

火黏土磚

Fireclay Bricks

三和的火粘土磚係以精選的矽~鋁原料所製造，具有優異的熱穩定性，可廣泛使用於各種工業用窯爐，且可按客戶品質需求生產、供應特殊之產品。

Sunward's fireclay bricks are made by silica-alumina materials and are widely used in the various type of industrial kilns. The advantages of Sunward's fireclay bricks are:

1. Superior stability of volume over a wide temperature range.
2. We can follow the unique specifications of customers' requirement.



Product Specification

Properties	Brand	F1-1	F1	F2-1	F2	F3-1	F3	F4	F5
Refractoriness (SK)		34	34	33	33	32	32	31	30
Apparent Porosity (%)		≤22	≤26	≤22	≤26	≤22	≤26	≤26	≤26
Bulk Density (g/cm ³)		≥2.3	≥2.2	≥2.2	≥2.1	≥2.1	≥2.0	≥2.0	≥1.95
Cold Crushing Strength(kg/cm ²)		≥400	≥300	≥400	≥300	≥400	≥300	≥300	≥300
Chemical Composition(%)									
Al ₂ O ₃		≥42	≥40	≥37	≥35	≥32	≥30	≥28	≥26
Fe ₂ O ₃		≤3	≤3	≤3	≤3	≤3	≤3	≤3	≤3

高鋁磚

High Alumina Bricks

本公司使用高鋁骨材，以高壓力成型機成型，和適當之高溫燒成，開發製造，具有：

1. 高耐侵蝕力。
2. 高耐剝落性。

之高鋁磚提供盛鋼桶、魚雷車、水泥窯及其它高溫窯使用。

Sunward's high alumina bricks are made by superior grade mullite, bauxite and fused alumina. Each brick is formed by high pressure press and undergoes a sophisticated, controlled temperature firing process. These high-tech high alumina bricks are often used for ladles, torpedo car and cement kilns. The characteristics of Sunward's high alumina bricks are :

1. Excellent spalling resistance
2. Excellent corrosion resistance



Product Specification

Properties	Brand	HA	HS	H1-1	H1	H2-1	H2	H3-1	H3	H4
Refractoriness (SK)		39	38	38	38	37	37	36	35	35
Apparent Porosity (%)		≤20	≤27	≤22	≤27	≤22	≤27	≤25	≤27	≤28
Bulk Density (g/cm ³)		≥2.6	≥2.4	≥2.5	≥2.3	≥2.4	≥2.2	≥2.3	≥2.1	≥2.1
Cold Crushing Strength(kg/cm ²)		≥600	≥249	≥500	≥294	≥500	≥294	≥300	≥245	≥196
Chemical Composition(%)										
Al ₂ O ₃		≥90	≥80	≥70	≥70	≥60	≥60	≥50	≥50	≥45
Fe ₂ O ₃		≤2.0	≤2.0	≤2.5	≤2.5	≤2.5	≤2.0	≤2.5	≤2.5	≤2.0

氧化鋁-碳化矽-碳磚

Alumina-Silicon Carbide-Carbon Bricks

本公司使用高鋁骨材，配合耐磨性佳之碳化矽及耐蝕性最優之石墨，開發製造具：

1. 高強度
2. 高耐蝕性
3. 高耐剝落性

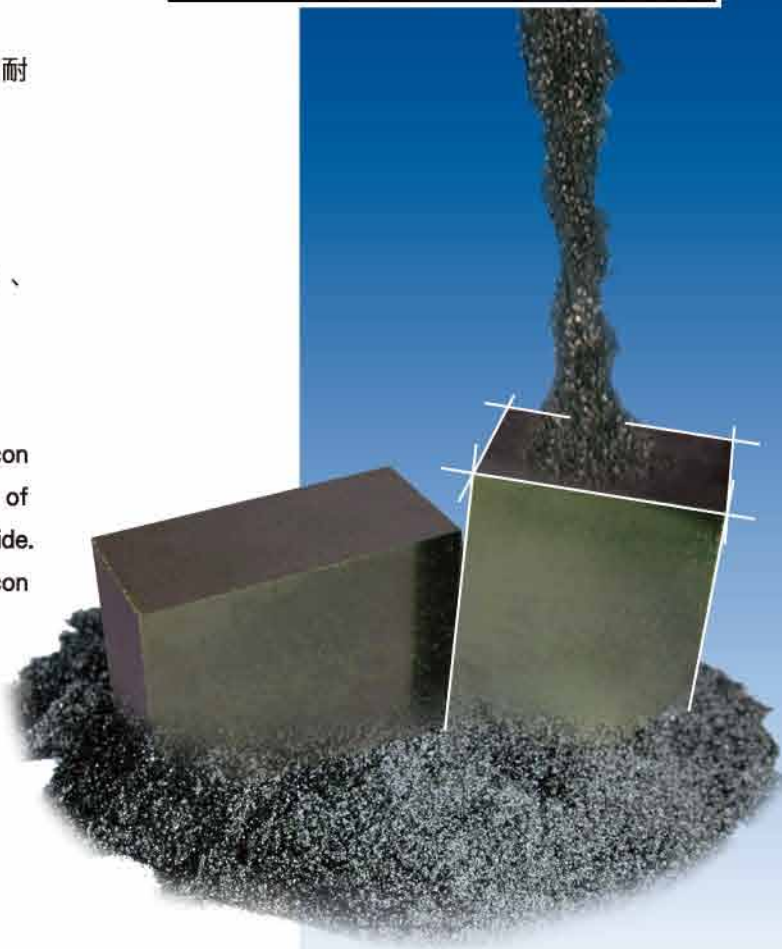
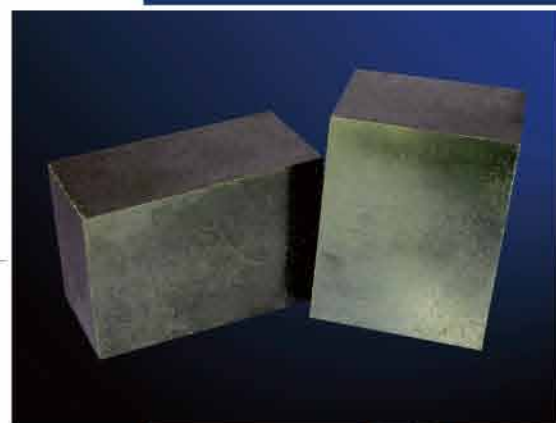
之鋁矽碳磚提供魚雷車(脫矽、脫硫、脫磷製程)、盛銑桶使用。

Sunward offers a series of unburned alumina-silicon carbide-carbon bricks. These bricks are made of high-purity alumina clinker, Graphite, and Silicon Carbide. The advantages of Sunward's alumina-silicon carbide-carbon bricks are:

1. High mechanical strength.
2. High corrosion resistance to slag.
3. High abrasion resistance to molten pig iron.
4. High thermal and structure spalling resistance.

Product Specification

Properties	Brand	SAS-TP1	SAS-TR1	SAS-TS2	SAS-TC1	SRASC-B1	SRASC-W1
Apparent Porosity(%)		≤11.0	≤7.0	≤7.0	≤7.0	≤10.0	≤10.0
Bulk Density(g/cm ³)		≥2.85	≥2.90	≥2.90	≥2.90	≥2.35	≥2.60
Cold Crushing Strength(kg/cm ²)		≥300	≥300	≥300	≥300	≥250	≥300
Chemical Composition(%)							
Al ₂ O ₃		≥60.0	≥63	≥65.0	≥62.5	≥27.5	≥45
SiC+F.C.		≥13.5	≥14.0	≥17.0	≥13.0	≥14.0	≥18.0
Application		Torpedo Car Impact Zone	Torpedo Car Roof Zone	Torpedo Car Slag Zone	Torpedo Car Iron Zone	Iron Ladle Wall	Iron Ladle Wall & Slag Zone



鎂碳磚

Magnesia-Carbon Bricks

本公司針對轉爐、電弧爐、盛鋼桶、精鍊爐等嚴苛操作環境需要，以高純度氧化鎂、鱗狀石墨、金屬配合高壓力脫氧真空成型機開發製造，具有：

1. 高耐侵蝕力（尤其對鹼性渣）。
2. 高耐剝落性。

之各種鎂碳磚供應中鋼及民間鍊鋼廠使用。

For the demand of operating conditions of converter, E.A.F. and L.F, S.W develops and manufactures various types of MgO-C bricks. These bricks are composed of high purity magnesia clinker, graphite and additives then molded by high pressure vacuum de-gassing press. Features:

1. Superior Corrosion resistance to basic-slag.
2. Superior thermal-shock resistance.

Product Specification

Properties	Brand	SMGC-025	SMGC-026	SMGC-027	SMGC-029	SMGC-032
Apparent Porosity (%)		≤4	≤6	≤5	≤5	≤5
Bulk Density (g/cm ³)		≥2.92	≥2.88	≥2.8	≥2.80	≥2.80
Cold Crushing Strength(Kg/cm ²)		≥350	≥330	≥300	≥250	≥300
Chemical Composition (%)						
MgO		≥80.0	≥75.5	≥75.0	≥75.0	≥76.0
F.C.		≥10.0	≥13.0	≥15	≥13	≥17.0
Application		LF	LF	LF	LF	BOF

Properties	Brand	SMGC-033	SMGC-035	SMGC-036	SMGC-037	SMGC-038
Apparent Porosity (%)		≤5	≤5	≤4	≤5	≤6.5
Bulk Density (g/cm ³)		≥2.78	≥2.82	≥2.9	≥2.85	≥2.8
Cold Crushing Strength(Kg/cm ²)		≥300	≥300	≥300	≥300	≥310
Chemical Composition (%)						
MgO		≥76.0	≥76.0	≥81.0	≥73.0	≥75.0
F.C.		≥17.5	≥17	≥12.0	≥17.5	≥15.0
Application		BOF	BOF	BOF	BOF	BOF



鋁鎂碳磚

Alumina-Magnesia Carbon Bricks

本公司採用優質電熔剛玉、電熔鎂砂、高碳石墨為主要原料，以酚醛樹脂為結合劑高壓成形。其特性有：

1. 低氣孔率
 2. 高耐侵蝕性
 3. 高耐剝落性
- 之鋁鎂碳磚提供盛鋼桶使用。

Sunward chooses premium fused corundum, fused Magnesite, and high carbide graphite as the main material, to produce Alumina-Magnesia Carbon bricks for Ladle.

Characters:

1. Low porosity ratio.
2. High corrosion resistance to slag.
3. High abrasion resistance to molten pig iron.



Product Specification

Properties	Brand	SAMG-006	SAMG-007	SAMG-008	SAMG-AM6C	SAMG-AM8C	SLD-AM1
Cold Crushing Strength(kg/cm ²)at1500°Cx3hrs		≥ 400	≥ 400	≥ 450	≥ 600	≥ 500	≥ 500
Bulk Density(g/cm ³)at1500°Cx3hrs		≥ 2.85	≥ 2.85	≥ 3.00	≥ 3.18	≥ 2.85	≥ 3.16
Apparent Porosity(%)at1500°Cx3hrs		≤ 8.0	≤ 8.0	≤ 8.0	≤ 7.5	≤ 6.0	≤ 11.0
Chemical Composition (%)	Al ₂ O ₃	≥ 60	≥ 75	≥ 60	≥ 75	≥ 75	≥ 8.7
	MgO	≥ 15	≥ 15	≥ 25	≥ 6	≥ 6	≥ 6
	F.C.	≥ 6	≥ 7	≥ 8	≥ 5	≥ 7	---
Characteristics	Brick						
Application	Wall, Bottom-Zone						Wall-Zone

鎂磚/鎂鉻磚

Magnesia / Magnesia-Chrome Bricks

本公司精選各種鎂砂、鉻礦並經高溫燒成，製造出適合轉爐及電爐使用之高品質鎂磚及鎂鉻磚。

Sunward's high quality magnesia and magnesia-chrome bricks are made from high grade magnesia clinker and chrome ore. Each brick undergoes a high temperature firing process these high-tech bricks are often used for BOF and EAF. The advantages of Sunward's Magnesia/ magnesia-chrome bricks are:

1. Excellent thermal shock resistance.
2. Little volume change at high temperature.



Product Specification

Properties	Brand	MA-90	MA-95	MC-65	MC-75	UMC-65	UMC-75
Refractoriness (SK)		40	40	40	40	40	40
Apparent Porosity (%)		≤ 20	≤ 20	≤ 20	≤ 20	≤ 21	≤ 21
Bulk Density (g/cm ³)		≥ 2.75	≥ 2.8	≥ 2.90	≥ 2.90	≥ 2.80	≥ 2.80
Cold Crushing Strength(Kg/cm ²)		≥ 400	≥ 400	≥ 300	≥ 350	≥ 250	≥ 250
Chemical Composition(%)	MgO	≥ 90	≥ 94	≥ 65	≥ 75	≥ 65	≥ 75
	Cr ₂ O ₃	---	---	≥ 9	≥ 6	≥ 12	≥ 8
	Characteristics	---	---	---	---	Unburned	Unburned

鋯磚、腊石磚

Zircon Bricks, Pyrophyllite Bricks

本公司生產的鋯磚具有高耐蝕性、耐剝落性等優點，腊石磚具有氣孔率低，抗熔渣侵蝕力佳等特性，適用於盛鋼桶。

Sunward's zircon bricks and Pyrophyllite are made from zircon and pyrophyllite widely used in ladle linings. The advantage of Sunward's zircon and Pyrophyllite bricks are:

1. Good erosion resistance to slag
2. Excellent resistance to spalling



Product Specification

Properties	Brand	ZR-40	ZR-60	ZR-65	RK-28
Refractoriness (SK)		34	35	35	28
Apparent Porosity (%)		≤22	≤22	≤22	≤15.5
Bulk Density (g/cm ³)		≥3.05	≥3.35	≥3.45	≥2.2
Cold Crushing Strength(Kg/cm ²)		≥500	≥500	≥500	≥300
Chemical Composition(%)					
ZrO ₂		≥40	≥58	≥60	----
SiO ₂		----	----	----	≥78
Al ₂ O ₃		----	----	----	≤18

保溫磚 耐火斷熱磚

Insulating Bricks, Insulating Fire Bricks

本公司針對各種窯爐之維護及作業環境需求，提供多樣保溫斷熱產品供客戶使用。

如：保溫／斷熱磚、陶瓷纖維類產品(毯、板、磚)...等，並可依客戶需求訂作。

Sunward offers variety of insulating products to suit the maintenance request of various kiln and furnace. The products such like insulating bricks and ceramic fiber products (blanket, board and brick, etc) can follow the cheed of customers.

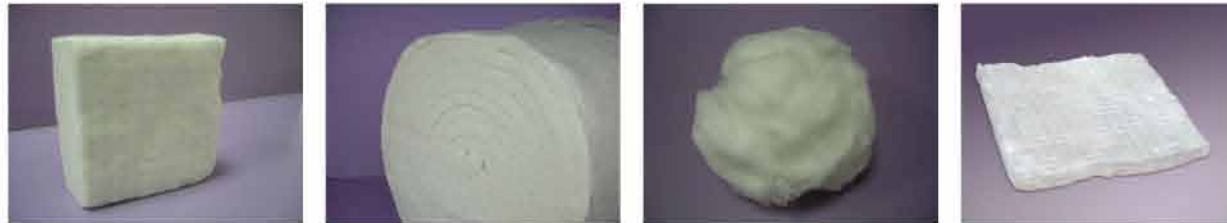


Product Specification

Properties	Brand	Temp. (°C) Reheating Shrinkage Less Than 2%	Bulk Density (g/cm ³)	Cold Crushing Strength(Kg/cm ²)	Thermal Conductivity (Kcal/m.h.°C adv. 350 ±10)
Insulating Brick	A1	900	≤0.50	≥5	≤0.13
	A2	1000	≤0.50	≥5	≤0.14
	A3	1100	≤0.50	≥5	≤0.15
	A4	1200	≤0.55	≥8	≤0.16
	A5	1300	≤0.60	≥8	≤0.17
	A6	1400	≤0.70	≥10	≤0.20
	A7	1500	≤0.75	≥10	≤0.22
Insulating Fire Brick	B1	900	≤0.70	≥25	≤0.17
	B2	1000	≤0.70	≥25	≤0.18
	B3	1100	≤0.75	≥25	≤0.20
	B4	1200	≤0.80	≥25	≤0.22
	B5	1300	≤0.80	≥25	≤0.23
	B6	1400	≤0.90	≥30	≤0.27
	B7	1500	≤1.00	≥30	≤0.31
Insulating Brick	C1	1300	≤1.10	≥50	≤0.30
	C2	1400	≤1.20	≥70	≤0.38
	C3	1500	≤1.25	≥100	≤0.45

陶瓷纖維

本公司針對各種窯爐之維護及作業環境需求，提供多樣保溫斷熱產品供客戶使用。
如：保溫／斷熱磚、陶瓷纖維類產品（毯、板、磚）...等，並可依客戶需求訂作。



Product Specification

Properties	Brand	Ceramic Fiber Board									
Max. Service temp. (°C)		1000°C	1260°C	1400°C	1600°C	1600°C (HA Board)	1700°C	1000°C	1100°C	1400°C	1400°C
Bulk Density (kg/m³)		0.25	0.25	0.25	0.18	0.18	0.30	1.00	1.00	1.00	1.50
Reheating Shrinkage (%) (at °C × 24hrs)		-0.3(800°C)	-0.8(900°C)	-0.8(1000°C)	-0.7(1300°C)	+0.4	-0.6	-1.4	-1.4	-0.6	-3.4
Thermal Conductivity (kcal/mh°C)		400°C	600°C	800°C	1000°C	1200°C	1400°C	1600°C	1700°C	1800°C	1900°C
		0.07	0.11	0.17	0.20	0.18	0.15	0.12	0.10	0.08	0.07
		0.08	0.12	0.16	0.20	0.18	0.15	0.12	0.10	0.08	0.07
		0.10	0.14	0.18	0.22	0.20	0.17	0.14	0.12	0.10	0.08
		0.12	0.16	0.20	0.24	0.22	0.19	0.16	0.14	0.12	0.10
		0.14	0.18	0.22	0.26	0.24	0.21	0.18	0.16	0.14	0.12
		0.16	0.20	0.24	0.28	0.26	0.23	0.20	0.18	0.16	0.14
		0.18	0.22	0.26	0.30	0.28	0.25	0.22	0.20	0.18	0.16
		0.20	0.24	0.28	0.32	0.30	0.27	0.24	0.22	0.20	0.18
		0.22	0.26	0.30	0.34	0.32	0.29	0.26	0.24	0.22	0.20
		0.24	0.28	0.32	0.36	0.34	0.31	0.28	0.26	0.24	0.22
		0.26	0.30	0.34	0.38	0.36	0.33	0.30	0.28	0.26	0.24
		0.28	0.32	0.36	0.40	0.38	0.35	0.32	0.30	0.28	0.26
		0.30	0.34	0.38	0.42	0.40	0.37	0.34	0.32	0.30	0.28
		0.32	0.36	0.40	0.44	0.42	0.39	0.36	0.34	0.32	0.30
		0.34	0.38	0.42	0.46	0.44	0.41	0.38	0.36	0.34	0.32
		0.36	0.40	0.44	0.48	0.46	0.43	0.40	0.38	0.36	0.34
		0.38	0.42	0.46	0.50	0.48	0.45	0.42	0.40	0.38	0.36
		0.40	0.44	0.48	0.52	0.50	0.47	0.44	0.42	0.40	0.38
		0.42	0.46	0.50	0.54	0.52	0.49	0.46	0.44	0.42	0.40
		0.44	0.48	0.52	0.56	0.54	0.51	0.48	0.46	0.44	0.42
		0.46	0.50	0.54	0.58	0.56	0.53	0.50	0.48	0.46	0.44
		0.48	0.52	0.56	0.60	0.58	0.55	0.52	0.50	0.48	0.46
		0.50	0.54	0.58	0.62	0.60	0.57	0.54	0.52	0.50	0.48
		0.52	0.56	0.60	0.64	0.62	0.59	0.56	0.54	0.52	0.50
		0.54	0.58	0.62	0.66	0.64	0.61	0.58	0.56	0.54	0.52
		0.56	0.60	0.64	0.68	0.66	0.63	0.60	0.58	0.56	0.54
		0.58	0.62	0.66	0.70	0.68	0.65	0.62	0.60	0.58	0.56
		0.60	0.64	0.68	0.72	0.70	0.67	0.64	0.62	0.60	0.58
		0.62	0.66	0.70	0.74	0.72	0.69	0.66	0.64	0.62	0.60
		0.64	0.68	0.72	0.76	0.74	0.71	0.68	0.66	0.64	0.62
		0.66	0.70	0.74	0.78	0.76	0.73	0.70	0.68	0.66	0.64
		0.68	0.72	0.76	0.80	0.78	0.75	0.72	0.70	0.68	0.66
		0.70	0.74	0.78	0.82	0.80	0.77	0.74	0.72	0.70	0.68
		0.72	0.76	0.80	0.84	0.82	0.79	0.76	0.74	0.72	0.70
		0.74	0.78	0.82	0.86	0.84	0.81	0.78	0.76	0.74	0.72
		0.76	0.80	0.84	0.88	0.86	0.83	0.80	0.78	0.76	0.74
		0.78	0.82	0.86	0.90	0.88	0.85	0.82	0.80	0.78	0.76
		0.80	0.84	0.88	0.92	0.90	0.87	0.84	0.82	0.80	0.78
		0.82	0.86	0.90	0.94	0.92	0.89	0.86	0.84	0.82	0.80
		0.84	0.88	0.92	0.96	0.94	0.91	0.88	0.86	0.84	0.82
		0.86	0.90	0.94	0.98	0.96	0.93	0.90	0.88	0.86	0.84
		0.88	0.92	0.96	1.00	0.98	0.95	0.92	0.90	0.88	0.86
		0.90	0.94	0.98	1.02	1.00	0.97	0.94	0.92	0.90	0.88
		0.92	0.96	1.00	1.04	1.02	0.99	0.96	0.94	0.92	0.90
		0.94	0.98	1.02	1.06	1.04	1.01	0.98	0.96	0.94	0.92
		0.96	1.00	1.04	1.08	1.06	1.03	1.00	0.98	0.96	0.94
		0.98	1.02	1.06	1.10	1.08	1.05	1.02	1.00	0.98	0.96
		1.00	1.04	1.08	1.12	1.10	1.07	1.04	1.02	1.00	0.98
		1.02	1.06	1.10	1.14	1.12	1.09	1.06	1.04	1.02	1.00
		1.04	1.08	1.12	1.16	1.14	1.11	1.08	1.06	1.04	1.02
		1.06	1.10	1.14	1.18	1.16	1.13	1.10	1.08	1.06	1.04
		1.08	1.12	1.16	1.20	1.18	1.15	1.12	1.10	1.08	1.06
		1.10	1.14	1.18	1.22	1.20	1.17	1.14	1.12	1.10	1.08
		1.12	1.16	1.20	1.24	1.22	1.19	1.16	1.14	1.12	1.10
		1.14	1.18	1.22	1.26	1.24	1.21	1.18	1.16	1.14	1.12
		1.16	1.20	1.24	1.28	1.26	1.23	1.20	1.18	1.16	1.14
		1.18	1.22	1.26	1.30	1.28	1.25	1.22	1.20	1.18	1.16
		1.20	1.24	1.28	1.32	1.30	1.27	1.24	1.22	1.20	1.18
		1.22	1.26	1.30	1.34	1.32	1.29	1.26	1.24	1.22	1.20
		1.24	1.28	1.32	1.36	1.34	1.31	1.28	1.26	1.24	1.22
		1.26	1.30	1.34	1.38	1.36	1.33	1.30	1.28	1.26	1.24
		1.28	1.32	1.36	1.40	1.38	1.35	1.32	1.30	1.28	1.26
		1.30	1.34	1.38	1.42	1.40	1.37	1.34	1.32	1.30	1.28
		1.32	1.36	1.40	1.44	1.42	1.39	1.36	1.34	1.32	1.30
		1.34	1.38	1.42	1.46	1.44	1.41	1.38	1.36	1.34	1.32
		1.36	1.40	1.44	1.48	1.46	1.43	1.40	1.38	1.36	1.34
		1.38	1.42	1.46	1.50	1.48	1.45	1.42	1.40	1.38	1.36
		1.40	1.44	1.48	1.52	1.50	1.47	1.44	1.42	1.40	1.38
		1.42	1.46	1.50	1.54	1.52	1.49	1.46	1.44	1.42	1.40
		1.44	1.48	1.52	1.56	1.54	1.51	1.48	1.46	1.44	1.42
		1.46	1.50	1.54	1.58	1.56	1.53	1.50	1.48	1.46	1.44
		1.48	1.52	1.56	1.60	1.58	1.55	1.52	1.50	1.48	1.46
		1.50	1.54	1.58	1.62	1.60	1.57	1.54	1.52	1.50	1.48
		1.52	1.56	1.60	1.64	1.62	1.59	1.56	1.54	1.52	1.50
		1.54	1.58	1.62	1.66	1.64	1.61	1.58	1.56	1.54	1.52
		1.56	1.60	1.64	1.68	1.66	1.63	1.60	1.58	1.56	1.54
		1.58	1.62	1.66	1.70	1.68	1.65	1.62	1.60	1.58	1.56
		1.60	1.64	1.68	1.72	1.70	1.67	1.64	1.62	1.60	1.58
		1.62	1.66	1.70	1.74	1.72	1.69	1.66	1.64	1.62	1.60
		1.64	1.68	1.72	1.76	1.74	1.71	1.68	1.66	1.64	1.62
		1.66	1.70	1.74	1.78	1.76	1.73	1.70	1.68	1.66	1.64
		1.68	1.72	1.76	1.80	1.78	1.75	1.72	1.70	1.68	1.66
		1.70	1.74	1.78	1.82	1.80	1.77	1.74	1.72	1.70	1.68
		1.72	1.76	1.80	1.84	1.82	1.79	1.76	1.74	1.72	1.70
		1.74	1.78	1.82	1.86	1.84	1.81	1.78	1.76	1.74	1.72
		1.76	1.80	1.84	1.88	1.86	1.83	1.80	1.78	1.76	1.74
		1.78	1.82	1.86	1.90	1.88	1.85	1.82	1.80	1.78	1.76
		1.80	1.84	1.88	1.92	1.90	1.87	1.84	1.82	1.80	1.78
		1.82	1.86	1.90	1.94	1.92	1.89	1.86	1.84	1.82	1.80
		1.84	1.88	1.92	1.96	1.94	1.91	1.88	1.86	1.84	1.82
		1.86	1.90	1.94	1.98	1.96	1.93	1.90	1.88	1.86	1.84
		1.88	1.92	1.96	2.00	1.98	1.95	1.92	1.90	1.88	1.86
		1.90	1.94	1.98	2.02	2.00	1.97	1.94	1.92	1.90	1.88
		1.92	1.96	2.00	2.04	2.02	1.99	1.96	1.94	1.92	1.90
		1.94	1.98	2.02	2.06	2.04	2.01	1.98	1.96	1.94	1.92
		1.96	2.00	2.04	2.08	2.06	2.03	2.00	1.98	1.96	1.94
		1.98	2.02	2.06	2.10	2.08	2.05	2.02	2.00	1.98	1.96
		2.00	2.04	2.08	2.12	2.10	2.07	2.04	2.02	2.00	1.98
		2.02	2.06	2.10	2.14	2.12	2.09	2.06	2.04	2.02	2.00
		2.04	2.08	2.12	2.16	2.14	2.11	2.08	2.06	2.04	2.02
		2.06	2.10	2.14	2.18	2.16	2.13	2.10	2.08	2.06	2.04
		2.08	2.12	2.16	2.20	2.18	2.15	2.12	2.10	2.08	2.06
		2.10	2.14	2.18	2.22	2.20	2.17	2.14	2.12	2.10	2.08
		2.12	2.16	2.20	2.24	2.22	2.19	2.16	2.14	2.12	2.10
		2.14	2.18	2.22	2.26	2.24	2.21	2.18	2.16	2.14	2.12
		2.16	2.20	2.24	2.28	2.26	2.23	2.20	2.18	2.16	2.14
		2.18	2.22	2.26	2.30	2.28	2.25	2.22	2.20	2.18	2.16
		2.20	2.24	2.28	2.32	2.30	2.27	2.24	2.22	2.20	2.18
		2.22	2.26	2.30	2.34	2.32	2.29	2.26	2.24	2.22	2.20
		2.24	2.28	2.32	2.36	2.34	2.31	2.28	2.26	2.24	2.22