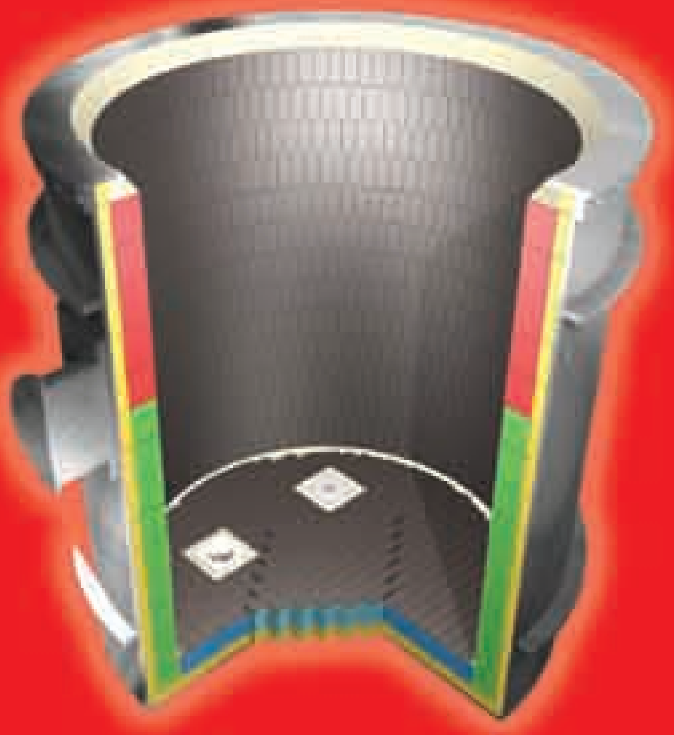
KÜMAŞ MANYEZİT SANAYİ A.Ş.

STEEL INDUSTRY

LADLE

- MgO-C Bricks
- Dolomite Bricks
- AMC Bricks

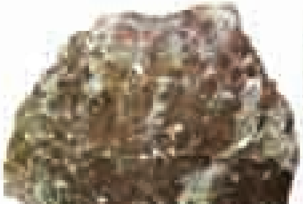


KÜMAŞ is located in Midwestern Turkey near the city of Kütahya, the location is famous as being one of the most valuable sources of magnesite ore in the world. Kümaş is a fully integrated refractory supplier mainly for steel, cement, nonferrous, lime, glass, copper and refractory industries.

KÜMAŞ represents the largest sinter magnesite and dolomite production today in Turkey, with a total production capacity of 300.000 tons/year. Kümaş has 127 million tons cryptocrystalline magnesite ore and 112 million tons dolomite ore reserve. Dead burnt magnesite and dolomite production process incorporates 3 rotary kilns and 1 shaft kiln at a temperature between 1750 and 2100°C.

Kümaş has 8 presses with capacities between 1250 and 2500 tons, 2 tunnel kilns with the firing temperature up to 1750 °C and 2 temper kilns to supply demands for refractory bricks.

Total brick production capacity is 120.000 tons / year and monolithic materials (mortar) capacity is produced 60.000 tons / year



Kümaş has been producing Caustic Calcined Magnesia with the capacity of 100.000 tons / year in Tavşanlı Plant.

Kümaş is proud to be producer of high quality magnesia Carbon and Dolomite bricks as a reliable partner for worlswide steel industry.

Kümaş is the first fused magnesia producer in Europe. Kümaş uses his large crystal size and high purity fused magnesia in his products. Kümaş produces 37.500 tons / year high quality fused magnesia.

KÜMAŞ

STEEL CASTING LADLE (MgO-C)

KÜMAŞ

STEEL CASTING LADLE

MAGNESIA CARBON BRICKS

PRODUCT	CHEMICAL ANALYSIS (weight %)						Bulk Density (gr/cm³)	Apparent Porosity (%)	C.C.S. (N/mm²)
	MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Residual Carbon			
KÜMACAR 15 GR E10	97,5	0,1	0,5	1,3	0,6	15	2,92-2,98	5	35
KÜMACAR 12GR E7	97,2	0,1	0,5	1,5	0,7	12	2,95-3,01	5	40
KÜMACAR 12 GR E5	97,0	0,1	0,5	1,6	0,8	12	2,95-3,01	5	40
KÜMACAR 8 GR E5	97,0	0,1	0,5	1,6	0,8	8	2,98-3,04	5	45
KÜMACAR 5 GR E5	97,0	0,1	0,5	1,6	0,8	5	3,00-3,06	5	50
KÜMACAR 8 GR E3	96,8	0,1	0,6	1,6	0,9	8	2,98-3,04	5	45
KÜMACAR 10 GR 2	96,5	0,1	0,6	1,8	1,0	10	2,95-3,01	5	42
KÜMACAR 8 GR 2	96,5	0,1	0,6	1,8	1,0	8	2,98-3,04	5	45
KÜMACAR 5 GR 2	96,5	0,1	0,6	1,8	1,0	5	3,00-3,06	5	50

SAFETY LINING

PRODUCT	CHEMICAL ANALYSIS (weight %)						Bulk Density (gr/cm³)	Apparent Porosity (%)	C.C.S. (N/mm²)
	MgO	Al_2O_3	Fe_2O_3	CaO	TiO_2	Na_2O+K_2O			
KÜMAL B70	0,3	72,0	1,7	0,3	2,8	0,4	2,65	20	75
KÜMAL B80	0,3	82,0	1,7	0,3	3,3	0,4	2,72	21	85
P452 Y	55-62	7-10	6-8	2,5	SiO_2=3,0	Cr_2O_3=18-22	3,00-3,10	15-22	30

MIXES

PRODUCT	CHEMICAL ANALYSIS (weight %)						Bulk Density (gr/cm³)	Grain Size (mm)
	MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Cr_2O_3		
MAGNESIA RAMMING MIXES								
YD 026	95,0	0,5	0,5	2,5	1,5		2,60	0-5
KÜMRAM 03	90,5	0,3	0,6	2,3	4,3	2,0	2,70	0-3
ND 016	92,0	0,5	1,0	2,5	4,5		2,60	0-5
MAGNESIA FILLING MIXES								
KÜMFILL 04	90,0	1,0	1,5	3,0	4,0		2,30	0-4

Chemical analyses are magnesia clinker based.

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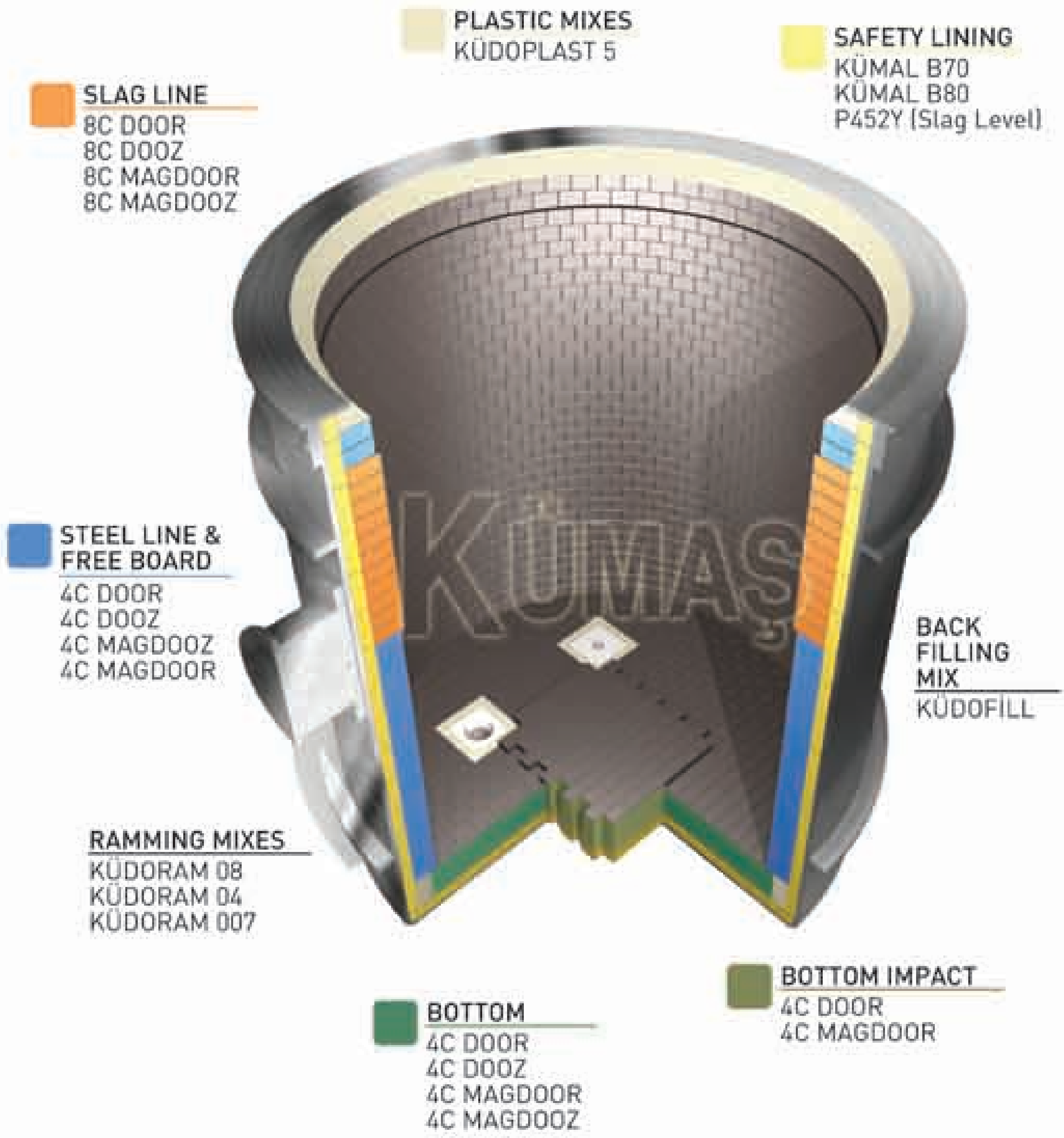
STEEL CASTING LADLE (Dolomite)



KÜMAŞ

STEEL CASTING LADLE

DOLOMITE BRICKS

PRODUCT	CHEMICAL ANALYSIS (weight %)						Bulk Density (gr/cm³)	Apparent Porosity (%)	C.C.S. (N/mm²)
	MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Residual Carbon			
DOOR*	40-44	0,2	1,0	54-58	1,0	2,5	2,93	6	75
DOOZ**	40-44	0,2	1,0	54-58	1,0	2,5	2,95	6	45
ECODOOZ***	40-44	0,2	1,0	54-58	1,0	2,5	2,95	6	40
MAGDOOR*	48-52	0,2	1,0	46-50	1,0	2,5	2,90	7	110
MAGDOOZ**	48-52	0,2	1,0	46-50	1,0	2,5	2,95	5	45
8C DOOR*	40-44	0,2	1,0	54-58	1,0	8	2,86	7	35
8C DOOZ**	40-44	0,2	1,0	54-58	1,0	8	2,90	7	35
8C MAGDOOR*	48-52	0,2	1,0	46-50	1,0	8	2,86	7	35
8C MAGDOOZ**	48-52	0,2	1,0	46-50	1,0	8	2,92	7	35
8C ECODOOZ***	40-44	0,2	1,0	54-58	1,0	8	2,92	6	35
4C DOOR*	40-44	0,2	1,0	54-58	1,0	4	2,92	6	50
4C DOOZ**	40-44	0,2	1,0	54-58	1,0	4	2,97	6	35
4C MAGDOOR*	48-52	0,2	1,0	46-50	1,0	4	3,00	6	70
4C MAGDOOZ**	48-52	0,2	1,0	46-50	1,0	4	2,96	6	35

SAFETY LINING

PRODUCT	CHEMICAL ANALYSIS (weight %)						Bulk Density (gr/cm³)	Apparent Porosity (%)	C.C.S. (N/mm²)
	MgO	Al_2O_3	Fe_2O_3	CaO	TiO_2	Na_2O+K_2O			
KÜMAL B70	0,3	72,0	1,7	0,3	2,8	0,4	2,65	20	75
KÜMAL B80	0,3	82,0	1,7	0,3	3,3	0,4	2,72	21	85
P452 Y	55-62	7-10	6-8	2,5	SiO_2=3,0	Cr_2O_3=18-22	3,00-3,10	15-22	30

MIXES

PRODUCT	CHEMICAL ANALYSIS (weight %)					Bulk Density (gr/cm³)	Grain Size (mm)
	MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2		
DOLOMITE RAMMING MIXES							
KÜDORAM 08	37-40	0,5	1,5	54-58	3,0	2,90	0-8
KÜDORAM 04	34-38	0,5	5-8	53-57	1,2	3,15	0-4
KÜDORAM 007	38,0	1,0	1,0	58,0	2,0	2,90	0-8
DOLOMITE FILLING MIXES							
KÜDOFILL	36-44	0,5	2,0	52-60	2,0	2,40	0-4
DOLOMITE PLASTIC MIXES							
KÜDOPLAST 5	40,0	1,0	1,0	57,0	1,0	2,65	0-5

Chemical analyses are raw material based.

* R = Resin Bonded | ** Z = Pitch Bonded | *** ECO = Ecological Pitch (BAP content lower than 15 ppm)

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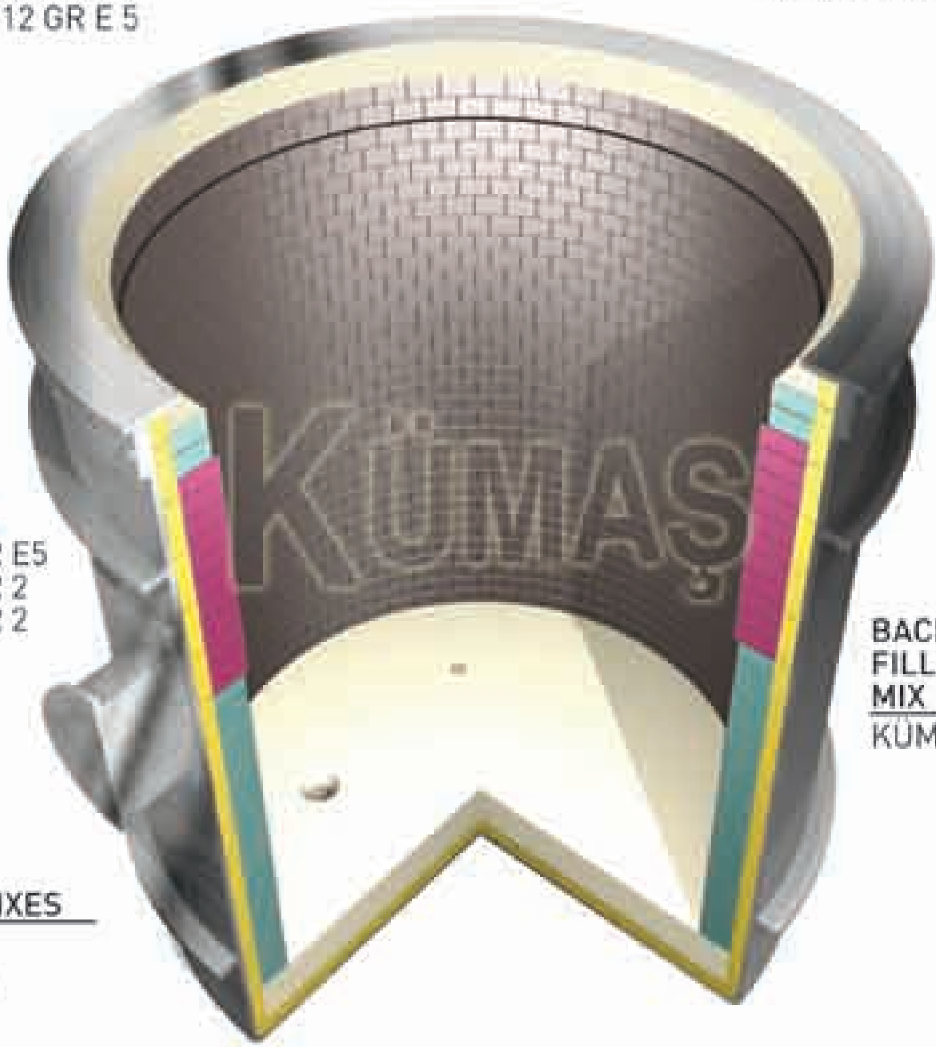
STEEL CASTING LADLE (AMC & MgO-C)



KÜMAŞ

STEEL CASTING LADLE

MAGNESIA CARBON BRICKS

PRODUCT	CHEMICAL ANALYSIS (weight %) MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Residual Carbon	Bulk Density (gr/cm³)	Apparent Porosity (%)	C.C.S. (N/mm²)
KÜMACAR 15 GR E10	97,5	0,1	0,5	1,3	0,6	15	2,92-2,98	5	35
KÜMACAR 15 GR E5	97,0	0,1	0,5	1,6	0,8	15	2,92-2,98	5	35
KÜMACAR 12 GR E7	97,2	0,1	0,5	1,5	0,7	12	2,95-3,01	5	40
KÜMACAR 12 GR E5	97,0	0,1	0,5	1,6	0,8	12	2,95-3,01	5	40
KÜMACAR 8 GR E5	97,0	0,1	0,5	1,6	0,8	8	2,98-3,04	5	45
KÜMACAR 8 GR E3	96,8	0,1	0,6	1,6	0,9	8	2,98-3,04	5	45
KÜMACAR 8 GR 2	96,5	0,1	0,6	1,8	1,0	8	2,98-3,04	5	45
KÜMACAR 5 GR 2	96,5	0,1	0,6	1,8	1,0	5	3,00-3,06	5	50

Al_2O_3 - MgO BRICKS

PRODUCT	CHEMICAL ANALYSIS (weight %) MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Residual Carbon	Bulk Density (gr/cm³)	Apparent Porosity (%)	C.C.S. (N/mm²)
KÜMAL 7 CER	8,0	90,3	1,0	0,2	0,5	7	3,10-3,20	6	60
KÜMAL 7C Mg	80,0	16,6	0,7	1,7	1,0	7	3,00-3,10	6	60
KÜMAL 5 CE	10,0	85,0	1,5	0,5	3,0	5	3,00-3,10	9	50

BOTTOM CASTABLE

PRODUCT	CHEMICAL ANALYSIS (weight %) MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Bulk Density (gr/cm³)		C.C.S. (N/mm²)	
KÜMCAST 92 ML	6,5	92,0	0,2	1,0	0,3	at 110 °C	2,95	at 110 °C	40
						at 1000 °C	2,90	at 1000 °C	50
						at 1500 °C	2,80	at 1500 °C	60

SAFETY LINING

PRODUCT	CHEMICAL ANALYSIS (weight %) MgO	Al_2O_3	Fe_2O_3	CaO	TiO_2	Na_2O+K_2O	Bulk Density (gr/cm³)	Apparent Porosity (%)	C.C.S. (N/mm²)
KÜMAL B70	0,3	72,0	1,7	0,3	2,8	0,4	2,65	20	75
KÜMAL B80	0,3	82,0	1,7	0,3	3,3	0,4	2,72	21	85
P452 Y	55-62	7-10	6-8	2,5	SiO_2=3,0	Cr_2O_3=18-22	3,00-3,10	15-22	30

MIXES

PRODUCT	CHEMICAL ANALYSIS (weight %) MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Cr_2O_3	Bulk Density (gr/cm³)	Grain Size (mm)
MAGNESIA RAMMING MIXES								
YD 026	95,0	0,5	0,5	2,5	1,5		2,60	0-5
KÜMRAM 03	90,5	0,3	0,6	2,3	4,3	2,0	2,70	0-3
ND 016	92,0	0,5	1,0	2,5	4,5		2,60	0-5
MAGNESIA FILLING MIXES								
KÜMFILL 04	90,0	1,0	1,5	3,0	4,0		2,30	0-4

Chemical analyses are magnesia clinker based.

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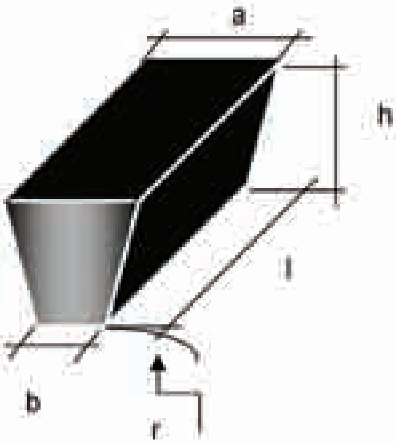
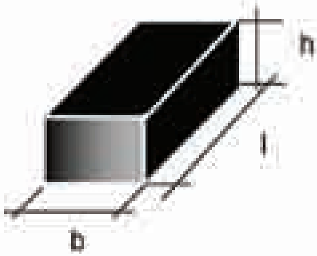
STEEL CASTING LADLE

LADLE BRICKS



ITEM	DIMENSION a	DIMENSION b	DIMENSION h	DIMENSION l	Volume (dm³)	Radius 2r(mm)
1P 18	134	116	90	250	2,81	590
1P 8	129	121				1384
2P 36	143	107	124	250	3,88	375
2P 24	137	113				594
2P 10	130	120				1513
3P 8	104	96	155	250	3,88	531
3P 20	110	90				713
3P 10	105	95				1504
4P 22	111	89	187	250	4,68	774
4P 12	106	94				1496
4P 8	104	96				2291
5P 22	111	89	220	250	5,5	910
5P 16	108	92				1293
5P 10	105	95				2134
5P 8	104	96				2695
6P 26	113	87	250	250	6,25	856
6P 18	109	91				1292
6P 10	105	95				2425
7P 18	109	91	280	250	7	1447
7P 12	106	94				2240



ITEM	l	b	h	dm³
1P 0	250	90	125	2,81
2P 0	250	124	125	3,88
3P 0	250	155	100	3,88
4P 0	250	187	100	4,68
5P 0	250	220	100	5,5
6P 0	250	250	100	6.25

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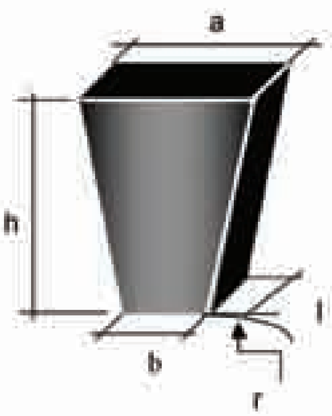
STEEL CASTING LADLE

LADLE BRICKS	ITEM	DIMENSION a	DIMENSION b	DIMENSION h	DIMENSION l	Volume (dm³)	Radius 2r(mm)
	5/6	153	147	127	100	1,91	6223
	5/12	156	144				3048
	5/20	160	140				1778
	6/6	153	147	152,4	100	2,25	7350
	6/8	154	146				5475
	6/20	160	140				2100
	6/30	165	135				1350
	7/8	154	146	177,8	100	2,67	6490
	7/16	158	142				3156
	7/20	160	140				2489
	7/30	165	135				1600
	8/6	154	146	203,2	100	3,00	9800
	8/8	154	146				7300
	8/16	158	142				2800
	8/20	160	140				7300
	9/8	154	146	228,6	100	3,43	8344
	9/16	158	142				4058
	9/20	160	140				3200
	9/30	165	135				2057

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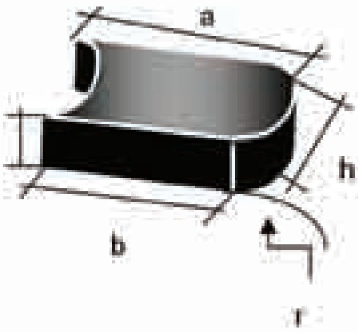
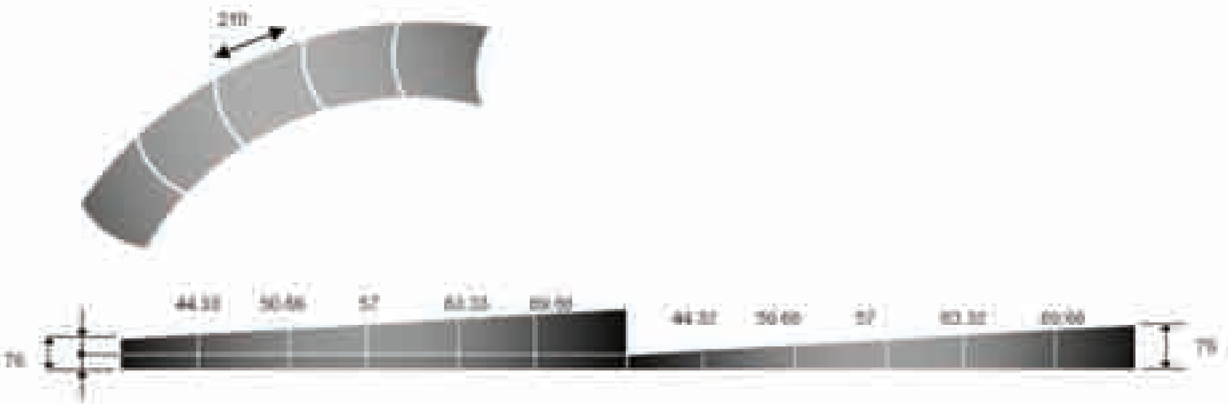
STEEL CASTING LADLE

LADLE BRICKS	ITEM	DIMENSION				Volume (dm³)
		a	b	h	l	
	SU 545-4	210	192,3	127	100	2,55
	SU 560-4	210	196,7	127	100	2,58
	SU 645-4	210	188,7	152,4	100	3,04
	SU 660-4	210	194,0	152,4	100	3,08
	SU 745-4	210	185,2	177,8	100	3,51
	SU 760-4	210	191,4	177,8	100	3,57
	SU 845-4	210	181,6	203,2	100	3,98
	SU 860-4	210	188,7	203,2	100	4,05
	SU 945-4	210	178,1	228,6	100	4,44
	SU 430-3	210	188,7	101,6	76	1,54
	SU 530-3	210	183,4	127	76	1,90
	SU 545-3	210	192,3	127	76	1,94
	SU 630-3	210	178,0	152,4	76	2,21
	SU 645-3	210	188,7	152,4	76	2,31
	SU 660-3	210	194,0	152,4	76	2,34
	SU 745-3	210	185,0	177,8	76	2,67
	SU 845-3	210	181,6	203,2	76	3,02
	SU 945-3	210	178,0	228,6	76	3,37

STARTER SET



GUNNING

Gunning material application should be required to have high productivity and high perfromance of refractory.

Advantages:

- Balanced Wear
- Lower Brick Consumption
- Extended Refractory Life
- Increased Productvity
- Lower Rebound Loss by Using Special Binding systems

KUMAS Services:

- Consultancy
- High Quality Mixes
- Specially Designed Mixes and Machinery

GUNNING MIXES

PRODUCT	CHEMICAL ANALYSIS (weight %)						Bulk Density (gr/cm³)	Grain Size (mm)
	MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Cr_2O_3		
ST3 LF	91,0	0,5	1,0	2,5	5,0		2,50	0-3
KÜMGUN 03	91,0	0,5	1,0	3,0	4,5		2,60	0-3
KÜMGUN CR 03	90,5	0,3	0,6	2,3	4,3	2,0	2,60	0-3

Chemical analyses are magnesia clinker based.

KÜMAŞ

STEEL CASTING LADLE

TUNDISH SPRAY COATING

KÜMTUN series coating materials can be designed according to customer requirements for long casting times.

TUNDISH GUNNING MIXES

PRODUCT	MgO	Al_2O_3	Fe_2O_3	CaO	SiO_2	Bulk Density (gr/cm³)	Grain Size (mm)
KÜMTUN M-90	90,0	1,5	1,0	2,5	4,5	1,45-1,60	0-1
KÜMTUN M-88	88,0	1,5	1,5	2,0	7,0	1,40-1,60	0-1
KÜMTUN M-82	82,0	2,0	2,0	2,5	11	1,40-1,60	0-1
KÜMTUN M-78	78,0	2,0	2,5	1,5	16	1,35-1,55	0-1
KÜMTUN M-70	70,0	1-3	2-5	1-3	20-25	1,35-1,55	0-1

Advantages:

- Excellent refractory and insulation character
- Minimized heat loss from tundish
- Lowest thermal conductivity
- Protection of permanent linings
- Lower consumption
- Easy deskulling
- Lowest hydrogen pick up
- Long sequences


16188
KALİTE YÖNETİM SİSTEMİ BELGESİ
QUALITY MANAGEMENT SYSTEM CERTIFICATE
Partner of
IQNet
TÜRK STANDARDLARI ENSTİTÜSÜ
bu belge ile
TURKISH STANDARDS INSTITUTION
hereby certifies that the organization
K - Q
TSE-ISO-EN
9000
Belge kapsamı Ek'te verilmiştir
Scope of the certificate is given in annex
TÜRK STANDARDLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION


ÇEVRE YÖNETİM SİSTEMİ BELGESİ
ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE
Partner of
IQNet
TÜRK STANDARDLARI ENSTİTÜSÜ
bu belge ile
TURKISH STANDARDS INSTITUTION
hereby certifies that the organization
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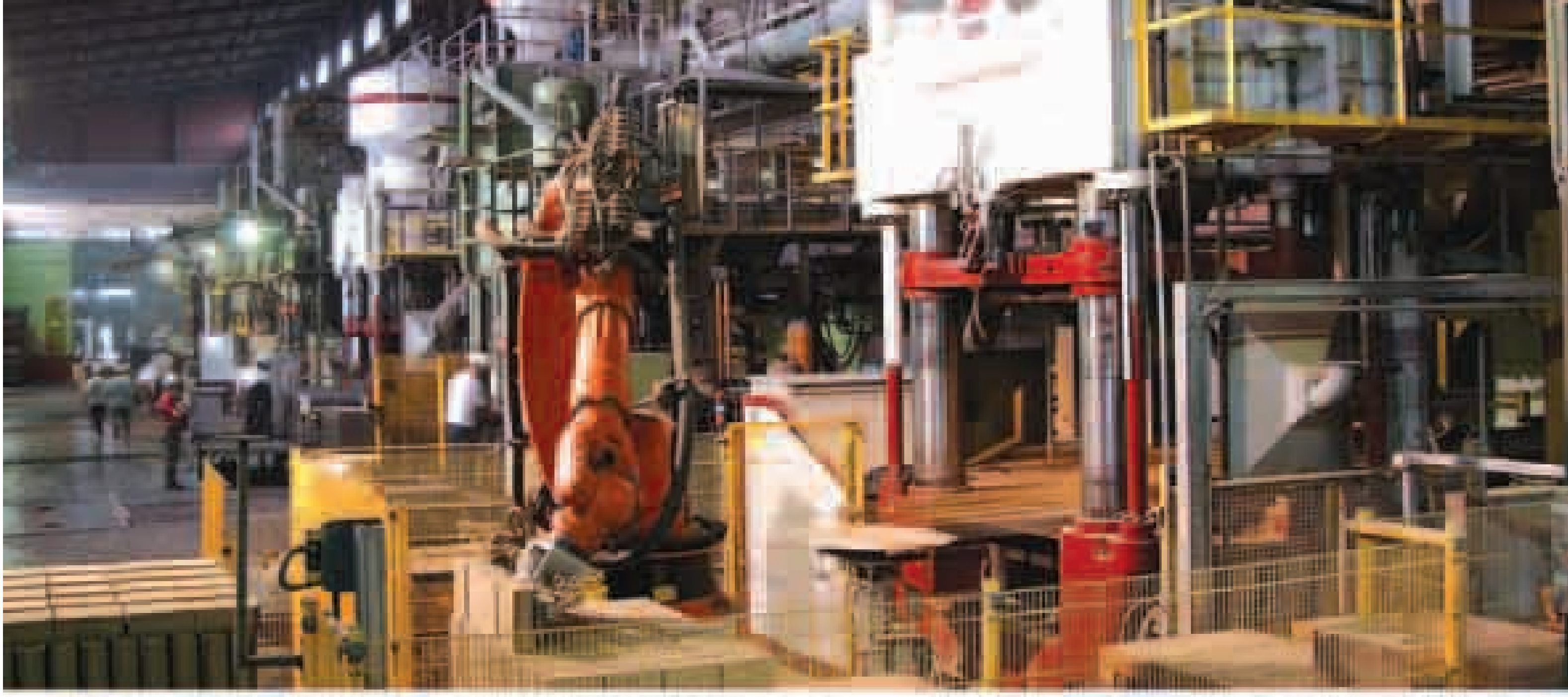
TSE-ISO-EN
14000
TÜRK STANDARDLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION



KÜMAŞ

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