# ASTRON
REINFORCED CONCRETE SPACERS

*Making Tomorrow Stronger*

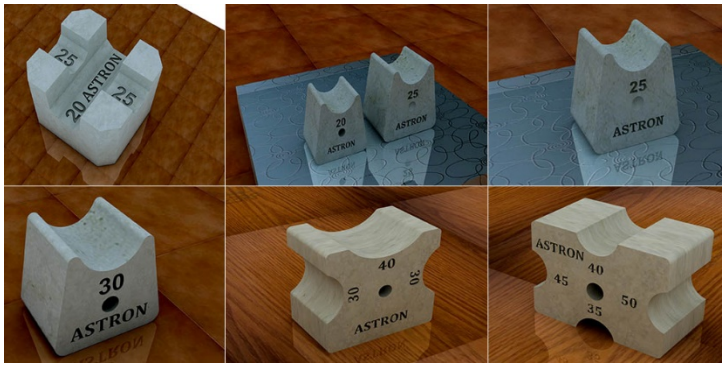
**WHAT ARE CONCRETE SPACERS?**


Concrete Spacers(Concrete Cover Blocks) are used to provide spacing at Slab, Column, Beam & foundation. It is essentially a spacer that is used to lift the rebar matrix off the ground so that concrete may flow underneath the rebar.

**WHY CONCRETE SPACERS?**

- To give clear cover to concrete.
- To prevent the corrosion of reinforcement of concrete.
- To give fire protection (thermal insulation) to reinforcement.
- To add strength to life of concrete without much increase of cost.
- To give reinforcing bars sufficient embedding to enable them to be stressed without slipping.

**WHY ASTRON CONCRETE PRODUCTS?**





Astron Spacers is the leading company in manufacturing and supplying the complete range of Concrete Spacers. Our Company was established on 2010 in Ernakulam, Kerala. We are working in the field of construction and concrete spacer since years. Our products are made with high quality materials and all our products ensure long life to our valuable customers. Astron Concrete Products works on the basis of order and customers choice.

Our range of products includes:

- Concrete Spacers
- Cover blocks
- Hollow bricks
- Door Frame and Window Frame

**ASTRON CONCRETE SPACERS**

***Single Cover Spacers***


Single Cover Spacers are the most basic form of spacers in use. It offers a solid support which is ideal for horizontal reinforcement. We Astron Spacers are best in manufacturing and supplying all kinds of cover blocks and spacers including single cover spacers. It is strong, durable, and the optimum choice for heavy-duty steel fixing applications.

***Multiple Cover Spacers***


Astron Spacers offers the good quality Multiple Cover Spacers to our customers. Our Multiple cover blocks are best known for its strength. We provide this product at a low price and we are the leading cover block dealers in Ernakulam and all over Kerala. This Multiple cover spacers are strong and durable at any situations.

***Heavy Duty Spacers***


Astron Spacers provide the best and high-quality heavy-duty spacers. Heavy duty Concrete spacers are used for the horizontal and vertical spacing of reinforcement steel bars and fabric. This gives support to the bars and strength to the constructions. Heavy duty spacer prevents the corrosion of rebars.

***Circular Spacers***


Astron Spacers manufacture the circular spacers in a good quality using the best raw materials. Circular Spacers are mostly used for vertical applications like columns, piles and pile caps. It is designed to give minimum contact with formwork. Circular spacers provide maximum stability when used in vertical applications.

***Spacers with Clips***

Astron Spacers provides the best quality of cover blocks and spacers. Spacers with clips are designed to save time for labour in tying a spacer. It ensures quick and effortless fixing of spacers. These spacers are also used for pre-casting members with complex or challenging mould designs. It is easier to use and also provides the good durability.

**WHY ASTRON CONCRETE SPACERS – OUR OWN SPECIALITIES**

- **High Strength** – Compressive strength not less than 50 MPa, made under strict quality control and according to specifications
- **High Durability** – Offers high durability to concrete structures with very low chloride penetration
- **High Precision** – Ensures accurate dimensions well within the prescribed tolerance
- **Low Permeability** – Offers low water and chloride penetration
- **Unique Dimensions** – Size of spacers is embossed on every spacer, offering easy identification
- **Excellent Quality** – Fabricated in accordance with International Standards and also conforming to Indian Standards

## TECHNICAL SPECIFICATIONS

### A. CHEMICAL TEST REPORT *(conducted byEngineers Diagnostic Centre (P) Ltd)*

| Grade of concrete & Period of test | Identification | Name of Test | |
|---|---|---|---|
| | | **Chloride content - Acid Soluble (kg/cu.m)** | **Sulphate as ($SO_3$) (% by mass of cement in concrete mix)** |
| M30 & 08.03.2019 to 11.03.2019 | About One kg of Concrete Lump | 0.11 | 0.21 |
| **Requirements as per IS:456-2000 (Reaffirmed in 2005)** | | For reinforced concrete or plain concrete containing embedded metal, max. acid soluble chloride content in concrete should not exceed 0.6 kg/cu.m. | Total water-soluble sulphate content as $SO_3$ should not exceed 4% by mass of cement in the concrete mix. |

### B. ABILITY TO RESIST CHLORIDE ION PENETRATION REPORT*(conducted byEngineers Diagnostic Centre (P) Ltd)*

| Grade of concrete & Period of test | Sl. No. | Identification | Total Charge passed (Coulombs) |
|---|---|---|---|
| M30 & 11.03.2019 to 17.03.2019 | 1 | M30/A | 1790 |
| | 2 | M30/B | 1750 |
| | 3 | M30/C | 1810 |
| **Requirement as per ASTM C-1202-03, Table I, Chloride ion penetrability based on charge passed is low.** | | | |

### C. WATER PERMEABILITY TEST REPORT*(conducted byEngineers Diagnostic Centre (P) Ltd)*

| Grade of concrete & Period of test | Sl. No. | Sample ID / Date of Casting* | Depth of Water Penetration (mm) | Requirement as per MORT&H Cl.1716.5 |
|---|---|---|---|---|
| M30 &14.03.2019 to 21.03.2019 | 1 | M30/A | 14.58 | **Max. 25.0 mm** |
| | 2 | M30/B | 15.40 | |
| | 3 | M30/C | 12.70 | |

## FINAL SPECIFICATIONS

| Test Parameters | Results |
|---|---|
| Compressive Strength | Not less than M50 |
| Water Absorption | 0.45% |
| Rapid Chloride Penetration Test | Low |
| Sulphate Content | 0.21% by mass of cement |
| Chloride Content | 0.11 kg/cubic meter |
| Water Penetration | 14.22 mm |
| Chloride Migration Coefficient | 2.2 x 10^-12 sqm/sec |
| Alkali Silica Reactivity | Harmless |
| Salt Content | 0.003% |

**CONCRETE MIX DESIGN REPORT***(conducted byEngineers Diagnostic Centre (P) Ltd)*

| DESCRIPTION | M30 | M50 |
|---|---|---|
| *Cement Used* | OPC 53 Grade | OPC 53 Grade |
| *Fine Aggregate Used* | Manufactured Sand | Manufactured Sand |
| *Coarse Aggregate Used* | Angular crusher aggregate 6mm | Angular crusher aggregate 6mm |
| *Sample Condition* | Satisfactory | Satisfactory |
| *Admixture Used* | 1). Chemical admixture<br>2). Mineral admixture (Polypropylene) | 1). Chemical admixture<br>2). Mineral admixture (Polypropylene) |
| *Mix to be designed* | M30 with aggregates of maximum size 6 mm. | M50 with aggregates of maximum size 6 mm. |
| *Characteristic compressive strength of concrete at 28 days (fck)* | For M30, it is 30N/sq.mm | For M50, it is 50N/sq.mm |
| *Desired degree of workability** | Corresponding to a slump of 150 - 160 mm | Corresponding to a slump of 150 - 160 mm |
| *Type and maximum size of aggregate supplied.* | Granite, Angular 6 mm | Granite, Angular 6 mm |
| *Expected degree of quality control in the field* | Control level B | Control level B |
| *Target mean compressive strength of concrete at 28 days* | For M30 it is 38.25/$mm^2$ | For M50 it is 58.25/$mm^2$ |
| *Type of exposure* | Moderate | Moderate |

**FINAL PROPOSED PROPERTIES OF CONCRETE**

| Sl. No | Properties | Properties & Proportions | |
|---|---|---|---|
| | | **M30** | **M50** |
| 1 | Mix Proportion (By weight) | **1 : 3.44 : 2.06** | **1 : 3.06 : 1.83** |
| 2 | Fresh Density of concrete Kg/$m^3$ | **2345** | **2345** |
| 3 | Free water cement Ratio | **0.42** | **0.40** |
| 4 | Slump Obtained in, mm | | |
| | a) Initial Slump | **65mm** | **70 mm** |
| | b) After 30 minutes | **25 mm** | **30 mm** |
| 5 | Average Compressive strength of the Concrete Cube<br>@ 7Days (N/$mm^2$)<br>@ 28 Days (N/$mm^2$) | <br>**29.46 N/$mm^2$**<br>**38.27 N/$mm^2$** | <br>**40.58 N/$mm^2$**<br>**59.21 N/$mm^2$** |

**SUGGESTED MIX (BY WEIGHT) FOR CONCRETE**

| Sl. No | Material | | Quantity per $m^3$ (kg) | |
|---|---|---|---|---|
| | | | **M30** | **M50** |
| 1 | Cement – OPC 53 | | **330** | **365** |
| 2 | Fine Aggregates – M. Sand | | **1136** | **1095** |
| 3 | Coarse Aggregates – 6 mm | | **681** | **657** |
| 4 | Mineral Admixtures | 1. | **46.56** | **1.46** |
| | | 2. | **31.04** | **46.56** |
| | | 3. | **-** | **31.04** |

**Technical Reference:**


1) IS: 10262-2009 (Reaffirmed 2014) - Indian standard recommended method of concrete mix design
2) IS: 456-2000 (Reaffirmed 2011) - Code of practice for plain and reinforce concrete.
3) IS: 383-1970 (Reaffirmed 2011) - Specification of coarse and fine aggregate from natural Source for concrete.
4) IS: 1199-1959 (Reaffirmed 2013) - Indian Standard specifications for methods of sampling and analysis of concrete.
5) IS: 2386-1963 (Reaffirmed 2011) - Method of test aggregate for concrete.
6) IS: 516-1959 (Reaffirmed 2013) - Method of test for strength of concrete.
7) IS 8112 :2013 - Indian Standard Specifications for OPC 53.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