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## Mortars

### summary

Definition of mortars

Composition and manufacturing of mortars

Implementation and applications of mortars

Quality of a good mortar

The different mortars

## Definition of mortar

Mortar is a mixture of cement, sand, and water that is used to bond or bind masonry units, such as bricks or stones, together. It plays a crucial role in the construction of various structures, providing strength and durability to the overall building. The basic ingredients of mortar include:

**Cement:** Cement is a binding agent that reacts chemically with water to harden and bind the other components of the mortar. Common types of cement used in mortar include Portland cement.

**Sand:** Sand is the filler material in mortar. It adds volume and helps create a workable consistency. The type and gradation of sand used in mortar can affect its strength and workability.

## Definition of mortar

Water: Water is used to activate the cement and make the mortar workable. The right amount of water is crucial for achieving the desired consistency and strength in the mortar.

The proportions of these ingredients can vary depending on the specific application and the desired properties of the mortar. Different types of mortar may be used for different purposes, such as bricklaying, stonemasonry, or plastering. Proper mixing and application of mortar are essential for the structural integrity and longevity of a building.

# Composition and manufacturing of mortars

## Composition and manufacturing of mortars

The composition and manufacturing of mortars depend on the specific type of mortar needed for a particular application. However, I can provide a general overview of the composition and manufacturing process of traditional cement mortar used in construction:

### Composition of Cement Mortar:

**Cement:** Portland cement is commonly used in mortar. It is a fine powder that, when mixed with water, forms a paste that hardens over time. The chemical reaction between cement and water, known as hydration, is a key factor in the setting and hardening of the mortar.

## Composition and manufacturing of mortars

**Sand:** Sand is the aggregate component in mortar. The type and gradation of sand can influence the strength and workability of the mortar. Coarse sand is often used for strength, while finer sand may improve workability.

**Water:** Water is essential for the hydration of the cement and the overall workability of the mortar. The right water-to-cement ratio is crucial to achieving the desired strength and consistency.

### Manufacturing Process:

The manufacturing process of mortar typically involves the following steps:

**Mixing:** The dry ingredients, including cement and sand, are measured and mixed thoroughly to achieve a uniform blend. The proportions of cement to sand can vary based on the desired characteristics of the mortar.

## Composition and manufacturing of mortars

**Adding Water:** Water is gradually added to the dry mix while continuing to mix.

The goal is to achieve a workable consistency without making the mortar too wet, as an excessive amount of water can weaken the mortar.

**Mixing Continues:** The mixing process continues until a homogeneous and uniform mortar paste is obtained. The mortar should be free of lumps and have a smooth texture.

**Application:** Once the mortar is mixed, it is ready for application. It is typically used for bonding masonry units, such as bricks or stones, together. The mortar is applied between the units, and the structure is allowed to cure and harden over time.



## Composition and manufacturing of mortars

It's important to note that there are different types of mortars, including masonry mortar, pointing mortar, and plaster mortar, each with its own specific requirements and variations in composition. Specialty mortars may also include additives or admixtures to enhance certain properties, such as durability or flexibility.

The specific manufacturing process can vary based on the type of mortar and its intended use.

## Implementation and applications of mortars

## Implementation and applications of mortars

The implementation and applications of mortars are diverse and depend on the specific type of mortar being used. Here are some common implementations and applications of mortars:

### **Construction and Masonry:**

**Bricklaying and Blocklaying:** Mortar is widely used to bond bricks or concrete blocks together in the construction of walls, buildings, and other structures.

**Stonemasonry:** In the construction of stone structures, mortar is applied to bond individual stones, providing stability and strength to the overall structure.

## Implementation and applications of mortars

### Pointing:

**Mortar Pointing:** Mortar is used for pointing, which involves filling in gaps or joints between bricks or stones to improve the appearance and weather resistance of a structure.

### Plastering:

**Interior and Exterior Plaster:** Mortar is employed for plastering interior and exterior surfaces, providing a smooth and even finish to walls and ceilings.

### Tile Setting:

**Tile Adhesive Mortar:** Mortar is used in tile setting to bond tiles to surfaces, such as floors or walls, providing a secure and durable attachment.

## Implementation and applications of mortars

### Repair and Restoration:

**Structural Repairs:** Mortar is often used for repairing and restoring damaged masonry structures, including filling cracks, replacing deteriorated mortar joints, or restoring historical buildings.

### Fireproofing:

**Fire Mortar:** Specialized fire-resistant mortars are used to create fireproof barriers in industrial settings or areas where fire resistance is critical.

### Waterproofing:

**Waterproofing Mortar:** Some mortars are designed to be waterproof, making them suitable for applications in areas prone to water exposure, such as basements or bathrooms.

## Implementation and applications of mortars

### Specialized Applications:

**Refractory Mortar:** Used in high-temperature environments, such as in the construction of fireplaces or industrial furnaces.

**Soundproofing Mortar:** Designed to absorb or dampen sound vibrations, used in soundproofing applications.

The specific implementation and application of mortars can vary based on factors such as the type of mortar, the construction requirements, environmental conditions, and the intended use of the structure. It's crucial to choose the right type of mortar for a particular application to ensure the desired performance and durability. Additionally, advances in construction materials may lead to the development of new mortar formulations tailored to specific needs.

## Quality of a good mortar

## Quality of a good mortar

The quality of mortar is essential for ensuring the structural integrity, durability, and overall performance of a construction project. Several factors contribute to the quality of a good mortar:

### **Proper Mix Proportions:**

The correct proportion of cement, sand, and water is crucial. Deviations from the recommended mix ratios can affect the strength, workability, and durability of the mortar.

### **Consistent Mixing:**

The mixing process should be thorough and consistent to ensure uniform distribution of ingredients. This helps in achieving a homogenous mortar with a smooth and workable consistency.



## Quality of a good mortar

### **Appropriate Water Content:**

The water-to-cement ratio is critical. Too much water can weaken the mortar, while too little can result in poor workability. The goal is to achieve a balance that allows for proper hydration of the cement without compromising the mortar's strength.

### **Use of Quality Materials:**

The quality of the raw materials, including the cement and sand, directly influences the mortar's performance. High-quality cement and clean, well-graded sand contribute to a stronger and more durable mortar.

## Quality of a good mortar

### **Adherence to Specifications:**

Following the recommended specifications and guidelines for the type of mortar and application is essential. Different construction projects may require specific mortar formulations to meet structural and performance standards.

### **Appropriate Curing:**

Proper curing involves maintaining the right conditions, such as temperature and moisture, during the initial setting and hardening of the mortar. Adequate curing helps prevent cracking and ensures optimal strength development.

## Quality of a good mortar

### **Consistent Workability:**

The mortar should have consistent workability to facilitate easy application and proper bonding of masonry units. This is especially important in construction applications where mortar needs to be applied in various conditions.

### **Admixtures (if necessary):**

In some cases, admixtures may be used to enhance specific properties of the mortar, such as workability, water retention, or resistance to certain environmental conditions. The addition of admixtures should be done in accordance with industry standards.

## Quality of a good mortar

### **Compatibility with Substrates:**

The mortar should be compatible with the substrates it is bonding. Different substrates may require different types of mortar to ensure proper adhesion and long-term stability.

### **Resistance to Environmental Factors:**

A good mortar should exhibit resistance to environmental factors such as freeze-thaw cycles, chemical exposure, and moisture. This ensures the long-term durability of the structure.

Regular testing and quality control measures during the manufacturing and construction processes help ensure that the mortar meets the required standards. Following best practices and industry guidelines is crucial for achieving a high-quality mortar that contributes to the success and longevity of a construction project.

## The different mortars

## The different mortars

### 1. Cement mortars:

Cement mortars are widely recognized for their exceptional resistance, rapid setting, and quick hardening properties, making them a staple in the construction industry. The fundamental volumetric dosage ratio of cement to sand in cement mortars is commonly established at 1:3, a formulation that balances the cohesive strength required for structural integrity.



## The different mortars

### 1. Cement mortars:

This ratio may, however, be subject to variations based on the specific demands of diverse construction projects. Moreover, the meticulous control of the water-to-cement ratio plays a pivotal role in achieving optimal performance. Typically hovering around 0.35, this ratio ensures the mortar's workability without compromising its overall strength. One noteworthy attribute of cement mortars is their capacity to become practically waterproof when a sufficient dosage of cement is employed.

## The different mortars

### 1. Cement mortars:

This waterproofing quality enhances the durability of structures by preventing the infiltration of water, which is particularly advantageous in diverse environmental conditions. These characteristics collectively contribute to the versatility and reliability of cement mortars in various construction applications.



## The different mortars

### 2. Lime mortars :

Lime mortars, in contrast to their cement counterparts, exhibit distinctive characteristics that set them apart in the realm of construction materials. Notably, lime mortars are recognized for their unique texture, often described as "greasy and creamy." This distinct quality imparts a certain flexibility to lime mortars, making them more accommodating to movements and settlement within a structure. Unlike the rapid setting of cement mortars, lime mortars undergo a comparatively slower hardening process.



## The different mortars

### 2. Lime mortars :

This delayed hardening time can be advantageous in situations where a more gradual and controlled setting is desired, allowing for greater workability and ease of application. Additionally, the slower setting time of lime mortars contributes to their compatibility with historic or older structures, as it minimizes the risk of damage during restoration or conservation efforts. It's worth noting that the performance of lime mortars is often evaluated based on their breathability, which allows moisture to pass through, making them suitable for certain heritage conservation applications.

## The different mortars

### 3. Bastard mortars :

Bastard mortars represent a distinctive category within the spectrum of mortar types, characterized by their binder composition, which is a combination of both cement and lime. In the formulation of these mortars, it is common practice to incorporate equal proportions of lime and cement. However, the flexibility inherent in bastard mortars allows for adjustments in the ratio, with the specific quantity of one binder being varied relative to the other.



[MALTA BASTARDA - Traditional "bastard type" mortar](#)

## The different mortars

### 3. Bastard mortars :

This variability is determined by the intended application and the desired qualities of the mortar, allowing for a tailored approach to meet the unique requirements of different construction projects. The hybrid nature of bastard mortars capitalizes on the advantageous properties of both cement and lime, offering a balance between the rapid setting and high strength associated with cement, and the flexibility and slow-setting characteristics characteristic of lime mortars. As a result, bastard mortars find application in diverse contexts, providing a versatile solution for construction projects that demand a nuanced blend of properties.

## The different mortars

### 4. Mortars manufactured on-site :

Mortars manufactured on-site represent a pragmatic approach to construction, where the materials are sourced and prepared directly at the construction site. The primary constituents of these mortars include cement and sand sourced from the immediate construction environment. Commonly used cements, such as CPA or CPJ cement, are supplemented with specialized variants like fused aluminous cement to meet specific project requirements.



[Everything About Mortar In Construction](#)

## The different mortars

### 4. Mortars manufactured on-site :

Additionally, the inclusion of hydraulic lime and, on occasion, masonry binders adds a layer of flexibility to the mortar composition, catering to diverse construction needs.

The sand used in on-site manufactured mortars is typically of silico-lime nature, with some instances incorporating crushed sand. The mixing process is carried out manually with a shovel or, for larger projects, using a small concrete mixer. Although the sands employed may vary from one delivery to another, it is imperative that they are consistently clean and possess a suitable particle size to ensure the desired mortar properties.

## The different mortars

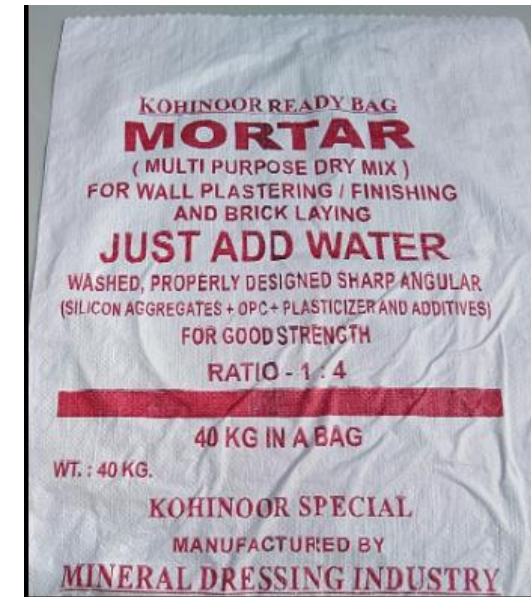
### 4. Mortars manufactured on-site :

The dosing of sand in on-site mortars is generally performed by weight, a method preferred for its accuracy. In smaller construction sites, volume-based dosing might be employed, necessitating careful consideration of the phenomenon of sand abundance. This variability in the composition and preparation of on-site manufactured mortars acknowledges the practical constraints of construction environments while highlighting the importance of maintaining essential standards for cleanliness and particle size.

## The different mortars

### 5. Premixed dry industrial mortars:

Premixed dry industrial mortars stand out as a modern and efficient solution in the construction industry, offering a host of advantages that contribute to streamlined and high-quality construction processes. These mortars are meticulously manufactured from dry, carefully selected components, packaged in factory-controlled conditions, and consistently maintain a regular and uniform composition. The simplicity of use is a defining characteristic – users need only add the required amount of water, mix the mortar, and apply it as needed.



[Light Gray Dry Ready PreMix  
Sand Cement Mortar, Packaging  
Size: 40 Kg](#)



## The different mortars

### 5. Premixed dry industrial mortars:

The composition of these premixed mortars is versatile, incorporating various binders, sands, and sometimes additives or colorings to meet specific construction requirements. The key advantages of using premixed dry industrial mortars are evident in the pre-dosing of components, ensuring a constant composition that guarantees regularity and high-quality performance. This feature not only enhances the reliability of the construction material but also contributes to time savings during the construction process. The efficiency of these premixed mortars significantly reduces the preparation time, resulting in cleaner and more organized construction sites.

## The different mortars

### 5. Premixed dry industrial mortars:

Manufacturers of industrial mortars offer a comprehensive range of products, catering to diverse construction needs. This includes mortars designed for coatings with varied color and appearance, waterproofing mortars to protect structures from water ingress, thermal insulation mortars for enhancing energy efficiency, pointing mortars for joint applications, leveling mortars to create smooth surfaces, sealing mortars for enhanced durability, screed mortars for floor applications, adhesive mortars for tiles on either plaster or cement bases, and repair mortars for addressing structural or cosmetic issues. This extensive product range ensures that construction professionals have access to a variety of solutions that align with the specific requirements of their projects.

## The different mortars

### 6. Fresh mortars delayed, stabilized, ready to use:

The construction industry has witnessed the emergence of a novel generation of mortars in recent years—fresh, delayed, and stabilized mortars, conveniently provided by ready-mixed concrete plants. This innovation in mortar technology has significantly enhanced the efficiency of construction processes. A distinctive feature of these mortars is their delayed setting, allowing for delivery and storage in substantial quantities.



[Mortar Delay Set: For Hot Weather Mortar Work](#)

## The different mortars

### 6. Fresh mortars delayed, stabilized, ready to use:

This characteristic extends the window of usability, providing construction professionals with a generous timeframe of up to 36 hours to utilize the mortar without the need for constant small-batch preparations.

The convenience of these mortars is further underscored by their user-friendly nature and homogeneity. Their ease of handling streamlines construction procedures, making them particularly advantageous for masonry and pointing applications.

## The different mortars

### 6. Fresh mortars delayed, stabilized, ready to use:

Despite their delayed setting, these mortars exhibit sufficient strength to meet the demands of the intended work, ensuring that they provide robust performance in structural and finishing aspects of construction projects.

This evolution in mortar technology not only addresses the logistical challenges of on-site mortar preparation but also contributes to enhanced project management, allowing construction teams to focus on other critical aspects of the build. The ability to store and utilize these fresh, delayed, and stabilized mortars efficiently represents a notable advancement in construction materials, marking a significant step forward in optimizing construction processes.