

KAST-O-LITE[®] 26 LI

(KAST-O-LITE[®] 25)

2600°F, Insulating, Refractory Castable

KAST-O-LITE 26 LI has now been improved to meet the demands of severe furnace environments. Low iron content minimizes destructive CO disintegration attack by reducing furnace atmospheres. Vastly improved strengths reduce cracking from mechanical abuse or steel shell flexing. Higher alumina content improves its maximum service temperature to 2600°F (1425°C). Lower water content for placement, reduces internal steam pressure during initial heat up. Ideal for boilers, reheat furnace floor backup, furnace stacks and flues, air heaters, aluminum furnace roof backup, and petrochem oil heaters.

KAST-O-LITE 26 LI Plus is the fast fire version of **KAST-O-LITE 26 LI**.

CHEMICAL ANALYSIS - Calcined Basis

Silica - SiO ₂	38.2%
Alumina - Al ₂ O ₃	46.5%
Iron Oxide - Fe ₂ O ₃	1.3%
Lime - CaO.....	10.5%
Magnesia - MgO	0.4%
Titania - TiO ₂	2.0%
Alkalies - Na ₂ O + K ₂ O.....	1.0%

A. P. Green is a supplier of high duty and super duty brick, insulating firebrick, high alumina brick, basic brick, silica brick, mortars, plastics, castables, and precast shapes as well as mineral wool block insulation and a complete ceramic fiber line. Stocks of these products are maintained in more than 90 locations throughout North America. And, having been in the refractories business for more than 80 years, A. P. Green can also provide the expertise and thorough technical assistance that you might require.

Harbison-Walker
Mixing & Using Instructions
KAST-O-LITE 26 LI

----- GENERAL INSTRUCTIONS -----

Material should be stored in a dry place. For best results, material should be maintained at 50-70F prior to casting. Under these conditions, the maximum recommended storage life for this product is twelve months.

Porous back-up materials or wood forms should be waterproofed. Absorption of water can result in reduced flow for the product. **Forms must be stout and water tight.**

This product is designed to be mixed with water and then poured/handcast into place. **All equipment used to mix this product must be clean.**

Never mix less than full bags. **Add only clean water suitable for drinking with a pH value between 6.0 and 7.5.** For best results, water should be maintained at 50-70F.

----- MIXING REQUIREMENTS -----

Approximate Water For Installation
Pints (Liters)

<u>Bag Size</u>	<u>Poured/Handcast</u>
100 lbs. (45.5 kg)	19.0 (9.0)
55 lbs. (25.0 kg)	10.5 (5.0)
50 lbs. (22.7 kg)	9.5 (4.5)
Wt. % of dry solids	20.0

Mix for at least three minutes. For best results, wet mix temperature should be maintained at 60-75F. Minor adjustments to the amount of water are permissible to achieve desired flow. **Do not exceed 23.0% water under any circumstances.**

----- INSTALLATION -----

Place material promptly. Do not trowel to slick finish. At temperatures above 60F, air cure, keeping surfaces damp and/or covered, for 16-24 hours typically or until a hard set has developed. **Lower temperatures will increase the time before a hard set develops.** The best results are achieved at curing temperatures of 90-110F. Keep material from freezing during air cure and preferably until a dryout can be initiated. Freezing of this product prior to water removal can cause structural damage.

**Harbison-Walker
Mixing & Using Instructions
KAST-O-LITE 26 LI**

----- *HEAT UP SCHEDULE* -----

Never enclose a castable in a vapor-tight encasement as a dangerous steam explosion may result. Typical dryout schedule for a single layer, 9" (229 mm) thick or less:

ambient to 250F (120C)	100F (55C) per hour
hold at 250F (120C)	1 / 2 hour per inch thickness
250F to 500F (120C to 260C)	100F (55C) per hour
hold at 500F (260C)	1 / 2 hour per inch thickness
500F (260C) to use temperature	100F (55C) per hour

For thicker or multi-layer linings, contact your Harbison-Walker representative for a recommended dryout schedule.

Review Material Safety Data Sheet & Warning Labels

Notes on Refractory Curing

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Budget Casting Supply LLC

Notes on Refractory Curing:

Castable refractories have various materials in the mix to create tiny air pockets after curing. These air pockets are what actually insulates the furnace. Typically the manufacturer creates these pockets by adding vermiculite to the mix. This can cause the curing to be deceptive, because the vermiculite can trap and hold water, even though the cement has kicked off and cured.

The refractory should be allowed to cure a minimum of 24 hours before the initial firing. This is an important time, and the longer you can wait, the better. As with concrete, keep the surface from drying out by covering with wetted cloth or burlap if the weather is hot or dry. It is important to keep the material from freezing during this time. Also keep in mind that this material does not set as hard and strong as concrete, due to all the trapped air pockets, different cement, and lack of aggregate.

After the initial curing process, it is good to *slowly* heat the material using a heat source such as a hot plate until there is no visible moisture. This will help to drive off the water in the cement prior to the initial firing.

The initial firing, known as calcining, is critical. During this time the refractory is *slowly* heated from room temperature to the full operating temperature. This should be done over a long time as well, to allow the steam to escape the refractory. A calcining time of 12 hours is not unreasonable. Increase the heat very slowly at first to prevent the escaping steam from causing cracks, or worse.

After calcining the unit is ready for use, or ready to have secondary coating such as ITC-100 or ceramic fiber blankets applied.

WARNING: Do NOT apply any surface coatings, such as ITC-100 or ceramic fiber blankets until the refractory is fully fired. Sealing the surface has caused steam explosions as the refractory heats!!

KAST-O-LITE® 26 LI

(KAST-O-LITE® 25)
 Technical Data

	<u>Poured</u>	
MAXIMUM TEMPERATURE	2600°F	1425°C
QUANTITY REQUIRED	86 lb/ft ³	1.38 g/cm ³
QUANTITY IN PLACE	<u>lb/ft³</u>	<u>g/cm³</u>
220°F (105°C).....	86 - 98	1.38 - 1.57
1500°F (815°C).....	81 - 91	1.30 - 1.46
WATER REQUIRED	<u>Approximately</u>	
Weight % Dry Solids.....	19.8	
Per 100 Pounds (45.4 kg)	2 ³ / ₈ gals (U.S.)	9.0 liters
WORKING TIME - Minutes.....	20	
PERMANENT LINEAR CHANGE - ASTM C113	Nil	
220°F (105°C).....	0.1 - 0.3% shr.	
1500°F (815°C).....	0.2 - 0.6% shr.	
2000°F (1095°C).....	0.3 - 2.0% exp.	
2500°F (1370°C).....		
MODULUS OF RUPTURE - ASTM C133	<u>lb/in²</u>	<u>MPa</u>
220°F (105°C).....	500 - 900	3.4 - 6.2
1500°F (815°C).....	220 - 440	1.5 - 3.0
2000°F (1095°C).....	200 - 500	0.3 - 2.0
COLD CRUSHING STRENGTH - ASTM C133		
220°F (105°C).....	2400 - 3600	16.6 - 24.8
1500°F (815°C).....	1300 - 2100	9.0 - 14.5
2000°F (1095°C).....	1300 - 1800	9.0 - 12.4
PARTICLE SIZE - ASTM C92		
Retained on 4 Mesh Screen	Less Than 1%	
THERMAL CONDUCTIVITY	<u>Btu·in/hr·ft²·°F</u>	<u>W/m·°C</u>
400°F (205°C).....	3.6	0.52
800°F (425°C).....	3.4	0.49
1200°F (650°C).....	3.5	0.50
1600°F (870°C).....	3.7	0.53
2000°F (1095°C).....	4.0	0.58

NOTE: **KAST-O-LITE 26 LI Plus** will typically show 1-2 lb/ft³ lower density and up to 10% lower strength values.

The test data shown are based on average results on production samples and are subject to normal variation on individual tests. Accordingly, test data cannot be taken as establishing maximum or minimum specifications.



1 Identification of substance

· **Product details**

· **Trade name:** KAST-O-LITE 26 LI

· **Manufacturer/Supplier:**

ANH Refractories Company
400 Fairway Drive
Moon Township, PA 15108

General Phone: (412)375-6600

· **Information department:** MSDS Technical Information: (412)375-6837

· **Emergency information:** CHEMTREC 24 HOUR EMERGENCY PHONE NUMBER: 1-800-424-9300.

2 Composition/Data on components

· **Chemical characterization**

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Components:**

1302-93-8	alumina silicate	10-20%
1344-28-1	non-fibrous alumina	10-20%
12042-68-1	calcium aluminate	10-20%
1302-87-0	hydrous alumina silicate	10-20%
14464-46-1	crystalline silica (cristobalite)	10-20%
1302-76-7	alumina silicate (kyanite)	5-10%
14808-60-7	crystalline silica (quartz)	5-10%
69012-64-2	amorphous silica	2.5-5%

3 Hazards identification

· **Hazard description:**

Toxic

· **Medical conditions aggravated by exposure to the product:** Asthma, chronic lung disease, and skin irritation.

· **Carcinogenicity Information:**

Crystalline silica is listed by IARC as a Group 1 Carcinogen "sufficient evidence of carcinogenicity in humans", and is listed by NTP as K, "Known To Be A Human Carcinogen".

· **Information pertaining to particular dangers for man and environment:**

May cause cancer by inhalation.

Irritating to eyes, respiratory system and skin.

Danger of serious damage to health by prolonged exposure.

PRODUCT CONTAINS CRYSTALLINE SILICA, "a chemical known to the State of California to cause cancer."
Prolonged or repeated inhalation of dust from products containing crystalline silica can cause silicosis or cancer.

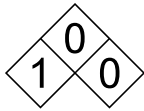
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Trade name: **KAST-O-LITE 26 LI**

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· **NFPA ratings (scale 0-4)**



Health = 1
Fire = 0
Reactivity = 0

· **HMIS Classification**

HEALTH	*1
FIRE	0
REACTIVITY	0

Health: *1
Flammability: 0
Reactivity: 0

4 First aid measures

- **After inhalation:** Move to fresh air; consult doctor if needed.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:** Flush eyes with water for 15 minutes. If irritation persists, consult a doctor.
- **After swallowing:**
This product is intended for industrial applications; in the unlikely event that this product is swallowed, consult a physician if any adverse medical conditions occur.

5 Fire fighting measures

- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Person-related safety precautions:** Not required.
- **Measures for environmental protection:** No special measures required.
- **Measures for cleaning/collecting:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

7 Handling and storage

- **Handling:**
- **Information for safe handling:**
Ensure good ventilation/exhaust at the workplace.
Prevent formation of dust.
- **Information about protection against explosions and fires:** Keep respiratory protective device available.
- **Storage:**
- **Requirements to be met by storerooms and containers:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Store product inside, out of extreme weather conditions.

(Contd. on page 3)



Trade name: **KAST-O-LITE 26 LI**

(Contd. from page 2)

- **Storage class:**
- **Class according to regulation on flammable liquids:** Not applicable

8 Exposure controls and personal protection

- **Components with limit values that require monitoring at the workplace:**

1344-28-1 non-fibrous alumina

PEL	15*,5** mg/m ³ *Total dust **Respirable fraction
TLV	10 mg/m ³ (e)

14464-46-1 crystalline silica (cristobalite)

REL	0.05* mg/m ³ *Respirable dust
TLV	0.05 R mg/m ³

14808-60-7 crystalline silica (quartz)

REL	0.05* mg/m ³ *Respirable dust
TLV	0.05 R mg/m ³

69012-64-2 amorphous silica

TLV	2 R mg/m ³
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- **Personal protective equipment:**
- **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
- **Breathing equipment:**



NIOSH approved respirators should be used if dust is present. A respiratory protection program should be implemented if exposures exceed OSHA PELs.

- **Protection of hands:**



Protective gloves recommended

- **Eye protection:** Safety glasses with side shields recommended

9 Physical and chemical properties

- **Form:** Solid
- **Color:** According to product specification

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Trade name: **KAST-O-LITE 26 LI**

(Contd. from page 3)

· Odor:	<i>No specific odor.</i>
· Change in condition Melting point/Melting range:	<i>Undetermined.</i>
Boiling point/Boiling range:	<i>Undetermined.</i>
· Flash point:	<i>Not applicable.</i>
· Auto igniting:	<i>Product is not selfigniting.</i>
· Danger of explosion:	<i>Product does not present an explosion hazard.</i>
· Density:	<i>Not determined.</i>
· Solubility in / Miscibility with Water:	<i>Insoluble.</i>

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** *No decomposition if used according to specifications.*
- **Dangerous reactions** *No dangerous reactions known.*
- **Dangerous products of decomposition:**
Refractories containing crystalline silica may, after service, contain more or less crystalline silica. Care must be taken to avoid and/or control dust from demolition. If in doubt of the proper protection, seek advice from a safety professional.

11 Toxicological information

- **Acute toxicity:**
- **Primary acute effects:**
- **Skin contact:** *Irritant to skin and mucous membranes.*
- **Eye contact:** *Irritating effect.*
- **Sensitization:** *No sensitizing effects known.*
- **Additional toxicological information:**
*The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant.
Carcinogenic if inhaled.*

12 Ecological information

- **General notes:** *At present there are no ecotoxicological assessments.*

13 Disposal considerations

- **Recommendation for Disposal of Product:**
*As sold, this product is not RCRA hazardous. Final used condition must be evaluated prior to disposal. Dispose of waste product in accordance with Federal, State and Local regulations.
Dust created during demolition of used product may contain crystalline silica.*

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Trade name: **KAST-O-LITE 26 LI**

(Contd. from page 4)

· **Recommendation for Disposal of Uncleaned Packaging:** Reuse, recycle or treat as industrial waste.

14 Transport information

· **Transport/Additional information:** Not dangerous according to available information.

15 Regulations

· **SARA 313 TOXIC CHEMICALS**

No material listed in the components in Section 2 of this MSDS is on the SARA 313 list.

· **SARA 302 EXTREMELY HAZARDOUS SUBSTANCES**

No material listed in the components in Section 2 of this MSDS is on the SARA 302 list.

· **TSCA (Toxic Substances Control Act)**

This substance or all the ingredients of this product are on the Chemical Substances Inventory of the Toxic Substances Control Act (TSCA Inventory). The presence on this list does not require any legal reporting.

· **WHMIS Classification**

Class D - Division 2 - Sub Division A
 Untested mixture containing a very toxic material
 Class D - Division 2 - Sub Division B
 Untested mixture containing a toxic material

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

· **Carcinogenicity categories**

· **IARC (International Agency for Research on Cancer)**

14464-46-1	crystalline silica (cristobalite)	1
14808-60-7	crystalline silica (quartz)	1
69012-64-2	amorphous silica	3

· **NTP (National Toxicology Program)**

14464-46-1	crystalline silica (cristobalite)	R
14808-60-7	crystalline silica (quartz)	R

· **TLV (Threshold Limit Value established by ACGIH)**

1344-28-1	non-fibrous alumina	A4
14808-60-7	crystalline silica (quartz)	A2

· **MAK (German Maximum Workplace Concentration)**

1344-28-1	non-fibrous alumina	2
14464-46-1	crystalline silica (cristobalite)	1
14808-60-7	crystalline silica (quartz)	1

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

14464-46-1	crystalline silica (cristobalite)
14808-60-7	crystalline silica (quartz)

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Trade name: KAST-O-LITE 26 LI

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· **Classification according to EU-guidelines**

· **Hazard symbols:**
Toxic

· **Hazard-determining components of labeling:**
crystalline silica (cristobalite)
crystalline silica (quartz)

· **Risk phrases:**
May cause cancer by inhalation.
Irritating to eyes, respiratory system and skin.
Danger of serious damage to health by prolonged exposure.

· **Safety phrases:**
When using do not eat or drink.
Do not breathe dust.
Avoid contact with eyes.
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
After contact with skin, wash immediately with plenty of soap and water
Wear suitable protective clothing and gloves.
In case of accident or if you feel unwell, seek medical advice immediately.

· **Special labeling of certain preparations:**

PRODUCT CONTAINS CRYSTALLINE SILICA, "a chemical known to the State of California to cause cancer."
Prolonged or repeated inhalation of dust from products containing crystalline silica can cause silicosis or cancer.

· **National regulations:**

· **The following ingredients are known in the state of California to be a cancer risk (Proposition 65):**

14464-46-1	crystalline silica (cristobalite)
14808-60-7	crystalline silica (quartz)

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Contact:** Patricia A. Kott 412-375-6712
· **Creation date:** 08/14/2000

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