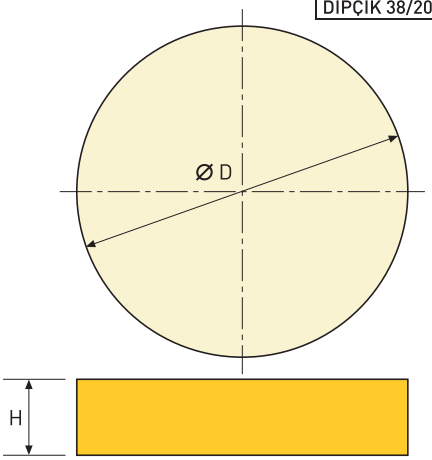
POTA ALTI TUĞLALARI
LADLE UNDER BRICKS

Poz Item	Boyutlar (mm) Dimensions (mm)		Hacim Volume V dm^3
	D	H	
DİPÇİK 25/6	250	60	2,9
DİPÇİK 25/10	250	100	4,9
DİPÇİK 25/14	250	140	6,9
DİPÇİK 30/6	300	60	4,3
DİPÇİK 30/10	300	100	7,1
DİPÇİK 30/14	300	140	10,0
DİPÇİK 30/20	300	200	14,1
DİPÇİK 35/6	350	60	5,8
DİPÇİK 35/10	350	100	9,6
DİPÇİK 35/14	350	140	13,5
DİPÇİK 35/20	350	200	19,3
DİPÇİK 38/10	380	100	11,3
DİPÇİK 38/14	380	140	15,9
DİPÇİK 38/20	380	200	22,7

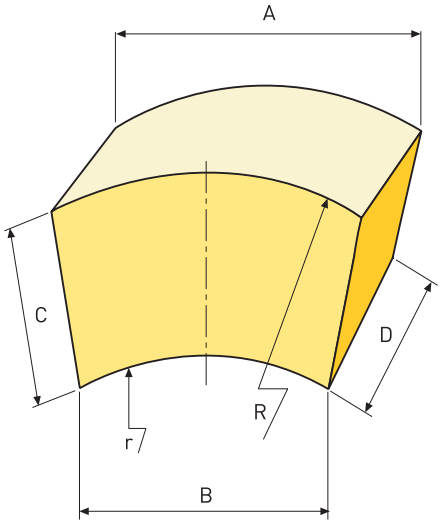
POTA TABAN TUĞLALARI
LADLE BOTTOM BRICKS

Poz Item	Boyutlar (mm) Dimensions (mm)			Hacim Volume V dm^3
	l	b	h	
B1	187	155	124	3,59
B2	210	187	155	6,09
B3	340	210	88	6,28
25B	250	225	100	5,62
1P0	250	90	125	2,81
2P0	250	124	125	3,88
3P0	250	155	100	3,88
4P0	250	187	100	4,68
5P0	250	220	100	5,50
6P0	250	250	100	6,25

Not : İç yarıçap (r) 2mm'lik harç payına göre verilmiştir
Note : Joint approx,2 mm



KUPOL TUĞLALARI
CUPOLA BRICKS



Poz Item	Boyutlar (mm)				Hacim Volume V dm^3	Yarıçap Radius r	İççap Inside Diameter 2r mm	Dış çap Diameter 2R (mm)	Bir ringteki tuğla sayısı (ADET) Quant/Circle
	A	B	C	D					
KUP-1000	237	150	100	100	1,94	175	350	550	7
KUP-1001	228	151	100	100	1,90	200	400	600	8
KUP-1002	214	153	100	100	1,84	250	500	700	10
KUP-1003	205	153	100	100	1,79	300	600	800	12
KUP-1004	198	153	100	100	1,76	350	700	900	14
KUP-1005	193	152	100	100	1,73	400	800	1000	16
KUP-1250	398	273	125	100	4,19	275	550	800	6
KUP-1251	423	298	125	100	4,51	300	600	850	6
KUP-1252	410	302	125	100	4,45	350	700	950	7
KUP-1253	400	304	125	100	4,40	400	800	1050	8
KUP-1254	391	306	125	100	4,36	450	900	1150	9
KUP-1255	384	307	125	100	4,32	500	1000	1250	10
KUP-12510	245	168	125	100	2,58	275	550	800	10
KUP-12511	218	153	125	100	2,32	300	600	850	12
KUP-12512	210	154	125	100	2,28	350	700	950	14
KUP-12513	202	154	125	100	2,23	400	800	1050	16
KUP-12514	198	154	125	100	2,20	450	900	1150	18
KUP-12515	198	154	125	100	2,20	500	1000	1250	20
KUP-1501	448	298	125	100	4,66	300	600	900	6
KUP-1502	432	302	125	100	4,59	350	700	1000	7
KUP-1503	419	304	125	100	4,52	400	800	1100	8
KUP-1504	400	307	150	100	5,30	500	1000	1300	10
KUP-1505	386	308	150	100	5,21	600	1200	1500	12
KUP-1506	380	309	150	100	5,17	650	1300	1600	13
KUP-1507	378	316	150	100	5,21	765	1530	1830	15
KUP-15010	304	189	150	100	3,70	250	500	800	8
KUP-15011	231	153	150	100	2,88	300	600	900	12
KUP-15012	221	154	150	100	2,81	350	700	1000	14
KUP-15013	212	154	150	100	2,75	400	800	1100	16
KUP-15014	201	154	150	100	2,66	500	1000	1300	20
KUP-15015	193	154	150	100	2,60	600	1200	1500	24
KUP-15016	191	155	150	100	2,60	650	1300	1600	26
KUP-15017	191	160	150	100	2,63	765	1530	1830	30

TS EN ISO 9001:2000

KUPOL TUĞLALARI ÖRGÜ PLANI
INSTALLATION PLAN OF CUPPOLA BRICKS

İç çap Inside Diameter 2r (mm)	Dış çap Diameter 2R (mm)	1000	1001	1002	1003	1004	1005	Bir ringteki tuğla sayısı Quant/Circle
350	550	7						7
400	600		8					8
450	650		5	4				9
500	700			10				10
550	750			6	5			11
600	800				12			12
650	850				7	6		13
700	900					14		14
750	950					8	7	15
800	1000						16	16

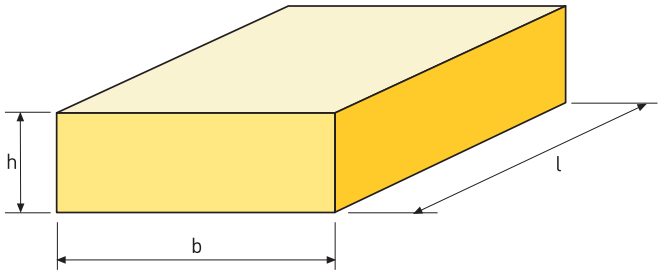
İç çap Inside Diameter 2r (mm)	Dış çap Diameter 2R (mm)	1250	1251	1252	1253	1254	1255	Bir ringteki tuğla sayısı Quant/Circle
550	800	6						6
600	850		6					6
700	950			7				7
800	1050				8			8
900	1150					9		9
1000	1250						10	10

İç çap Inside Diameter 2r (mm)	Dış çap Diameter 2R (mm)	12510	12511	12512	12513	12514	12515	Bir ringteki tuğla sayısı Quant/Circle
550	800	10						10
600	850		12					12
650	900		7	6				13
700	950			14				14
750	1000			8	7			15
800	1050				16			16
850	1100				9	8		17
900	1150					18		18
950	1200					10	9	19
1000	1250						20	20

İç çap Inside Diameter 2r (mm)	Dış çap Diameter 2R (mm)	1501	1502	1503	1504	1505	1506	1507	Bir ringteki tuğla sayısı
600	900	6							6
700	1000		7						7
800	1100			8					8
900	1200			5	4				9
1000	1300				10				10
1100	1400				6	5			11
1200	1500					12			12
1300	1600						13		13
1530	1830							14	14

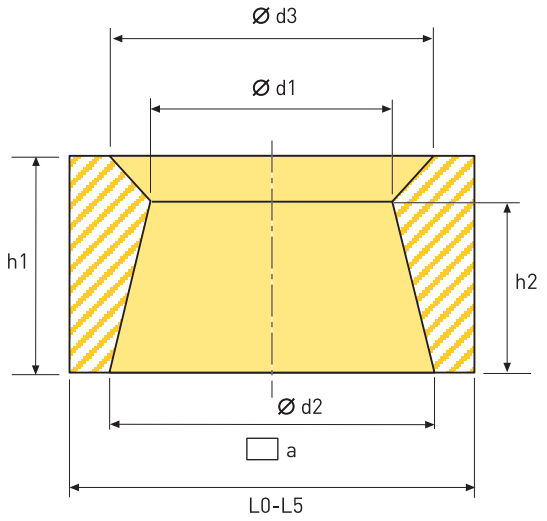
İç çap Inside Diameter 2r (mm)	Dış çap Diameter 2R (mm)	15010	15011	15012	15013	15014	15015	15016	15017	Bir ringteki tuğla sayısı
500	800	8								8
600	900		12							12
650	950		7	6						13
700	1000			14						14
750	1050			8	7					15
800	1100				16					16
850	1150				9	8				17
900	1200				9	9				18
950	1250					19				19
1000	1300					20				20
1050	1350					11	10			21
1100	1400					11	11			22
1150	1450					12	11			23
1200	1500						24			24
1250	1550						13	12		25
1300	1600							26		26
1530	1830								30	30

CAM FIRINI BLOK TUĞLALARI
GLASS FURNACE BLOCKS



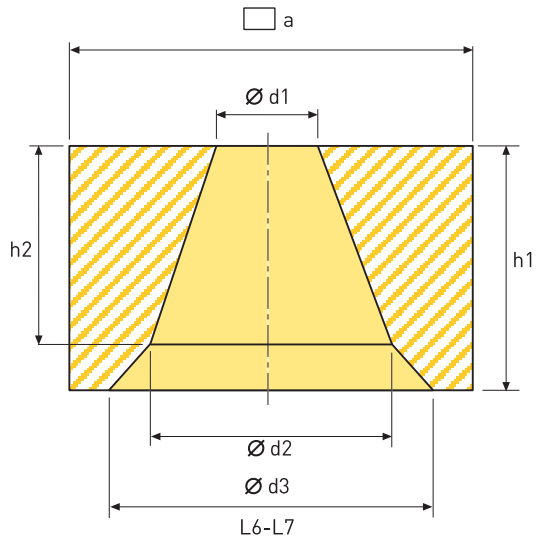
Poz Item	Boyutlar (mm) Dimensions in (mm)			Hacim Volume
	h	b	l	dm^3
CB - 232	200	300	200	12
CB - 233	200	300	300	18
CB - 234	200	300	400	24
CB - 235	200	300	500	30
CB - 236	200	300	600	36
CB - 238	200	300	800	48
CB - 2310	200	300	1000	60
CB - 244	200	400	400	32
CB - 245	200	400	500	40
CB - 246	200	400	600	48
CB - 248	200	400	800	64
CB - 2410	200	400	1000	80
CB - 252	200	500	200	20
CB - 255	200	500	500	50
CB - 256	200	500	600	60
CB - 258	200	500	800	80
CB - 2510	200	500	1000	100
CB - 262	200	600	200	24
CB - 266	200	600	600	72
CB - 268	200	600	800	96
CB - 2610	200	600	1000	120
CB - 282	200	800	200	32
CB - 288	200	800	800	128
CB - 333	300	300	300	27
CB-334	300	300	400	36
CB - 335	300	300	500	45
CB - 336	300	300	600	54
CB - 338	300	300	800	72
CB - 3310	300	300	1000	90
CB - 344	300	400	400	48
CB - 345	300	400	500	60
CB - 346	300	400	600	72
CB - 347	300	400	700	84
CB - 348	300	400	800	96
CB - 349	300	400	900	108
CB - 3410	300	400	1000	120
CB - 355	300	500	500	75
CB - 356	300	500	600	90
CB - 358	300	500	800	120
CB - 366	300	600	600	108
CB - 444	400	400	400	64
CB - 446	400	400	600	96
CB - 448	400	400	800	128
CB - 455	400	500	500	100
CB - 456	400	500	600	120
CB - 555	500	500	500	125

TS EN ISO 9001:2000

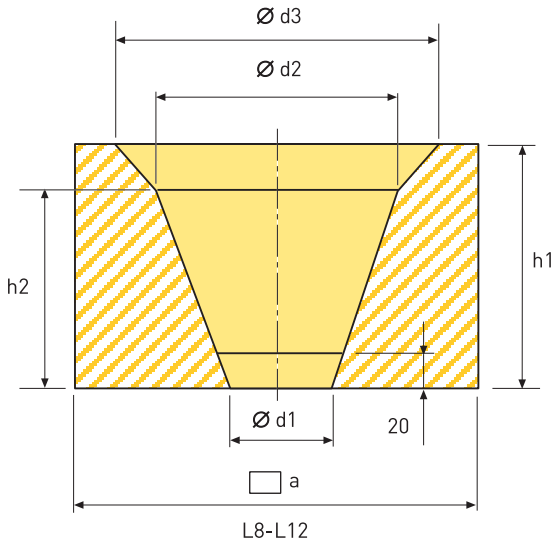


POTA TABAN DELİK TUĞLALARI
POCKET BLOCKS

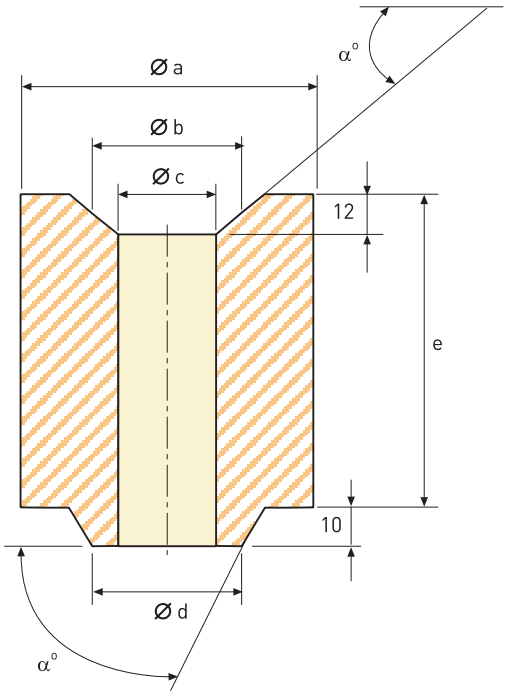
Poz Item	Boyutlar (mm) Dimensions (mm)						Hacim Volume V
	▭ a	h1	h2	Ød1	Ød2	Ød3	
L0	250	107	90	125	143	220	5,01
L1	320	123	100	149	169	260	9,83
L2	320	165	130	143	169	260	13,26
L3	360	190	155	163	194	300	13,22
L4	360	222	185	157	194	300	22,71
L5	320	254	185	157	194	300	25,51



Poz Item	Boyutlar (mm) Dimensions (mm)						Hacim Volume V
	▭ a	h1	h2	Ød1	Ød2	Ød3	
L6	320	123	100	123	143	260	10,45
L7	320	165	130	123	149	260	13,82

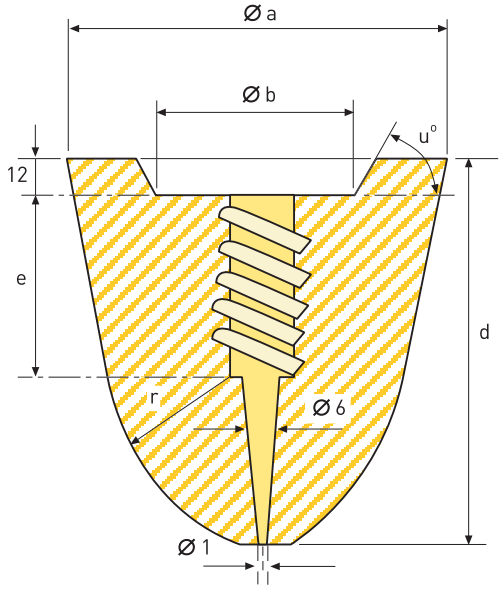


Poz Item	Boyutlar (mm) Dimensions (mm)						Hacim Volume V
	▭ a	h1	h2	Ød1	Ød2	Ød3	
L8	360	190	155	130	157	300	20,69
L9	360	222	185	130	163	300	24,11
L10	360	254	185	130	163	300	26,87
L11	360	254	185	130	163	310	24,98
L12	420	254	185	130	260	300	32,36



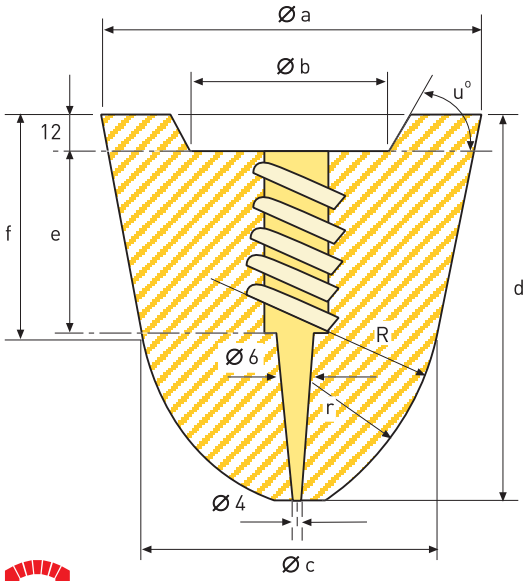
POTA MİL TUĞLALARI
LADLE TUBE BRICKS

Poz Item	Boyutlar (mm) Dimensions in (mm)						Hacim Volume V dm^3
	Øa	Øb	Øc	Ød	e	α°	
SR0	90	62	40	60	270	75	1,37
SR1	105	72	47	70	330	75	2,27
SR2	120	72	47	70	330	60	3,15
SR3	140	72	47	70	330	60	4,50
SR4/1	155	72	47	70	330	60	5,64
SR4/2	155	97	60	95	330	60	5,27
SR5	170	97	60	95	330	60	6,54
SR6	210	97	60	95	330	60	10,48

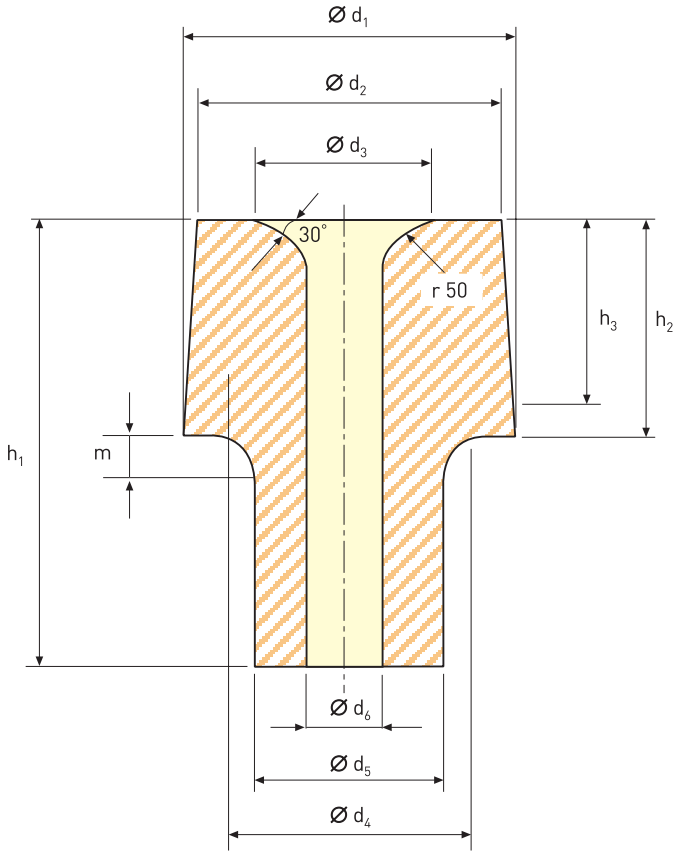


TAPA TUĞLALARI
STOPPER BRICKS

Poz Item	Boyutlar (mm) Dimensions in (mm)									Hacim Volume V dm^3
	Øa	Øb	Øc	d	e	f	r	R	U°	
S0	90	62		120	80		40		75	0,50
S1	105	72		130	90		45		75	0,70
S2	120	72		135	90		55		60	1,06
S3	140	72		145	90		60		60	1,47
S4/1	155	72		155	90		65		60	1,89
S4/2	155	97		155	90		65		60	1,84
S5	170	97		170	90		70		60	2,46
S6	210	97	172	220	90	120	60	143	60	4,63



TS EN ISO 9001:2000



NOZUL TUĞLASI
NOZZLES BRICK

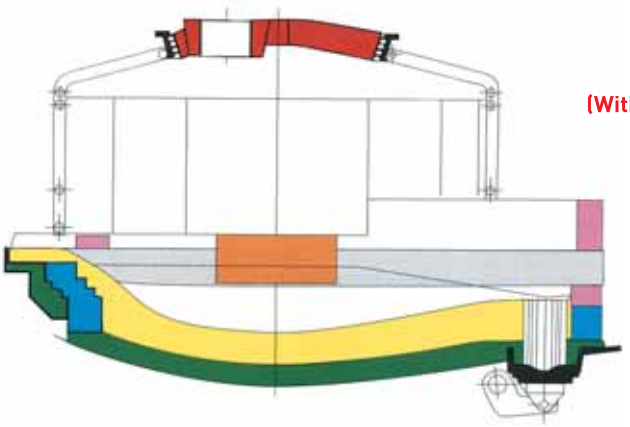
Poz Item	Ød1	Ød2	Ød3	Ød4	Ød5	Ød6	h1	h2	h3	m	Hacim Volume dm3
2A10	155	133	115	110	100	10	240	130	110	10	2.90
2A15	155	133	115	110	100	15	240	130	110	10	2.88
2A16	155	133	115	110	100	16	240	130	110	10	2.87
2A20	155	133	115	110	100	20	240	130	110	10	2.85
2A22	155	133	115	110	100	22	240	130	110	10	2.83
2A25	155	133	115	110	100	25	240	130	110	10	2.81
2A30	155	133	115	110	100	30	240	130	110	10	2.76
2A32	155	133	115	110	100	32	240	130	110	10	2.74
2A35	155	133	115	110	100	35	240	130	110	10	2.70
2A37	155	133	115	110	100	37	240	130	110	10	2.68
2A40	155	133	115	110	100	40	240	130	110	10	2.63
2A45	155	133	115	110	100	45	240	130	110	10	2.56
2A50	155	133	115	110	100	50	240	130	110	10	2.47
2A55	155	133	115	110	100	55	240	130	110	10	2.38
2A60	155	133	115	110	100	60	240	130	110	10	2.38
2A65	155	133	115	110	100	65	240	130	110	10	2.17
3A10	180	153	135	140	120	10	285	155	135	20	4.75
3A20	180	153	135	140	120	20	285	155	135	20	4.68
3A25	180	153	135	140	120	25	285	155	135	20	4.64
3A30	180	153	135	140	120	30	285	155	135	20	4.58
3A35	180	153	135	140	120	35	285	155	135	20	4.51
3A40	180	153	135	140	120	40	285	155	135	20	4.43
3A45	180	153	135	140	120	45	285	155	135	20	4.34
3A50	180	153	135	140	120	50	285	155	135	20	4.24
3A55	180	153	135	140	120	55	285	155	135	20	4.13
3A60	180	153	135	140	120	60	285	155	135	20	4.03
3A65	180	153	135	140	120	65	285	155	135	20	4.88
3A70	180	153	135	140	120	70	285	155	135	20	4.74
3A75	180	153	135	140	120	75	285	155	135	20	4.58
3A80	180	153	135	140	120	80	285	155	135	20	4.42
4A10	180	147	135	140	120	10	315	185	165	20	5.27
4A20	180	147	135	140	120	20	315	185	165	20	5.20
4A25	180	147	135	140	120	25	315	185	165	20	5.15
4A30	180	147	135	140	120	30	315	185	165	20	5.09
4A35	180	147	135	140	120	35	315	185	165	20	5.01
4A40	180	147	135	140	120	40	315	185	165	20	4.92
4A45	180	147	135	140	120	45	315	185	165	20	4.82
4A50	180	147	135	140	120	50	315	185	165	20	4.71
4A55	180	147	135	140	120	55	315	185	165	20	4.59
4A60	180	147	135	140	120	60	315	185	165	20	4.45
4A65	180	147	135	140	120	65	315	185	165	20	4.31
4A70	180	147	135	140	120	70	315	185	165	20	4.15
4A75	180	147	135	140	120	75	315	185	165	20	3.98
4A80	180	147	135	140	120	80	315	185	165	20	3.79

ELEKTRİK ARK OCAĞI

(Su Soğutmalı ve Alttan Boşaltmalı)

ELECTRIC ARC FURNACE

(With Water Cooling and E.B.T. System)



Kullanılacak Malzemenin Kalitesi — **Materials Recommended**

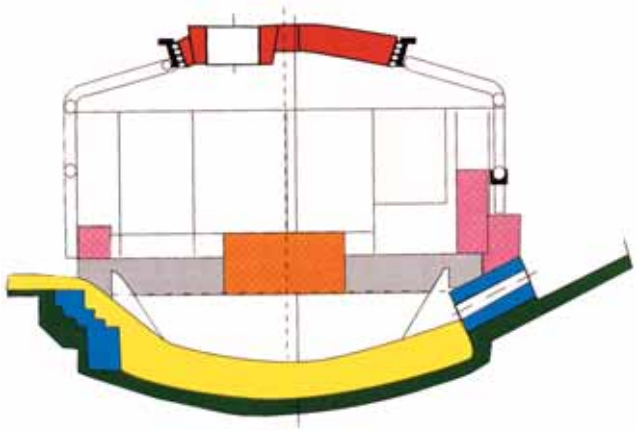
Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Sıcak Bölge Hot Spots	_____	_____
Yan Duvar Sidewall	_____	_____
Curuf Bölgesi Slag Zone	_____	_____
Tavan Roof	SEL 80 SEL 75	SELMOR.80 - SELCAST.85 SELMOR.75 - SELCAST.80

ELEKTRİK ARK OCAĞI

(Su Soğutmalı)

ELECTRIC ARC FURNACE

(With Water Cooling)

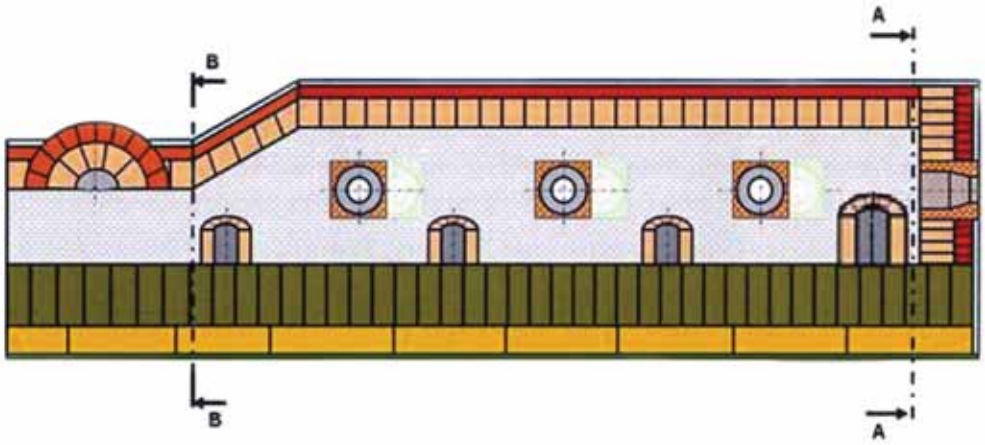


Kullanılacak Malzemenin Kalitesi — **Materials Recommended**

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Sıcak Bölge Hot Spots	_____	_____
Yan Duvar Sidewall	_____	_____
Curuf Bölgesi Slag Zone	_____	_____
Tavan Roof	SEL 80 SEL 75	SELMOR.80-SELCAST.85 SELMOR.75-SELCAST.80

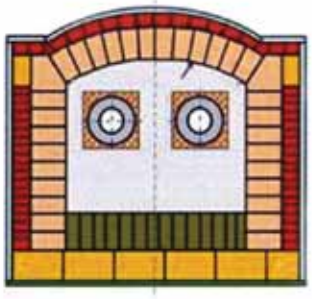
TS EN ISO 9001:2000

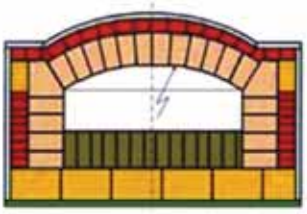
HADDEHANE FIRINI **ROLLING FURNACE**



FIRIN YAN DUVARLARI BOY KESİT

FURNACE SIDEWALLS VERTICAL SECTIONING





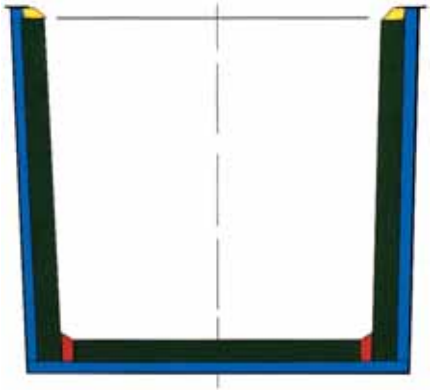
A - A KESİTİ
A - A SECTION

B - B KESİTİ
B - B SECTION

Kullanılacak Malzemenin Kalitesi **Materials Recommended**

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Tavan ve Yan Duvar Roof and Sidewall	SEL.80 SEL.60	SELMOR.80 SELMOR.60
Taban İzolasyon Bottom Insulation	SEL.46	SELMOR.46
İzolasyon Insulating	KALSİYUM SİLİKAT	-
İzolasyon Insulating	SEL.ŞİZ SEL.KİZ	SELMOR.ŞİZ SELMOR.KİZ
Emniyet Astarı Permanent	SEL.46	SELMOR.46
Taban Aşınma Astarı Bottom Wear Lining	SEL.85.Cr SEL.85	SELMOR.80

ÇELİK DÖKÜM POTASI
(Şamot Örgü)

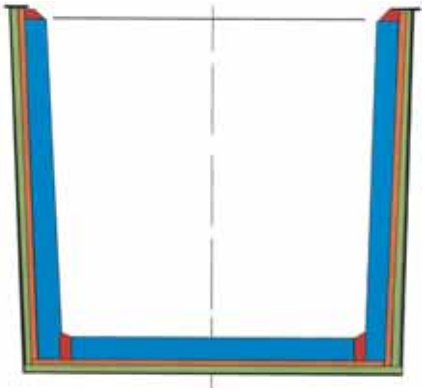


STEEL CASTING LADLE
(Fireclay Lining)

Kullanılacak Malzemenin Kalitesi — **Materials Recommended**

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Çalışma Astarı Wear Lining	SEL 46 SEL 42	SELMOR.46 SELMOR.42
Taban Etrafı Sıkıştırma Harcı Rammin Around Bottom		SELCAST.80 SELCAST.60
Emniyet Astarı Permanent Lining	SELMOR.42 SELMOR.39	SELMOR.42 SELMOR.39
Pota Ağzı Edge Covering		SELCAST.50 SELCAST.45

ÇELİK DÖKÜM POTASI
(Alümina Örgü)



STEEL CASTING LADLE
(Alumina Lining)

Kullanılacak Malzemenin Kalitesi — **Materials Recommended**

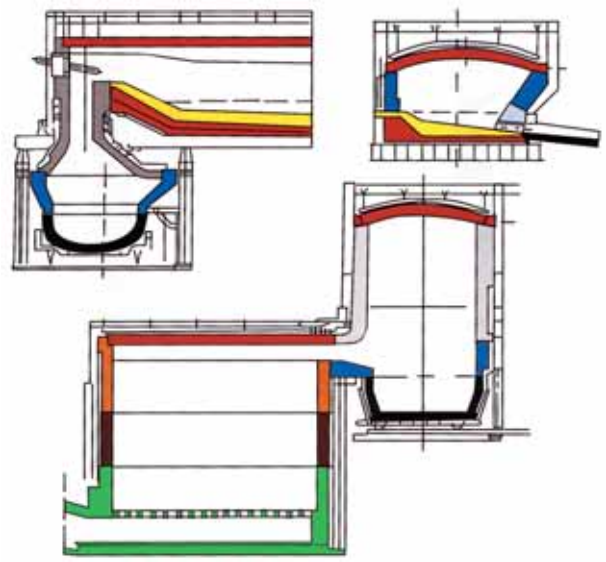
Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Çalışma Astarı Wear Lining	SEL 80 SEL 75 SEL 70	SELMOR.80 SELMOR.75 SELMOR.70
Pota Ağzı ve Taban Kenarları Rammin Around Bottom and Packet Block	———	SELCAST.85 SELCAST.80 SELCAST.75
Emniyet Astarı Permanent Lining	SEL 42 SEL 39	SELMOR.42 SELMOR.39
İzole Insulation	SEL.ŞİZ.1,0	SELMOR.39

(*) Pota Tabanlarında
As Bottom Lining

TS EN ISO 9001:2000

SIEMENS MARTIN

SIEMENS MARTIN FURNACE



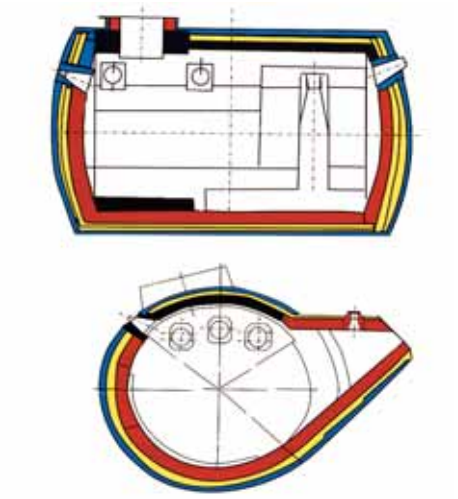
Kullanılacak Malzemenin Kalitesi

Materials Recommended

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Curuf Kamarası Tavanı Checker Chamber Roof	SEL 50 SEL 46	SELMOR.50 SELMOR.46
Curuf Kamarası Yan Duvar Ustü Chamber Wall and Checker	SEL 46 SEL 50	SELMOR.65 SELMOR.50
Curuf Kamarası Yan Duvar Chamber Wall and Checker	SEL 46 SEL 42	SELMOR.46 SELMOR.42
Curuf Kamarası Yan ve Destek Duvarları Chamber Wall and Supports Walls Checker	SEL 39 SEL 39	SELMOR.42 SELMOR.39

PİK DEMİR MİKSERİ

PIG IRON MIXER



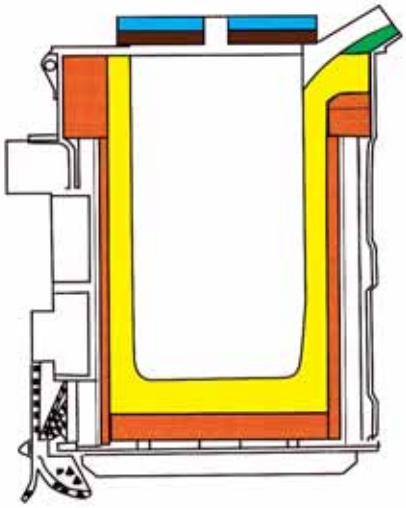
Kullanılacak Malzemenin Kalitesi

Materials Recommended

Bölge - Zone	Tuğla -Shapped	Harç - Unshapped
Tavan Roof	SEL 50 SEL 46 SEL 42	SELMOR.50 SELCAST.80 SELMOR.46 SELCAST.70 SELMOR.42
Emniyet Astarı Permanent Lining Back Lining	SEL 46 SEL 42	SELMOR.46 SELCAST.50 SELMOR.42 SELCAST.45
İzole Insulation	SEL.ŞİZ.1,0 SEL.KİZ.0,8	SELMOR.39 SELMOR.KİZ

İNDÜKSİYON OCAĞI

INDUCTION FURNACE



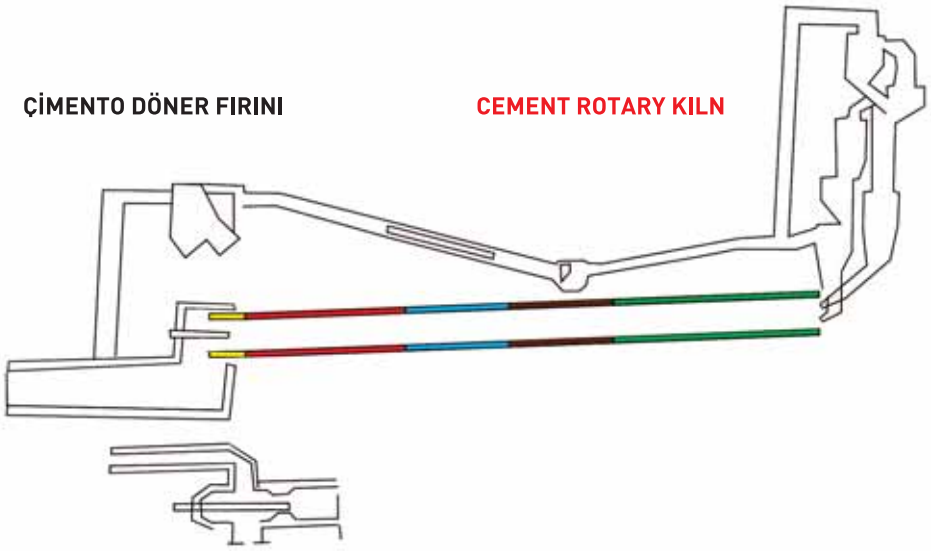
Kullanılacak Malzemenin Kalitesi

Materials Recommended

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Döküm Ağzı Tap	—	SELCAST.80 SELCAST.70
Taban ve Yan Duvarlar Bottom and Walls	SEL 46 SEL 42	SELMOR.46 SELMOR.42
Tavan Roof	—	SELCAST.80 SELCAST.70
İzole Insulation	SELİZO-BLOK SEL.KİZ.0,6	SELMOR.KİZ

ÇİMENTO DÖNER FIRINI

CEMENT ROTARY KILN



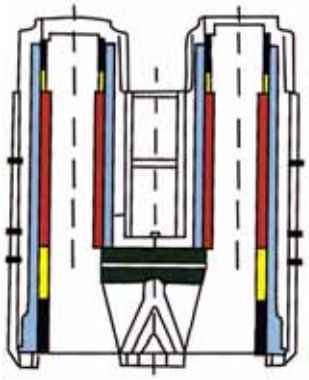
Kullanılacak Malzemenin Kalitesi

Materials Recommended

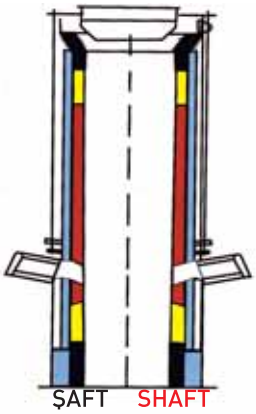
Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Ağız Tuğlaları Discharge	SEL 80 SEL 75	SELMOR.80 SELMOR.75
Emniyet Bölgesi Security	SEL 75 SEL 70 SEL 65	SELMOR.75 SELMOR.70 SELMOR.65
Kalsinasyon Bölgesi Calcinin	SEL 60 SEL 55 SEL 50	SELMOR.60 SELMOR.55 SELMOR.50

TS EN ISO 9001:2000

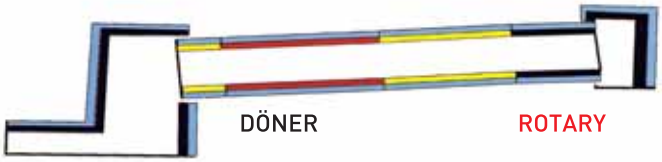
KİREÇ FIRINLARI — LIME KILNS



MEARZ — MEARZ



ŞAFT — SHAFT

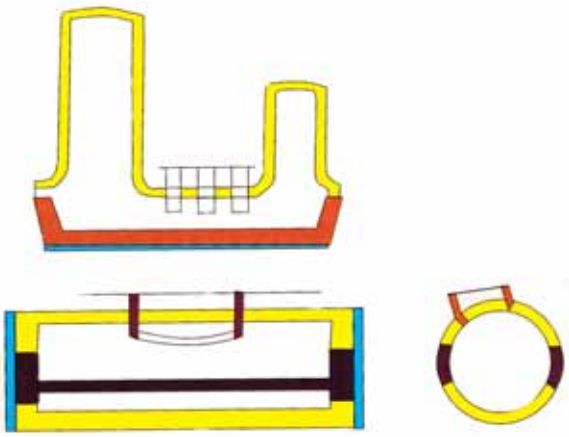


DÖNER — ROTARY

Kullanılacak Malzemenin Kalitesi — Materials Recommended

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Geçiş Bölgesi Transition	SEL 50 SEL 60 SEL 70 SEL 80	SELMOR.50 SELMOR.60 SELMOR.70 SELMOR.80
Giriş - Çıkşı Inlet - Outlet (Cooling)	SEL 42 SEL 39 SEL.ASİD	SELMOR.42 SELMOR.39 SELMOR.ASİD
İzole Insulation	SEL.ŞİZ.1,2 SEL.ŞİZ.1,3 SEL.KİZ.0,8 SEL.KİZ.0,6	SELMOR.36 SELMOR.KİZ

BAKIR FLAŞ FIRINI — FLASH SMELTER (Copper)

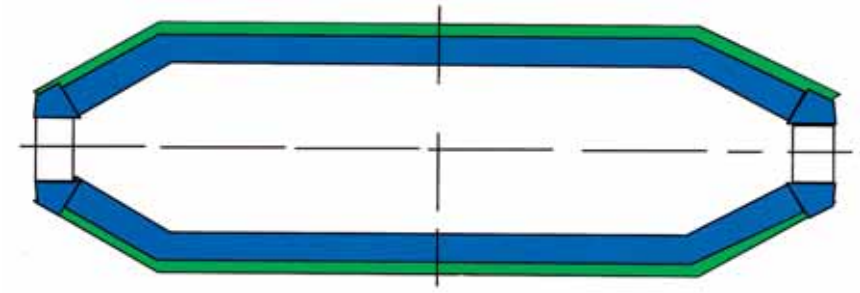


Kullanılacak Malzemenin Kalitesi — Materials Recommended

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
İzole Insulation	SEL 42 SEL 39 SEL.ŞİZ.1,2	SELMOR.42 SELMOR.39 SELMOR.36

BAKIR RAFİNE FIRINI

(Thomas Fırını)



COPPER REFINING FURNACE

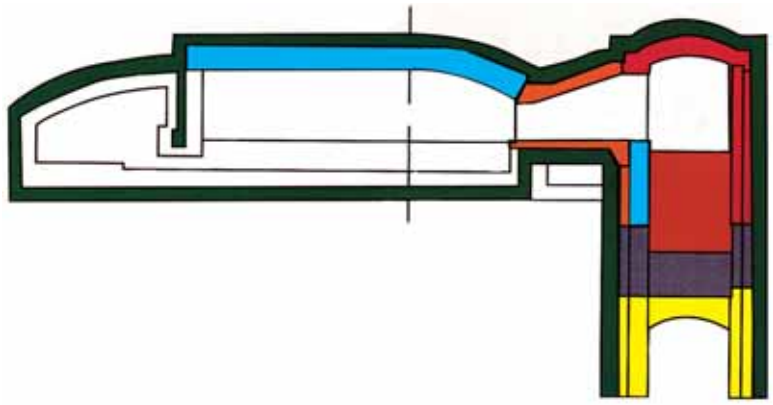
(Thomas Furnace)

Kullanılacak Malzemenin Kalitesi — Materials Recommended

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Emniyet Astarı Permanent Lining	SEL 46 SEL 42	SELMOR.46 SELMOR.42 SELMOR.50 SELMOR.45

CAM ERİTME FIRINI

ve REJENERATÖR



GLASS MELTING FURNACE

and REGENERATOR

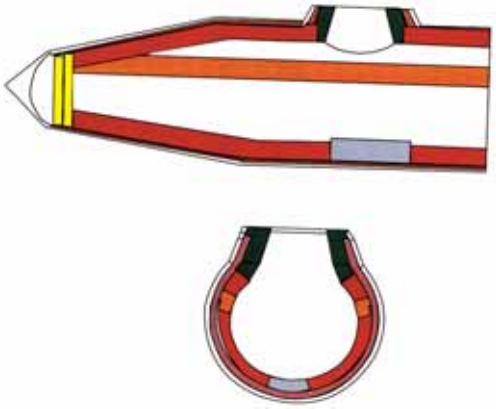
Kullanılacak Malzemenin Kalitesi — Materials Recommended

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Tavan Roof		
Çeker 2 Checker Work 2	SEL 60	SELMOR.60
Çeker 3 Checker Work 3	SEL 46 SEL 42	SELMOR.46 SELMOR.42
İzolasyon Insulation	SEL.ŞİZ.1,2 SEL.ŞİZ.1,3 SEL.KİZ.0,8 SEL.KİZ.0,6	SELMOR.ŞİZ SELMOR.ŞİZ SELMOR.KİZ SELMOR.KİZ

TS EN ISO 9001:2000

TORPEDO ARABASI

TORPEDO CAR

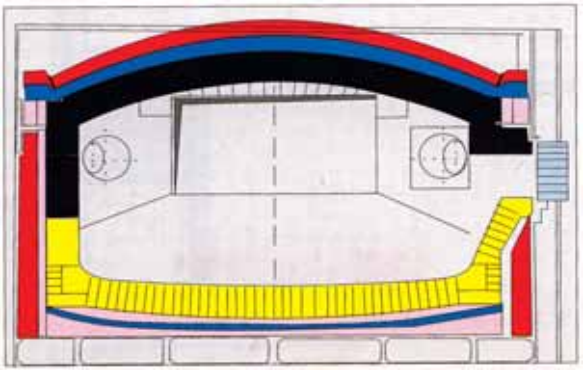


Kullanılacak Malzemenin Kalitesi — **Materials Recommended**

Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Emniyet Astarı Permanent Lining	SEL 46	SELMOR.42
Curuf Bölgesi Slag Zone	SEL 70	SELMOR.70
Aşınma Astarı Wear Lining	SEL 70	SELMOR.70
Aşınma Astarı Wear Lining	SEL 60	SELMOR.60
Çıkış Ağızı Outlet	SEL 70	SELMOR.70
Çarpma Bölgesi Impact Zone	SEL 70	SELMOR.70

ALÜMİNYUM ERGİTME FIRINI

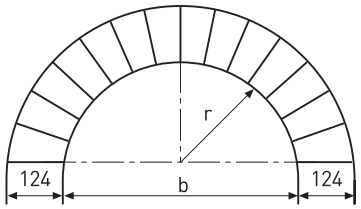
ALUMINUM MELTING FURNACE



Kullanılacak Malzemenin Kalitesi — **Materials Recommended**

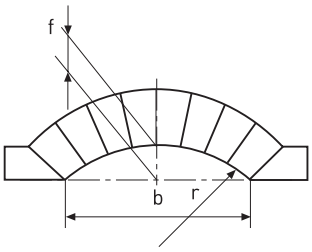
Bölge - Zone	Tuğla - Shapped	Harç - Unshapped
Tavan + Yanduvar Roof + Sidewall	SEL.İZOCAST.35	-
Tavan + Taban Roof + Bottom	SELMOR.ŞİZ	SELMOR.ŞİZ
Tavan + Yanduvar Roof + Sidewall	SEL.42	SELMOR.42
Yanduvar + Taban Sidewall + Bottom	SEL 75	SELMOR.75
Taban Bottom	SELCAST.40	-
Ağız Mouth	SEL.ŞİZ.1,45	SELMOR.ŞİZ
Taban arası Middle Bottom	SEL.39	SELMOR.39

YUVARLAK KEMER ÖRÜMÜ
ROUND ROOFS OF SIDE ARCHES



Kemer Açıklığı b (mm) Channel Width	İç Yarı Çap r (mm) Roof Radius	Tuğla Sayısı - Number of the Side Arches in the Arch					
		Toplam Total	2H6	2H10	2H16	2H24	2H50
300	150	10				4	6
400	200	13				9	4
500	250	15				15	
600	300	17			3	14	
700	350	20			10	10	
800	400	22			17	5	
900	450	25			25		
1000	500	27		6	21		
1100	550	29		13	16		
1200	600	32		19	13		
1300	650	34		26	8		
1400	700	36		32	4		

YATIK KEMER ÖRÜMÜ
FLAT ROOFS OF SIDE ARCHES

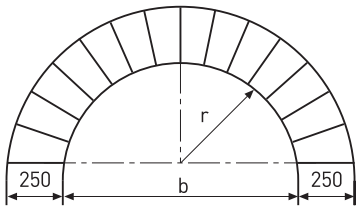


Kemer Yük. (Rise) : f = 0,1b
Yarı çap (Radius) : r = 1,3 b

Kemer Açıklığı b (mm) Channel Width	İç Yarı Çap r (mm) Roof Radius	Tuğla Sayısı - Number of the Side Arches in the Arch					
		Toplam Total	2H6	2H10	2H16	2H24	2H50
100	130	3				1	2
200	260	4				4	
300	390	6			4	2	
400	520	7		2	5		
500	650	9		7	2		
600	780	10		10			
700	910	12	4	8			
800	1040	14	9	5			
900	1170	15	12	3			
1000	1300	17	17				

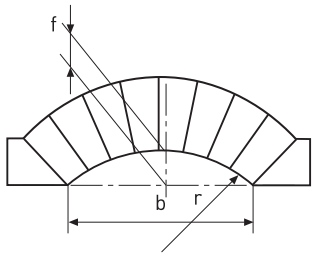
Not : Tuğla sayısı 2 mm'lik harç payına göre verilmiştir
Note : Joint approx,2 mm.

YUVARLAK KEMER ÖRÜMÜ
ROUND ROOFS OF SIDE ARCHES



Kemer Açıklığı b (mm) Channel Width	İç Yarı Çap r (mm) Roof Radius	Tuğla Sayısı - Number of End Arches in the Arch					
		Toplam Total	2G-4	2G-10	2G-16	2G-24	2G-50
800	400	25				18	7
1000	500	30				27	3
1200	600	35			6	29	
1400	700	40			20	20	
1600	800	44			34	10	
1800	900	49			49		
2000	1000	54		12	42		
2500	1250	66		44	22		
3000	1500	78		78			
3500	1750	89	18	71			
4000	2000	101	38	63			
4500	2250	113	58	55			

YATIK KEMER ÖRÜMÜ
FLAT ROOFS OF SIDE ARCHES



Kemer Yük. (Rise) : f = 0,1b
Yarı çap (Radius) : r = 1,3 b

Kemer Açıklığı b (mm) Channel Width	İç Yarı Çap r (mm) Roof Radius	Tuğla Sayısı - Number of End Arches in the Arch					
		Toplam Total	2G-4	2G-10	2G-16	2G-24	2G-50
300	390	6				4	2
400	520	8				8	
500	650	9			3	6	
600	780	11			7	4	
800	1040	14		4	10		
1000	1300	17		13	4		
1200	1560	20		20			
1400	1820	23	5	18			
1600	2080	27	11	16			
1800	2340	30	16	14			
2000	2600	33	22	11			
2500	3250	41	35	6			
3000	3900	49	49				

Not : Tuğla sayısı 2 mm'lik harç payına göre verilmiştir
Note : Joint approx,2 mm.

TS EN ISO 9001:2000

ELEK STANDARTLARI
SIEVE STANDARDS

Amerikan Standardı U.S. Standards			Tyler Standardı Tyler Standards			İngiliz Standardı British Standards			Alman Standardı German Standards		
Elek No Screen No	Göz Boyutu Mesh Size		Elek No Screen No	Göz Boyutu Mesh Size		Elek No Screen No	Göz Boyutu Mesh Size		Elek No Screen No	Göz Boyutu Mesh Size	
	mm	inch		mm	inch		mm	inch		mm	inch
			26,67	1,050							
			18,85	0,742			12,70	1/2			
			13,33	0,525			9,53	0,375			
			9,423	0,371							
$2^1/_2$	8,00	0,315	$2^1/_2$	7,925	0,312						
3	6,73	0,265	3	6,680	0,263		6,35	1/4		6	0,23
$3^1/_2$	5,66	0,223	$3^1/_2$	5,613	0,221						
4	4,76	0,187	4	4,699	0,185		4,76	3/16		5	0,19
5	4,00	0,157	5	3,962	0,156						
6	3,36	0,132	6	3,327	0,131	5	3,353	0,1320		4	0,15
7	2,83	0,111	7	4,794	0,110	6	2,812	0,1107		3	0,12
8	2,38	0,0937	8	2,362	0,093	7	2,411	0,0949		0,5	0,09
10	2,00	0,0787	9	1,981	0,078	8	2,057	0,0810		2	0,07
12	1,68	0,0661	10	1,651	0,065	10	1,677	0,0660	4	1,5	0,06
14	1,41	0,0555	12	1,397	0,055	12	1,405	0,0553			
16	1,19	0,0469	14	1,168	0,046	14	1,204	0,0474	5	1,2	0,047
18	1,00	0,9394	16	0,991	0,039	16	1,003	0,0395	6	1	0,04
20	0,84	0,0331	20	0,883	0,0328	18	0,853	0,0336			
25	0,71	0,0280	24	0,701	0,0276	22	0,699	0,0275	8	0,75	0,03
30	0,59	0,0232	28	0,589	0,0232	25	0,599	0,0236	10	0,6	0,02
35	0,50	0,0197	32	0,495	0,0195	30	0,500	0,0197	12	0,50	0,019
40	0,42	0,0165	35	0,417	0,0164	36	0,422	0,0166	14	0,43	0,017
45	0,35	0,0138	42	0,351	0,0138	44	0,353	0,0139	16	0,4	0,015
50	0,297	0,0117	48	0,295	0,0116	52	0,295	0,0116	20	0,30	0,012
60	0,250	0,0098	60	0,246	0,0097	60	0,251	0,0099	24	0,25	0,0098
70	0,210	0,0083	65	0,208	0,0082	72	0,211	0,0083	30	0,2	0,0078
80	0,177	0,0070	80	0,175	0,0069	85	0,178	0,0070			
100	0,149	0,0059	100	0,147	0,0058	100	0,152	0,0060	40	0,15	0,006
120	0,125	0,0049	115	0,124	0,0049	120	0,124	0,0049	50	0,12	0,0047
140	0,105	0,0041	150	0,104	0,0041	150	0,104	0,0041	60	0,1	0,0040
170	0,088	0,0035	170	0,088	0,0035	170	0,089	0,0035	70	0,09	0,0035
200	0,074	0,0029	200	0,074	0,0029	200	0,076	0,0030	80	0,075	0,003
230	0,149	0,0024	250	0,061	0,0024	240	0,066	0,0020	100	0,06	0,0023
270	0,053	0,0021	270	0,053	0,0021	300	0,053	0,0021			
325	0,044	0,0017	325	0,043	0,0017	400	0,038	0,0015			
400	0,038	0,0015	400	0,038	0,0015						

SEGER KONİLERİ TABLOSU
SEGER CONES TABLE

Koni No. Cone No.	Amerikan Standardı PCE U.S. Standards PCE		Alman Standardı SK German Standards SK	
	°C	°F	°C	°F
022	605	1121	605	1121
021	615	1139	650	1202
020	650	1202	675	1247
019	660	1220	695	1233
018	720	1328	715	1319
017	770	1418	735	1355
016	795	1463	760	1400
015 (a)	805	1481	785	1445
014 (a)	830	1526	815	1499
013 (a)	860	1580	845	1553
012	875	1607	890	1634
011	895	1643	900	1652
010	905	1661	925	1697
09	930	1706	940	1724
08	950	1742	965	1769
07	990	1814	975	1787
06	1015	1859	995	1323
05	1040	1904	1010	1850
04	1060	1940	1055	1931
03	1115	2039	1070	1958
02	1125	2057	1100	2012
01	1145	2093	1125	2057
1	1160	2120	1145	2093
2	1165	2129	1165	2129
3	1170	2138	1185	2165
4	1190	2174	1220	2228
5	1205	2201	1230	2246
6	1230	2246	1260	2300
7	1250	2282	1270	2318
8	1260	2300	1295	2363
9	1285	2345	1315	2399
10	1305	2381	1330	2426

Koni No. Cone No.	Amerikan Standardı PCE U.S. Standards PCE		Alman Standardı SK German Standards SK	
	°C	°F	°C	°F
11	1325	2417	1350	2462
12	1335	2435	1375	2507
13	1350	2462	1395	2543
14	1400	2552	1410	2570
15	1535	2615	1440	2624
16	1465	2669	1470	2678
17	1475	2687	1490	2714
18	1490	2714	1520	2786
19	1520	2768	1530	2786
20	1530	2786	1540	2804
23	1580	2876	1560	2840
26	1595	2903	1585	2885
27	1605	2921	1605	2921
27.$^1/_2$	-	-	1620	2948
28	1615	2939	1635	2975
29	1640	2984	1655	3011
30	1650	3002	1680	3056
31	1680	3056	1695	3083
32	1700	3092	1710	3110
32.$^1/_2$	1725	3137	1720	3128
33	1745	3173	1730	3146
33.$^1/_2$	-	-	1740	3164
34	1760	3200	1755	3191
35	1785	3245	1780	3236
36	1810	3290	1805	3281
37	1820	3308	1830	3326
38	1835	3335	1855	3371
39	1865	3389	1875	3407
40	1885	3425	1900	3452
41	1970	3578	1940	3524
42	2015	3659	1980	3596

TS EN ISO 9001:2000

Uzunluk — Length

cm	m	in	ft
1	10^{-2}	$3{,}94 \times 10^{-1}$	$3{,}28 \times 10^{-2}$
10^{2}	1	$3{,}94 \times 10$	3,28
2,54	$2{,}54 \times 10^{-2}$	1	$8{,}33 \times 10^{-2}$
$3{,}048 \times 10$	$3{,}048 \times 10^{-1}$	$1{,}2 \times 10$	1

Alan — Area

cm^2	m^2	in^2	ft^2
1	10^{-4}	$1{,}55 \times 10$	$1{,}1 \times 10^{-3}$
10^{4}	1	$1{,}55 \times 10^{5}$	$1{,}08 \times 10$
6,45	$6{,}452 \times 10^{-5}$	1	$6{,}94 \times 10^{-3}$
$9{,}29 \times 10^{2}$	$9{,}29 \times 10^{-2}$	144	1

Hacim — Volume

cm^3	m^3	in^3	ft^3
1	10^{-6}	$6{,}103 \times 10^{-2}$	$3{,}53 \times 10^{-5}$
1×10^{6}	1	$6{,}103 \times 10^{4}$	$3{,}53 \times 10$
$1{,}638 \times 10$	$1{,}64 \times 10^{-5}$	1	$5{,}78 \times 10^{-4}$
$2{,}83 \times 10^{4}$	$2{,}83 \times 10^{-2}$	1728	1

Ağırlık — Weight

g	kg	t	N	lb
1	1×10^{-3}	1×10^{-6}	$9{,}81 \times 10^{-3}$	$2{,}20 \times 10^{-3}$
1×10^{3}	1	1×10^{-3}	9,806	2,205
1×10^{6}	1×10^{3}	1	$9{,}81 \times 10^{3}$	$2{,}20 \times 10^{3}$
$1{,}02 \times 10^{2}$	$1{,}02 \times 10^{-1}$	$1{,}02 \times 10^{-4}$	1	$2{,}25 \times 10^{-1}$
$4{,}54 \times 10^{2}$	$4{,}54 \times 10^{-1}$	$4{,}54 \times 10^{-4}$	4,448	1

Basınç — Pressure

kg/cm^2	bar	N/m^2 (Pa)	lb/in^2 (ps)	lb/ft^2
1	$9{,}81 \times 10^{-1}$	$9{,}81 \times 10^{4}$	$1{,}42 \times 10$	$2{,}05 \times 10^{3}$
1,019	1	1×10^{5}	$1{,}45 \times 10$	$2{,}09 \times 10^{3}$
$1{,}019 \times 10^{-5}$	1×10^{-5}	1	$1{,}450 \times 10^{-4}$	$2{,}088 \times 10^{-2}$
$7{,}03 \times 10^{-2}$	$6{,}89 \times 10^{-2}$	$6{,}89 \times 10^{3}$	1	$1{,}44 \times 10^{2}$
$4{,}88 \times 10^{-4}$	$4{,}79 \times 10^{-4}$	$4{,}79 \times 10$	$6{,}94 \times 10^{-3}$	1

Yoğunluk — Bulk Density

kg/cm^3	g/cm^3	lb/in^3	lb/ft^3
1	1×10^{-3}	$3{,}61 \times 10^{-5}$	$6{,}24 \times 10^{-2}$
1×10^{3}	1	$3{,}61 \times 10^{-2}$	$6{,}24 \times 10$
$2{,}76 \times 10^{4}$	$2{,}77 \times 10$	1	$1{,}73 \times 10^{3}$
$1{,}60 \times 10$	$1{,}60 \times 10^{-2}$	$5{,}79 \times 10^{-4}$	1

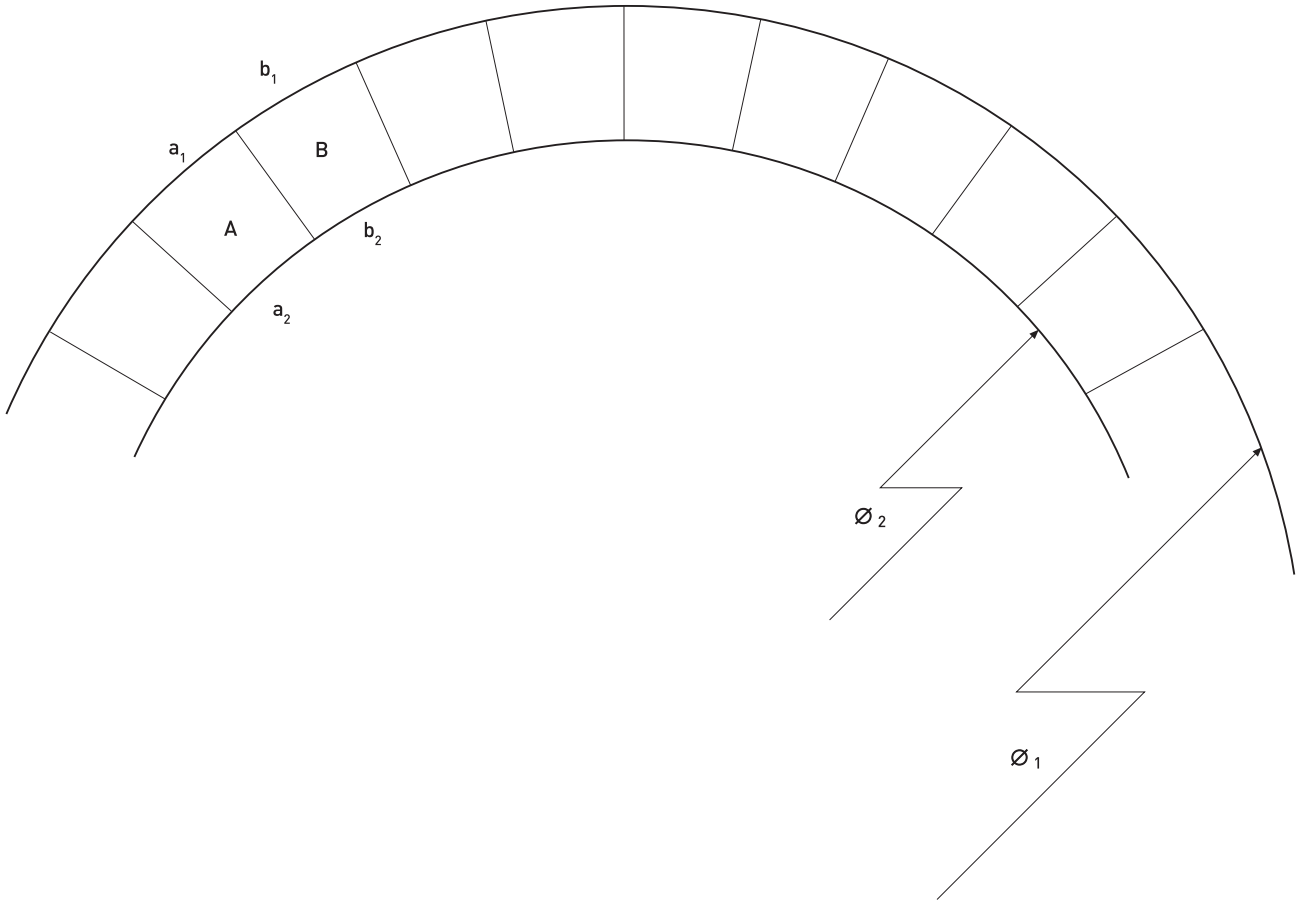
Isıl İletkenlik — Thermal Conductivity

W/mK	kcal/m h °C	Btu/in h °F	Btu/ft h °F
1	$8{,}59 \times 10^{-1}$	$4{,}81 \times 10^{-2}$	$5{,}78 \times 10^{-1}$
1,163	1	$5{,}60 \times 10^{-2}$	$6{,}72 \times 10^{-1}$
$2{,}08 \times 10$	$1{,}79 \times 10$	1	12
$6{,}81 \times 10$	$6{,}85 \times 10$	$8{,}33 \times 10^{-2}$	1

Isıl Aktarım Katsayısı — Coefficient of Thermal Conductivity

W/m^2K	$kcal/m^2$ h °C	Btu/in^2 h °F	Btu/ft^2 h °F
1	$8{,}59 \times 10^{-1}$	$1{,}22 \times 10^{-3}$	$1{,}76 \times 10^{-1}$
1,163	1	$1{,}43 \times 10^{-3}$	$2{,}05 \times 10^{-1}$
$8{,}177 \times 10^{2}$	$7{,}03 \times 10^{2}$	1	144
5,678	4,882	$6{,}94 \times 10^{-3}$	1

KONİK TUĞLALARA AİT RİNG HESAPLAMALARI



Bir ringdeki tuğla sayısı hesabı

$$a_1 . x + b_1 . y = \pi \varnothing_1$$

$$x = \frac{\pi \left| (b_2 . \varnothing_1 - b_1 . \varnothing_2) \right|}{\left| (a_1 . b_2 - a_2 . b_1) \right|}$$

$$a_2 . x + b_2 . y = \pi \varnothing_2$$

$$y = \frac{\pi \left| (a_2 . \varnothing_1 - a_1 . \varnothing_2) \right|}{\left| (a_2 . b_1 - a_1 . b_2) \right|}$$

x= A tuğlasının bir ringdeki adedi

y= B tuğlasının bir ringdeki adedi

$\varnothing_1$: Örülecek dairenin dış çapı

$\varnothing_2$: Örülecek dairenin iç çapı

A : A tuğlası

B : B tuğlası

a_1 : A tuğlasının dış çaptaki konik uzun kenarları

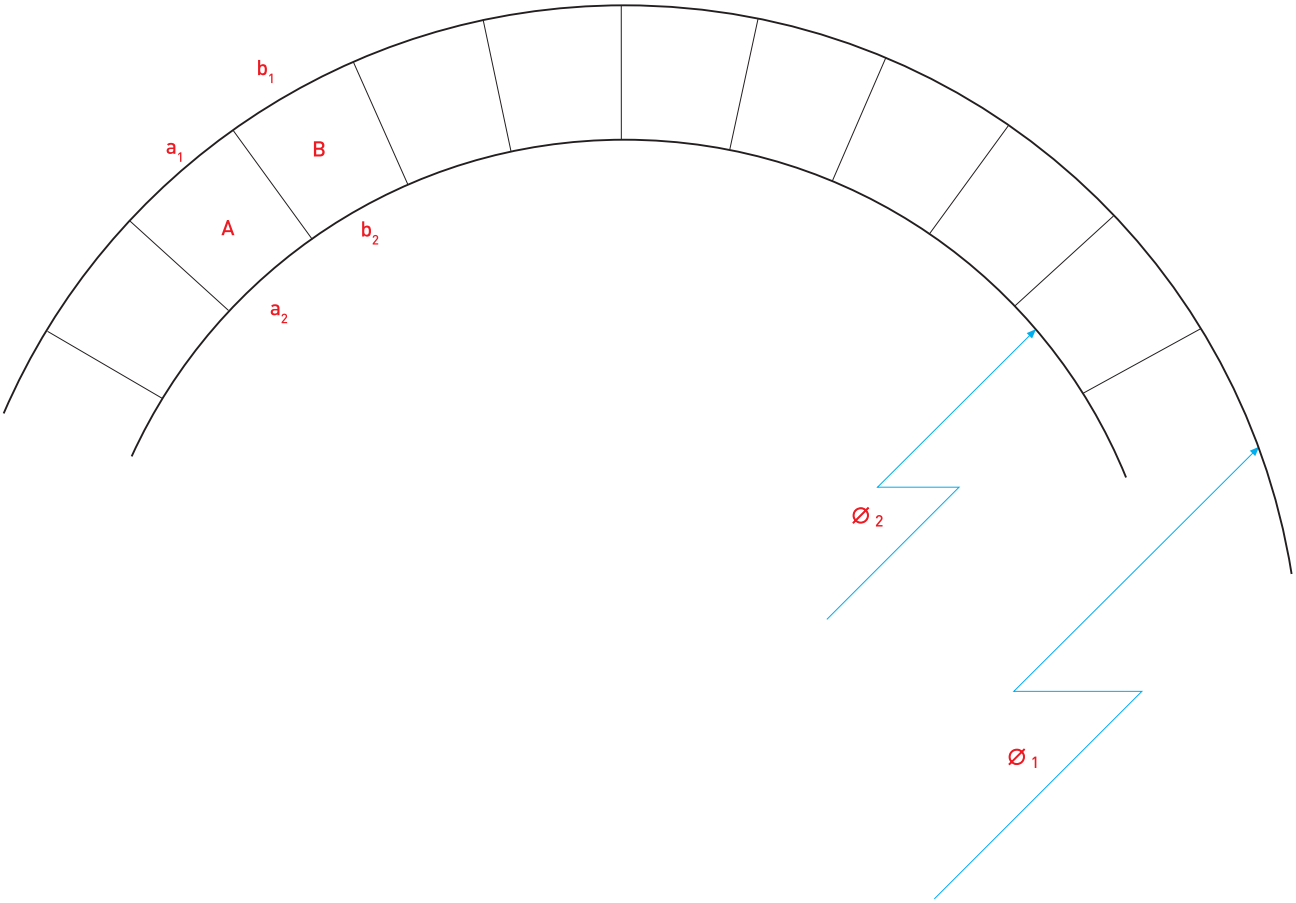
a_2 : A tuğlasının iç çaptaki konik kısa kenarları

b_1 : B tuğlasının dış çaptaki konik uzun kenarları

b_2 : B tuğlasının iç çaptaki konik kısa kenarları

TS EN ISO 9001:2000

RING CALCULATING FOR CONIC BRICKS



Calculation of brick number in one ring

$$a_1 . x + b_1 . y = \pi \varnothing_1$$

$$x = \frac{\pi \left| (b_2 . \varnothing_1 - b_1 . \varnothing_2) \right|}{\left| (a_1 . b_2 - a_2 . b_1) \right|}$$

$$a_2 . x + b_2 . y = \pi \varnothing_2$$

$$y = \frac{\pi \left| (a_2 . \varnothing_1 - a_1 . \varnothing_2) \right|}{\left| (a_2 . b_1 - a_1 . b_2) \right|}$$

x= Number of A brick in one ring

y= Number of B brick in one ring

$\varnothing_1$: Outer diameter of the ring

$\varnothing_2$: Inner diameter of the ring

A : A bricks

B : B bricks

a_1 : Conic long edge of A brick of outer diameter

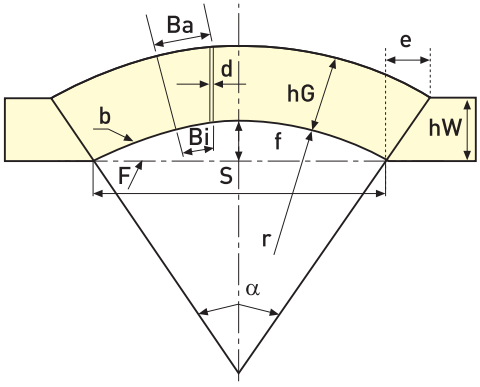
a_2 : Conic short edge of A brick of inner diameter

b_1 : Conic long edge of B brick of outer diameter

b_2 : Conic short edge of B brick of inner diameter

KEMER KONSTRÜKSİYON HESABI

CALCULATION OF ARCH CONSTRUCTION



$$e = \frac{hG.s}{2r}$$

$$hW = \frac{hG(r-f)}{r}$$

$$r = \frac{s^2}{8f} + \frac{f}{2}$$

$$r = \frac{Bi.hG}{(Ba-Bi)}$$

$$s = \sqrt{8rf-4f^2}$$

$$s = 2.r \sin \frac{28,648.b}{r}$$

$$b = \frac{\left(8\sqrt{\frac{s^2}{4} + f^2}\right) - s}{3}$$

$$b = \sqrt{s^2 + 5,333\ f^2}$$

$$b = \frac{r \pi \alpha}{180}$$

$$\sin \frac{\alpha}{2} = \frac{s}{2r}$$

$$\frac{\alpha}{2} = \frac{57,296.b}{2r}$$

$$f = \sqrt{r^2 - \left(\frac{s}{2}\right)^2}$$

$$f = \frac{1}{4}\sqrt{3(b^2 - s^2)}$$

$$f = r\sqrt{1 - \cos\frac{\alpha}{2}}$$

$$f = \frac{s}{2}\ tg\frac{\alpha}{4}$$

$$f = 2.r \sin^2 \frac{\alpha}{4}$$

$$F \cong \frac{f}{6s}(3f^2 + 4s^2)$$

$$F = 0,5\ br - 0,5\ s\ (r-f)$$

$$F = \frac{r(b-s) + s.f}{2}$$

$$F = \frac{1}{2} r^2 \cdot \left(\pi \frac{\alpha}{180} - \sin \alpha\right)$$

$$Bi = (Ba + d) . \frac{r}{(r + hG)} - d$$

$$Ba = (Bi + d) . \frac{(r + hG)}{r} - d$$

TS EN ISO 9001:2000

TS EN ISO 9001:2000

SELKO

KÜM 0312 434 34 55

K - Q
TSE-ISO-EN
9000

TS EN ISO 9001:2000

SELKO

SELKO ATEŞ TUĞLA SANAYİ ve TİCARET A. Ş.

Organize Sanayi Bölgesi 7. Cadde Kurtköy, BARTIN / TÜRKİYE
Tel: (+90 378) 266 10 60 (3 hat) • Faks: (+90 378) 266 10 66
www.selko.com.tr • info@selko.com.tr