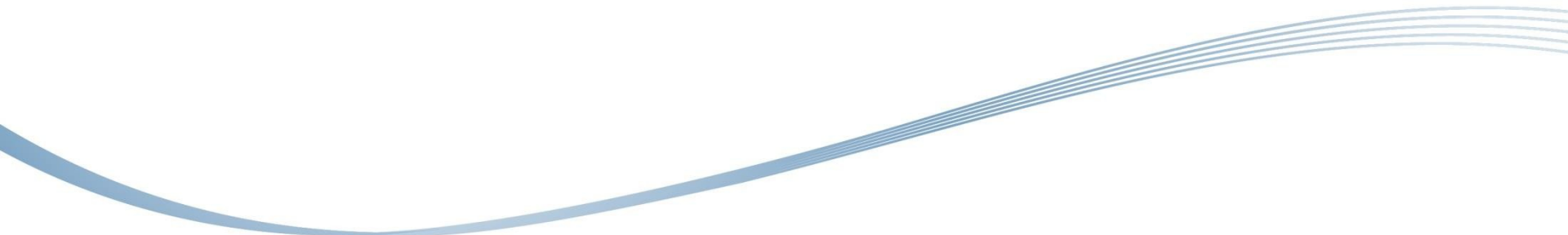


API 936 Refractory Quality Control Personnel Training Certification

WELCOME

Course on Refractory Materials, Design, Installation, Inspection and Repair

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Q1-Refractories containing a substantial amount of silica which is reactive with basic refractories, basic slags, or basic fluxes at high temperature are known as:

- a) Acid refractories
- b) Basic refractories
- c) Neutral refractories
- d) None of the above



Q1-Refractories containing a substantial amount of silica which is reactive with basic refractories, basic slags, or basic fluxes at high temperature are known as:

- a) Acid refractories
- b) Basic refractories
- c) Neutral refractories
- d) None of the above

Q2-Refractories whose major constituent is lime, magnesia, or both and which may react chemically with acid refractories, acid slags or acid fluxes at a high temperature is known as:

- a) Acid refractories
 - b) Basic refractories
 - c) Natural refractories
 - d) None of the above
- 

Q2-Refractories whose major constituent is lime, magnesia, or both and which may react chemically with acid refractories, acid slags or acid fluxes at a high temperature is known as:

a) Acid refractories

b) Basic refractories

c) Natural refractories

d) None of the above



Q3-Which function of refractories is to resist temperature.

- a) Primary function
- b) Secondary function
- c) Tertiary function
- d) None of the above.



Q3-Which function of refractories is to resist temperature.

- a) Primary function
- b) Secondary function
- c) Tertiary function
- d) None of the above.

Q4-The functions of refractories include resistance to other destructive influences such as abrasion, pressure, chemical attack and or rapid changes in temperature is called:

- a) Primary function
- b) Secondary function
- c) Tertiary function
- d) None of the above



Q4-The functions of refractories include resistance to other destructive influences such as abrasion, pressure, chemical attack and or rapid changes in temperature is called:

a) Primary function

b) Secondary function

c) Tertiary function

d) None of the above



Q5-Refractories means:

- a) Hard to fuse
- b) Hard to test
- c) Hard to set
- d) None of the above



Q5-Refractories means:

- a) Hard to fuse
- b) Hard to test
- c) Hard to set
- d) None of the above

API 936 deals with

Monolithic refractory

Installations of refractory linings

Installation, quality control procedures for
monolithic refractory linings

None of the above



API 936 deals with

Monolithic refractory

Installations of refractory linings

Installation, quality control procedures for
monolithic refractory linings

None of the above

A decorative blue wavy line that starts at the bottom left and curves towards the bottom right, ending near the right edge of the slide.

Q7-Refractories chemically and physically stable at

- a) Low temperatures
- b) Average temperatures
- c) High temperatures
- d) None of the above.



Q7-Refractories chemically and physically stable at

- a) Low temperatures
- b) Average temperatures
- c) High temperatures
- d) None of the above.



Q- Materials having refractory properties which form a refractory body when bonded into a conglomerate mass by a matrix is called

- a) Cementious concrete
- b) Refractory mass
- c) Refractory aggregate
- d) None of the above.

Q- Materials having refractory properties which form a refractory body when bonded into a conglomerate mass by a matrix is called

- a) Cementious concrete
- b) Refractory mass
- c) Refractory aggregate
- d) None of the above.

Q-Compositions of ground refractory materials which develop a strong bond at air ambient temperatures by chemical reactions within the binder phase that is usually activated by water additions is called:

- a) Air setting refractories
- b) Heat setting refractories
- c) Air and heat setting refractory
- d) None of the above



Q-Compositions of ground refractory materials which develop a strong bond at air ambient temperatures by chemical reactions within the binder phase that is usually activated by water additions is called:

- a) Air setting refractories
- b) Heat setting refractories
- c) Air and heat setting refractory
- d) None of the above

Q-Packing of chemical setting refractories should have mechanical protection by

- a) Cardboard
- b) rigid plastic
- c) metal outside
- d) any of the above

Q-Packing of chemical setting refractories should have mechanical protection by

- a) Cardboard
- b) rigid plastic
- c) metal outside
- d) any of the above

Q-Castable refractories containing more than 2.5% CaO (Calcium oxide) are known as:

A) Alumina-Silica

B) Basic

C) Conventional

D) Neutral



Q-Castable refractories containing more than 2.5% CaO (Calcium oxide) are known as:

A) Alumina-Silica

B) Basic

C) Conventional

D) Neutral



Q-A combination of refractory grain and suitable bonding agent that, after addition of a proper liquid, is generally poured into place to form a refractory shape or structure which becomes rigid because of a chemical action is called

- a) Mortar
- b) Castable
- c) ceramic modules
- d) all of the above



Q-A combination of refractory grain and suitable bonding agent that, after addition of a proper liquid, is generally poured into place to form a refractory shape or structure which becomes rigid because of a chemical action is called

a) Mortar

b) Castable

c) ceramic modules

d) all of the above

Q-Based on screen analysis the fines (cement, fume silica, fine alumina) in typical modern castable is

- a) 40 – 50%
 - b) 30 – 40%
 - c) 20 – 30%
 - d) None of the above
- 

Q-Based on screen analysis the fines (cement, fume silica, fine alumina) in typical modern castable is

a) 40 – 50%

b) 30 – 40%

c) 20 – 30%

d) None of the above



Q-Based on screen analysis, the size of Alumina – silicate aggregate in typical modern castable is

- a) 50 – 60%
 - b) 60 – 70%
 - c) 70 – 80%
 - d) None of the above
- 

Q-Based on screen analysis, the size of Alumina – silicate aggregate in typical modern castable is

a) 50 – 60%

b) 60 – 70%

c) 70 – 80%

d) None of the above

A decorative blue wavy line that starts at the bottom left, curves downwards, and then rises towards the bottom right, spanning the width of the slide.

Q20-Alumina – silica refractories containing 45% or more alumina, materials used in their production include diaspore, bauxite, gibbsite, Sillimanite and fused alumina (artificial corundum) is called

- a) fire clay refractory
- b) insulating refractories
- c) high alumina refractories
- d) all of the above



Q20-Alumina – silica refractories containing 45% or more alumina, materials used in their production include diaspore, bauxite, gibbsite, Sillimanite and fused alumina (artificial corundum) is called

a) fire clay refractory

b) insulating refractories

c) high alumina refractories

d) all of the above



Conventional refractories means

Castable refractories containing more than 2.5% Ca O.

Castable refractories containing less than 2.5% Ca O.

Castable refractories containing minimum 25% Ca O.

Castable refractories containing maximum 2.0% CaO.



Conventional refractories means

Castable refractories containing more than 2.5% Ca O.

Castable refractories containing less than 2.5% Ca O.

Castable refractories containing minimum 25% Ca O.

Castable refractories containing maximum 2.0% CaO.

Q16- Commercially on a basis bauxite must contain at least

- a) 65% fused silica
- b) 60% alumina
- c) 65% alumina
- d) None of the above



Q16- Commercially on a basis bauxite must contain at least

a) 65% fused silica

b) 60% alumina

c) 65% alumina

d) None of the above



Q14-A high alumina mineral usually consisting of grains embedded in clay – like mass, and believed to consist essentially of alumina tri hydrate ($\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$) and alumina hydrate ($\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$) in varying proportions is called

- a) Kyanite
- b) Bauxite
- c) fused alumina
- d) alusite

Q14-A high alumina mineral usually consisting of grains embedded in clay – like mass, and believed to consist essentially of alumina tri hydrate ($\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$) and alumina hydrate ($\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$) in varying proportions is called

a) Kyanite

b) Bauxite

c) fused alumina

d) alusite

Q17- A natural or synthetic mineral theoretically consisting solely of alumina (Al_2O_3), specific gravity 4.00 – 4.02, melting point 3720° F . (2050° C) Hardness 8.8 is called

- a) Corundum
 - b) Kaolin
 - c) Mica
 - d) none of the above
- 

Q17- A natural or synthetic mineral theoretically consisting solely of alumina (Al_2O_3), specific gravity 4.00 – 4.02, melting point 3720° F . (2050° C) Hardness 8.8 is called

- a) Corundum
 - b) Kaolin
 - c) Mica
 - d) none of the above
- 

Q11-Fused silica aggregate is used as a raw material in a castable providing

- a) Low thermal conductivity
- b) Low thermal expansion
- c) Low thermal conductivity and low thermal expansion
- d) None of the above



Q11-Fused silica aggregate is used as a raw material in a castable providing

a) Low thermal conductivity

b) Low thermal expansion

c) Low thermal conductivity and low thermal expansion

d) None of the above

A decorative blue wavy line that starts at the bottom left, curves downwards, and then rises towards the bottom right, ending near the right edge of the slide.

Q21-A separation between adjoining parts of a refractory lining which allows small expansive movements, such as those caused by thermal change is known as

- a) Thermal expansion
- b) Expansion joint
- c) Thermal conductivity
- d) None of the above

Q21-A separation between adjoining parts of a refractory lining which allows small expansive movements, such as those caused by thermal change is known as

a) Thermal expansion

b) Expansion joint

c) Thermal conductivity

d) None of the above

Q22- Mechanical wearing away of the surfaces of refractory bodies in service by washing action of moving liquid or gases is called

- a) erosion of refractories
- b) spalling of refractories
- c) crumble of refractories
- d) none of the above

Q22- Mechanical wearing away of the surfaces of refractory bodies in service by washing action of moving liquid or gases is called

- a) **erosion of refractories**
- b) spalling of refractories
- c) crumble of refractories
- d) none of the above

Q23- Hot wall means a thin refractory lining system with

Metal shell temperature greater than 500°F (260°C)

Metal shell temperature greater than 700°F (370°C)

Metal shell temperature greater than 40°F to 100°F (5°C to 38°C)

Metal shell temperature greater than 1500°F (815°C)

Q23- Hot wall means a thin refractory lining system with

Metal shell temperature greater than 500°
F(260° C)

Metal shell temperature greater than 700°
F(370° C)

Metal shell temperature greater than 40° F
to 100° F (5° C to 38° C)

Metal shell temperature greater than 1500°
F(815° C)

Q24-The property of matter of which heat energy is transmitted through particles in contact.

- a) thermal expansion
- b) thermal conductivity
- c) thermal shock
- d) none of the above.

Q24-The property of matter of which heat energy is transmitted through particles in contact.

a) thermal expansion

b) thermal conductivity

c) thermal shock

d) none of the above.

Q25- The exposure of a material or body to a rapid change in temperature which may have damaging effect

- a) thermal expansion
- b) thermal conductivity
- c) thermal shock
- d) none of the above

Q25- The exposure of a material or body to a rapid change in temperature which may have damaging effect

- a) thermal expansion
- b) thermal conductivity
- c) thermal shock
- d) none of the above

The term abrasion resistance means

Effects of eroding particles for an extended period

the ability to withstand effects of eroding particles for an extended period without significant loss of material or other damage

A measure of a refractory ability to resist failure

A non reactive coating applied to freely installed cementations materials that aids the hydration process by retarding moisture loss

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the ability to withstand effects of eroding particles for an extended period without significant loss of material or other damage

A measure of a refractory ability to resist failure

A non reactive coating applied to freely installed cementations materials that aids the hydration process by retarding moisture loss

Metallic anchor made from rod or bar stock that is configured in a V shape is called:

- a) V-anchor
- b) Footed anchor
- c) Stud wed
- d) None of the above

Metallic anchor made from rod or bar stock that is configured in a V shape is called:

- a) V-anchor
 - b) Footed anchor
 - c) Stud wed
 - d) None of the above
- 

Metallic anchor, usually V-stud which has a foot shaped configuration at the base to aid weld attachment to the shell is called:

- a) V-anchor
- b) Footed anchor
- c) Stud weld
- d) None of the above

Metallic anchor, usually V-stud which has a foot shaped configuration at the base to aid weld attachment to the shell is called:

- a) V-anchor
 - b) Footed anchor
 - c) Stud weld
 - d) None of the above
- 

Welding method utilizing an arc-welding machine in conjunction with a timer and a gun is called:

- a) V-anchor
 - b) Footed anchor
 - c) Stud weld
 - d) None of the above
- 

Welding method utilizing an arc-welding machine in conjunction with a timer and a gun is called:

- a) V-anchor
- b) Footed anchor
- c) Stud weld
- d) None of the above

Metallic anchor made from rod or bar and usually used for dual layer linings that is configured in

- a) Y shape
- b) V shape
- c) U shape
- d) All of the above



Metallic anchor made from rod or bar and usually used for dual layer linings that is configured in

- a) Y shape
- b) V shape
- c) U shape
- d) All of the above

Metallic anchor used to attach ceramic anchors to the casing or shell of a process unit is

- a) Claw anchor
- b) C-clip
- c) U – anchor
- d) None of the above

Metallic anchor used to attach ceramic anchors to the casing or shell of a process unit is

a) Claw anchor

b) C-clip

c) U – anchor

d) None of the above



In ceramics, the property of resistance to melting, softening or deformation at high temperature is called.

- a) Refractoriness
- b) Pyrometric cone equivalent
- c) Cold crushing strength
- d) None of the above.



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- a) Refractoriness
- b) Pyrometric cone equivalent
- c) Cold crushing strength
- d) None of the above.

Castable, gunning mixes, ramming mixes, plastics and mortars are

- a) Shaped refractory
- b) Unshaped refractory
- c) Refractory fibre
- d) All of the above



Castable, gunning mixes, ramming mixes, plastics and mortars are

a) Shaped refractory

b) Unshaped refractory

c) Refractory fibre

d) All of the above



Plastic refractory should

- a) have low emissivity
- b) have low drying and firing shrinkage
- c) have high workability
- d) have a high fusion point

Plastic refractory should

- a) have low emissivity
- b) have low drying and firing shrinkage
- c) have high workability
- d) have a high fusion point

Workability is **defined** as the extent to which a **material** be deformed in a specific metal working process without the formation of cracks.



Quantity of catable refractory produced by a single blending or mixing operation either during field mixing is known as

- a) Blend
- b) Batch
- c) Mix
- d) Lot

Quantity of catable refractory produced by a single blending or mixing operation either during field mixing is known as

a) Blend

b) Batch

c) Mix

d) Lot



Castable, gunning mixes, ramming mixes, plastics and mortars are:

- a) Shaped refractory
- b) Unshaped refractory
- c) Refractory fiber
- d) All of the above



Castable, gunning mixes, ramming mixes, plastics and mortars are:

a) Shaped refractory

b) Unshaped refractory

c) Refractory fiber

d) All of the above



The main purpose of curing a castable is to

- a) Harden the surface of the castable
- b) Protect the green castable from air pollution
- c) Keep the castable cool
- d) Prevent the castable from drying out too quickly



The main purpose of curing a castable is to

- a) Harden the surface of the castable
- b) Protect the green castable from air pollution
- c) Keep the castable cool
- d) Prevent the castable from drying out too quickly

Three of the following are ways in which steel fibre assists monolithic linings. Which one is not

- a) Improves abrasion resistance
- b) Improves thermal resistance
- c) Improves tensile strength
- d) Improves thermal shock resistance



Three of the following are ways in which steel fibre assists monolithic linings. Which one is not

a) Improves abrasion resistance

b) Improves thermal resistance

c) Improves tensile strength

d) Improves thermal shock resistance



Brick, tile, fired shapes and fused cast shapes are

- a) shaped refractory
- b) unshaped refractory
- c) refractory fibre
- d) all above



Brick, tile, fired shapes and fused cast shapes are

- a) shaped refractory
- b) unshaped refractory
- c) refractory fibre
- d) all above

Semi Silica fire clay brick contains

27 % Silica maximum.

Not less than 72% Silica.

Maximum 58% Silica

Maximum 45% Silica.

Semi Silica fire clay brick contains

27 % Silica maximum.

Not less than 72% Silica.

Maximum 58% Silica

Maximum 45% Silica.

Blanket, Module, Bulk paper, rope and vacuum formed shaped are:

- a) shaped refractory
- b) unshaped refractory
- c) refractory fibre
- d) all of the above.



Blanket, Module, Bulk paper, rope and vacuum formed shaped are:

- a) shaped refractory
- b) unshaped refractory
- c) refractory fiber
- d) all of the above.

Forms (types) of refractory :

- a) Shaped
- b) Unshaped
- c) Refractory (ceramic) fiber
- d) All above



Forms (types) of refractory :

a) Shaped

b) Unshaped

c) Refractory (ceramic) fiber

d) All above

A flat or sloped portion of a fired heater radiant section opposite to floor is

- a) Arch
- b) Radiant wall
- c) Convection
- d) Flat

A flat or sloped portion of a fired heater radiant section opposite to floor is

- a) Arch
- b) Radiant wall
- c) Convection
- d) Flat

An arch, which is supported by abutments at the side or ends only is

- a) Suspended arch
- b) Flat arch
- c) Sprung arch
- d) Dome

An arch, which is supported by abutments at the side or ends only is

a) Suspended arch

b) Flat arch

c) Sprung arch

d) Dome

Reactor is a vessel in which

- a) Cracking reaction occurs or is completed and product gases are separated from Coke.
- b) Coke and residual hydrocarbons are burned off the catalyst and the flue gas is then separated from the catalyst.
- c) By heat treatment the adjacent particles of the material cohere, at a temperature below that of complete melting.
- d) None of the above.

Reactor is a vessel in which

- a) Cracking reaction occurs or is completed and product gases are separated from Coke.
- b) Coke and residual hydrocarbons are burned off the catalyst and the flue gas is then separated from the catalyst.
- c) By heat treatment the adjacent particles of the material cohere, at a temperature below that of complete melting.
- d) None of the above.

Section of transfer line in which flow is in a downward direction is called:

- a) transfer line of FCCU
- b) riser of FCCU
- c) stand pipe of FCCU
- d) none of the above

Section of transfer line in which flow is in a downward direction is called:

- a) transfer line of FCCU
- b) riser of FCCU
- c) stand pipe of FCCU
- d) none of the above

An internal component used for the separation of solids from flue or product gas in a fluid coking unit is called

- a) a cyclone
- b) Plenum
- c) riser of FCU
- d) none of the above

An internal component used for the separation of solids from flue or product gas in a fluid coking unit is called

- a) a cyclone
- b) Plenum
- c) riser of FCU
- d) none of the above

Enclosure inside the top head of a reactor or regenerator vessel which supports the cyclones and in which gases exiting the cyclone outlets are collected is called

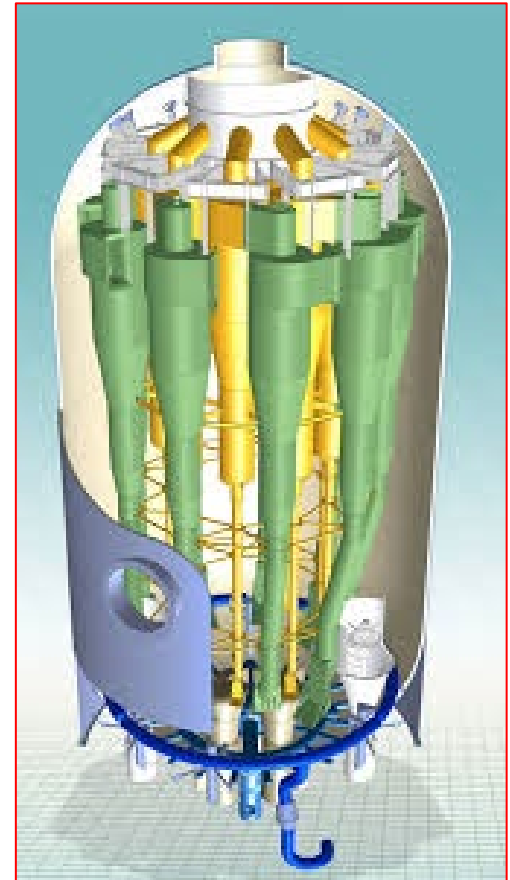
- a) cyclone of FCCU
- b) Plenum of FCCU
- c) Riser of FCCU
- d) None of the above

Enclosure inside the top head of a reactor or regenerator vessel which supports the cyclones and in which gases exiting the cyclone outlets are collected is called

- a) cyclone of FCCU
- b) Plenum of FCCU
- c) Riser of FCCU
- d) None of the above

Abrasion resistant lining on hex-mesh is widely in practice on the following equipment

- a) SRU thermal incinerator
- b) Coke oven battery
- c) FCCU Cyclones
- d) WHB tube sheet



Abrasion resistant lining on hex-mesh is widely in practice on the following equipment

a) SRU thermal incinerator

b) Coke oven battery

c) FCCU Cyclones

d) WHB tube sheet

Section of transfer line in which flow is in an upward direction is called

- a) cyclone of FCCU
- b) Plenum of FCCU
- c) Riser of FCCU
- d) None of the above

Section of transfer line in which flow is in an upward direction is called

- a) cyclone of FCCU
- b) Plenum of FCCU
- c) **Riser of FCCU**
- d) None of the above

The temperature of the air and shell at the refractory installation site shall be:

A) Between 32°F and 90°F (0°C and 32°C) during refractory installation & for 24 hrs thereafter

B) Between 50°F and 90°F (10°C and 32°C) during refractory installation & for 24 hrs thereafter

C) Between 70°F and 90°F (21°C and 32°C) during refractory installation & for 24 hrs thereafter

D) Between 75°F and 90°F (24°C and 32°C) during refractory installation & for 24 hrs thereafter

During cold weather, what can be done to maintain refractory application temperatures above the minimum required for the air and shell?

- A) Heating metal only is permitted
- B) Heating and / or use of external insulation is allowed
- C) Heating in an enclosure only
- D) None of these meet the requirements of API 936

During cold weather, what can be done to maintain refractory application temperatures above the minimum required for the air and shell?

- A) Heating metal only is permitted
- B) Heating and / or use of external insulation is allowed
- C) Heating in an enclosure only
- D) None of these meet the requirements of API 936

Temperature limits for refractory & mix water shall be per manufacturer's requirements. In the absence of manufacturer's mix temperature limits, mix temperatures shall be between:

- A) Between 32°F and 90°F (0°C and 32°C)
- B) Between 50°F and 90°F (10°C and 32°C)
- C) Between 60°F and 80°F (15°C and 27°C)
- D) Between 70°F and 90°F (21°C and 32°C)

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- C) Between 60°F and 80°F (15°C and 27°C)
- D) Between 70°F and 90°F (21°C and 32°C)

An atmosphere that, at high temperature, lowers the state of oxidation of exposed material is

- a) Basic atmosphere
- b) Oxidizing atmosphere
- c) Reducing atmosphere
- d) Acidic atmosphere

An atmosphere that, at high temperature, lowers the state of oxidation of exposed material is

a) Basic atmosphere

b) Oxidizing atmosphere

c) Reducing atmosphere

d) Acidic atmosphere

At the refractory application site, the temperature of the air and shell to be between

- a) 50F (10oC) minimum and 90F (32oC) maximum
- b) 52F (11oC) minimum and 92F (33oC) maximum
- c) 59F (15oC) minimum and 104F (40oC) maximum
- d) 48F (8oC) minimum and 86F (30oC) maximum

At the refractory application site, the temperature of the air and shell to be between

a) 50F (10oC) minimum and 90F (32oC) maximum

b) 52F (11oC) minimum and 92F (33oC) maximum

c) 59F (15oC) minimum and 104F (40oC) maximum

d) 48F (8oC) minimum and 86F (30oC) maximum

During hot weather, what can be done to maintain refractory application temperatures below the maximum required for the air and shell?

- A) Air conditioning only is allowed
- B) Shading the area (enclosure) only is allowed
- C) Water spraying only is allowed
- D) Shading, water spray & A/C use is permitted

During hot weather, what can be done to maintain refractory application temperatures below the maximum required for the air and shell?

- A) Air conditioning only is allowed
- B) Shading the area (enclosure) only is allowed
- C) Water spraying only is allowed
- D) Shading, water spray & A/C use is permitted

The application of wet mixed castable refractory by placing (possibly with the aid of vibration), pouring, or rodding is called:

- A) Casting
- B) Hand Packing
- C) Pump Casting
- D) Vibration Casting

The application of wet mixed castable refractory by placing (possibly with the aid of vibration), pouring, or rodding is called:

- A) Casting
- B) Hand Packing
- C) Pump Casting
- D) Vibration Casting

During vibration casting the time between successive mix to be no more than

- a) 20 minutes
- b) 15 minutes
- c) 12 minutes
- d) 10 minutes

During vibration casting the time between successive mix to be no more than

- a) 20 minutes
- b) 15 minutes
- c) 12 minutes
- d) 10 minutes

The application of monolithic refractories by means of air placement guns is

- a) Gunning
- b) Placing
- c) Pouring
- d) casting

The application of monolithic refractories by means of air placement guns is

a) Gunning

b) Placing

c) Pouring

d) casting

The inclination of pneumatic gunning test panel approximately 6 ft (1.9 m) above ground level is

- a) 30 degrees
- b) 45 degrees
- c) 40 degrees
- d) 35 degrees



The inclination of pneumatic gunning test panel approximately 6 ft (1.9 m) above ground level is

a) 30 degrees

b) 45 degrees

c) 40 degrees

d) 35 degrees



One of the main disadvantage of gunning application is

- a) Rapid installation
- b) No form work is required
- c) High level of rebound
- d) No vibration



One of the main disadvantage of gunning application is

- a) Rapid installation
- b) No form work is required
- c) High level of rebound
- d) No vibration



Test panels for pneumatic gunning are inclined above the horizontal at an angle of

- a) 45°
- b) 30°
- c) 60°
- d) None of the above

Test panels for pneumatic gunning are inclined above the horizontal at an angle of

- a) 45 °
- b) 30 °
- c) 60 °
- d) None of the above

The standard size of a fabricated test panel for pneumatic gunning qualification is:

- a) (500 mm x 500 mm)
- b) (600 mm x 600 mm) 24 " x 24"
- c) (700 mm x 700 mm)
- d) None of the above

The standard size of a fabricated test panel for pneumatic gunning qualification is:

- a) (500 mm x 500 mm)
- b) (600 mm x 600 mm) 24 " x 24"
- c) (700 mm x 700 mm)
- d) None of the above

Gunning test panels are constructed with removable backs as required
For

- a) laboratory test
- b) visual inspection of the castable
- c) physical property test
- d) None of the above

Gunning test panels are constructed with removable backs as required
For

- a) laboratory test
 - b) visual inspection of the castable
 - c) physical property test
 - d) None of the above
- 

Downward gunning below horizontal is prohibited unless agreed to otherwise by the Owner, beyond

- a) 30 degrees
- b) 25 degrees
- c) 40 degrees
- d) 35 degrees



Downward gunning below horizontal is prohibited unless agreed to otherwise by the Owner, beyond

a) 30 degrees

b) 25 degrees

c) 40 degrees

d) 35 degrees



Individual at the point of application in a dry gun operation who controls water addition is called as

- a) Water man
- b) Gun man
- c) Nozzle man
- d) Spray man

Individual at the point of application in a dry gun operation who controls water addition is called as

a) Water man

b) Gun man

c) Nozzle man

d) Spray man

A plane of weakness within installation monolithic refractory lining by gunning that is parallel to the hotface of the lining and permits separation into layers is

- a) Crack
- b) Pinch spalling
- c) Lamination
- d) Segregation



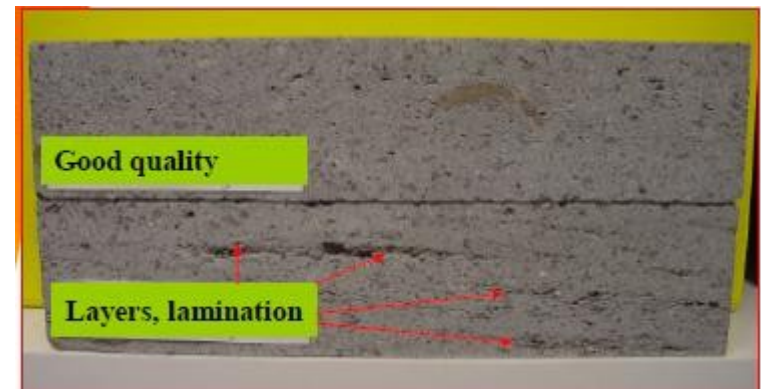
A plane of weakness within installation monolithic refractory lining by gunning that is parallel to the hotface of the lining and permits separation into layers is

a) Crack

b) Pinch spalling

c) Lamination

d) Segregation



Bad gunning!

No test possible!

Individual in a dry gun operation who controls material charging, flow rate and air flow is called as

- a) Nozzle man
- b) Gun man
- c) Crafts man
- d) Air Controller

Individual in a dry gun operation who controls material charging, flow rate and air flow is called as

a) Nozzle man

b) Gun man

c) Crafts man

d) Air Controller

A standard brick shape whose thickness tapers along its width is called as

- a) Arch brick
- b) Key brick
- c) Wedge brick
- d) Standard brick



A standard brick shape whose thickness tapers along its width is called as

a) Arch brick

b) Key brick

c) Wedge brick

d) Standard brick



A standard brick shape whose width tapers along its length is

a) Key brick

b) Wedge

c) Arch

d) Flat curve



A standard brick shape whose width tapers along its length is

a) Key brick

b) Wedge

c) Arch

d) Flat curve



Fireclay brick which has a PCE not lower than Cone 15, nor higher than Cone 28 - 29 is

- a) Super-duty fireclay brick
- b) Medium-duty fireclay brick
- c) Low-duty fireclay brick
- d) High-duty fireclay brick



Fireclay brick which has a PCE not lower than Cone 15, nor higher than Cone 28 - 29 is

- a) Super-duty fireclay brick
- b) Medium-duty fireclay brick
- c) Low-duty fireclay brick
- d) High-duty fireclay brick

The pyrometric cone reports refractories in terms of

- a) Density
- b) Thermal Expansion
- c) Temperature
- d) Conduction



The pyrometric cone reports refractories in terms of

a) Density

b) Thermal Expansion

c) Temperature

d) Conduction



Fireclay brick which has a PCE not lower than Cone 33, and which meet certain other requirements as outlined in ASTM C 27 is

- a) Super duty Firebrick
- b) Semi-silica brick
- c) Low duty Firebrick
- d) Medium duty Firebrick

Fireclay brick which has a PCE not lower than Cone 33, and which meet certain other requirements as outlined in ASTM C 27 is

a) Super duty Firebrick

b) Semi-silica brick

c) Low duty Firebrick

d) Medium duty Firebrick

A decorative blue wavy line that starts at the bottom left, curves downwards, and then rises towards the bottom right, ending near the right edge of the slide.

A fireclay brick which has a PCE value not lower than Cone 29, and not higher than 31 to 31 ½ is

- a) Medium duty Firebrick
- b) Low duty Firebrick
- c) High duty Firebrick
- d) Normal Firebrick

A fireclay brick which has a PCE value not lower than Cone 29, and not higher than 31 to 31 ½ is

a) Medium duty Firebrick

b) Low duty Firebrick

c) High duty Firebrick

d) Normal Firebrick

The party or individual who has no commercial affiliation with the contractor or manufacturer, unless otherwise agreed by the owner is

- a) Contractor
 - b) Inspector
 - c) Supervisor
 - d) Engineer
- 
- A decorative blue wavy line that starts at the bottom left, dips down, and then rises towards the bottom right, spanning the width of the page.

The party or individual who has no commercial affiliation with the contractor or manufacturer, unless otherwise agreed by the owner is

a) Contractor

b) Inspector

c) Supervisor

d) Engineer



Scheduling of material qualification tests and delivery of those materials and test results to the site is the responsibility of

- a) Independent laboratory
- b) Inspector
- c) Contractor
- d) Owner

Scheduling of material qualification tests and delivery of those materials and test results to the site is the responsibility of

a) Independent laboratory

b) Inspector

c) Contractor

d) Owner

Demonstration of capabilities in simulated installation by the Contractor, which is witnessed and inspected by the Inspector, is

- a) Material qualification
- b) As-installed testing
- c) Applicator qualification
- d) Specification qualification

Demonstration of capabilities in simulated installation by the Contractor, which is witnessed and inspected by the Inspector, is

a) Material qualification

b) As-installed testing

c) Applicator qualification

d) Specification qualification

The test specimen of castable refractory for cold crushing strength shall be

- a) 2 in. (51mm) cubes
- b) Cylinders, 2 in. (51mm) in dia. by 2 in. (51 mm) height.
- c) a or b
- d) none of the above

The test specimen of castable refractory for cold crushing strength shall be

a) 2 in. (51mm) cubes

b) Cylinders, 2 in. (51mm) in dia. by 2 in. (51 mm) height.

c) a or b

d) none of the above

Regarding specimen preparation for tests, Specimens shall be dried and fired as required by the testing procedure and Oven drying* requires what hold time at what temperature?

- A) Hold for 12 hrs minimum at 220°F to 230°F (104°C to 110°C) in forced air, convection dryer.
- B) Hold for 24 hrs minimum at 300°F to 320°F (160°C to 170°C) in forced air, convection dryer.
- C) Hold for 24 hrs minimum at 220°F to 230°F (104°C to 110°C) in forced air, convection dryer.
- D) Hold for 12 hrs minimum at 300°F to 320°F (160°C to 170°C) in forced air, convection dryer.

Regarding specimen preparation for tests, Specimens shall be dried and fired as required by the testing procedure and Oven drying* requires what hold time at what temperature?

- A) Hold for 12 hrs minimum at 220°F to 230°F (104°C to 110°C) in forced air, convection dryer.
- B) Hold for 24 hrs minimum at 300°F to 320°F (160°C to 170°C) in forced air, convection dryer.
- C) Hold for 24 hrs minimum at 220°F to 230°F (104°C to 110°C) in forced air, convection dryer.
- D) Hold for 12 hrs minimum at 300°F to 320°F (160°C to 170°C) in forced air, convection dryer.

All the samples for CCs test must be dried at 220 to 230°C (105 to 110°C) for

- a) 12 hrs (overnight)
- b) 18 hrs (overnight)
- c) 20 hrs (overnight)
- d) 24 hrs (overnight)

All the samples for CCs test must be dried at 220 to 230°C (105 to 110°C) for

- a) 12 hrs (overnight)
- b) 18 hrs (overnight)
- c) 20 hrs (overnight)
- d) 24 hrs (overnight)

Regarding specimen preparation for tests, Specimens shall be dried and fired as required by the testing procedure and Oven firing* requires what hold times at what temperature?

- A) Heat 220°F/hr (104°C/hr) to 700°F max (370°C), 5 hr hold, Cool at 220°F/hr (104°C/hr) max
- B) Heat 300°F/hr (170°C/hr) to 1500°F max (815°C), 5 hr hold, Cool at 300°F/hr (170°C/hr) max
- C) Heat 300°F/hr (170°C/hr) to 1500°F max (815°C), 5 hr hold, Cool at 500°F/hr (280°C/hr) max
- D) Heat 220°F/hr (104°C/hr) to 700°F max (370°C), 5 hr hold, Cool at 300°F/hr (170°C/hr) ma

Regarding specimen preparation for tests, Specimens shall be dried and fired as required by the testing procedure and Oven firing* requires what hold times at what temperature?

A) Heat 220°F/hr (104°C/hr) to 700°F max (370°C), 5 hr hold, Cool at 220°F/hr (104°C/hr) max

B) Heat 300°F/hr (170°C/hr) to 1500°F max (815°C), 5 hr hold, Cool at 300°F/hr (170°C/hr) max

C) Heat 300°F/hr (170°C/hr) to 1500°F max (815°C), 5 hr hold, Cool at 500°F/hr (280°C/hr) max

D) Heat 220°F/hr (104°C/hr) to 700°F max (370°C), 5 hr hold, Cool at 300°F/hr (170°C/hr) ma

The application of monolithic refractories by means of air placement guns is

- a) Gunning
- b) Placing
- c) Pouring
- d) Casting



The application of monolithic refractories by means of air placement guns is

- a) Gunning
- b) Placing
- c) Pouring
- d) Casting

Flocculating agent means

A chemical additive causing rapid stiffening of fluid refractory castables

A non reactive coating applied to freshly installed cementitious materials

Phosphate bonded plastics

None of the above.



Flocculating agent means

A chemical additive causing rapid stiffening of fluid refractory castables

A non reactive coating applied to freshly installed cementitious materials

Phosphate bonded plastics

None of the above.



Ramming means:

- a) The use of compressive force or impact to deform a stiff refractory mix.
 - b) Castable installation technique by way of pumping castable to installation site
 - c) A technique used with dry gunning machine
 - d) A castable installation technique by packing successive handfulls of material to the desired shape.
- 

Ramming means:

- a) The use of compressive force or impact to deform a stiff refractory mix.
 - b) Castable installation technique by way of pumping castable to installation site
 - c) A technique used with dry gunning machine
 - d) A castable installation technique by packing successive handfuls of material to the desired shape.
- 

Temporary containments used in gunning that are set up and secured to provide a firm surface on which to make perpendicular cold joints at the termination of work areas is known as

Dry gunning

Shot board

Wet gunning

Cut Back Effect

A decorative blue wavy line that starts at the bottom left, curves upwards, and then levels out towards the bottom right.

Temporary containments used in gunning that are set up and secured to provide a firm surface on which to make perpendicular cold joints at the termination of work areas is known as

Dry gunning

Shot board

Wet gunning

Cut Back Effect

Testing of refractory materials sampled from the installation to confirm that they meet specified physical property standards mean

As-installed testing

laboratory testing

application qualification testing

compliance data sheet

Testing of refractory materials sampled from the installation to confirm that they meet specified physical property standards mean

As-installed testing

laboratory testing

application qualification testing

compliance data sheet

Ramming means

The use of compressive force or impact to deform a stiff refractory mix.

Castable installation technique by way of pumping castable to installation site

A technique used with dry gunning machine

A castable installation technique by packing successive handfuls of material to the desired shape.

Ramming means

The use of compressive force or impact to deform a stiff refractory mix.

Castable installation technique by way of pumping castable to installation site

A technique used with dry gunning machine

A castable installation technique by packing successive handfuls of material to the desired shape.

The objective of the material qualification is

Confirm that the specifications, good practice and installation procedures are followed.

Confirm that agreed procedure is followed.

Confirm that the installed linings meet specification standards.

Confirm that materials manufactured for the job meet the specified physical property standards.

The objective of the material qualification is

Confirm that the specifications, good practice and installation procedures are followed.

Confirm that agreed procedure is followed.

Confirm that the installed linings meet specification standards.

Confirm that materials manufactured for the job meet the specified physical property standards.

Preparing detailed specification related to using products, thickness, etc is responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Preparing detailed specification related to using products, thickness, etc is responsibility of_____

Owner

Contractor

Inspector

Manufacturer

The term that describes the condition of pre-set refractory in which gravitational forces cause it to lose its desired shaped is called

- a) Bloating
- b) Punky
- c) Slumping
- d) none of the above

The term that describes the condition of pre-set refractory in which gravitational forces cause it to lose its desired shaped is called

a) Bloating

b) Punky

c) Slumping

d) none of the above

Approval of engineering drawings & execution plan & dry out procedures is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Approval of engineering drawings & execution plan & dry out procedures is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Preparation & execution plan is responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Preparation & execution plan is responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Sampling frequency as applicable for the products intended use in either erosion service or other service is responsibility of ____

Contractor

Owner

Inspector

Manufacturer

Sampling frequency as applicable for the products intended use in either erosion service or other service is responsibility of ____

Contractor

Owner

Inspector

Manufacturer

Additives used in refractory to improve applied lining toughness and shrinkage crack distribution:

- a) Metal fiber
- b) Organic fiber
- c) Mineral fiber
- d) None of the above

Additives used in refractory to improve applied lining toughness and shrinkage crack distribution:

- a) Metal fiber
- b) Organic fiber
- c) Mineral fiber
- d) None of the above

Execution plan should include_____

Required lining thickness tolerance

Cutting & dry out procedures

Designation of inspection hold points & the required advanced notification to be given to the inspector

Material and applicator qualification test results

Execution plan should include_____

Required lining thickness tolerance

Cutting & dry out procedures

Designation of inspection hold points & the required advanced notification to be given to the inspector

Material and applicator qualification test results

Which statement is NOT TRUE regarding ORGANIC FIBERS used in refractories?

- A) They are composed of low-temp melting organic materials (polypropylene or polyethylene)
- B) They are added to refractory to enhance moisture release by burning out on initial Dryout
- C) They are added to refractory to increase permeability by leaving tiny interconnected voids
- D) They blend into plastic refractory during mixing at 1 volume percent (1 wt % - 4 wt %)

Which statement is NOT TRUE regarding ORGANIC FIBERS used in refractories?

A) They are composed of low-temp melting organic materials (polypropylene or polyethylene)

B) They are added to refractory to enhance moisture release by burning out on initial Dryout

C) They are added to refractory to increase permeability by leaving tiny interconnected voids

D) They blend into plastic refractory during mixing at 1 volume percent (1 wt % - 4 wt %)

Submission to the owner of all exceptions, substitutions & deviation of the requirements of execution plan, API 936 Standard & other referenced documents is the responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Submission to the owner of all exceptions, substitutions & deviation of the requirements of execution plan, API 936 Standard & other referenced documents is the responsibility of_____

Contractor

Inspector

Owner

Manufacturer

A condition describing a refractory lining that is soft and friable

- a) Bloating
- b) Plunky
- c) Slumping
- d) None of the above

A condition describing a refractory lining that is soft and friable

a) Bloating

b) Plunky

c) Slumping

d) None of the above

Deciding required lining thickness tolerances is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Deciding required lining thickness tolerances is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Documentation of material & applicator qualification test results is the responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Documentation of material & applicator qualification test results is the responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Specifying physical property requirement to be used for qualification & installation quality control by specific product installation method & location where the product will be utilized is the responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Specifying physical property requirement to be used for qualification & installation quality control by specific product installation method & location where the product will be utilized is the responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Providing inspector verified documentation of installation records is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Providing inspector verified documentation of installation records is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Deciding criteria for hammer testing & the extent of cracking & surface voids permitted is the responsibility of__

Owner

Contractor

Inspector

Manufacturer

Deciding criteria for hammer testing & the extent of cracking & surface voids permitted is the responsibility of__

Owner

Contractor

Inspector

Manufacturer

Submission of verified documentation of weather conditions & any other unusual conditions of occurrences & dry out records is responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Submission of verified documentation of weather conditions & any other unusual conditions of occurrences & dry out records is responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Providing a compliance data sheet in accordance with Annex C for each product is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Providing a compliance data sheet in accordance with Annex C for each product is responsibility of_____

Contractor

Inspector

Owner

Manufacturer

Providing inspector verified documentation of installation records related to fiber & water percentage is responsibility of___

Contractor

Inspector

Owner

Manufacturer

Providing inspector verified documentation of installation records related to fiber & water percentage is responsibility of___

Contractor

Inspector

Owner

Manufacturer

The process of bond formation in a newly installed monolithic refractory is called:

- A) Dry out
- B) Curing
- C) Setting
- D) Firing

The process of bond formation in a newly installed monolithic refractory is called:

A) Dry out

B) Curing

C) Setting

D) Firing

Recording all non-conformances and/or potential problems is the responsibility of_____

Owner

Contractor

Inspector

Manufacturer

Recording all non-conformances and/or potential problems is the responsibility of_____

Owner

Contractor

Inspector

Manufacturer

In case of casting, the mock up should be cured for

12 hrs minimum prior to stripping the forms

24 hrs minimum prior to stripping the forms

8 hrs minimum prior to stripping the forms

None of the above

In case of casting, the mock up should be cured for

12 hrs minimum prior to stripping the forms

24 hrs minimum prior to stripping the forms

8 hrs minimum prior to stripping the forms

None of the above

For Dry gunning, optimum water addition at mixer, mixing time and aging of prewetted material shall be as per recommendations of _____

Owner's recommendation

Contractor's recommendation

Manufacturer's recommendation

Inspector's recommendation

For Dry gunning, optimum water addition at mixer, mixing time and aging of prewetted material shall be as per recommendations of _____

Owner's recommendation

Contractor's recommendation

Manufacturer's recommendation

Inspector's recommendation

Arrange for testing at either an independent laboratory or the manufacturer's plant is

- a) Owner responsibility
- b) Inspector responsibility
- c) Contractor responsibility
- d) Manufacturer responsibility

Arrange for testing at either an independent laboratory or the manufacturer's plant is

- a) Owner responsibility
- b) Inspector responsibility
- c) Contractor responsibility
- d) Manufacturer responsibility

Pyrometric cone is a three sided truncated pyramid

Has

Base $5/8$ in (16 mm) wide and $2\ 5/8$ in (66 mm) in height.

Base $1\ 1/8$ in (29 mm) wide and $3/8$ in (10 mm) in height.

Pyrometric cone is a three sided truncated pyramid

Has

Base $5/8$ in (16 mm) wide and $2\ 5/8$ in (66 mm) in height.

Base $1\ 1/8$ in (29 mm) wide and $3/8$ in (10 mm) in height.

Additives used to facilitate moisture removal of refractory linings during dry out is called

- a) metal fiber
- b) organic fiber
- c) mineral fiber
- d) none of the above

Additives used to facilitate moisture removal of refractory linings during dry out is called

a) metal fiber

b) organic fiber

c) mineral fiber

d) none of the above

Drying out of refractory the cooling down rates shall not exceed

- a) 75 deg F / HR (42 DEG C / HR)
- b) 50 deg F / HR (28 DEG C / HR)
- c) 100 deg F / HR (56 DEG C / HR)
- d) None of the above

Drying out of refractory the cooling down rates shall not exceed

- a) 75 deg F / HR (42 DEG C / HR)
- b) 50 deg F / HR (28 DEG C / HR)
- c) 100 deg F / HR (56 DEG C / HR)
- d) None of the above

Submission of verified documentation of weather conditions & any other unusual conditions of occurrences & dry out records is responsibility of

- a) Owner
- b) Contractor
- c) Inspector
- d) Manufacturer

Submission of verified documentation of weather conditions & any other unusual conditions of occurrences & dry out records is responsibility of

- a) Owner
- b) Contractor
- c) Inspector
- d) Manufacturer

The process of heating refractories to develop desired properties is called:

- A) Dryout
- B) Curing
- C) Setting
- D) Firing

The process of heating refractories to develop desired properties is called:

A) Dryout

B) Curing

C) Setting

D) Firing

The initial heating of a newly installed castable lining in which heating rates and hold times are controlled to safely remove retained water without explosive spalling and to form a well distributed network of shrinkage cracks in the lining is called:

- A) Dryout
- B) Curing
- C) Setting
- D) Firing

The initial heating of a newly installed castable lining in which heating rates and hold times are controlled to safely remove retained water without explosive spalling and to form a well distributed network of shrinkage cracks in the lining is called:

- A) Dryout
- B) Curing
- C) Setting
- D) Firing

The hardening of a refractory that occurs with time and/or temperature is called:

- A) Dryout
- B) Curing
- C) Setting
- D) Firing

The hardening of a refractory that occurs with time and/or temperature is called:

A) Dryout

B) Curing

C) Setting

D) Firing

Approval of engineering drawings & execution plan & dry out procedures is responsibility of

- a) Contractor
- b) Inspector
- c) Owner
- d) Manufacturer

Approval of engineering drawings & execution plan & dry out procedures is responsibility of

a) Contractor

b) Inspector

c) Owner

d) Manufacturer

Drying out index for conventional castable refractories of density less than 75 lbs / cu ft (1200 kg / cu mtr) is

- a) 23 Hours
- b) 31 Hours
- c) 40 Hours
- d) None of the above

Drying out index for conventional castable refractories of density less than 75 lbs / cu ft (1200 kg / cu mtr) is

- a) 23 Hours
- b) 31 Hours
- c) 40 Hours
- d) None of the above

. For drying out of conventional castable refractories, for arefractory density of 75 lbs/cu ft (1200 kg/cu mtr) the drying out initial temperature to the first hold is at

- a) 250 deg F to 300 deg F (122 deg C to 150 deg C)
- b) 600 deg F to 700 deg F (318 deg C to 374 deg C)
- c) 1300 deg F to 1500 deg F (710 deg C to 815 deg C)
- d) 1000 deg F to 1050 deg F (542 deg C to 565 deg C)

. For drying out of conventional castable refractories, for arefractory density of 75 lbs/cu ft (1200 kg/cu mtr) the drying out initial temperature to the first hold is at

- a) 250 deg F to 300 deg F (122 deg C to 150 deg C)
- b) 600 deg F to 700 deg F (318 deg C to 374 deg C)
- c) 1300 deg F to 1500 deg F (710 deg C to 815 deg C)
- d) 1000 deg F to 1050 deg F (542 deg C to 565 deg C)

For deciding dry out index for a unit or vessel having multiple refractories the dry out should be based on

- a) the refractory that has the longest duration requirement for the maximum thickness at each stage of dry out
- b) the refractory that has the shortest duration requirement for the maximum thickness at each stage of dry out
- c) the refractory that has the average duration requirement for the maximum thickness at each stage of dry out
- d) the manufacturer's recommendations

For deciding dry out index for a unit or vessel having multiple refractories the dry out should be based on

- a) the refractory that has the longest duration requirement for the maximum thickness at each stage of dry out
- b) the refractory that has the shortest duration requirement for the maximum thickness at each stage of dry out
- c) the refractory that has the average duration requirement for the maximum thickness at each stage of dry out
- d) the manufacturer's recommendations

For dry out of conventional castable refractories the:

- a) Dry out index increases with refractory density
- b) Dry out index decreases with refractory index
- c) Dry out index remains unchanged irrespective of refractory index
- d) None of the above

For dry out of conventional castable refractories the:

- a) Dry out index increases with refractory density
- b) Dry out index decreases with refractory index
- c) Dry out index remains unchanged irrespective of refractory index
- d) None of the above

The term that describes defect that can occur in plastic refractory lining systems caused by steam pockets entrapped in the pore structure is:

- a) Bloating
- b) Punky
- c) Slumping
- d) none of the above



The term that describes defect that can occur in plastic refractory lining systems caused by steam pockets entrapped in the pore structure is:

- a) **Bloating**
- b) Punky
- c) Slumping
- d) none of the above

Refractory failure mechanism are.

- a) erosion and corrosion
- b) thermal shock and mechanical abuse
- c) overheating and chemical attack
- d) all of the above

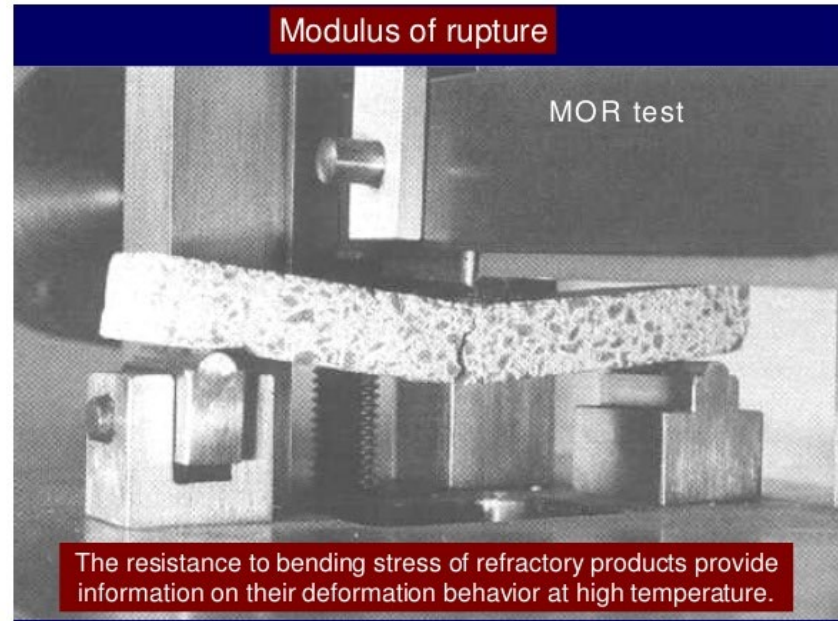


Refractory failure mechanism are.

- a) erosion and corrosion
- b) thermal shock and mechanical abuse
- c) overheating and chemical attack
- d) all of the above

For modules of rupture test of brick and shapes, the preferred test specimen shall be standard

- a) 50 x 50 x 225mm
- b) 150 x 114 x 76mm
- c) 200 x 150 x 76mm
- d) None of the above



For modules of rupture test of brick and shapes, the preferred test specimen shall be standard

a) 50 x 50 x 225mm

b) 150 x 114 x 76mm

c) 200 x 150 x 76mm

d) None of the above

For fire clay and some high alumina materials, the most commonly used index of refractoriness is known as:

- a) Refractoriness
- b) Pyrometric cone equivalent
- c) Refractoriness under load
- d) None of the above.

For fire clay and some high alumina materials, the most commonly used index of refractoriness is known as:

- a) Refractoriness
- b) Pyrometric cone equivalent
- c) Refractoriness under load
- d) None of the above.

In API RP 936, the referenced ASTM standard procedure for cold crushing strength and modules of rupture is

- a) C133
- b) C704
- c) C181
- d) None of the above



In API RP 936, the referenced ASTM standard procedure for cold crushing strength and modules of rupture is

- a) C133
 - b) C704
 - c) C181
 - d) None of the above
- 

Standard test method for abrasion resistance of refractory materials at room temperature is

- a) C 181
- b) C 704
- c) C 133
- d) None of the above



Standard test method for abrasion resistance of refractory materials at room temperature is

a) C 181

b) C 704

c) C 133

d) None of the above

As per API recommended practice 936, the standard test method for reheat change of refractory brick is

- a) C113
 - b) C 133
 - c) C 181
 - d) none of the above
- 

As per API recommended practice 936, the standard test method for reheat change of refractory brick is

- a) C113
 - b) C 133
 - c) C 181
 - d) none of the above
- 

API 936, standard test method for workability index of fire clay and high alumina plastic refractories is

- a) C 113
 - b) C 133
 - c) C 181
 - d) None of the above
- 

API 936, standard test method for workability index of fire clay and high alumina plastic refractories is

a) C 113

b) C 133

c) C 181

d) None of the above

A decorative blue wavy line that starts at the bottom left, curves downwards, and then rises towards the bottom right, ending near the right edge of the slide.

API 936 documentation should content

- a) Execution details
- b) Design details
- c) Quality standards
- d) All above



API 936 documentation should content

- a) Execution details
- b) Design details
- c) Quality standards
- d) All above

Plastic refractory should

have low emissivity

have low drying and firing shrinkage

have high workability

have a high fusion point



Plastic refractory should

have low emissivity

have low drying and firing shrinkage

have high workability

have a high fusion point



The main cause of spalling is

Slag attack

Differential expansion

Poor Design

High thermal conductivity



The main cause of spalling is

Slag attack

Differential expansion

Poor Design

High thermal conductivity



Spalling

- Thermal shock: The exposure of a material or body to a rapid change in temperature which may have deleterious effect.
- Thermal spalling: Spalling which occurs as the result of stresses caused by non-uniform heating and/or cooling.
- Explosive spalling: A sudden spalling which occurs as the result of a build-up of **steam pressure** caused by too rapid heating of a castable refractory on first firing.
- Sheeting: Spalling of layers from the hot face of a refractory lining.

Spalling that occurs as result of stresses caused by non-uniform heating/cooling is:

- A) Thermal shock
- B) Thermal spalling
- C) Creep
- D) Fluxing



Spalling that occurs as result of stresses caused by non-uniform heating/cooling is:

A) Thermal shock

B) Thermal spalling

C) Creep

D) Fluxing



The deviation of the surface of a refractory shape from that intended, caused by bending or bowing during manufacture is called:

- A) Slumping
- B) Plastic deformation
- C) Creep
- D) Warpage



Refractory Installation Methods – Gunning Application

In a wet gunning operation, the nozzleman controls flocculant and possibly air via a valve

wet gunning: Pneumatic placement of premixed castables (including water) where flocculating agents and placement air are added at the nozzle.



Punky*: A refractory lining that is abnormally soft and friable.

Slumping: Condition of preset refractory in which gravitational forces cause it to lose its desired shape

The deviation of the surface of a refractory shape from that intended, caused by bending or bowing during manufacture is called:

A) Slumping

B) Plastic deformation

C) Creep

D) Warpage



The selected compression test section of specimen for CCs test shall be free from

- a) Cracks
- b) Chipped surfaces
- c) Other obvious defects
- d) All of the above

Chipped surface



The selected compression test section of specimen for CCs test shall be free from

- a) Cracks
- b) Chipped surfaces
- c) Other obvious defects
- d) All of the above

To compose a sample for modulus of rupture test from an equivalent number of refractory shapes, the specimen should be

- a) At least two
- b) At least three
- c) At least four
- d) At least five

To compose a sample for modulus of rupture test from an equivalent number of refractory shapes, the specimen should be

- a) At least two
- b) At least three
- c) At least four
- d) At least five



C133 – 97 (2015)

6. Procedure

6.1 At least five specimens from an equivalent number of refractory shapes compose a sample.

The test specimen of castable refractory for cold crushing strength shall be

- a) 2 in. (51mm) cubes
- b) Cylinders, 2 in. (51mm) in dia. by 2 in. (51 mm) height.
- c) a or b
- d) none of the above

The test specimen of castable refractory for cold crushing strength shall be

- a) 2 in. (51mm) cubes
- b) Cylinders, 2 in. (51mm) in dia. by 2 in. (51 mm) height.
- c) a or b
- d) none of the above

The test specimen of castable refractory for cold crushing strength shall be

a) 2 in. (51mm) cubes

b) Cylinders, 2 in. (51mm) in dia. by 2 in. (51 mm) height.

c) a or b

d) none of the above

5.3 *Castable Refractories*—The test specimens shall be 2- by 2- by 2-in. (51- by 51- by 51-mm) cubes or cylinders 2 in. (51 mm) in diameter by 2 in. (51 mm) high, prepared by casting or gunning. It is permissible to prepare one specimen from each 9- by 2- by 2-in. (230- by 51- by 51-mm) bar after the modulus of rupture test (see Sections 9 – 14). The selected compression test section shall be free of cracks, chipped surfaces, and other obvious defects. The loaded surfaces shall be approximately parallel planes. All samples must be dried at 220 to 230°F (105 to 110°C) for 18 h (overnight). Upon removal from the oven, allow the sample to cool naturally until cool to the touch. Complete testing within 2 h of removal from the drying oven. (See Practices C862 and C1054.)

As per ASTM C- 704, for the erosion tests, silicon carbide grit to be used by

- a) one time
- b) two time
- c) three time
- d) None of the above

As per ASTM C- 704, for the erosion tests, silicon carbide grit to be used by

- a) one time
- b) two time
- c) three time
- d) None of the above

The air pressure to blast the 1000 g of size graded silicon carbide grain for abrasion resistance test should be

- a) 448 KPa (65 PSi)
- b) 450 KPa
- c) 400 KPa
- d) None of the above

The air pressure to blast the 1000 g of size graded silicon carbide grain for abrasion resistance test should be

a) 448 KPa (65 PSi)

ASTM C704

b) 450 KPa

c) 400 KPa

d) None of the above

a specimen 10 mm inside diameter.

5.1.2 Air Pressure—Variation in the test air pressure statistically affected the abrasion values obtained on the glass plate. Air pressure as specified in this test method is 448 kPa [65 psi] measured by a gauge capable to ± 6.9 kPa [± 1 psi]. For the ruggedness test, air pressure was maintained at values of 441 kPa [64 psi] and 455 kPa [66 psi] by the use of a calibrated master series pressure gauge. Take the statistically significant effect of this small air pressure variation into consideration and use only gauges as specified in 6.1.5. It is also recommended that air gauges be recalibrated at frequent intervals.

In abrasion test method the amount of size graded Silicon Carbide grain is

- a) 1000 grams
- b) 1500 grams
- c) 448 grams
- d) 1800 grams

In abrasion test method the amount of size graded Silicon Carbide grain is

a) 1000 grams

b) 1500 grams

c) 448 grams

d) 1800 grams

erosion resistance (as applies to ASTM C704 test results): Volume of refractory loss, as measured in cubic centimeters, after abrading the surface of a test specimen with 1000 g of silicon carbide (SiC) grit in accordance with ASTM C704. The lower the amount of cubic centimeters lost, the higher the erosion resistance of the refractory.

For Abrasion media in ASTM C-704 is having screen analysis as shown in

- a) Table 1
- b) Table 2
- c) No. 16 Grit silicon carbide
- d) No.30 Grit silicon carbide

For Abrasion media in ASTM C-704 is having screen analysis as shown in

a) Table 1

b) Table 2

c) No. 16 Grit silicon carbide

d) No.30 Grit silicon carbide

6.1.6 *Abrading Media*—New (unused), sharp (angular, jagged edged grains), No. 36 grit silicon carbide containing minimal foreign material and having a screen analysis as shown in Table 1. Verify the sizing of the grit by either user confirmation of the screen analysis or a certificate of conformance from the supplier. Take care to avoid segregation in large containers of abrading media. Splitting (possibly with use of a riffler) or another similar procedure and reblending may be necessary to obtain a grit sample conforming to the required screen analysis.

Fusion or melting of substance as a result of chemical action is called:

- A) Thermal shock
- B) Thermal spalling
- C) Creep
- D) Fluxing

Fusion or melting of substance as a result of chemical action is called:

- A) Thermal shock
- B) Thermal spalling
- C) Creep
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Spalling that occurs as result of stresses caused by non-uniform heating/cooling is:

- A) Thermal shock
- B) Thermal spalling
- C) Creep
- D) Fluxing

Spalling that occurs as result of stresses caused by non-uniform heating/cooling is:

A) Thermal shock

B) Thermal spalling

C) Creep

D) Fluxing

Time-dependent deformation due to sustained load is called:

- A) Slumping
- B) Plastic deformation
- C) Creep
- D) Warpage

Time-dependent deformation due to sustained load is called:

A) Slumping

B) Plastic deformation

C) Creep

D) Warpage

A cylindrical mechanical shaft driven device immersed into cast refractory to assist in consolidation, deairing, and promotion of flow by vibration is called:

- A) Rotary vibrator
- B) Submersion Vibrator
- C) Vibrator
- D) Planetary Mixer

A cylindrical mechanical shaft driven device immersed into cast refractory to assist in consolidation, deairing, and promotion of flow by vibration is called:

A) Rotary vibrator

B) Submersion Vibrator

C) Vibrator

D) Planetary Mixer

Individual cube, bar, plate, or other test piece used in physical property tests is called:

- A) Production run
- B) Sample
- C) Specimen
- D) Batch

Individual cube, bar, plate, or other test piece used in physical property tests is called:

A) Production run

B) Sample

C) Specimen

D) Batch

The quantity of refractory taken from a single container or installation sequence that is used to make a complete set of test specimens to determine compressive strength, erosion resistance, density, linear change, and/or any other physical properties is called:

A) Production run

B) Sample

C) Specimen

D) Batch

The quantity of refractory taken from a single container or installation sequence that is used to make a complete set of test specimens to determine compressive strength, erosion resistance, density, linear change, and/or any other physical properties is called:

A) Production run

B) Sample

C) Specimen

D) Batch

The quantity of refractory having the same formulation that is prepared in an uninterrupted manufacturing operation is called:

- A) Production run
- B) Sample
- C) Specimen
- D) Batch

The quantity of refractory having the same formulation that is prepared in an uninterrupted manufacturing operation is called:

A) Production run

B) Sample

C) Specimen

D) Batch

For repair procedures before placement of the new refractory, the sound refractory material adjacent to the repair area shall be cleaned of debris and completely prewetted with

- A) Sweet water
- B) Raw water
- C) Utility water
- D) Potable water

For repair procedures before placement of the new refractory, the sound refractory material adjacent to the repair area shall be cleaned of debris and completely prewetted with

A) Sweet water

B) Raw water

C) Utility water

D) Potable water

Refractory installed in locations where erosion resistance is not a required feature of the lining service is called:

- A) Light service
- B) Other service
- C) Basic refractory
- D) None of these terms are correct

Refractory installed in locations where erosion resistance is not a required feature of the lining service is called:

A) Light service

B) Other service

C) Basic refractory

D) None of these terms are correct

High energy mixer with rotating paddle on vertical orbiting mixer shaft is called:

- A) Planetary mixer
- B) Orbiting mixer
- C) Batch Mixer
- D) None of these

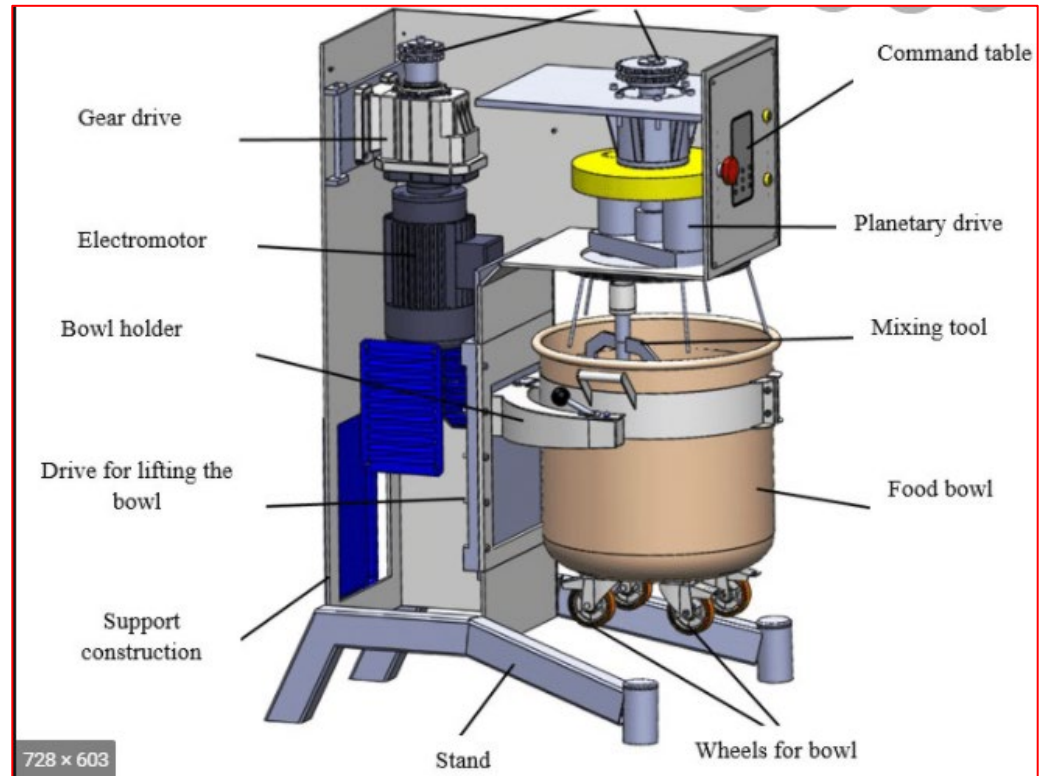
High energy mixer with rotating paddle on vertical orbiting mixer shaft is called:

A) Planetary mixer

B) Orbiting mixer

C) Batch Mixer

D) None of these



A longitudinally hinged version of mesh supplied in flexible rolls for easy access through vessel openings to the installation area and ready fit to curved surfaces with enclosed cells normally trapezoidal is called:

- A) Flex mesh
- B) Footed anchors
- C) Hexmetal
- D) Hexalt anchors

A longitudinally hinged version of mesh supplied in flexible rolls for easy access through vessel openings to the installation area and ready fit to curved surfaces with enclosed cells normally trapezoidal is called:

A) Flex mesh

B) Footed anchors

C) Hexmetal

D) Hexalt anchors



A written document prepared by contractor and submitted to and approved by the owner before work starts detailing how contractor intends to perform the job and meet objectives and quality standards set for the job in owner's specifications and drawings is called:

- A) Quality Plan
- B) Quality Control Plan
- C) Detailed Specification
- D) Execution Plan

A written document prepared by contractor and submitted to and approved by the owner before work starts detailing how contractor intends to perform the job and meet objectives and quality standards set for the job in owner's specifications and drawings is called:

A) Quality Plan

B) Quality Control Plan

C) Detailed Specification

D) Execution Plan

A list of mechanical and chemical properties for a specified refractory material that are warranted by the manufacturer to be met if and when the product is tested by the listed procedure is called:

- A) Compliance Data Sheet
- B) Product Data Sheet
- C) Product Specification Sheet
- D) (MSDS)

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A) Compliance Data Sheet

B) Product Data Sheet

C) Product Specification Sheet

D) (MSDS)

Castable installation technique whereby refractory is placed by packing successive handfuls of material to the desired shape, and refractory is mixed at a consistency that is stiff enough for the placed refractory to hold its shape, and wet and sticky enough so that the lining formed is structurally homogenous is called:

- A) Casting
- B) Hand Packing
- C) Pump Casting
- D) Vibration Casting

Castable installation technique whereby refractory is placed by packing successive handfuls of material to the desired shape, and refractory is mixed at a consistency that is stiff enough for the placed refractory to hold its shape, and wet and sticky enough so that the lining formed is structurally homogenous is called:

A) Casting

B) Hand Packing

C) Pump Casting

D) Vibration Casting

A layer coat of refractory, usually troweled on, which is applied to an existing lining in an attempt to extend the lining life is called:

- A) Lightweight refractory concrete
- B) Point-up (refractory)
- C) Mortar (refractory)
- D) Overlay (refractory)

A layer coat of refractory, usually troweled on, which is applied to an existing lining in an attempt to extend the lining life is called:

- A) Lightweight refractory concrete
- B) Point-up (refractory)
- C) Mortar (refractory)
- D) Overlay (refractory)

A finely ground preparation which becomes plastic and trowelable when mixed with water and is suitable for use in laying and bonding refractory bricks together is called:

- A) Lightweight refractory concrete
- B) Point-up (refractory)
- C) Mortar (refractory)
- D) Overlay (refractory)

A finely ground preparation which becomes plastic and trowelable when mixed with water and is suitable for use in laying and bonding refractory bricks together is called:

- A) Lightweight refractory concrete
- B) Point-up (refractory)
- C) Mortar (refractory)
- D) Overlay (refractory)

As compared to a one-shot lining*, a refractory lining consisting of two different types of monoliths, typically consisting of a low-density insulating refractory located behind a stronger medium-density or high-density refractory ... is called:

- A) Two-shot lining
- B) Two-layer refractory
- C) Dual-layer lining
- D) None of these terms is correct

As compared to a one-shot lining*, a refractory lining consisting of two different types of monoliths, typically consisting of a low-density insulating refractory located behind a stronger medium-density or high-density refractory ... is called:

A) Two-shot lining

B) Two-layer refractory

C) Dual-layer lining

D) None of these terms is correct

Destructive chemical reaction between refractories and external agencies at high temperatures, resulting in the formation of a liquid is called:

- A) Slagging of refractories
- B) Spalling of refractories
- C) Porosity of refractories
- D) None of these terms is correct

Destructive chemical reaction between refractories and external agencies at high temperatures, resulting in the formation of a liquid is called:

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C) Porosity of refractories

D) None of these terms is correct



What standard is used for Power Tool Cleaning associated with surface preparation?

- A) SSPC SP 3
- B) SSPC SP 5
- C) SSPC SP 7
- D) SSPC SP 10

What standard is used for Power Tool Cleaning associated with surface preparation?

- A) SSPC SP 3
- B) SSPC SP 5
- C) SSPC SP 7
- D) SSPC SP 10

What standard is used for Brush-off blast cleaning associated with surface preparation?

- A) SSPC SP 3
- B) SSPC SP 5
- C) SSPC SP 7
- D) SSPC SP 10

What standard is used for Brush-off blast cleaning associated with surface preparation?

- A) SSPC SP 3
- B) SSPC SP 5
- C) SSPC SP 7
- D) SSPC SP 10

Pre-set refractory trimmed from the lining surface via a cutting action to give the final lining thickness dimension, usually in a gunning installation is called:

- A) Point-up
- B) Trim-up
- C) Trim-back
- D) Cut-back

Pre-set refractory trimmed from the lining surface via a cutting action to give the final lining thickness dimension, usually in a gunning installation is called:

A) Point-up

B) Trim-up

C) Trim-back

D) Cut-back

What ACI standard covers Refractory Concrete?

A) ACI 518

B) ACI 547

C) ACI 547.1

D) None of these

What ACI standard covers Refractory Concrete?

A) ACI 518

B) ACI 547

C) ACI 547.1

D) None of these

What API 936 referenced Handbook covers Refractory Practices?

- A) ANH Handbook (Refractory Practices)
- B) Harbison-Walker Handbook (Refract Practices)
- C) Refractory Manufacturer's Handbook
- D) A.P. Green Handbook for Refractory Practices

What API 936 referenced Handbook covers Refractory Practices?

A) ANH Handbook (Refractory Practices)

B) Harbison-Walker Handbook (Refract Practices)

C) Refractory Manufacturer's Handbook

D) A.P. Green Handbook for Refractory Practices

Refractories having a substantial amount of silica, which is reactive with basic refractories, basic slags, or basic fluxes at high temperatures, are called:

- A) Alumina-Silica
- B) High-Alumina
- C) Acid
- D) Neutral

Refractories having a substantial amount of silica, which is reactive with basic refractories, basic slags, or basic fluxes at high temperatures, are called:

A) Alumina-Silica

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C) Acid

D) Neutral

Hydraulic-setting refractory is commonly known as:

- A) Castable (refractory)
- B) Plastic (refractory)
- C) Erosion-resistant (refractory)
- D) Monolithic (refractory)

Hydraulic-setting refractory is commonly known as:

- A) Castable (refractory)
- B) Plastic (refractory)
- C) Erosion-resistant (refractory)
- D) Monolithic (refractory)

CASTABLE LINING WITHOUT JOINTS, formed of material which is rammed, cast, or gunned and sintered* into place (*heat treatment that causes adjacent particles of material to cohere at a temperature below that of complete melting) is called:

- A) Plastic lining
- B) Castable lining
- C) Monolithic lining
- D) Erosion-resistant lining

CASTABLE LINING WITHOUT JOINTS, formed of material which is rammed, cast, or gunned and sintered* into place (*heat treatment that causes adjacent particles of material to cohere at a temperature below that of complete melting) is called:

A) Plastic lining

B) Castable lining

C) Monolithic lining

D) Erosion-resistant lining

A newly installed refractory before it is exposed to Dry out or initial heating is called:

- A) Cast refractory
- B) Fresh refractory
- C) Green refractory
- D) Punky refractory

A newly installed refractory before it is exposed to Dry out or initial heating is called:

- A) Cast refractory
- B) Fresh refractory
- C) Green refractory
- D) Punky refractory

Refractory concrete mix that is designed/formulated at or near a particular job site is a:

- A) Refractory mix
- B) Refractory aggregate mix
- C) Refractory concrete mix
- D) Field Mix

Refractory concrete mix that is designed/formulated at or near a particular job site is a:

- A) Refractory mix
- B) Refractory aggregate mix
- C) Refractory concrete mix
- D) Field Mix

The ratio of the volume of the pores or voids in a body to the total volume usually expressed as a percentage is called:

- A) Slagging of refractories
- B) Spalling of refractories
- C) Porosity of refractories
- D) None of these terms is correct

The ratio of the volume of the pores or voids in a body to the total volume usually expressed as a percentage is called:

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Permanent Linear Change (PLC) is calculated as the:

- A) Percentage change in the dimension
- B) Ratio of change in at least two dimensions
- C) Total linear change in the dimension
- D) Total linear change in at least two dimensions

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- A) Percentage change in the dimension
- B) Ratio of change in at least two dimensions
- C) Total linear change in the dimension
- D) Total linear change in at least two dimensions

PERMEABILITY of a body is largely dependent upon the number, size, and shape of the open connecting pores, and is measured by:

- A) The ratio of the volume of the pores or voids in a body to the total volume
- B) The rate of flow of a standard fluid under definite pressure
- C) The open pore volume only
- D) The total pore volume

PERMEABILITY of a body is largely dependent upon the number, size, and shape of the open connecting pores, and is measured by:

A) The ratio of the volume of the pores or voids in a body to the total volume

B) The rate of flow of a standard fluid under definite pressure

C) The open pore volume only

D) The total pore volume

An example of erosion service includes which of the following:

- A) Transfer lines, overhead lines, cyclone linings and deflector shields of fluid solids units
- B) Cyclone linings and deflector shields of fluid solids units only
- C) Cyclone linings only
- D) None of these

An example of erosion service includes which of the following:

- A) Transfer lines, overhead lines, cyclone linings and deflector shields of fluid solids units
- B) Cyclone linings and deflector shields of fluid solids units only
- C) Cyclone linings only
- D) None of these

Measurable refractory properties (density, strength, erosion resistance, linear change etc) are called:

- A) Test Properties
- B) Physical Properties
- C) Material Properties
- D) None of these terms is correct

Measurable refractory properties (density, strength, erosion resistance, linear change etc) are called:

A) Test Properties

B) Physical Properties

C) Material Properties

D) None of these terms is correct

A specific Permanent Linear Change (PLC) specimen dimension is measured at:

- A) Room temperature before heating
- B) Ambient temperature before heating
- C) Room temperature before and after Heating
- D) Ambient temperature before and after heating

A specific Permanent Linear Change (PLC) specimen dimension is measured at:

- A) Room temperature before heating
- B) Ambient temperature before heating
- C) Room temperature before and after Heating
- D) Ambient temperature before and after heating

Pre-installation testing of refractory materials in which the production lots of refractories manufactured for a specific installation are sampled and tested to confirm that they meet specified physical property requirements is called:

- A) As-Installed Testing
- B) Applicator Qualification Testing
- C) Material Qualification Testing
- D) Production Qualification Testing

Pre-installation testing of refractory materials in which the production lots of refractories manufactured for a specific installation are sampled and tested to confirm that they meet specified physical property requirements is called:

A) As-Installed Testing

B) Applicator Qualification Testing

C) Material Qualification Testing

D) Production Qualification Testing

Castable installation technique in which refractory is mixed with water and pumped through piping and/or hoses to the installation site, where it is poured from the outlet nozzle directly into a formed enclosure is called:

- A) Casting
- B) Hand Packing
- C) Pump Casting
- D) Vibration Casting

Castable installation technique in which refractory is mixed with water and pumped through piping and/or hoses to the installation site, where it is poured from the outlet nozzle directly into a formed enclosure is called:

A) Casting

B) Hand Packing

C) Pump Casting

D) Vibration Casting

Which of these statements is NOT true regarding Hammer testing (of refractory linings):

- A) Hammer testing is performed on either green or fired refractories
- B) Hammer testing is considered an objective test, not a subjective test
- C) Hammer testing uses hammer impact to gauge the soundness and uniformity
- D) Hammer testing uses hammer impact that gauges the resulting audible resonance

Which of these statements is NOT true regarding Hammer testing (of refractory linings):

A) Hammer testing is performed on either green or fired refractories

B) Hammer testing is considered an objective test, not a subjective test

C) Hammer testing uses hammer impact to gauge the soundness and uniformity

D) Hammer testing uses hammer impact that gauges the resulting audible resonance

Casting is defined as the application of wet mixed castable refractory by:

- A) Placement always using vibration
- B) Placement always using vibration or rodding
- C) Placing (always using vibration), pouring, or rodding
- D) Placing (possibly using vibration), pouring, or rodding

Casting is defined as the application of wet mixed castable refractory by:

- A) Placement always using vibration
- B) Placement always using vibration or rodding
- C) Placing (always using vibration), pouring, or rodding
- D) Placing (possibly using vibration), pouring, or rodding

A cement-rich layer of refractory that deposits on exposed surfaces around a gunning installation site from airborne, wetted, refractory dust generated by the gunning operation:

- A) Overspray
- B) Cut-back
- C) Rebound
- D) Flash Coat

A cement-rich layer of refractory that deposits on exposed surfaces around a gunning installation site from airborne, wetted, refractory dust generated by the gunning operation:

A) Overspray

B) Cut-back

C) Rebound

D) Flash Coat

S-Bar, Hexcel, Curl & Tacko anchors are an EXAMPLE of:

- A) Flexmesh
- B) Footed anchors
- C) Hexmetal anchors
- D) Hexalt anchors

S-Bar, Hexcel, Curl & Tacko anchors are an EXAMPLE of:

- A) Flexmesh
- B) Footed anchors
- C) Hexmetal anchors
- D) Hexalt anchors

The maximum time interval when a material may be stored and remain in a usable condition ... is called:

A) Service life

B) Useful life

C) Shelf life

D) Storage life

The maximum time interval when a material may be stored and remain in a usable condition ... is called:

A) Service life

B) Useful life

C) Shelf life

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Individual cube, bar, plate, or other test piece used in physical property tests ... is called:

A) Production run

B) Sample

C) Specimen

D) Batch

Individual cube, bar, plate, or other test piece used in physical property tests ... is called:

A) Production run

B) Sample

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Thank You

&

Good Luck!