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| RAS AI KHAIMAH MUNICIPALITY (RAKM) - URBAN PLANNING & DEVELOPMENT SECTOR | |
| BUILDING DEPARTMENT (BD)- PERMITS SECTION (PS) | |
| Specific Product Card for Blocks | RAKM-BD-PS-RD-1006 |
| | October, 2024 |

RAKM-BD-PS-RD-1006

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| Issue | Date | Clause | Amendments |
|-------|------------|------------------------|------------|
| 01 | 01-10-2024 | Requirements Issued | |

Revision History is updated, and document issued whenever an amendment of the document is done. Amendments are highlighted in light grey.

Table of Contents

| | |
|---|----|
| 1. FORWARD..... | 4 |
| 2. PRODUCT IDENTIFICATION AND APPLICABLE STANDARD/ REFERENCES | 4 |
| 3. REQUIREMENTS FOR SAMPLING AND TESTING | 4 |
| 4. BLOCK TAGGING..... | 11 |

1. FORWARD

- 1.1 This specific product card describes the requirements for the product(s) as identified in accordance with the requirements of Type 1 Product Certification Scheme as per ISO/IEC 17067 and as reflected in RAKM-BD-PS-GD-0002 "General Requirements for Certification Systems", in addition to the requirements for conformity evaluation, as stated below.
- 1.2 The process involves technical assessment/ evaluation of product(s) compliance with the set specific requirements.
- 1.3 Wherever applicable, approved manufacturers bear the right to use RAK Quality mark on the certified products listed within the scope of certification as well using the mark on promotional material. Approved manufacturers will be subjected to announced and/or unannounced market/factory surveillances by RAK Municipality representing team for continued compliance with the approval requirements.

2. PRODUCT IDENTIFICATION AND APPLICABLE STANDARD/ REFERENCES

| Product Name | Applicable Standard/References |
|--|--|
| Concrete Masonry Blocks | Ras Al Khaimah Municipality Requirements Reflected within this Specific Product Card |
| Concrete Filler (Hourdi) Blocks | |
| Concrete Sandwich (Thermal) Blocks | |
| Concrete Paving Blocks (Interlock) | |
| Autoclaved Aerated Concrete (AAC) Masonry Blocks | |

3. REQUIREMENTS FOR SAMPLING AND TESTING

- 3.1 The process of application of applicant/client, product sampling, fees, and condition for issuance of the Type 1 certificate of conformity shall be in line with the related provisions as specified for the Type 1 certification system.

Application Documents covering the below:

- Factory Industrial License
- List of products required for certification.
- Product(s) manufacturing process and production parameters
- List of testing equipment and production machineries with their valid calibration records
- List of key staff (Management, production, quality control, etc..)
- Test reports *if any*

- 3.2 Selection of samples: Product details as well grades shall be of uniform physical description covering the size, dimensions, etc.. and shall be distinctly identified by any appropriate means.
- 3.3 The assigned certification personnel shall formulate a statistical random sampling plan based on available information about the product to be certified (i.e. quantity, types, models, location, source, etc.);
- 3.4 The sampling and testing plan shall be prepared in such manner that will provide highest confidence that the sample represents the entire population of product being certified.
- 3.5 Quantity of samples shall be as per the requirements of tests to be carried out.
- 3.6 In case the sample fails to meet the requirements, the applicant may request for re-sampling and re-testing from the same batch of product/s, in accordance with the agreed sampling plan. If the new sample again fails to meet the requirements, the product shall be considered non-conforming, and no certificate shall be issued.
- 3.7 Test reports representing one or more sub-categories of the products to be covered in the scope of certification and issued by an accredited third-party laboratory to ISO/IEC 17025 may be considered and subjected to evaluation if carried out within one year from the application date.

3.8 Test(s) to be conducted as follows:

Part 1: Concrete Masonry Blocks

| S/N | Properties to be Determined | Requirements | | | | | | | | | | | | | | | |
|-------------|--|--|------------|------------------|------------------|---------------|------------|---|---------------|----------|-----|-------------|------------|-----|-------------|----------|---|
| 1 | Dimensions, mm | All dimensions (Length (L), Width (W) and Height (H)) are as per the declared size with maximum allowable tolerance of ± 3.0 mm . | | | | | | | | | | | | | | | |
| 2 | Density, Kg/m³ | Maximum allowable tolerance of ± 10% of the declared Value | | | | | | | | | | | | | | | |
| 3 | Total Linear Drying Shrinkage, (Max), % | Maximum 0.06% | | | | | | | | | | | | | | | |
| 4 | Compressive Strength, (Min), Mpa | <table border="1"> <thead> <tr> <th>Type</th> <th>Criteria</th> <th>Value (min), Mpa</th> </tr> </thead> <tbody> <tr> <td>Normal Weight</td> <td>Individual</td> <td>6</td> </tr> <tr> <td>Normal Weight</td> <td>Average*</td> <td>7.5</td> </tr> <tr> <td>Lightweight</td> <td>Individual</td> <td>2.4</td> </tr> <tr> <td>Lightweight</td> <td>Average*</td> <td>3</td> </tr> </tbody> </table> | Type | Criteria | Value (min), Mpa | Normal Weight | Individual | 6 | Normal Weight | Average* | 7.5 | Lightweight | Individual | 2.4 | Lightweight | Average* | 3 |
| | | Type | Criteria | Value (min), Mpa | | | | | | | | | | | | | |
| | | Normal Weight | Individual | 6 | | | | | | | | | | | | | |
| | | Normal Weight | Average* | 7.5 | | | | | | | | | | | | | |
| | | Lightweight | Individual | 2.4 | | | | | | | | | | | | | |
| Lightweight | Average* | 3 | | | | | | | | | | | | | | | |
| 5 | Web and Shell thickness, (Min), mm | 20 for 100, 25 for 150 & 30 for 200 and above | | | | | | | | | | | | | | | |
| 6 | Chloride Content, (Max), % | Maximum 0.06% | | | | | | | | | | | | | | | |
| 7 | Sulphate Content, (Max), % | Maximum 0.4% | | | | | | | | | | | | | | | |

* Average results are for 3 blocks

Part 2: Concrete Filler (Hourdi) Blocks

| S/ N | Properties to be Determined | Requirements | | | |
|---------|--|--|-------------------|-------------------------|--|
| 1 | Dimensions, mm | All dimensions (Length (L), Width (W) and Height (H)) are as per the declared size with maximum allowable tolerance of ± 3.0 mm . | | | |
| 2 | Density, Kg/m³ | Maximum allowable tolerance of ± 10% of the declared Value | | | |
| 3 | Total Linear Drying Shrinkage, (Max), % | Maximum 0.06% | | | |
| 4 | Compressive Strength, (Min), Mpa | Type | Criteria | Value (min), Mpa | |
| | | Normal Weight | Individual | 2.4 | |
| | | Normal Weight | Average* | 3.0 | |
| 5 | Web and Shell thickness, (Min), mm | 25mm | | | |
| 6 | Chloride Content, (Max), % | Maximum 0.06% | | | |
| 7 | Sulphate Content, (Max), % | Maximum 0.4% | | | |

* Average results are for 3 blocks

Part 3: Concrete Sandwich (Thermal) Blocks

| S/ N | Properties to be Determined | Requirements | | | | | | | | | | | | | | | |
|---------------|---|--|------|----------|------------------|---------------|------------|---|---------------|----------|-----|-------------|------------|-----|-------------|----------|---|
| 1 | Dimensions, mm | All dimensions (Length (L), Width (W) and Height (H)) are as per the declared size with maximum allowable tolerance of ± 3.0 mm . | | | | | | | | | | | | | | | |
| 2 | Nominal size, mm | (400x200x200), (400x200x250) | | | | | | | | | | | | | | | |
| 3 | Density, Kg/m³ | Maximum allowable tolerance of ± 10% of the declared Value | | | | | | | | | | | | | | | |
| 4 | Polystyrene Size, (Min), mm | 60 | | | | | | | | | | | | | | | |
| 5 | Polystyrene Density, (Min), Kg/m³ | 22 | | | | | | | | | | | | | | | |
| 4 | Compressive Strength, (Min), Mpa | <table border="1"> <thead> <tr> <th>Type</th> <th>Criteria</th> <th>Value (min), Mpa</th> </tr> </thead> <tbody> <tr> <td>Normal Weight</td> <td>Individual</td> <td>6</td> </tr> <tr> <td>Normal Weight</td> <td>Average*</td> <td>7.5</td> </tr> <tr> <td>Lightweight</td> <td>Individual</td> <td>2.4</td> </tr> <tr> <td>Lightweight</td> <td>Average*</td> <td>3</td> </tr> </tbody> </table> | Type | Criteria | Value (min), Mpa | Normal Weight | Individual | 6 | Normal Weight | Average* | 7.5 | Lightweight | Individual | 2.4 | Lightweight | Average* | 3 |
| Type | Criteria | Value (min), Mpa | | | | | | | | | | | | | | | |
| Normal Weight | Individual | 6 | | | | | | | | | | | | | | | |
| Normal Weight | Average* | 7.5 | | | | | | | | | | | | | | | |
| Lightweight | Individual | 2.4 | | | | | | | | | | | | | | | |
| Lightweight | Average* | 3 | | | | | | | | | | | | | | | |
| 5 | Face Shell thickness, (Min), mm | 20mm | | | | | | | | | | | | | | | |
| 6 | Chloride Content, (Max), % | Maximum 0.06% | | | | | | | | | | | | | | | |
| 7 | Sulphate Content, (Max), % | Maximum 0.4% | | | | | | | | | | | | | | | |

* Average results are for 3 blocks

Part 4: Concrete Paving Blocks (Interlock)

| S/N | Properties to be Determined | Requirements | | | | | | | | | |
|----------------------|--|--|-------------------|----------|------------------|----------------------|-------------------|----|----------------------|-----------------|----|
| 1 | Dimensions, mm | All dimensions (Length (L), Width (W) and Height (H)) are as per the declared size with maximum allowable tolerance of ± 3.0 mm . | | | | | | | | | |
| 2 | Density, Kg/m³ | Maximum allowable tolerance of ± 10% of the declared Value . | | | | | | | | | |
| 3 | Water Absorption, (Max), % | <table border="1"> <tr> <td>Individual</td> <td>7</td> </tr> <tr> <td>Average</td> <td>5</td> </tr> </table> | Individual | 7 | Average | 5 | | | | | |
| Individual | 7 | | | | | | | | | | |
| Average | 5 | | | | | | | | | | |
| 4 | Compressive Strength, (Min), Mpa | <table border="1"> <thead> <tr> <th>Type</th> <th>Criteria</th> <th>Value (min), Mpa</th> </tr> </thead> <tbody> <tr> <td>Normal Weight</td> <td>Individual</td> <td>40</td> </tr> <tr> <td>Normal Weight</td> <td>Average*</td> <td>50</td> </tr> </tbody> </table> | Type | Criteria | Value (min), Mpa | Normal Weight | Individual | 40 | Normal Weight | Average* | 50 |
| Type | Criteria | Value (min), Mpa | | | | | | | | | |
| Normal Weight | Individual | 40 | | | | | | | | | |
| Normal Weight | Average* | 50 | | | | | | | | | |
| 5 | Acid soluble Chloride Content, (Max), % | 0.06 | | | | | | | | | |
| 6 | Acid soluble Sulphate Content, (Max), % | 0.4 | | | | | | | | | |
| 7 | Solar Reflectance Index (SRI), (Min) | 29 | | | | | | | | | |

* Average results are for 3 blocks

Part 4: Autoclaved Aerated Concrete (AAC) Masonry Blocks

| S/N | Properties to be Determined | Requirements | | | | | | |
|----------------------------|--|---|----------|------------------|-------------------|-----|----------------------------|-----|
| 1 | Dimensions, mm | All dimensions (Length (L), Width (W) and Height (H)) are as per the declared size with maximum allowable tolerance of ± 3.0 mm . | | | | | | |
| 2 | Gross Density, Kg/m³ | Maximum 850 Kg/m³ With maximum allowable tolerance of ± 10% of the declared Value and in no case more than the above maximum value. | | | | | | |
| 3 | Drying Shrinkage, (Max), mm/m | 0.9 mm/m | | | | | | |
| 4 | Normalized Compressive Strength, (Min), Mpa | <table border="1"> <thead> <tr> <th>Criteria</th> <th>Value (min), Mpa</th> </tr> </thead> <tbody> <tr> <td>Individual</td> <td>2.5</td> </tr> <tr> <td>Average¹</td> <td>3.0</td> </tr> </tbody> </table> | Criteria | Value (min), Mpa | Individual | 2.5 | Average¹ | 3.0 |
| Criteria | Value (min), Mpa | | | | | | | |
| Individual | 2.5 | | | | | | | |
| Average¹ | 3.0 | | | | | | | |
| 5 | Chloride Content, (Max), % | 0.05% by mass | | | | | | |
| 6 | Sulphate Content, (Max), % | 1.0% by mass | | | | | | |
| 7 | Thermal Conductivity (Where applicable)², (Max), | Shall not exceed the declared value by the manufacturer | | | | | | |
| 8 | Appearance (Visual Aspects) | Sound and free of defects to ensure proper placing in construction sites. Shall have uniform texture and do not show defects/cracking | | | | | | |
| 9 | Special Texture (Visual Aspects) | For blocks with special surface textures, the texture shall meet the description declared by the manufacturer | | | | | | |
| 10 | Durability Aspect | Consistent Compliance with Strength Requirements | | | | | | |

¹ Average results are for 3 blocks

² For blocks intended to be used in elements subject to thermal requirements, thermal conductivity of AAC Blocks shall be declared by the manufacturer according to BS EN ISO 10456 at 35°C and 60% relative humidity (RH).

4. BLOCK TAGGING

4.1 The manufacturer of concrete masonry blocks shall submit to RAKM a blocks marking of their products for approval. The approved mark shall be applied to the products covered by the certification and shall include as a minimum:

- Company name and logo
- Address for the manufacturing facility
- Block type, dimensions, and minimum density
- Lot/batch number
- Production date
- Bundle quantity (Number of Blocks / Square Meters)
- RAKM Certificate of Conformity number and RAK Quality Mark logo wherever applicable
- Polystyrene Insert (Thickness and Density) *for Sandwich Blocks only*
- Color of the blocks (Interlock) *for Paving Blocks only*
- Thermal Conductivity *if declared for AAC Blocks only*