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Bulletin 24-1

# PQ® Soluble Silicates in Refractory and Chemical-Resistant Cements

## INTRODUCTION

PQ Soluble Silicates are used effectively as binders where heat stability or resistance to chemicals is required. Silicate binders develop high green strength by air-setting without heat. They also impart increased fired strength, are easy and safe to handle, low in price, non-corrosive, form no fumes or fire hazards and resist deterioration after placement. Consequently, air-setting specialties containing soluble silicates are used in refractory mortars and ramming, gunning and patching mixes in practically all refractory or chemical-resistant construction and in their maintenance. Some examples include:

<b>boilers</b>	<b>heat treating furnaces</b>
<b>incinerators</b>	<b>ladle linings</b>
<b>cupolas</b>	<b>catalytic cracking chambers</b>
<b>smelting furnaces</b>	<b>sewage works</b>
<b>coke ovens</b>	<b>chimney construction</b>
<b>blast furnaces</b>	<b>sulfite digesters</b>
<b>open-hearths</b>	<b>electrolytic cells</b>
<b>electric steel furnaces</b>	<b>acid manufacturing</b>
<b>oxygen converters</b>	<b>soaking pits</b>

The liquid sodium silicates are solutions of water soluble glasses manufactured from varied proportions of  $\text{Na}_2\text{CO}_3$  and  $\text{SiO}_2$ . They are available in a variety of  $\text{SiO}_2/\text{Na}_2\text{O}$  weight ratios ranging from 1.6 (highly alkaline) to 3.22 (highly siliceous). In addition to the liquid sodium silicates, PQ produces a wide variety of solid products to meet the needs of different formulations. They range from highly soluble powders to lumps of transparent glass.

The potassium silicates are solutions manufactured from varied proportions of  $\text{K}_2\text{CO}_3$  and  $\text{SiO}_2$ . They are available in  $\text{SiO}_2 : \text{K}_2\text{O}$  weight ratios of 2.5 and 2.1. Table 1 lists the compositions and properties of the PQ sodium and potassium silicates used in refractory and chemical resistant cements.

## EFFECTS OF SILICATE COMPOSITION

The highly siliceous (high  $\text{SiO}_2/\text{Na}_2\text{O}$  ratio) sodium silicates tend to air dry rapidly. They are the most refractory of the sodium silicates as well as the most resistant to acids. Because the total solids of these high ratio silicate solutions are relatively low, compared to the lower ratio solutions, a cement containing a high ratio solution will necessarily contain more water.

# Soluble Silicates

**ML Morrison**



## **Soluble Silicates:**

## **Soluble Silicates** Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its ability to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "**Soluble Silicates**," compiled by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound effect on our existence. Throughout this critique, we will delve into the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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### **Table of Contents Soluble Silicates**

1. Understanding the eBook Soluble Silicates
  - The Rise of Digital Reading Soluble Silicates
  - Advantages of eBooks Over Traditional Books
2. Identifying Soluble Silicates
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an eBook
  - User-Friendly Interface
4. Exploring eBook Recommendations from Soluble Silicates
  - Personalized Recommendations
  - eBook User Reviews and Ratings
  - eBook and Bestseller Lists

5. Accessing Soluble Silicates Free and Paid eBooks
  - Soluble Silicates Public Domain eBooks
  - Soluble Silicates eBook Subscription Services
  - Soluble Silicates Budget-Friendly Options
6. Navigating Soluble Silicates eBook Formats
  - ePub, PDF, MOBI, and More
  - Soluble Silicates Compatibility with Devices
  - Soluble Silicates Enhanced eBook Features
7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Soluble Silicates
  - Highlighting and Note-Taking Soluble Silicates
  - Interactive Elements Soluble Silicates
8. Staying Engaged with Soluble Silicates
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Soluble Silicates
9. Balancing eBooks and Physical Books Soluble Silicates
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Soluble Silicates
10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
11. Cultivating a Reading Routine Soluble Silicates
  - Setting Reading Goals Soluble Silicates
  - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Soluble Silicates
  - Fact-Checking eBook Content of Soluble Silicates
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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