



## AAC BLOCKS

TECHNICAL DATA SHEET



Lightweight, reduces  
Structural Cost



Best-in-class  
Thermal Insulation



Superior  
Fire Resistance



Excellent Sound  
Absorption



Resists  
Efflorescence



Green Walling  
Material



## PRODUCT DESCRIPTION

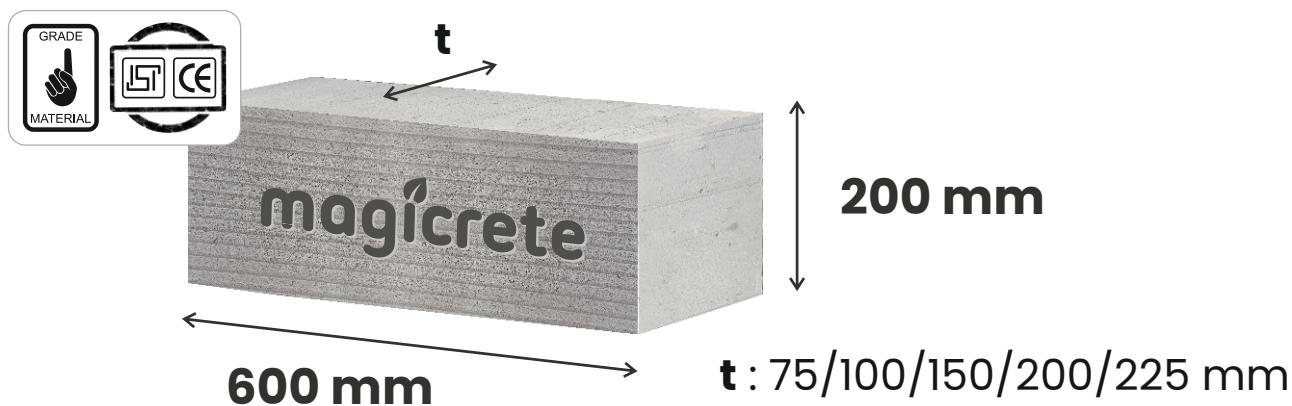
Autoclaved Aerated Concrete (AAC) blocks are lightweight walling materials offering superior thermal insulation, sound absorption, and fire resistance. Manufactured using a precise mix of cement, gypsum, lime, fly ash, water, and an aerating agent, AAC blocks undergo autoclaving to achieve high strength and durability. Their uniform shape, larger size, and ease of installation make them an ideal choice for modern construction, contributing to faster project completion and sustainable building practices.

## APPLICATION AREAS

|                         |                            |
|-------------------------|----------------------------|
| Residential Buildings   | High-rise Constructions    |
| Commercial Complexes    | Partition & Exterior Walls |
| Industrial Structures   | Boundary Walls             |
| Institutional Buildings | Soundproof Enclosures      |

## PRODUCT CERTIFICATION AND SIZES

Magicrete AAC blocks conform to IS 2185 (Part 3):2015 for Autoclaved Aerated Concrete Blocks and related standards. They are also recognized as a green building material and are GRIHA certified, owing to their use of industrial waste (fly ash) and energy-saving properties. They are available in various standard sizes (length x height x thickness) to suit different applications.



## PHYSICAL PROPERTIES

AAC blocks are produced to precise dimensions, allowing for thin mortar joints and minimal finishing.

- **Standard Block Sizes (L×H):** 600 × 200 mm
- **Thickness (Width) Options:** 75, 100, 150, 200, 225 mm.
- **Dimensional Tolerances:** Length  $\pm 5$  mm; Height & Width  $\pm 3$  mm

These tolerances meet IS 2185 (Part 3) specifications, ensuring walls are plumb and true, requiring only a thin layer of plaster.

- **Appearance:** Typically, grey-white with a uniform, closed-cell structure. Surfaces are flat but slightly porous, providing a good key for plasters and adhesives. Edges are straight and true, enabling neat masonry with thin-bed mortar.
- **Weight:** Each block usually weighs between 6–20 kg, depending on its size, making handling easy.

Conforms to IS 2185 Part 3 (Grade 1)

## TECHNICAL PROPERTIES

| PARAMETERS                     | UNITS              | REQUIREMENT                                                      | RESULTS                        | TEST METHODS                              |
|--------------------------------|--------------------|------------------------------------------------------------------|--------------------------------|-------------------------------------------|
| Compressive Strength           | N/mm <sup>2</sup>  | $\geq 4.0$ for Grade-1 @ density range 551–650 Kg/m <sup>3</sup> | $\geq 4.0$ (Grade-1)           | IS:6441 (Part 5) – 1972 (Reaffirmed 2022) |
| Oven Dry Density               | Kg/m <sup>3</sup>  | 551–650                                                          | 560–650                        | IS:6441 (Part 1) – 1972 (Reaffirmed 2022) |
| Fire Resistance                | Hrs.               | 2                                                                | 4 (for 150 mm thick wall)      | -                                         |
| Thermal Conductivity (K Value) | W/m·K              | Max 0.24                                                         | 0.16                           | IS-3346, 1980 (Reaffirmed 2005)           |
| Sound Reduction                | dB                 | NA                                                               | 43 (for 100 mm thick wall)     | -                                         |
| Modulus of Elasticity          | Mpa                | NA                                                               | 2040                           | -                                         |
| Thermal Resistance (R Value)   | m <sup>2</sup> K/W | Max Value is desirable                                           | 0.95 (200mm width) @ 0.21 W/mK | -                                         |
| Drying Shrinkage (Maximum)     | %                  | 0.05 Maximum for Grade-1                                         | 0.04                           | IS:6441 (Part 2) – 1972 (Reaffirmed 2022) |
| Capillary Water Absorption     | gm/dm              | < 210 @ 24 hours (as per NFP 14306)                              | 180 Max                        | IS: 6041:1985 (Reaffirmed 2020)           |

\*Note: The values obtained are from laboratory testing conditions and at  $27 \pm 2^\circ\text{C}$ . On site tests may show slight variation due to site conditions and/or methods of testing/application.

## WALLING MATERIAL COMPARISON



| Property                                    | AAC Blocks                                         | Concrete Blocks             | Red Clay Bricks            |
|---------------------------------------------|----------------------------------------------------|-----------------------------|----------------------------|
| Material Composition                        | Fly Ash + Gypsum + Lime + Cement+ Aluminium powder | Cement+Sand+Gravel          | Top Soil                   |
| Speed of Installation (1 Mason + 2 Helpers) | 35 m <sup>2</sup> /day                             | 18 m <sup>2</sup> / day     | 10 m <sup>2</sup> /day     |
| Water Absorption                            | Low                                                | Average                     | High                       |
| Dry Density                                 | 551–650 kg/m <sup>3</sup>                          | 2400–2500 Kg/m <sup>3</sup> | 1800–200 Kg/m <sup>3</sup> |
| Earth Quake Resistance                      | High                                               | Low                         | Low                        |
| Fire Rating (150 mm)                        | 4 Hours                                            | 3 Hours                     | 2 Hours                    |
| Energy Saving                               | High                                               | Low                         | Low                        |
| Thermal Conductivity                        | ~0.16 W/m·k                                        | ~2 W/m·k                    | ~0.81 W/m·k                |
| Sound Reduction Index (100 mm)              | 43 dB                                              | 41 dB                       | 40 dB                      |
| Pest & Termite                              | None                                               | None                        | High                       |
| MEP Installation difficulty level           | Minimal                                            | Very High                   | Medium                     |
| Eligible For Green Points Under GRIHA/IGBC  | Yes                                                | Yes                         | No                         |

## MAGICRETE AAC BLOCKS COVERAGE

| SIZE (mm)   | NUMBER OF BLOCKS |                     |                    | CUBIC METERS REQUIRED |                    |
|-------------|------------------|---------------------|--------------------|-----------------------|--------------------|
|             | 1 CBM            | 100 ft <sup>2</sup> | 100 m <sup>2</sup> | 100 ft <sup>2</sup>   | 100 m <sup>2</sup> |
| 600X200X075 | 111.11           | 77.42               | 833.33             | 0.70                  | 7.50               |
| 600X200X100 | 83.33            | 77.42               | 833.33             | 0.93                  | 10.00              |
| 600X200X150 | 55.56            | 77.42               | 833.33             | 1.39                  | 15.00              |
| 600X200X200 | 41.67            | 77.42               | 833.33             | 1.86                  | 20.00              |
| 600X200X225 | 37.04            | 77.42               | 833.33             | 2.09                  | 22.50              |
| 600X200X230 | 36.23            | 77.42               | 833.33             | 2.14                  | 23.00              |
| 600X200X300 | 27.78            | 77.42               | 833.33             | 2.79                  | 30.00              |
| 625X200X100 | 80.00            | 74.32               | 800.00             | 0.93                  | 10.00              |
| 625X200X150 | 53.33            | 74.32               | 800.00             | 1.39                  | 15.00              |
| 625X200X200 | 40.00            | 74.32               | 800.00             | 1.86                  | 20.00              |
| 625X240X100 | 66.67            | 61.94               | 666.67             | 0.93                  | 10.00              |
| 625X240X150 | 44.44            | 61.94               | 666.67             | 1.39                  | 15.00              |
| 625X240X200 | 33.33            | 61.94               | 666.67             | 1.86                  | 20.00              |
| 625X250X100 | 64.00            | 59.46               | 640.00             | 0.93                  | 10.00              |
| 625X250X150 | 42.67            | 59.46               | 640.00             | 1.39                  | 15.00              |
| 625X250X200 | 32.00            | 59.46               | 640.00             | 1.86                  | 20.00              |
| 625X250X225 | 28.44            | 59.46               | 640.00             | 2.09                  | 22.50              |



## MAGICRETE AAC BLOCKS – DETAILED APPLICATION GUIDELINES

To maximize the performance of [AAC blocks](#), proper construction practices should be followed, based on IS 6041:1985 Code of Practice for AAC block masonry and industry best practices.

### 1. Storage & Handling at Site

- **Level Surface:** Store blocks on a flat, dry surface, preferably on wooden pallets, to prevent uneven loads and moisture contact with the ground.
- **Protection from Moisture:** Cover block stacks with plastic sheeting or tarpaulins to prevent rainwater ingress. Allow wet blocks to dry completely before installation.
- **Stack Configuration:** Stack blocks in an interlocking manner to reduce toppling risk and protect corners.

### 2. Site Preparation Before Wall Construction

- **Concrete Frame Readiness:** Ensure RCC columns and beams are properly cured, aligned, and free of significant deflection before laying masonry.
- **Surface Hacking for Bond:** Roughen surfaces of adjacent columns and beams that will contact AAC masonry by hacking or using a mechanical scarifier to improve adhesion. If hacking is not feasible, apply an approved bonding agent.
- **Wetting of Blocks:** Pre-wetting AAC blocks is generally not required, unlike clay bricks. However, in hot, dry climates, lightly mist the blocks just before laying to prevent rapid water absorption from the [mortar](#). For normal conditions, simply clean dust from the blocks.

### 3. Wall Thickness Recommendations

- **Internal Partition Walls (Non-Load-Bearing):** Minimum 100 mm thick AAC blocks are recommended.
- **External Walls (Framed Structures, Infills):** 200 mm thick AAC walls are recommended for exteriors for better thermal and sound insulation. 150 mm thick external walls can be used if adequately braced or reinforced.
- **Parapet and Free-Standing Walls:** Limit height to no more than 5 times the wall thickness if unbraced (per IS 1905 for masonry stability). For example, a 100 mm parapet should be  $\leq 500$  mm tall unless tied to columns or stiffeners.
- **Bracing:** Providing support (bracing) at intervals not exceeding ~3 m allows for taller AAC parapets/wall.

## 4. Mortar Application

Use mortar conforming to IS 2250:1981 (Code of practice for masonry mortars).

- **Thin-bed mortar:** Thin-bed jointing mortars or [Magicrete Block joining Mortar](#) are highly recommended for AAC blocks due to their dimensional accuracy. This premixed blend of cement, graded sand, and polymer additives provides high bond strength with minimal thickness (3–5 mm). It reduces thermal bridging and shrinkage cracks.
- **Traditional cement mortar:** Mortar strength should be lower than block strength to minimize the risk of cracks. Common mix proportions are:
  - 1:2:9 (Cement:Lime:Sand) for internal walls.
  - 1:1:6 (Cement:Lime:Sand) for external walls or those with higher loads.
  - 1:6 (Cement:Sand) can be used if lime is unavailable, but consider a plasticizer.
- **Consistency:** Prepare mortar to a consistency of 90–130 mm (flow table or slump) as per IS 2250 Appendix-B.
  - **Application:** Use a notched trowel to apply thin-bed mortar evenly on block bed and head joints, aiming for ~100% coverage.
- **Curing:** Thin-bed mortar does not require water curing. Traditional cement mortar joints should be mist-cured for 2–3 days.

## 5. Laying of AAC Block Masonry

- **First Course:** Lay a conventional mortar leveling bed (~10–12 mm thick) for the first course. Place corner blocks first, ensuring they are level and plumb. Allow the first course to set for 24 hours before building subsequent course.
- **Laying Subsequent Courses:** Use thin-bed mortar. Clean the top of the previous course before applying new mortar. Blocks should be staggered from the course below, with at least a 100 mm overlap or one-third the length of the block, whichever is more. Continuously check for horizontal level and vertical plumb. Gently tap blocks into alignment with a rubber mallet.

## 6. Beam & Column Gaps

- **Gap at RCC Columns:** Leave a vertical gap (~10 mm) between the AAC wall and RCC column. Fill this gap with a flexible filler like polyurethane foam or lean mortar (cement–sand mortar in 1:8 mix). Install metal wall ties (e.g., galvanized straps) tying the AAC wall to the column every third course or ~600 mm vertically.
- **Gap below RCC Beams/Slabs:** Provide a horizontal gap of 15–20 mm at the top of the AAC wall, between the top course and the underside of the RCC beam or slab. Fill this gap with a backing rod and a flexible sealant or lean mortar.

## 7. Control Joints or Mullions

- **Vertical Control Joints:** Provide a vertical movement joint roughly every 3 m in long straight walls, or at significant changes in wall height/thickness.
- **Joint Construction:** A control joint is typically a 10 mm gap running full-height of the wall, filled with a flexible filler or sealant (e.g., foam backer rod and polyurethane or silicone sealant).

## 8. Nominal Bond Beams and Reinforcement or Coping

- **Nominal Bond Beams:** Horizontal RCC or reinforced mortar beams cast within the masonry at certain vertical intervals. Typically formed by U-shaped AAC lintel blocks filled with concrete, or by cutting a channel in blocks. Use at least 2 × 8 mm diameter mild steel bars or 2 × 6 mm high-strength deformed bars as reinforcement. Place every 4th or 5th course (around 1.2 m vertical spacing) or above and below openings. These beams tie the wall together, add bending strength, and distribute loads.
- **Joint Reinforcement (Wire Mesh):** Install [Magicrete Power Mesh](#) (or an equivalent substitute) on every alternate bed joint. The spacing between the outermost longitudinal wires of the mesh should be 50 mm less than the wall thickness. To ensure adequate tensile strength, a minimum overlap of ~75 mm is recommended at mesh joints. As per IS:6041 – 1985 clause 4.6.5, this method is more effective in crack control than bond beam.

## 9. Fixing of Door and Window Frames

- **Conventional Holdfasts into RCC Inserts:** Cast vertical RCC studs/columns (e.g., 100 mm × 100 mm) within the AAC wall on each side of the opening. Attach the door frame using metal holdfasts anchored into these RCC studs. This method is secure and minimizes cracking around frame corners.
- **Direct Fixing with Specialty Anchors:** For lighter frames, use direct anchoring into the AAC with long fasteners, but ordinary nails are inadequate. Use 200 mm long hardened screws or anchor bolts with sleeves designed for AAC. Space anchors at max 400 mm apart around the frame.
- **Lintel:** All openings must have a lintel spanning across the top. Use precast AAC lintel blocks or conventional RCC lintels.
- **Sill Level Bond Beam:** It's good practice to have a bond beam at window sill level. This boxes the opening with reinforced concrete, reducing crack formation.

## 10. Rendering & Plastering

- **External Rendering:** External AAC masonry must be protected from weather with suitable rendering. Follow IS 2402:1963. Ensure blocks are dry to apply a bonding agent or [Magicrete Unibond](#) before the first coat, and lightly mist the wall before plastering. Use a two-coat plaster system: a base coat (~12–15 mm) of 1:6 cement:sand or 1:1:6 cement:lime:sand, or Magicrete Readymix Plaster and a finish coat (~5–8 mm). Cure the base coat lightly for 2–3 days and protect freshly plastered walls from sun and rain.
- **Internal Plastering:** AAC walls indoors can be finished with a single-coat plaster (6–12 mm) of gypsum plaster or cement-lime-sand plaster 1:1:6 or [Magicrete Readymix Plaster](#). Clean the wall and apply a bonding agent if using cement plaster. Gypsum plaster is highly recommended for interiors due to its adhesion and superior finish. Avoid oil paints directly on AAC/plaster without proper priming due to alkalinity.

## 11. Chasing & Fixings (MEP Installations)

- **Planning:** Plan routes of conduits and plumbing lines in advance.
- **Chasing:** Use a motorized wall chaser or angle grinder with a masonry blade for precise grooves. Do not use brute force.
- **Depth Limit:** Chase depth must not exceed one-third of the block thickness.
- **Spacing:** Avoid back-to-back chases on opposite faces and do not cut too close to edges or openings.
- **Backfilling:** Fill grooves with a strong non-shrink grout or polymer-modified mortar, embedding the conduit. Reinforce over the chase with a strip of fiber mesh or chicken wire to prevent cracks.
- **Fixtures and Fastenings:** Use appropriate anchors rated for AAC (plastic or nylon wall plugs, or metal expansion/chemical anchors for heavy loads).

# HOW TO AVOID CRACKS IN AAC MASONRY

- **Accommodate Structural Movements:** Delay AAC partition wall construction until the primary structure has undergone most initial settlement and deformation.
- **Floor/Ceiling Deflection:** Ensure partitions do not inadvertently carry slab loads. Leave a gap at the top of the wall under slabs and provide a slip joint or cushion at the wall-ceiling junction.
- **Wall/Column Joints:** Use slip joints at abutments with columns (10 mm vertical separation filled with compressible material).
- **Openings Reinforcement:** Reinforce around openings with nominal RCC bond beams at sill level and vertical RCC studs at jambs.
- **Temperature & Moisture Effects:** Incorporate control joints at recommended spacing (every 6m) to allow expansion/contraction. Use horizontal reinforcement (joint mesh) to distribute tensile stresses. Keep walls dry during construction and protect them from rain.



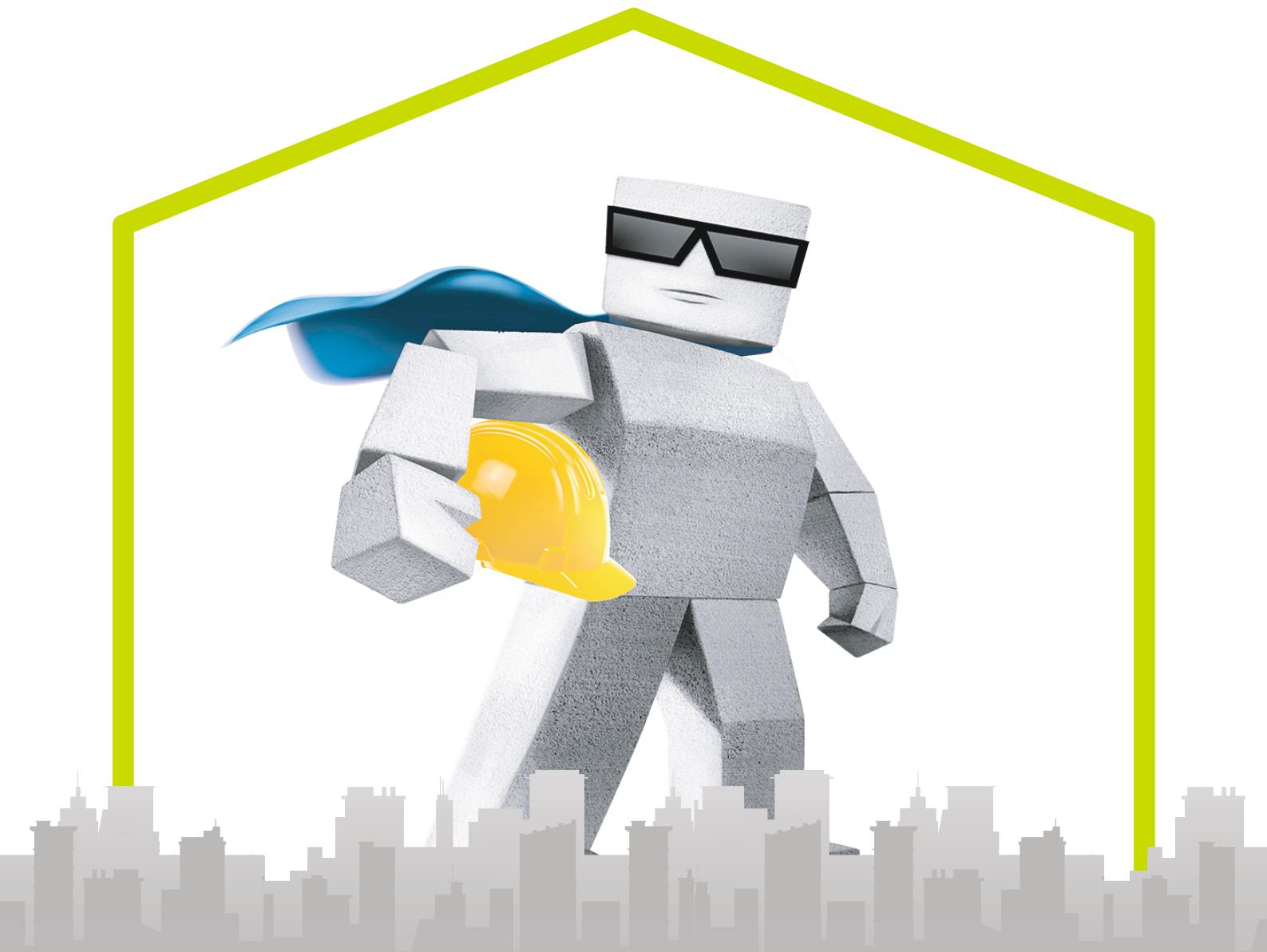
## SAFETY PRECAUTIONS

Working with [AAC blocks](#) is generally safer than very heavy masonry units, but standard construction safety practices apply.

- **Personal Protective Equipment (PPE):** Always wear gloves, a dust mask or respirator, and safety goggles. Use hearing protection when cutting with power saws.
- **Dust Control:** AAC cutting generates fine dust. Use wet cutting methods or water spray to suppress dust. If dry cutting, ensure good ventilation and use a vacuum dust-collector. Workers must avoid inhaling dust, and N95 rated masks are essential.
- **Handling and Lifting:** AAC blocks can still weigh ~20 kg for large sizes. Use proper lifting techniques (lift with legs, get help for heavier units). Use mechanical aids where possible. Set down blocks gently; do not drop them.
- **Worksite Safety:** Keep the worksite organized to avoid tripping hazards. Clear debris regularly. Dispose of AAC waste properly. Keep scaffolding free of loose blocks.
- **Fire Safety:** AAC is non-combustible. Maintain fire safety when using tools that produce sparks or with solvents on site.

## IMPORTANT USAGE NOTES

- **Thin-Bed Mortar Only:** Always use a purpose-made thin-bed mortar or [Magicrete block joining mortar](#) (3–4 mm thick joints) for laying AAC blocks. Traditional thick mortar can lead to poor adhesion, thermal bridging, and shrinkage cracks.
- **Waterproofing of Walls:** While AAC has low water absorption, proper waterproofing measures are essential for external walls. This includes DPC at plinth level, waterproof coatings/sealants or [Magicrete Unibond](#) on outer plaster in wet areas, adequately overhanging copings and sills, and proper sealant around window/door frames.
- **Seismic Reinforcement:** In earthquake-prone zones, always consider reinforcement for AAC masonry. Incorporate horizontal band reinforcements (bond beams or bed joint mesh) and vertical reinforcements (RCC tie-columns). Follow IS 4326 (seismic masonry) and IS 6041.
- **Accurate Alignment:** Lay blocks in proper alignment and level from the start. Consistent use of a straightedge and level is crucial. Correct misalignment immediately.
- **Minimal Curing:** AAC block masonry requires very little water curing. Excessive water can be detrimental, leading to mortar leaching or weakening, and AAC shrinking upon drying.
- **Drilling and Chasing Tools:** Use appropriate tools for AAC, such as wood-boring drill bits or carbide-tipped masonry bits on rotary mode for holes, and a wall chaser for grooves.
- **Avoid Vibration:** AAC blocks do not respond well to strong vibrations. Do not use mechanical vibration to consolidate masonry. Protect unfinished AAC walls from nearby compaction or demolition vibrations.
- **Choosing Plaster & Finishes:** Choose plasters or renders that bond well. Gypsum plaster is highly recommended for interiors. For exteriors, use rich cement mortar or [Magicrete Readymix Plaster](#) with waterproofing. Avoid very hard plaster. Always prime AAC surface before painting.



### **Magicrete Building Solutions Pvt. Ltd.**

(ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified co.)

101-102, Ritz Square, Near Narmad Library, Ghod Dod Road, Surat-395001 Gujarat.

**[www.magicrete.in](http://www.magicrete.in)**

In case of customer care: 80 70 40 80 10 | [info@magicrete.in](mailto:info@magicrete.in)

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SCAN FOR  
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