

# Manaseer Engineered Minerals – R&D

**Introduction to ManaseerCrete™**  
Newly-Engineered and Eco-Friendly  
Construction Material

**Building for Future Generations**



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## A Closer Look at ManaseerCrete®

**ManaseerCrete®**, which is a new engineered chemically and mechanically activated fine pozzlanic Product according to ASTM C618 Class N equivalent to fly ash Class F properties as per ASTM C618 standard.

**ManaseerCrete®** is a natural product **free** from heavy metals such as arsenic, lead, mercury, cadmium, chromium and selenium. Therefore, it has a superior specifications compared to the synthetic pozzlanic materials depending on its origin in respect to human health safety and environment.



**MANASEER  
GROUP**

### **Manaseer Group**

is a holding company established in the year 1999 in Jordan by **Ziad Al Manaseer** who is currently its chairman. The Company operates mainly in Jordan and has activity in West Bank as well and manages 24 subsidiary companies related to Infrastructure, Energy, Business solutions, Consumer products, services, Chemicals & Fertilizers.

1) The American Society for Testing Materials (AS®) defines pozzolan as a "siliceous and aluminous material that in itself possesses little or no cementitious value, but that will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperature to form compounds having cementitious properties. The pozzolan property of ManaseerCrete gives it the ability to add superior properties when mixed with Portland cement



**Building for Future Generations**

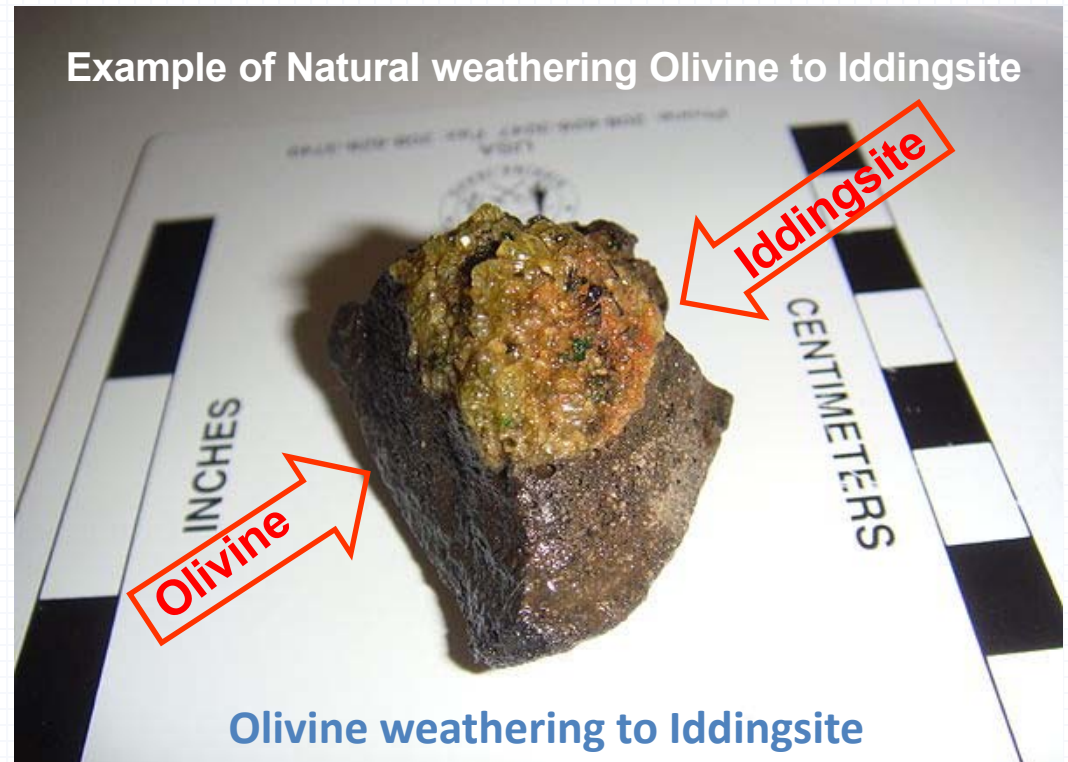
# ManaseerCreteCrete<sup>®</sup> Activation Process - WI-Process

Source : <https://wikivividly.com/wiki/Iddingsite>

**ManaseerCrete<sup>®</sup>**, is a composition of the primary minerals feldspar, pyroxene, opagues and Iddingsite which is formed by conversion completely the Olivine.

**Naturally**, Iddingsite is a common alteration of Olivine during oxidation, hydrothermal and deuteritic processes. It appear as a reddish-brown replacement of olivine

Our **WI-Process**, based on well established industrial technologies and equipment's, is **stimulating the natural conditions**. In which the alteration of olivine to Iddingsite occurs in a highly oxidizing environment under low pressure and at intermediate temperatures



Olivine weathering to Iddingsite

Composition

Olivine, clays, ferrihydrites

Deuteric alteration is a low-temperature magmatic alteration related to the solidification of a melt. The term “deuteric” is restricted to reactions involving changes in primary mineral phases during the process of magmatic crystallization, the agent of deuterism is the volatile material dissolved in the magma.



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# How ManaseerCrete<sup>®</sup> Works with Portland Cement in Concrete

## Similarities & Differences between ManaseerCrete<sup>®</sup> and Portland Cement

- The chemical composition of ManaseerCrete<sup>®</sup> is very similar to that of Portland cement. The same compounds exist in ManaseerCrete<sup>®</sup> and Portland cement. ManaseerCrete<sup>®</sup> compounds are amorphous (glassy) due to rapid cooling. Cement compounds are crystalline because of slow cooling.
- The main difference between ManaseerCrete<sup>®</sup> and Portland cement is the relative quantity of each of the different compounds, Portland cement is high percentage in lime CaO while ManaseerCrete<sup>®</sup> is low percentage. Reactive silicates SiO<sub>2</sub> are high in ManaseerCrete<sup>®</sup> while Portland cement has smaller amounts percentage.

## Typical Chemical Compounds In ManaseerCrete<sup>®</sup> and Portland Cement

CHEMICAL COMPOUND	ManaseerCrete™	CEMENT(OPC) UNIT
SiO <sub>2</sub>	45.79	19.55 %
Al <sub>2</sub> O <sub>3</sub>	13.91	4.68 %
Fe <sub>2</sub> O <sub>3</sub>	14.48	4.34 %
CaO	8.55	62.79 %
MgO	9.50	1.72 %
SO <sub>3</sub>	0.76	2.94 %
Na <sub>2</sub> O	2.70	0.44 %
K <sub>2</sub> O	0.93	0.40 %
Cl	0.010	0.035 %



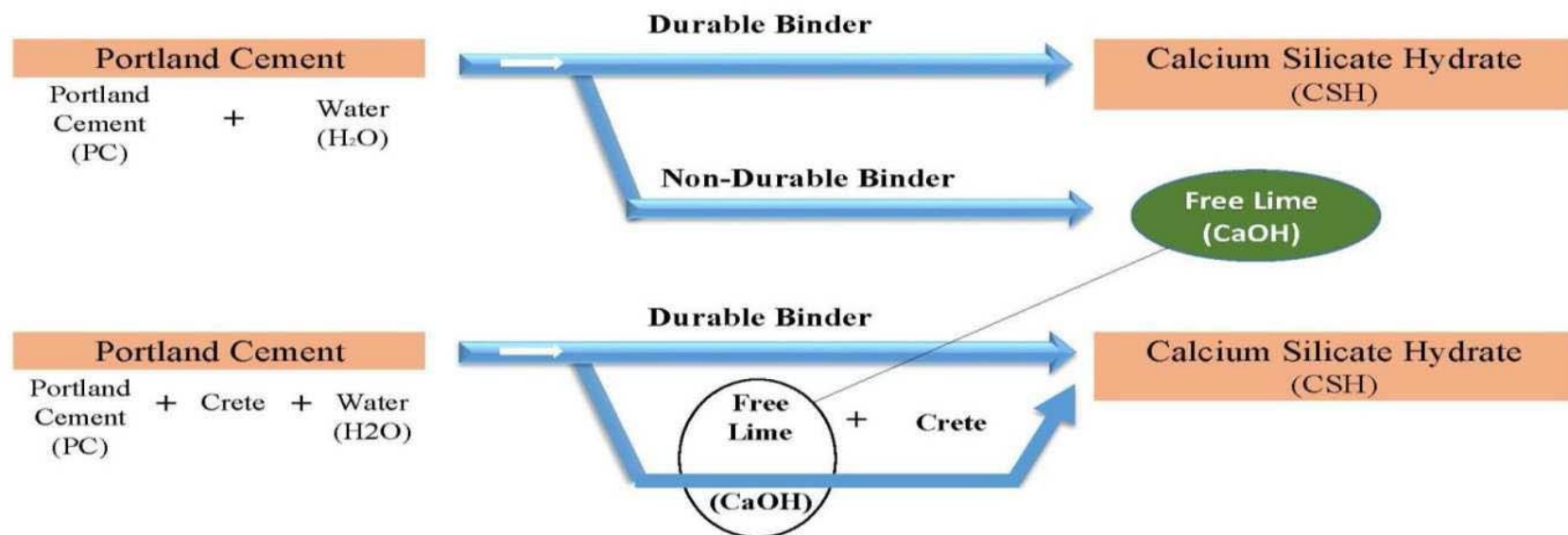
# Technical Specifications of ManaseerCrete®

## How ManaseerCrete® Works with Portland cement in Concrete

Portland cement is manufactured with CaO, some of which is released in a free state during the hydration reaction. This liberated lime forms the necessary ingredient for reaction with reactive product silicates to form strong and durable cementing compounds no different from those formed during hydration of ordinary Portland cement.

## Hydration Products of Cementing Binders

Through pozzolanic activity, ManaseerCrete® combines with free lime to produce the same cementitious compounds formed by the hydration of Portland cement.



## ManaseerCrete® confirmation criteria ASTM C-618

Required Test	Result	Conformity Criteria
Sulfur trioxide (SO <sub>3</sub> )	0.76 %	4.0 % max
Silicon Dioxide (SiO <sub>2</sub> ) , Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ) ,Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )	73.79 %	70 % min
loss on Ignition	0.5 %	10.0 % max
Moisture Content	0.057 %	3.0 %
Fineness (retained on 45 µm (Mesh No. 325 )	5 %	34.0 %
Strength Activity Index		
With Portland cement , at 7 days min , percent of control	84.4 %	75 %
With Portland cement , at 28 days min , percent of control	Comply	75 %
Water Requirement	99 %	115 %
Autoclave Expansion	0.06 %	0.8 %

# ManaseerCrete® can be used in various applications in ready-mix concrete and construction chemicals

## Applications of ManaseerCrete®

<b>Ready-Mix concrete</b>	<ul style="list-style-type: none"><li>• Mass Concrete Foundations and Sections</li><li>• High temperature environment</li><li>• High Quality Concrete applications</li><li>• Potentially Alkali-reactive Aggregates</li><li>• Sulphate/Chloride Bearing Environments</li><li>• Water Retaining Structures</li><li>• Chloride Bearing Environments</li><li>• Effluent Treatment Plant</li><li>• Marine Environments</li></ul>
<b>Construction Chemicals</b>	<ul style="list-style-type: none"><li>• Self-Levelling Screed</li><li>• Non Shrink Grout</li><li>• Anchoring Grout</li><li>• Water Proofing</li><li>• Floor Hardeners</li><li>• Tile Adhesives</li><li>• Repair Mortars</li><li>• Cosmetics Mortars</li><li>• Admixture</li></ul>



# Effects & Enhancements added by using ManaseerCrete® & recommended applications

## Applications of ManaseerCrete® in details

ManaseerCrete® Effect	Applications
<b>Reduction of Heat of Hydration</b>	<ul style="list-style-type: none"> <li>High temperature environments (Dams, Retaining walls , Solid slabs)</li> <li>Mass concretes (Rafts ,Shear walls,</li> </ul>
<b>Reduction of Water Requirements</b>	<ul style="list-style-type: none"> <li>Mass concrete</li> <li>High temperature environments</li> <li>Sites lacking water</li> </ul>
<b>High Ultimate Strength</b>	<ul style="list-style-type: none"> <li>Footings</li> <li>Columns, load bearing elements</li> <li>Shear walls , Retaining walls</li> <li>Shells</li> <li>Pre-stressed concrete</li> </ul>
<b>Provision of Required Time for The Casting &amp; Positioning</b>	<ul style="list-style-type: none"> <li>Retardation of setting time casting and positioning</li> <li>For far destinations and high temperature environments</li> </ul>
<b>Better Soundness</b>	<ul style="list-style-type: none"> <li>Marine environments</li> <li>Submerged structures</li> <li>Soil stabilization works</li> </ul>
<b>Reduction of Bleeding</b>	<ul style="list-style-type: none"> <li>Effective especially in hot weather environments</li> <li>Enhancement of strength</li> </ul>
<b>Reduction of Internal Cracks</b>	<ul style="list-style-type: none"> <li>Mass concrete</li> <li>Marine environments</li> <li>Hot weather conditions</li> </ul>
<b>Reduction of Corrosion of Embedded Steel</b>	<ul style="list-style-type: none"> <li>Marine environments ,water tanks and wells by embedded steel preventing segregation</li> </ul>





## ManaseerCrete® strengths

### ManaseerCrete® Strengths

- Natural product free from heavy metals, it is extracted from the nature
- Environmental-friendly
- Can be used for cement and concrete production.
- High consistency (quality of ManaseerCrete® is stable, including size and color of the product)
- Surface area of ManaseerCrete® is (350-500 m<sup>2</sup>/kg)
- Increases the concrete compressive strength when added to concrete mixes.
- Increases the concrete durability, concrete becomes more resistant to weather and chemical attack.
- Increases concrete setting time, which is beneficial for distant transport of concrete and improves surface finish.
- Decreases bleeding rate and bleeding capacity when added to concrete.
- Decreases concrete permeability.
- Reduces the amount of water required in concrete mixes.
- Reduces heat of hydration, in order to help prevent thermal cracks.
- Increases concrete resistance to sulphate attack, in order to help prevent concrete destructive expansion.
- Increases concrete resistance to alkali-silica reaction.
- Increases concrete resistance to freeze-thaw action.
- Decreases concrete segregation, in order to help prevent separation between cement paste and aggregates in concrete mix.
- Decreases concrete shrinkage.



# Benefits of ManaseerCrete®

## Ready-mix Producers

There are various reasons for ready-mix concrete producers to be interested in [ManaseerCrete™](#):

- ✓ Producing a more consistent finished product that will guarantee customer's acceptance.
- ✓ Giving the ready mix producer the advantage of offering a wider range of designs to suit every customer's need
- ✓ Giving high compressive strength at low W/C ratios .
- ✓ Increasing setting time .
- ✓ Increasing compressive strength when using as addition

## Engineers and Architects

Engineers and architects will detect that [ManaseerCrete™](#) provides the following advantages:

- ✓ Providing the client with a high quality, and more durable finished concrete.
- ✓ Producing a flexible, high strength concrete that could be used in thinner sections, curves, arches and other architectural shapes composed of complex shapes.
- ✓ Adding [ManaseerCrete™](#) to the concrete ensures later-age strength gain, and long-lasting durability.
- ✓ Enhancing the aesthetic appearance of the finished concrete.
- ✓ Developers, Contractors, Owners.



# Reference List of ManaseerCrete®

## Selected Reference Projects Overseas

1- **Al Moosa hospital north tower** - Golden Lead Certificate / **Contractor** - Masah specialized cont. - 80,000 cubic meter Green concrete <http://masahsplcon.com/al-moosa-speciality-hospital-north-tower/>



# Reference List of ManaseerCrete®

## Selected Reference Projects Overseas

2- **MGS pipeline project** - Aramco / **Contractor:** Arkad contracting / 30,000 cubic meter Green concrete ( <http://www.arkad.com/projects.php> )



**MGS pipeline project  
ARAMCO – SAUDI Arabia**

**30,000 cubic meter Green Concrete**



# Reference List of ManaseerCrete®

## Selected Reference Projects Overseas

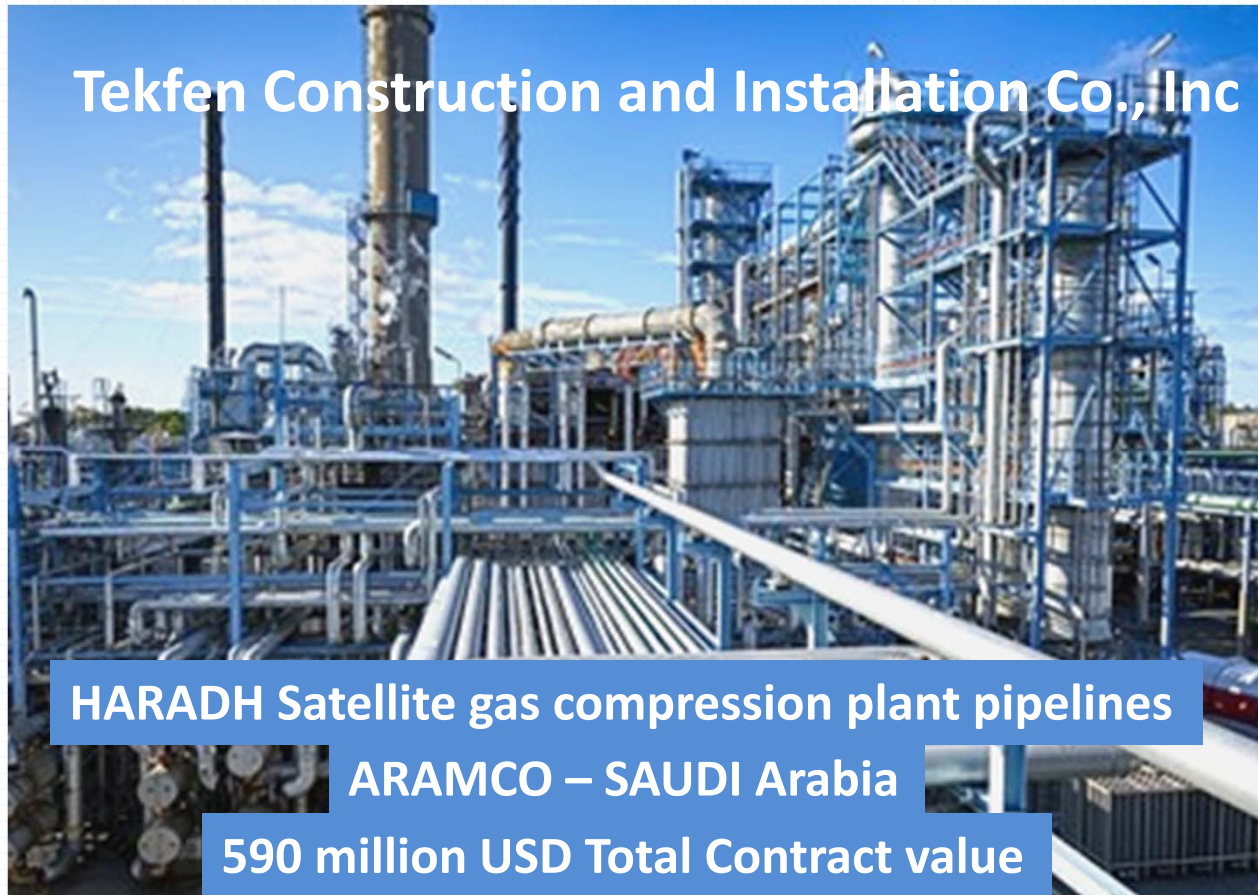
3- **Maritime Ras Al Khair project** - Aramco / Contractor - Archirodon / 1,000,000 cubic meter Green concrete ( <https://www.archirodon.net/project/680/all> )



## Reference List of ManaseerCrete®

### Selected Reference Projects Overseas

4- Haradh Satellite gas compression plant pipelines- Aramco / Contractor - Tekfen contracting (Turkish Contractor) / ([http://www.tekfeninsaat.com.tr/pipeline\\_project\\_detail.asp?id=30#](http://www.tekfeninsaat.com.tr/pipeline_project_detail.asp?id=30#))



# ManaseerCrete® Certificates

## Certificates and Compliances

**ManaseerCrete®** is Certified in compliance with the following standards

- 1- Compliance to American Standards, according to **ASTM C618 – 17a.**
- 2- Compliance to Jordanian Standards, according to **JQM-TR 99:2017.**
- 3- Green Declaration certificate from Ministry of Energy and Natural Resources of Jordan **MEMER:2017.**



# ManaseerCrete® Certificates and AWARDS

## Prestigious AWARDS

**ManaseerCrete®** is awarded the Certificate of Best Jordanian product in the field of Chemical Industries for year 2018 from Jordan Engineering Association in the field of Cement and Construction Chemicals.





# ManaseerCrete® Environmental Declaration

## ECO-Green Materials

**ManaseerCrete®** Utilizing our product assists our esteemed Business Partner Al-KIFAH ready-mix Concrete to achieve the prestigious “Environmental Product Declaration Certificates

- 1- ISO 14025:2006
- 2- ISO 21930:2017
- 3- EN 15804:2012



## Al Kifah Readymix green concrete passed Environmental Product Declaration Certificate

Environmental Product Declaration Ready-Mix Concrete

(per ISO 14025, ISO 21930 and EN 15804)

Date of Issue	Period of Validity	Declaration
July 15, 2019	5 Years	Number EPD 10255



920000747 | www.kifahreadymix.com



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# THANK YOU



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