

FLY ASH BRICK

Description of item: Fly ash brick as per IS 12894-2002

Note: This item is already covered in Unified SOR 2010 item no. 055090. However it has been observed that fly ash bricks are not being used though it is beneficial in view of environmental protection as well as cost.

Available sizes-

For Modular Size

Length 190 ± 4 mm

Width 90 ± 2 mm

Height 90 ± 2 mm and 40 ± 2 mm

For Non-modular Size

Length 230 ± 4 mm

Width 110 ± 2 mm

Height 70 ± 2 mm and 30 ± 2 mm

Composition of normal clay bricks and fly ash bricks

Fly Ash Bricks	Normal Clay Bricks
A) Fly ash- 60-65% Sand/Stone dust- 20-25% Hydrated lime- 8-12% Gypsum-5%	Silica (sand) – 50% to 60% Alumina (clay) – 20% to 30% Lime – 2 to 5% Iron oxide – $\leq 7\%$
B) Fly ash- 50% to 60% Sand/stone dust – 32%-40% Cement – 8-10%	Magnesia – less than 1%

Merits & Demerits of fly ash bricks-

Merit of Fly Ash Brick:

- 1- Fly ash bricks are light weight, therefore, transportation is easy.
- 2- Fly ash bricks are uniform in shape and size in comparison to burnt clay brick, therefore, require less mortar in brick work and finishing work resulting saving of cement mortar.
- 3- As, fly ash brick are machine made, quality control is better in comparison to burnt clay bricks.
- 4- Fly ash bricks are environment friendly as:
 - It is a green building product and recommended in LEED & TERI-GRIHA systems.
 - It uses fly ash, which is a waste – product of thermal power plants having no value itself.
 - Saves agricultural land which is used for manufacturing clay bricks.
 - Less energy intensive compared to clay bricks and help in keeping clean environment.

Demerit of Fly Ash Brick:

- 1- Mechanical bonding strength is weak. But this can be improved by adding marble/ stone dust and cementing materials.
- 2- Limitation of size. Only modular size can be produced.
- 3- Air exchange is poor in comparison to normal clay bricks. Hence proper ventilation of house is important.

Comparison of Clay brick and Fly ash Brick:

Clay Brick	Fly Ash Brick
Not in uniform colour as the colour of brick depends upon type of soil and quality control during production.	The colour of fly ash brick is same as the manufacturing is carried out using machinery in controlled condition.
Clay brick are uneven in shape as the mostly clay bricks are made manually.	Uniform in shape and smooth in finish as the manufacturing is carried out using machinery
As the surface finish is not even, plastering is necessary.	As the surface is even and joints are thinner, no plastering required in normal cases.
Clay brick are Heavier.	Fly ash brick are lighter as the main composition is fly ash.
Clay bricks are more porous	Fly ash bricks are less porous
The cost of clay brick is higher than fly ash brick.	The cost of fly ash brick is approximate 30%lower than clay brick.
Continuing use of clay bricks in construction industry will lead to extensive loss of fertile top soil. This could be a devastating environmental hazard.	This is made by using by-product of Thermal Power Plant. Which save environment from being polluted.

Manufacturing Process of Fly Ash Brick:

- 1- Fly Ash Bricks are made bricks manufactured by hydraulic or vibratory press.
- 2- Raw material required are fly ash shall conform to Grade 1 or Grade 2 of IS 3812 (60-65%), Bottom ash used as replacement of shall not have more than 12 percent loss on ignition when tested according IS 1727, lime shall conform to class C hydrated lime of IS 712(8-12%), gypsum (5%), locally available sand/stone dust (18-27%) and water.
- 3- Ordinary Portland Cement can also be used in place of hydrated lime and gypsum.
- 4- Raw materials in the required proportion are mixed in the pan mixer to have a semi dry uniform mix.
- 5- Semi dry mix is placed in the moulds of hydraulic/ vibro press.

- 6- Moulded bricks are air dried for one/two days in a shed depending upon the weather conditions and then water cured for 14-21 days.
- 7- The bricks thus produced are sound, compact and uniform in shape.

Use of Fly Ash Brick: Fly Ash Bricks can be used as replacement of common burnt clay building bricks. Some examples of Fly Ash Bricks used by other organizations are as under:

- 1- NTPC townships at Simhadri in Andhra Pradesh, Sipat in Chhattisgarh, Faridabad in Haryana and Talchar – Kaniha in Orissa .
- 2- NTPC's power plant construction works at Rihand, Unchahar & Dadri (Uttar Pradesh), Talchar – Kaniha (Orissa) and Ramagundam (Andhra Pradesh).
- 3- NTPC's NETRA office building at Greater Noida & residential quarters at Township at Noida .
- 4- Cafeteria and Management School building in IIT Delhi.
- 5- Office building construction by Greater Noida Development Authority .

Technical Specification: Technical Specification of Fly Ash Brick as per IS: 12894-2002 is as under:

1. Compressive Strength

The minimum average wet compressive strength of pulverized fuel ash-lime bricks shall not be less than the one specified for each class as mentioned in table 1 in IS: 12894, when tested as described in IS 3495 (Part 1). The wet compressive strength of any individual brick shall not fall below the minimum average wet compressive strength specified for the corresponding class of bricks by more than 20 percent.

2. Drying Shrinkage

The average drying shrinkage of the bricks when tested by the method described in IS 4139, being the average of three units, shall not exceed 0.15 percent.

3. Efflorescence Test

The bricks when tested in accordance with the procedure laid down in IS 3495 (Part 3), shall have the rating of efflorescence not more than 'moderate' up to Class 12.5 and 'slight' for higher classes.

4. Water Absorption

The bricks, when tested in accordance with the procedure laid down in IS 3495 (Part 2), after immersion in cold water for 24 hour, shall have average water absorption not more than 20 percent by mass up to class 12.5 and 15 percent by mass for higher classes.

Market Price: As per the analysis of SOR item no. 055093 of USSOR 2010, the rate of Fly ash brick is Rs. 1881/- per 1000. However, the markets prices obtain from supplier through IndiaMART.com is Rs. 3900/- per 1000 brick + freight + taxes from Gurgaon. The supplier has also informed that in case of bulk supply the plant can be installed at site to minimize the freight charges.

Market rate of 1st class burnt clay brick (ordinary brick) is Rs. 6500/- per 1000 brick + freight in Lucknow (U.P.)

Suppliers:

Manufacturer & Supplier of Fly Ash Bricks

- 1. Hindustan Tiles**
Mr. Narendra Saxena (Director)
No. 601/602, Suneja Tower - 2,, District Center, Janak Puri
New Delhi - 110058, Delhi, India
Contact No.: 08447496498

- 2. G. L. T. Enterprises**
Mr. Lokesh Gupta (CEO)
D - 639, Saraswati Vihar, Pitampura
Delhi - 110 034, India
Contact No.: 09953362622

- 3. Eco Vision Industries.**
Mr. Jitendra Pareek (Managing Director)
D-15 & 16, Site B, UPSIDC, Surajpur Industrial Area
Greater Noida - 203207, Uttar Pradesh, India
Contact No.:08447570282

- 4. S.R Windows & Glass Solutions**
Mr. Manoj Sharma (Proprietor)
Shop No. 4, Kadamba Shopping Complex, Gamma - 1
Greater Noida - 201308, Uttar Pradesh, India
Contact No.: 08587900505

- 5. V K Enterprises**
Mr. Inderjeet Singh (Manager)
Plot No. 2957, Sector-57
Gurgaon - 122003, Haryana, India
Contact No.: 09643007698

- 6. Aparna Enterprises Limited**
Mr. Naveen/ Mrs.Varsha
No. 8-2-293/82/A, Plot No. - 1214, Road No. - 60, Jubilee Hills
Hyderabad - 500 033, Andhra Pradesh, India
Contact No.: 08377809349

- 7. Affa Tile Company**
Mr. Anaz
No. 1116/8, Poonamalee High Road, Opposite Hotel Shan Royal
Chennai - 600107, Tamil Nadu, India
Contact No.: 08377802185

8. A.B.N. Enterprise

Mr. Tapan Dutta (Owner)
Nabin Sen Palli, Post Nabapalli Barasat
Kolkata - 700126, West Bengal, India
Contact No.: 08588832343

9. Aster Enterprise

Mr. Joseph John (CEO)
32/3055-A1, Near Marthoma Centre, St. Rita's Road, Vyttila, Landmark - Near Gold Souk
Kochi - 682019, Kerala, India
Contact No.: 08588800787

10. Dev Infratech

Mr. Kiran Patel
Survey No. 862, Beside Patel Tractor Showroom, Opposite GSFC Main Gate, Chhani
Vadodara - 391740, Gujarat, India
Contact No.: 09582599487

11. Marshall Corporation Limited

Mr. Anshul Chauhan (Director-Operation)
No. 2, Chowringhee Approach
Kolkata - 700072, West Bengal, India
Contact No.: 09953362698

12. Techno Design

Mr. R. Manivasagam (Proprietor)
No. - 1/3, Chandrasekar Street, S. M. Narayanan Nagar, Anna Nagar West
Chennai - 600101, Tamil Nadu, India
Contact No.:08588832165

13. Metco Blocks Mfg. Co.

Mr. Imtiyaz Patel / Mr Sattar Patel (Partners)
Shop No. 2, Patel Compound, Behind Bharat Petrol Pump, Panvel-Mumbra Road, Taloja-
Kharghar
Navi Mumbai - 410208, Maharashtra, India
Contact No.:08377808662

14. Bhoomi Trading Corporation

Mr. Sandeep Budhavale (Proprietor)
F - 51, Lake City Mall, Next To Big Bazaar, 1st Floor, Kapurbadi, Thane
Mumbai - 400604, Maharashtra, India
Contact No.: 08376806063

15. Mohta Cement Pvt. Ltd.

Mr. Saurabh Mohta / Mr. Gaurav Mohta (Managing Director)
Plot No 61-62, Pithampur Sector 3
Dhar - 454001, Madhya Pradesh, India
Contact No.: 09953354394

16. Pooja Enterprise

Mr. Anil Shinde / Ms. Lata Shinde (Proprietor)
Gate No. 281/2, Plot No. D-1, Kahane Malla, Chikhali
Pune - 412114, Maharashtra, India
Contact No.: 08376807223

17. Allied Concrete Works

Mr. Jayendra H. Gupta (Director)
S. H. Gupta Compound, Near Dattani Park, Western Express Highway, Opposite Sai Dham
Mandir, Kandivali
Mumbai - 400101, Maharashtra, India
Contact No.: 08587096799

18. Shreeji Flyash Bricks

Mr. Chandrakant Patel / Mr. Dilip patal (Proprietor)
No. 58, Navdurga Industrial Park, Village Sakarda
Vadodara - 390001, Gujarat, India
Contact No.: 08586979384

19. SRG Infratech

Mr. Kailash Morwal (Proprietor)
No. 70, Near Naraina Vihar, Village Asarpura, Teh. Sanganer
Jaipur - 302011, Rajasthan, India
Contact No.: 09873117160

20. Sheetal Pipes

Mr. Anuj Agrawal (Proprietor)
No. 180, Small Factory Area, Bhandara Road
Nagpur - 440008, Maharashtra, India
Contact No.: 08377809299

21. Shri Sai Pavers

Mr. Sameer Singhal / Mr. Anil Single (Partner)
Kohara- Machiwara Road, Village Kumkalan
Ludhiana - 141001, Punjab, India
Contact No.: 08588859155

22. Sonali International

Mr. K. Chakraborty
246, Shyambabu's Ghat, P. O. Chinsurah
Hooghly - 712101, West Bengal, India
Contact No.: 09953363063

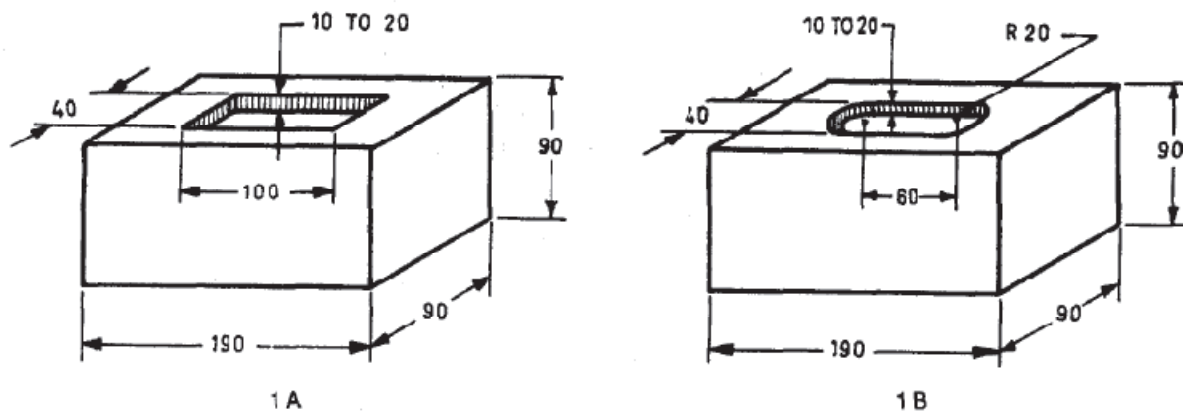
23. Teraco Tiles

Mr. Sreeram Kumar BE (Proprietor)
No. 2/4, Hanumaiah Reddy Road, Halasuru
Bengaluru - 560008, Karnataka, India
Contact No.: 09643007025

24. Balaji Cement Product

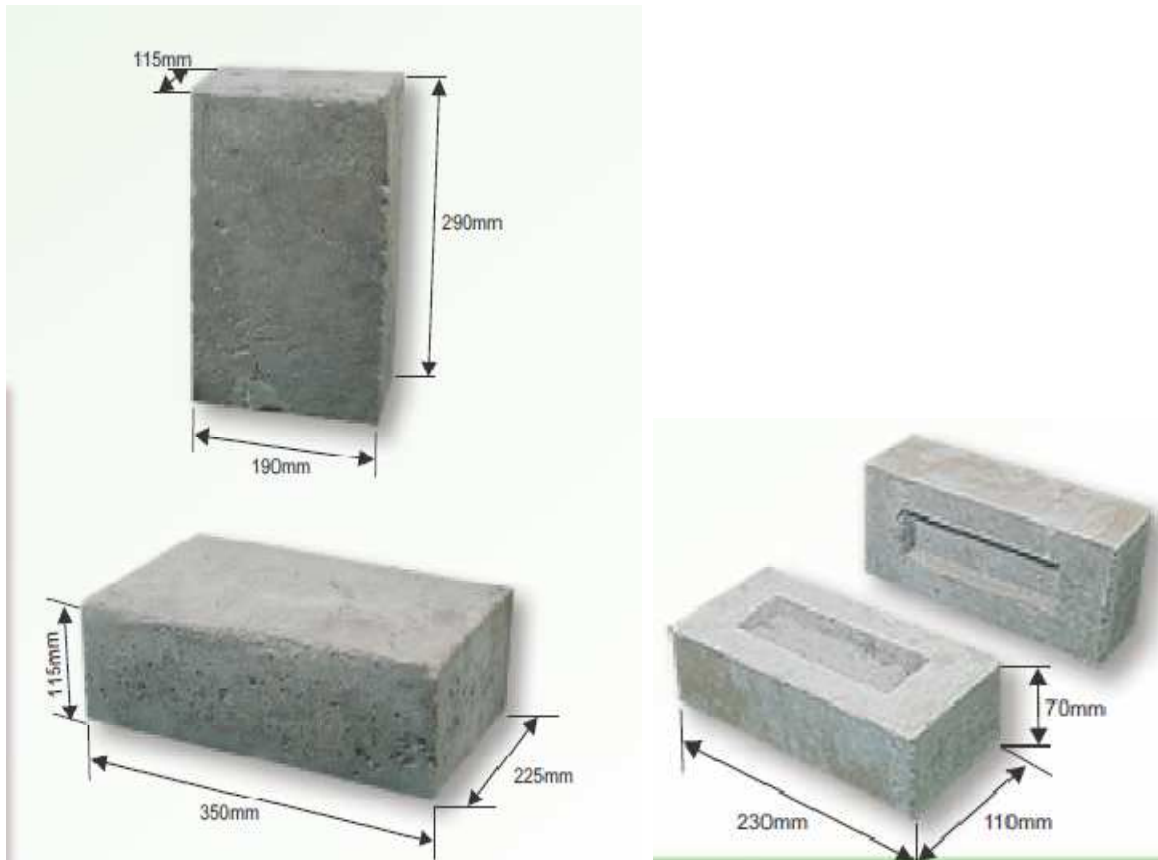
Mr. Karan Kamani (Director)
Koththariya Ring Road Chowkdi, Ranuja Temple Main Road, Near Brahmani Hall
Rajkot - 360002, Gujarat, India
Contact No.: 08376809237

- The details of above suppliers have been collected from internet.



All dimensions in millimetres.

FIG. 1 SHAPE AND SIZE OF FROGS IN BRICKS



IMAGES OF FLYASH BRICKS (WITH & WITHOUT FROG)