



भारतीय मानक ब्यूरो  
BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

व्यापक परिचालन मसौदा

हमारा संदर्भ : सीईडी 02:2/टी-30

11 जनवरी 2024

तकनीकी समिति : सीमेंट और कंक्रीट विषय समिति, सीईडी 02

प्राप्तकर्ता :

- 1 सिविल इंजीनियरिंग विभाग परिषद, सीईडीसी के सभी सदस्य
- 2 सीमेंट और कंक्रीट विषय समिति, सीईडी 02 के सभी सदस्य
- 3 सीईडी 02 उपसमिति एंव इसकी पैनल और कार्यदल के सभी सदस्य
- 4 रूचि रखने वाले अन्य निकाय।

महोदया/महोदय,

निम्नलिखित मसौदा संलग्न है:

प्रलेख संख्या	शीर्षक
सीईडी 02 (24633)WC	सीमेंट कंक्रीट से संबंधित शब्दों की शब्दावली: भाग 6 सामग्री, उपकरण और संयंत्र (पहला पुनरीक्षण) का भारतीय मानक मसौदा (ICS: 01.040.91)

कृपया इस मसौदे का अवलोकन करें और अपनी सम्मतियाँ यह बताते हुए भेजे कि यह मसौदा प्रकाशित हो तो इस पर अमल करने में, आपको व्यवसाय अथवा कारोबार में क्या कठिनाइयाँ आ सकती हैं।

सम्मतियाँ भेजने की अंतिम तिथि: **12 फरवरी 2024**

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को उपरिलिखित पते पर संलग्न फॉर्मेट में भेजें या [ced2@bis.gov.in](mailto:ced2@bis.gov.in) पर ईमेल कर दें या सम्मितियाँ बीआईएस ई-गवर्नेंस पोर्टल, [www.manakonline.in](http://www.manakonline.in) के माध्यम से ऑनलाइन भी भेजी जा सकती हैं।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दे दिया जाएगा। यदि सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रलेख को अंतिम रूप दे दिया जाएगा।

यह प्रलेख भारतीय मानक ब्यूरो की वेबसाइट [www.bis.gov.in](http://www.bis.gov.in) पर भी उपलब्ध हैं।

धन्यवाद।

भवदीय

ह/-

(अरुण कुमार एस.)

वै. 'ई' / निर्देशक और प्रमुख (सिविल इंजीनियरिंग)

संलग्न: उपरिलिखित



भारतीय मानक ब्यूरो  
BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

DRAFT IN  
WIDE CIRCULATION

**DOCUMENT DESPATCH ADVICE**

TECHNICAL COMMITTEE:

Reference	Date
CED 02:2/T-30	11 January 2024

**CEMENT AND CONCRETE SECTIONAL COMMITTEE, CED 02**

ADDRESSED TO:

1. All Members of Civil Engineering Division Council, CEDC
2. All Members of Cement and Concrete Sectional Committee, CED 02
3. All Members of Subcommittees, Panels and Working Groups under CED 02
4. All other interested

Dear Madam/Sir,

Please find enclosed the following draft:

Doc. No.	Title
CED 02 (24633)WC	Draft Indian Standard Glossary of terms relating to Cement Concrete : Part 6 Equipment, Tools and Plant ( <i>First Revision</i> ) (ICS 01.040.91)

Kindly examine the draft and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

**Last Date for comments: 12 February 2024**

Comments if any, may please be made in the attached format and mailed to the undersigned at the above address or preferably through e-mail to [ced2@bis.gov.in](mailto:ced2@bis.gov.in). The comments may preferably be shared in the prescribed template through the Manak Online portal at [www.manakonline.in](http://www.manakonline.in). Alternatively, the comments may be sent through the attached format for consideration by the BIS' Sectional Committee for necessary action.

In case no comments are received or comments received are of editorial nature, you will kindly permit us to presume your approval for the above document as finalized. However, in case comments, technical in nature are received, then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website [www.bis.gov.in](http://www.bis.gov.in) .

Thanking you,

Yours faithfully,  
Sd/-

(Arun Kumar S.)

Sc. 'E'/Director and Head (Civil Engg.)

Encl: As above



**BUREAU OF INDIAN STANDARDS****DRAFT FOR COMMENTS ONLY**

*(Not to be reproduced without the permission of BIS or used as a Standard)*

***Draft Indian Standard*****GLOSSARY OF TERMS RELATING TO CEMENT CONCRETE  
PART 6 EQUIPMENT, TOOLS AND PLANT  
*(First Revision)***

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Cement and Concrete  
Sectional Committee, CED 02

Last date of Comments:  
**12 February 2024**

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**FOREWORD**

*(Formal Clauses to be added later)*

Cement concrete is one of the most versatile and extensively used building materials in all civil engineering constructions. There are a number of technical terms connected with the basic materials for concrete as well as the production and use of concrete which quite often require clarification to give precise meaning to the stipulations in the standard specifications, codes of practices and other technical documents. Based on this necessity and to standardize the various terms and definitions used in cement and concrete technology, this standard was published in 12 parts.

The other parts in the series are:

- |         |   |
|---------|---|
| Part 1  | Concrete aggregates   |
| Part 2  | Materials (other than cement and aggregate)                       |
| Part 3  | Concrete reinforcement  |
| Part 4  | Types of concrete   |
| Part 5  | Formwork for concrete   |
| Part 7  | Mixing, laying, compaction, curing and other construction aspects |
| Part 8  | Properties of concrete  |
| Part 9  | Structural aspects  |
| Part 10 | Tests and testing apparatus                                       |
| Part 11 | Prestressed concrete  |
| Part 12 | Miscellaneous   |

In addition to the above, two separate standards were brought out concerning terminology relating to hydraulic cement and pozzolanic materials. These standards are IS 4845: 1968 'Definitions and terminology relating to hydraulic cement' and IS 4305: 1967 'Glossary of terms relating to pozzolana'.

This standard (Part 6) was first published in 1972. In this revision the necessary changes required have been incorporated in the light of experience gained in its use and also to bring it in line with the latest development on the subject. The significant modifications made in this revision include:

- a) Inclusion of different types of external vibrators, and
- b) Inclusion of different types of concrete spreader, concrete block making machines, concrete pumps and mixers.

In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by deriving assistance from the following publications:

- a) BS 6100-9 (2007) Building and civil engineering – Vocabulary – Part 9 – Work with concrete and plaster, British Standards Institution
- b) ASTM C125 (2021) Standard terminology relating to concrete and concrete aggregates, American Society for Testing and Materials (revision 21A)
- c) ACI No. SP-19 (1967) Cement and concrete terminology, American Concrete Institute.
- d) ACI 617 (1968) Recommended practice for concrete formwork, American Concrete Institute.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values (second revision)'. The number of significant places retained in the rounded off value should be periodically removed to create more space for the future falling blocks.

**BUREAU OF INDIAN STANDARDS****DRAFT FOR COMMENTS ONLY**

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***Draft Indian Standard*****GLOSSARY OF TERMS RELATING TO CEMENT CONCRETE  
PART 6 EQUIPMENT, TOOLS AND PLANT  
*(First Revision)***

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Cement and Concrete  
Sectional Committee, CED 02

Last date of Comments:  
**12 February 2024**

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**1 SCOPE**

1.1 This standard (Part 6) covers definitions of terms relating to equipment, tools, and plant for cement concrete.

**2 REFERENCES**

The Indian Standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

<i>IS No.</i>	<i>Title</i>
IS/ISO 18652: 2005	Building construction machinery and equipment – External vibrators for concrete
IS 5891: 2022	Specification for Hand – operated mortar concrete mixers
IS 5892: 2004	Concrete transit mixers – Specification ( <i>first revision</i> )
IS 7242: 1974	Specification for concrete spreaders
IS 13291: 2012	Concrete block making machines – General requirements ( <i>first revision</i> )
IS/ISO 18650 (Part 1): 2021	Building Construction Machinery and Equipment – Concrete Mixers Part 1 Commercial Specifications ( <i>first revision</i> )
IS 16730 (Part 1): 2018	Building Construction Machinery and Equipment – Concrete Pumps Part 1 Terminology and Commercial Specifications

### 3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

**3.1 Agitating Speed** – The rate of rotation of the drum or blades of a transit mixer or truck mixer or similar other device when used for agitation of mixed concrete.

**3.2 Agitating Truck (Transit Agitator, Track Agitator)** – A mobile equipment mounted on a truck or some other suitable mobile haulage unit; in which freshly mixed concrete may be agitated by rotating the drum continuously or intermittently during transit.

#### 3.3 Agitation

- a) The process of providing gentle motion in mixed concrete just sufficient to prevent segregation or loss of plasticity.
- b) The mixing and homogenization of slurries or finely ground powders by air or mechanical means (*see also 3.4*).

**3.4 Agitator** – A device for maintaining plasticity and preventing segregation of mixed concrete by agitation.

**3.5 Air-Blow Pipes** – Air jet used in shotcrete work to remove rebound or other loose material from the work area.

**3.6 Air Gun (Cement Gun)** – A machine in which a mixture of cement and small aggregate is forced by compressed air through a hose to a nozzle, where requisite quantity of water brought through a separate hose is added, and the combined materials are driven with force from the nozzle to the point of placement.

**3.7 Air Lift** – Equipment whereby slurry or dry powder is lifted through pipes by means of compressed air.

**3.8 Air Meter** – A device for measuring the air content of concrete and mortar.

**3.9 Air Ring** – Perforated manifold in nozzle of wet-mix shotcrete equipment through which high pressure air is introduced into the material flow.

**3.10 Air Separator** – An upright cylindrical-conical pneumatic apparatus, with internal rotating blades, which separates various size fractions of ground materials

pneumatically; discharging fine particles as a product and returning oversized ones to the mill as tailings.

**3.11 Amount of Mixing** – The designation of extent of mixer action employed in combining the ingredients for concrete or mortar; it is normally designated by the mixing time in the case of stationary mixers and the number of revolutions of the drum or blades at mixing speed after the intermingling of the cement with water and aggregates in case of transit mixer or truck mixer.

**3.12 Amplitude of Vibration** – The maximum displacement of a vibrating body from its mean position during vibration. It is usually expressed as half of total displacement.

**3.13 Angle Float** – A finishing tool having a surface bent to form a right angle; used to finish re-entrant angles.

**3.14 Arrising Tool** – A tool similar to a float, but having a form suitable for rounding an edge of freshly placed concrete.

**3.15 Batch** – Quantity of concrete or mortar mixed at one time.

**3.16 Batched Water** – The mixing water added by a batcher to a batch of concrete or mortar mixture before or during the initial stages of mixing.

**3.17 Batcher** – A device for measuring ingredients for a batch of concrete. It may consist of the following types:

- a) *Manual Batcher* — A batcher equipped with gates or valves which are operated manually, with or without supplementary power from pneumatic, hydraulic or electrical machinery, the accuracy of the weighing operation being dependent on the operator's observation of the scale.
- b) *Semiautomatic Batcher* — A batcher equipped with gates or valves which are separately opened manually to allow the material to be weighed but which are closed automatically when the designated weight of each material has been reached.
- c) *Automatic Batcher* — A batcher equipped with gates or valves which, when actuated by a single starter switch, will open automatically at the start of the weighing operation of each material and close automatically when the



designated weight of each material has been reached, interlocked in such a manner that:

- 1) The charging mechanism cannot be opened until the scale has returned to zero;
- 2) The charging mechanism cannot be opened if the discharging mechanism is open;
- 3) The discharge mechanism cannot be opened until the designated weight has been reached within the allowable tolerance; and
- 4) If different kinds of aggregates or different kinds of cements are weighed cumulatively in a single batcher, interlocked sequential controls are provided.

**3.18 Batching** – Weighing into the mixer the ingredients or volumetrically measuring and introducing for a batch of concrete or mortar.

**3.19 Batch Mixer** – A concrete mixer for cyclic operation in which the ingredients for concrete are charged in batches; each new batch is charged into drum of the mixer only when the preceding batch has been discharged.

**3.20 Batching Plant** – An operating installation of equipment including hatches and mixers as required for batching or for batching and mixing concrete materials; also called mixing plant when mixing equipment is included.

**3.21 Bull Float** – A tool comprising a large, flat, rectangular piece of wood, aluminium, or magnesium usually 20 cm wide and 100 to 150 cm long, and a handle 1 to 5 m in length used to smooth unformed surfaces of freshly placed concrete.

**3.22 Bush-Hammer** – A hammer having a serrated face, as rows of pyramidal points used to roughen or dress a surface; to finish a concrete surface; by application of a bush-hammer.

**3.23 Capacity** – The volume of concrete permitted to be mixed or carried in a particular mixer or agitator, usually limited by specifications to a maximum percentage of total gross volume; also the output of concrete, aggregate, or other product per unit of time (as plant capacity or screen capacity).

**3.24 Centrally-Mixed Concrete** – Concrete produced by completely mixing cement, aggregates, and water at a stationary central mixing plant and delivered in containers

fitted with agitating devices, except that which so agreed to between the purchaser and the manufacturer, the concrete may be transported without being agitated.

**3.25 Central Mixer** – A stationary concrete mixer from which the freshly mixed concrete is transported to the work.

**3.26 Charging** – Introducing, feeding, or loading materials into a concrete or mortar mixer, or other container or receptacle where they will further treated or processed.

**3.27 Chute** – A sloping trough or tube for conducting concrete cement, aggregate, or other free flowing materials from a higher to a lower point.

**3.28 Compulsory Concrete Mixer** – Concrete mixer with mixing effected by the action of one or more agitators moving inside a mixing chamber with either a vertical axis (pan) or horizontal axis (trough).

**3.28.1 Pan – type Concrete Mixer** – Compulsory concrete mixer with agitators rotating about the vertical axis of a stationary or rotating pan.

**3.28.2 Turbo – Concrete Mixer** – Compulsory concrete mixer with an agitator rotating about the vertical axis of a stationary pan, charged from the top and discharged by opening a segment of the pan bottom.

**3.28.3 Planetary Concrete Mixer** – Compulsory concrete mixer with vertically mounted agitators having a planetary type of motion, inside a stationary pan where the mixer is charged from the top, and discharged by opening a segment of the pan bottom.

**3.28.4 Turbo – Planetary Concrete Mixer** – Compulsory concrete mixer having one agitator rotating about the vertical axis of a stationary pan in addition to other agitators in planetary motion where the mixer is charged from the top and discharged by opening a segment of the pan bottom.

**3.28.5 Counter Current Operation Concrete Mixer** – Compulsory concrete mixer with one or more agitators rotating about the vertical axes in a counter-rotating pan where the mixer is charged from the top and discharged by opening a segment of the pan bottom.

**3.28.6 Concurrent Operation Concrete Mixer** – Compulsory concrete mixer with one or more agitators rotating about vertical axes in a pan rotating concurrently where the mixer is charged from the top and discharged by opening a segment of the pan bottom.

**3.28.7 Concrete Mixer with High Speed Activator** – Compulsory concrete mixer with one or more agitators rotating about vertical axes including one high speed agitator (activator) where the mixer is charged from the top and discharged by opening a segment of the pan bottom.

**3.28.8 Paddle Concrete Mixer** – Compulsory concrete mixer with one or two paddle agitators rotating about horizontal axis in a casing (trough) where the mixer is charged from the top and discharged by opening a segment of the pan bottom.

**3.28 Concrete Breaker** – A compressed-air tool specially designed and constructed to break up concrete or for use for similar demolition work.

**3.29 Concrete Finishing Machine** – A machine mounted on flanged wheels which rides on the forms or on specially set tracks, used to finish surfaces, such as those of pavements; or a portable power driven machine for floating and finishing of floors and other slabs.

**3.30 Concrete Paver** – A concrete mixer, usually mounted on crawler tracks, which mixes and places concrete in pavement or in the subgrade.

**3.31 Concrete Pump** – An apparatus which forces concrete to the placing position through a pipeline or hose.

**3.31.1 Piston type Concrete Pump** – Pump in which a piston is used to impart energy to the concrete mix, with the intent of transporting the mix to and through the conveying pipe and/or hose.

**3.31.2 Rotary type Concrete Pump** – Pump in which a peristaltic action is used to impart energy to the concrete mix with the intent of transporting the mix to and through the conveying pipe and/or hose.

**3.31.3 Stationary type Concrete Pump** – Skid, rail or wheeled-chassis mounted concrete pump intended for long-term operation on one building site.

**3.31.4 Piston type Concrete Pump Valve System** – System composed of cut-off valves successively locking and opening concrete mix flow from the hopper to the concrete cylinder and from the latter to the conveying pipe.

**3.32 Concrete Spreader** – A machine, usually carried on side forms or on rails parallel thereto, designed to spread concrete from heaps already dumped in front of it, or to receive and spread concrete in a uniform layer.

**3.33 Concrete Vibrating Machine** – A machine, commonly carried on side forms or on rails parallel thereto, which compacts a layer of freshly mixed concrete by vibration.

**3.34 Continuous Mixer** – A mixer into which the ingredients of the mixture are fed without stopping, and from which the mixed concrete is discharged in a continuous stream. A mixer into which the ingredients of the mixture are fed without stopping, and from which the mixed product is discharged in a continuous stream.

**3.35 Conveying Hose** – Hose through which shotcrete materials or pumped concrete pass; also known as material hose or conveying hose.

**3.36 Conveyor** – A device for moving materials; usually a continuous belt, an articulated system of buckets, a confined screw, or a pipe through which material is moved by air or water.

**3.37 Cumulative Batching** – Measuring more than one ingredient of a batch in the same container by bringing the batcher scale into balance at successive total weights as each ingredient is accumulated in the container.

**3.38 Cutting Screed** – Sharp edged tool used to trim shotcrete to finished outline.

**3.39 Darby** – A hand-manipulated straight edge 1 to 3.5 m or more long used in the early stage levelling concrete finishing to supple supplement floating.

**3.40 Delivery Hose** – Hose through which shotcrete materials or pumped operations of concrete pass; also known as material hose or conveying hose.

**3.41 Devil's Float** – A wooden float with two nails protruding from the toe; used to roughen the surface of the brown plaster coat.

**3.42 Eccentric Shaft** – The rotating shaft of the vibrating unit designed to produce the required frequency and amplitude of vibration.

**3.43 Edger (Edging Tool)** – A finishing tool used on the edges of fresh concrete to provide a rounded corner.

**3.44 Elephant Trunk (Down Pipe)** – An articulated tube or chute used in concrete placement.

**3.45 External Vibrator** – See 3.123.

**3.46 Feather Edge** – A wood or metal tool having a bevelled edge; used to straighten re-entrant angles in finish plaster coat; also edge of a concrete or mortar placement such as a patch or topping that is bevelled at an acute angle.

**3.47 Feed Wheel** – Material distributor or regulator in certain types of shotcrete equipment.

**3.48 Finishing Machine** – A power-operated machine used to give the desired surface texture to a concrete slab.

**3.49 Float** – A tool (not a darby), usually of wood, steel, aluminium or magnesium, not used in finishing operations to impart a relatively even (but smooth) texture to an unformed fresh concrete surface.

**3.50 Flush Water** – Water carried on a truck mixer or transit mixer in a special tank for flushing the interior of the mixer after discharge of the concrete.

**3.51 Free Fall** – Descent of freshly mixed concrete into forms without dropchutes or other means of confinement; also the distance through which such descent occurs; also uncontrolled fall of aggregate.

**3.52 Free Fall Mixer** – A free fall mixer having a drum with a series of blades fitted internally, which rotates about a horizontal or inclined axis. The mixing action is achieved by causing each part of the mix to be lifted in turn as the drum rotates and at a certain point in each revolution allowing it to be dropped or directed towards the bottom of the drum where it combines with other parts of the mix in continuously changing sequence to form a homogeneous mix. The free fall mixer is generally of the following types:

- a) *Tilting Type* — The free fall mixer in which the drum has an inclinable axis and is a single compartment;
- b) *Non-tilting Type* — The free fall mixer in which the drum rotates in one direction on a horizontal axis and comprises a single compartment drum having two openings; and

- c) *Reversing Drum Type* — The free fall mixer in which the drum rotates on a horizontal axis, the direction being reversed to discharge.

**3.53.1 Free Fall Barrow Tipping Mixer** – The free fall mixer in which the drum rotates about an inclined axis; the drum is mounted on a wheel barrow which can be tilted forward to discharge the mixed concrete from the drum; usually small capacity hand operated mixer.

**3.53 Go-Devil** – A ball of rolled-up burlap, paper, or specially fabricated device put into the pump end of a pipeline and forced through the pipe by water pressure to clean the pipeline.

**3.54 Grade Strip** – Usually a thin strip of wood tacked to inside of forms at the line to which the top of the concrete lift is to come, either at a construction joint or the top of the structure.

**3.55 Grizzly** – A simple, stationary screen or series of equally spaced parallel bars set at an angle to remove oversize particles in processing aggregate or other material.

**3.56 Groover** – A tool used to form grooves or weakened plane joints in a concrete slab before hardening to control crack location or provide pattern.

**3.57 Gross Volume (of Concrete Mixers)** – In the case of a revolving drum mixer, the total interior volume of the revolving portion of the mixer drum; in the case of an open top mixer, the total volume of the trough or pan calculated on the basis that no vertical exceeds twice the radius of the circular section shaft.

**3.58 Ground Wire** – Small gauge high-strength steel wires used to establish line and grade as in shotcrete work; also called alignment wire or screed wire.

### **3.59 Gun**

- a) Shotcrete material delivery equipment, usually consisting of double chambers under pressure; equipment with a single pressure chamber is used to some extent.
- b) Pressure cylinder used to propel freshly mixed concrete pneumatically.

**3.60 Hamm Tip** – Flared shotcrete nozzle having a diameter larger at the midpoint than either at the inlet or at the outlet; also designated premixing tip.

**3.61 Hawk** – A tool used by plasterers to hold and carry plaster mortar; generally a flat piece of wood or metal approximately 25 to 30 cm square, with a wooden handle centered and fixed to the underside.

**3.62 High-Discharge Mixer** – See 3.65.

**3.63 Hod** – A portable trough for carrying mortar, bricks, etc, fixed crosswise on top of a pole and carried on the shoulder.

**3.64 Horizontal-Axis Mixer** – A concrete mixer of the revolving drum type in which the drum rotates about a horizontal axis.

**3.65 Inclined-Axis Mixer** – A truck with revolving drum which rotates about an axis inclined to the bed of the truck chassis.

**3.66 Inclined Drum Mixer** – Free fall batch mixer with an inclined drum in the shape of two truncated cones connected at wide bases by a cylindrical insert. The drum rotates on a horizontal axis the direction being reversed to discharge the concrete mix.

**3.67 Jointer** – A metal tool about 15 cm long and from 5 to 10 cm wide and having shallow, medium, or deep bits (cutting edges) ranging from 5 to 20 mm or deeper used to cut a joint partly through fresh concrete.

**3.68 Loading Hopper** – A hopper in which concrete or other free flowing material is placed for loading by gravity into buggies or other conveyances for transport to the forms or to other place of processing, use, or storage.

**3.69 Material Hose** – See 3.40.

**3.70 Mixer** – A machine employed for blending the constituents of concrete, grout, mortar or other mixture.

**3.71 Mixer, Batch** – See 3.19.

**3.72 Mixer, Colloidal** – A mixer designed to produce colloidal grout.

**3.73 Mixer Efficiency** – The adequacy of a mixer in rendering a homogeneous product within a stated period; homogeneity is determinable by testing for relative differences in physical properties of samples extracted from different portions of a freshly mixed batch.

**3.74 Mixer, Forced Action (or Mixer, Counterflow)** – A mixer comprising a horizontal pan or drum in which mixing is accomplished by means of the rotating pan or fixed or rotating paddles or both; rotation is about a vertical axis.

**3.75 Mixer, Tilting** – A horizontal-axis mixer the drum of which can be tilted; the materials are fed in when the discharge opening of the drum is raised and the mixture is discharged by tilting the drum [see 3.52 (a)].

**3.76 Mixing Cycle** – The time taken for a complete cycle in a batch mixer, that is, the time elapsing between successive repetitions of the same operation (for example, successive discharges of the mixer).

**3.77 Mixing Plant** – See 3.20.

**3.78 Mixing Speed** – Rotation rate of a mixer drum or of the paddles in an open-top, pan, or trough mixer, when mixing a batch expressed in revolutions per minute (rev/min), or in peripheral feet per minute of a point on the circumference at maximum diameter.

**3.79 Mixing Time** – The period during which the constituents of a batch of concrete are mixed by a mixer; for a stationary mixer, time is given in minutes from the completion of mixer charging until the beginning of discharge; for a truck mixer, time is given, in total minutes at a specified mixing speed or expressed in terms of total revolutions at a specified mixing speed.

**3.80 Mixing Water** – The water in freshly mixed sand-cement grout, mortar, or concrete, exclusive of any water previously absorbed by the aggregate (for example, water considered in the computation of the net water-cement ratio).

**3.81 Non-agitating Unit** – A truck-mounted container, for transporting central-mixed concrete, not equipped to provide agitation (slow mixing) during delivery.

**3.82 Nozzle** – Attachment at end of shotcrete material hose from which material is jetted at high velocity; also attachment at end of hose used in machine applied Portland-cement plaster.

**3.83 Nozzle Liner** – Replaceable rubber insert in nozzle tip to prevent wear of metal nozzle.



**3.84 Nozzleman** – Workman on shotcrete crew who manipulates the nozzle, controls consistency, and makes final disposition of the material.

**3.85 Nozzle Tip** – See 3.83.

**3.86 Nozzle Velocity** – Velocity of shotcrete material particles at exit from nozzle, usually stated in cm per second.

**3.87 Open-Top Mixer** – A mixer consisting essentially of a trough within which mixing paddles revolve about the horizontal axis or a pan within which mixing blades revolve about the vertical axis.

**3.88 Paddle Mixer** – See 3.87.

**3.89 Pan**

- a) A prefabricated form unit used in concrete joist floor construction.
- b) A container that receives particles passing the finest sieve during mechanical analysis of granular materials.

**3.90 Pan Mixer** – See 3.87.

**3.91 Paving Train** – An assemblage of equipment designed to place and finish a concrete pavement.

**3.92 Pneumatic Feed** – Shotcrete delivery equipment in which material is conveyed by a pressurized air stream.

**3.93 Positive Displacement** – Wet-mix shotcrete delivery equipment in which the material is pushed through the material hose in a solid mass by a piston or auger.

**3.94 Power Float** – A motor-driven revolving disc that smoothens, flattens, and compacts the surface of concrete floors or floor toppings.

**3.95 Primary Crusher** – A heavy crusher suitable for the first stage in a process of size reduction.

A heavy crusher suitable for the first stage in a process of size reduction of rock, slag, or the like.

**3.96 Revolving-Blade (or Paddle) Mixer** – See 3.87.

**3.97 Rod** – Sharp-edged cutting screed used to trim shotcrete to forms or ground wires.

**3.98 Rotary Float** – See 3.94.

**3.99 Runway (for Concreting or Temporary Track)** – Decking over area of concrete placement, usually of movable panels and supports, on which buggies of concrete travel to points of placement.

**3.100 Scalper** – A screen for removing oversize particles.

**3.101 Screed**

- a) Firmly established grade strips or side forms for unformed concrete which will guide the strike off in producing the desired plane or shape.
- b) To strike off concrete lying above the desired plane or shape.
- c) A tool for striking off the concrete surface, preferably referred to as a strike off.

**3.102 Screed Wire** – See 3.58.

**3.103 Secondary Crusher** – A crusher used for the second stage in a process of size reduction. A crusher used for the second stage in a process of size reduction of aggregate and the like.

**3.104 Semiautomatic Batcher** – See 3.17.

**3.105 Sieve** – A metallic plate or sheet, a woven wire cloth, or other similar device, with regularly spaced apertures of uniform size, mounted in a suitable frame or holder for use in separating material according to size; in mechanical analysis an apparatus with square openings is a sieve.

**3.106 Slick Line** – End section of a pipe line used in placing concrete by pump which is immersed in the placed concrete and moved as the work progresses.

**3.107 Split Batch Charging** – Method of charging a mixer in which the solid ingredients do not all enter the mixer together; cement, and sometimes different sizes of aggregate, may be added separately.

**3.108 Spreader** – A device consisting of reciprocating paddles, a revolving screw, or other mechanism for distributing concrete to required uniform thickness in a paving slab;

also a' piece of lumber, usually about 3.5 × 5 cm, cut to thickness of wall or other form and inserted to hold it temporarily at the correct dimensions against tension of form ties; wires are usually attached to spreaders so that they can be pulled up out of the forms as the pressure of concrete permits their removal.

The type of the spreader shall be indicated by the arrangement provided for spreading the concrete distributed in its path.

**3.108.1 Reciprocating – Blade Type** – A machine equipped with a reciprocating blade which pushes the concrete (dumped on the formation in front of the machine) forward and sideways as the machine travels along the forms. The blade is turned through 90° at the end of each stroke so that the concrete is moved evenly to both sides of the lane.

**3.108.2 Screw Type** – A machine in which a horizontal screw with a large pitch is used to move the concrete sideways from heaps dumped on the formation in front of the machine. By reversing the screw the concrete is moved to one side or the other of the lane, the action being continued until a uniform surface is obtained.

**3.108.3 Trough – Hopper Type** – A machine consisting of an open bottom trough-hopper mounted on a chassis running on the forms and capable of being moved transversely or longitudinally over the formation to spread the concrete placed on the formation by the paver bucket or side tipping truck. The height of the hopper shall be adjustable to deal with different amounts of charge.

**3.109 Stationary Hopper** – A container used to receive and temporarily store freshly mixed concrete.

**3.110 Steel Trowel** – A flat, broad-blade steel hand tool used in the final stages of finishing operations to impart a relatively smooth surface to concrete floors and other unformed concrete surfaces; also a flat triangular blade tool used for applying mortar to masonry.

**3.111 Storage Hopper** – See 3.109.

**3.112 Straightedge** – A rigid, straight piece of wood or metal used to strike off or screed a concrete surface to proper grade.

**3.113 Tamper** – A hand-operated device for compacting floor topping or other unformed concrete by the Impact caused by dropping it repeatedly “ram a small height, in preparation for strike off and finishing; contact surface often consists of open-mesh

screen or a grid of bars to force coarse aggregate below the surface to prevent interference with floating or trowelling.

**3.114 Tamping Rod** – A round, straight steel rod, having one end rounded to a hemispherical tip.

**3.115 Template** – A thin plate or board frame used as a guide in positioning or spacing form parts, reinforcement, or anchors; also a full-size mold, pattern or frame, shaped to serve as a guide in forming or testing contour or shape.

**3.116 Tilting Concrete Mixer** – See 3.75.

**3.117 Tremie** – A pipe or tube through which concrete is deposited under water, having at its upper end a hopper for filling and a bail by means of which the assembly can be handled by a derrick.

**3.118 Trough Mixer** – See 3.87.

**3.119 Trowel** – A flat, broad-blade steel hand tool used in the final stages of finishing operations to impart a relatively smooth surface to concrete floors and other unformed concrete surfaces; also a flat triangular blade tool used for applying mortar to masonry.

**3.120 Trowelling Machine** – A motor driven device which operates orbiting steel trowels on radial arms from a vertical shaft.

**3.121 Truck Mixer** – A concrete mixer suitable for mounting on a truck chassis and capable of mixing concrete in transit.

**3.122 Turbine Mixer** – See 3.87.

**3.123 Vibrator** – An oscillating machine used to agitate fresh concrete so as to eliminate gross voids including entrapped air but not entrained air and produce intimate contact with form surfaces and embedded materials.

**3.124 Vibration** – Energetic agitation of freshly mixed concrete during placement by mechanical oscillating devices at moderately high frequency to assist in its consolidation:

- a) External vibration employs a vibrating device attached at strategic positions on the forms and is particularly applicable to manufacture of precast items and for vibration of tunnel-lining forms;

- b) Internal vibration employs a vibrating element which can be inserted into the concrete at selected locations, and is more generally applicable to in-place construction; and
- c) Surface vibration employs a portable horizontal platform on which a vibrating element is mounted.

**3.125 Wash (or Flush) Water** – See 3.50.

**3.126 Water Ring** – Perforated manifold in nozzle of dry-mix shotcrete equipment through which water is added to the materials.

**3.127 Floating** – the operation of finishing a fresh concrete or mortar surface by use of a float, preceding troweling when that is to be the final finish.

**3.128 Finger type Concrete Vibrator** – A series of immersion type concrete vibrators mounted on a horizontal frame with control arrangements for readily raising or lowering the vibrators and for changing the inclination of the vibrators to the horizontal frame.

**3.129 Stationary Mixer** – A mixer not provided with wheels and axles. The complete assembly of the mixer shall be supported on a structural steel frame.

**3.130 Portable Mixer** – A mixer fitted with a simple form of wheels.

**3.131 Trailer Mixer** – A mixer fitted with road wheels so that it can travel or be towed efficiently and safely at maximum statutory speed.

**3.132 Stationary Type** – A concrete block making machine with frame fixed on ground or on an elevated structure. The blocks are laid on wooden or metal pallets to be transported either manually or mechanically.

**3.133 Travelling Type or Egg laying Type** – A concrete block making mobile machine which lays blocks on a level platform on which it moves. The machine lays a particular number of blocks over the platform and moves further to lay another set of blocks, so as to cover the casting platform, in a continuous casting process.

**3.134 Transit Mixer** – A mixer generally mounted on a truck or some other suitable mobile haulage unit, capable of mixing ingredients of concrete and/or for agitation of already mixed/ partially mixed concrete during transit from a concrete batching plant to the point of placement of concrete.

**3.135 Concrete Casing** – Protective concrete covering to structural steel.

**3.136 Curb tool** – A tool used to give the desired finish and shape to the exposed surfaces of a concrete curb.

**3.137 Electric External Vibrator** – Vibrator in which the prime mover is an electric motor.

**3.138 Pneumatic External Vibrator** – Vibrator operating on the principle of bearing less turbine with pneumatic drive.

**3.139 Hydraulic External Motor** – Vibrator comprising a rotating eccentric mass directly coupled to a specially designed hydraulic motor.

**3.140 High Frequency External Vibrator** – Vibrator operating at a frequency 70 Hz and above.

**3.141 Normal Frequency External Vibrator** – Vibrator operating at a frequency below 70 Hz.

**3.142 External Vibrator of Directed Vibration** – Vibrator for generation of directed vibrations.

**3.143 Single External Vibrator of Directed Vibration** – Vibrator for generation of linear, vertical vibrations by special fixing on the hinge.

**3.144 Double External Vibrator of Directed Vibration** - Vibrator for generation of the linear directed vibrations and composed of two external vibrators rotating in opposite directions and joined by a gear.

**3.145 Fixed External Vibrator** - Vibrator fixed to the vibrating object directly by mean of treads.

**3.146 Removable External Vibrator** - Vibrator fixed to the vibrating object indirectly by means of a quick-action clamping and releasing device.

**3.147 External Vibrator with External Motor** - Vibrator driven by external electric motor or internal combustion engine.

**3.148 Frequency and Voltage Converter for External Vibrator** - Unit used for electric supply of the external vibrator with frequency higher than in power network and safety voltage.

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