



### Company introduction

Azar Seram Marand Refractory Industries factory is located on a land of 1/5 hectares in Marand industrial town, 5 km of Marand-Jolfa road.

The technical knowledge and construction technology of this factory was provided by the French-German Serik Vistray company, and compared to many large factories producing ceramic rollers, this factory is placed in the ranks of fully mechanized factories, such that the use of advanced equipment, speed and accuracy It has increased production far beyond expectations. The launch of this complex has created employment for 70 people directly and 300 people indirectly.

Azar Seram Marand Refractory Industries Factory is the only factory in the Middle East in the production of ceramic rollers with modern technology, which was set up with the aim of producing rollers and intermediate products for steel and ceramic industries. The company's technical knowledge is in line with the current European knowledge, and in this regard, the company has always tried to use European experts and consultants in order to improve its technical knowledge and keep it up-to-date. Azar Seram Marand Refractory Industries factory has two production halls, all processes related to the production of ceramic rollers are done in hall number one. This salon has a shuttle furnace of 37 cubic meters with a capacity of 1000 rollers per charge and a working temperature of 1650 degrees Celsius, capable of producing 120,000 rollers per year. has The possibility of producing ceramic rollers in dimensions of 1300 mm to 5000 mm and in diameters of 30 to 55 mm is one of the production capabilities of this salon.

The quality of the produced rollers is checked by performing specialized tests in the factory's laboratory. in the present Currently, this factory has the possibility of producing ceramic rollers in three grades: ACM LTR, ACM MTR, and ACM HTR. that each of these rollers has its own unique features and has specific uses.

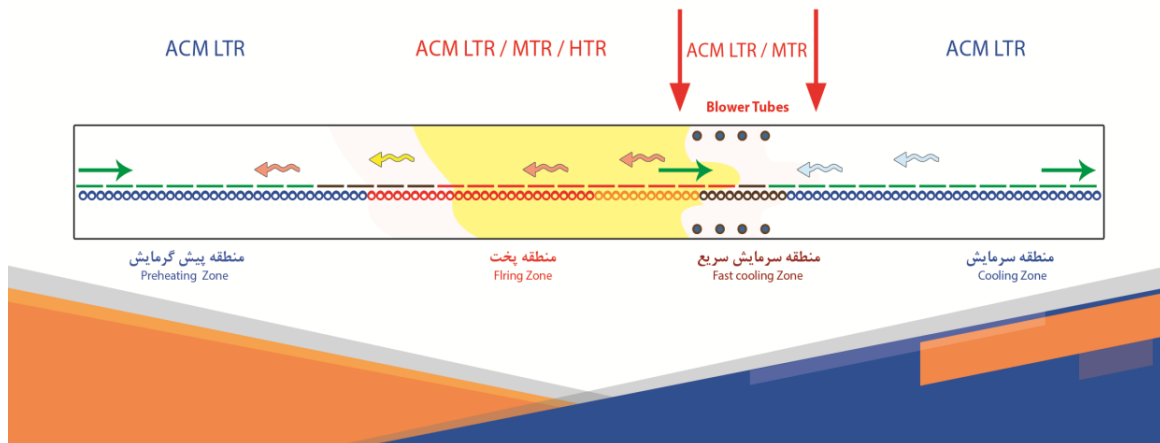




## Application of ceramic

Rollers ACM rollers are widely used in the manufacture of ceramic parts, polished glazed tiles, marble tiles, porcelain tiles, rustic tiles, wall tiles, roof tiles, water-permeable bricks, foam ceramics and containers.

| منطقه سرمایش سریع منطقه سرمایش |         |   | منطقه پخت |         |         | منطقه پیش گرمایش |         |         | item                  |
|--------------------------------|---------|---|-----------|---------|---------|------------------|---------|---------|-----------------------|
| ACM HTR                        | ACM LTR |   | ACM HTR   | ACM MTR | ACM LTR | ACM HTR          | ACM MTR | ACM LTR |                       |
|                                | ✓       | ✓ | ✓         | ✓       |         |                  | ✓       | ✓       | Polished glazed tile  |
|                                | ✓       | ✓ | ✓         | ✓       |         |                  | ✓       | ✓       | Marble tile           |
|                                | ✓       | ✓ | ✓         | ✓       | ✓       |                  | ✓       | ✓       | porcelain tile        |
|                                |         | ✓ |           | ✓       | ✓       |                  |         | ✓       | Rustic tile           |
|                                |         | ✓ |           | ✓       | ✓       |                  |         | ✓       | Wall tile             |
|                                |         | ✓ | ✓         | ✓       | ✓       |                  |         | ✓       | Roof tiles            |
|                                | ✓       |   | ✓         |         |         |                  |         |         | Water permeable brick |
|                                | ✓       |   | ✓         |         |         |                  |         |         | Ceramic foam          |
|                                |         |   | ✓         | ✓       |         |                  |         |         | tableware             |





### User guide Instructions for using

Before placing the rollers in the oven, apply a protective coating (Ngob Roller) on them.

Put the refractory ceramic fibers inside the two ends of the rubber.

Place the roller next to the oven so that the router's moisture is lost due to its heat and it dries to its full length.

### Preparation of rollers

After placing the roller in the furnace, rotate it continuously to avoid excessive heat concentration on one side of the roller.

Control the oven temperature between 700 and 200 degrees Celsius during baking. Insert the rollers into the oven and increase the temperature slowly.

### Installation of rollers

Gently remove the rollers from the furnace and place it on the platform covered with refractory ceramic fibers and rotate it.

### Replacement of rollers

### Cleaning rollers

Avoid impacts and scratches that cause mechanical

Clean the surface of the roller using sandpaper or using a sub machine

### Cleaning rollers

When you reduce the temperature of the furnace, pay attention to control the rate of temperature drop and temperature difference in the furnace.

Avoid using roller in alkaline environment



## Technical characteristics

Lorem Ipsum

## مشخصات فنی رولرهای تولیدی

|                                                    |                                | ACM LTR          | ACM HTR                    | ACM MTR                    |
|----------------------------------------------------|--------------------------------|------------------|----------------------------|----------------------------|
| Chemical analysis (%)                              | Al <sub>2</sub> O <sub>3</sub> | 72-74            | 73-75                      | 74-76                      |
|                                                    | SiO <sub>2</sub>               | 26-28            | 20-22                      | 18-20                      |
|                                                    | ZrO <sub>2</sub>               | -                | 5.5                        | 6                          |
| Crystallographic analysis                          |                                | Corundum/Mullite | Corundum/ Mullite / Zircon | Corundum/ Mullite / Zircon |
| Module of Rupture (N/mm2)(MPa)                     | 25 °C                          | 60-65            | 65-70                      | 70-75                      |
| Bulk density (g/cm3)                               |                                | 2.4-2.5          | 2.5-2.6                    | 2.6-2.7                    |
| Apparent porosity (%)                              |                                | 12-14            | 19.5-20.5                  | 10-12                      |
| Absorbed water (%)                                 |                                | 4.5-5.5          | 7.5-8.5                    | 4-4.5                      |
| Thermal shock resistance                           |                                | very good        | very good                  | very good                  |
| Maximum operating temperature (°C)                 |                                | 1280             | 1350                       | 1320                       |
| linearity                                          |                                | ≤0.07%L          | ≤0.07%L                    | ≤0.07%L                    |
| Thermal expansion coeffiient (K-1 x 10-6)20-1000°C |                                | 6.2 - 6.3        | 5.9 - 6.1                  | 6.5 - 6.9                  |
| Dimensions                                         | Outer diameter (O.D)           | 30-55mm          | 30-55mm                    | 30-55mm                    |
|                                                    | Length(L)                      | up to 5000mm     | up to 5000mm               | up to 5000mm               |



### Ceramic roller ACM MTR

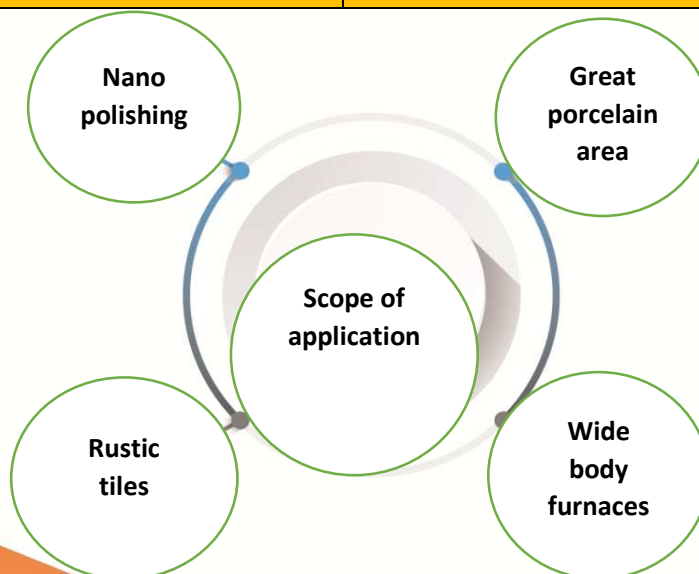
High load tolerance

High temperature strength

High density

Good resistance to thermal shock

| water absorption (%)                                                   | 4 – 4.5                                             |
|------------------------------------------------------------------------|-----------------------------------------------------|
| bending strength (MPa)                                                 | 70 - 75                                             |
| Coefficient of thermal expansion<br>(20 – 1000)°C *10 <sup>-6</sup> /K | 6.5 – 6.9                                           |
| Thermal shock resistance                                               | great                                               |
| Maximum working temperature( °C)                                       | 1320                                                |
| Specifications                                                         | External diameter : 30 – 55 mm<br>Length : 500 mm ≥ |





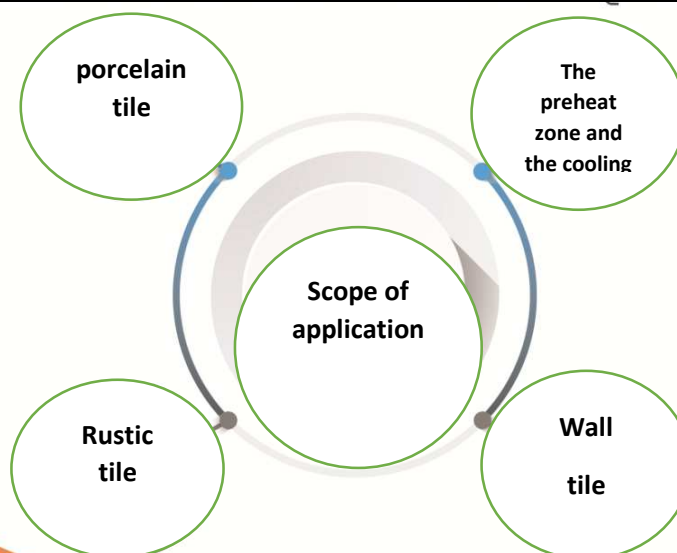
### Ceramic roller ACM LTR

High resistance to bending and stretching

High creep resistance at high temperature

High elastic modulus at room temperature

| water absorption (%)                                                | 4.5 – 5.5                                           |
|---------------------------------------------------------------------|-----------------------------------------------------|
| bending strength (MPa)                                              | 60 - 65                                             |
| Coefficient of thermal expansion (20 – 1000)°C *10 <sup>-6</sup> /K | 6.2 – 6.3                                           |
| Thermal shock resistance                                            | very good                                           |
| Maximum working temperature( °C)                                    | 1280                                                |
| Specifications                                                      | External diameter : 30 – 55 mm<br>Length : 500 mm ≥ |





### Ceramic roller ACM HTR

High creep resistance.  
Long working life

High load  
tolerance

High strength at high  
temperature

Good density

| water absorption (%)                                                   | 7.5 – 8.5                                           |
|------------------------------------------------------------------------|-----------------------------------------------------|
| bending strength (MPa)                                                 | 65 - 70                                             |
| Coefficient of thermal expansion<br>(20 – 1000)°C *10 <sup>-6</sup> /K | 5.9 – 6.1                                           |
| Thermal shock resistance                                               | great                                               |
| Maximum working temperature( °C)                                       | 1350                                                |
| Specifications                                                         | External diameter : 30 – 55 mm<br>Length : 500 mm ≥ |

