TECHNICAL SPECIFICATION /TD of GABION

1 Scope & Functional Description:

This technical specification defines the rigorous engineering requirements for rectangular or custom-shaped rigid gabion baskets fabricated entirely from **smooth structural Mild steel round bars**. Unlike standard prefabricated flexible wire mesh, this design uses a heavy-duty, manually or factory-welded and tied structural steel cage. This framework provides exceptional load-bearing resilience, superior dimensional rigidity, and advanced protection against impact resistance.

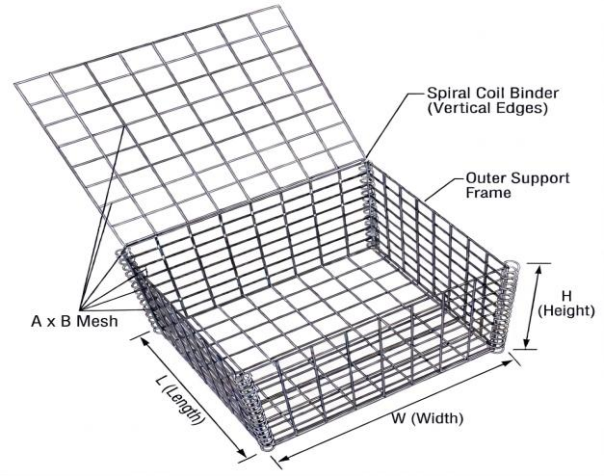

Fig. 1 Gabion Box

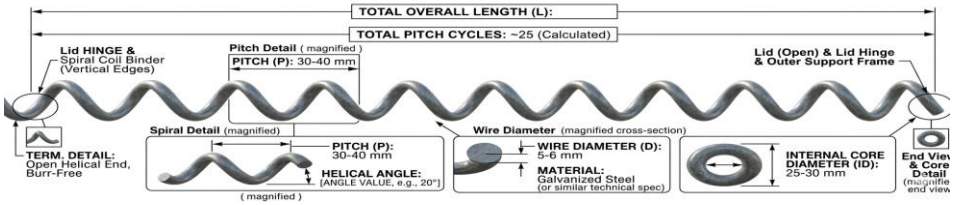

Fig. 2 Spiral Coil Binder

2 Technical Parameters & Core Material Requirements

The basket assembly must strictly adhere to the technical properties mapped below to guarantee compliance with tactical field engineering loads:

Table 1 Technical details

S.No.	Requirement Component	Technical Parameters	Testing standards
1	Core Structural Steel to construct the mesh and lid (Optional)	Hot-rolled (Smooth) structural Mild steel round bars conforming exclusively to Grade E250 Quality C (fully killed, fine-grained steel).	Conforming to IS 2062
2	Mechanical properties of Core Structural Steel	Yield Strength: Must reach a minimum of 250 N/mm² before exhibiting permanent plastic deformation. Ultimate Tensile Strength (UTS): Must fulfill standard high-ductility ratio thresholds characteristic of Grade E250 Quality C material. The minimum UTS shall be 410 N/mm2. Elongation Percentage: Minimum 23% total elongation at structural fracture to allow the cage walls to deform controlled plastic deformation without brittle failure during impact.	Conforming to IS 2062
		Bend Test: The bar must withstand cold bending to an angle of 180 degrees around a standardized pin diameter with an internal diameter equal to 2 times the nominal bar diameter without showing any surface fissures, cracking, or longitudinal splitting under visual examination.	Conforming to IS 1599
3.	Welding joint for mesh panel	Require controlled-heat electric resistance welding or low-hydrogen structural arc welding (IS 816) so the heat-affected zone (HAZ) does not harden and crack in sub-zero temperatures.. Weld joints must be free of structural undercut, visible porosity, or slag inclusion. In accordance	Conforming to IS 816

S.No.	Requirement Component	Technical Parameters	Testing standards
		with IS 816, welded joint test specimens must achieve a minimum tensile strength equal to the specified tensile strength of the parent mild steel bar (410 N/mm2).	
4	Chemical Composition of Core Structural Steel	Carbon (C): Maximum 0.20% to maximize field weldability without thermal cracking. Manganese(Mn): 1.5% Sulphur (S): Maximum 0.040% to limit material brittleness under cold conditions. Phosphorus (P): Maximum 0.040% to prevent microstructural cracking during blast impacts. Silicon (Si):0.40%	Conforming to IS 2062
5	Core Structural Steel Diameters	Main Mesh Grid Panels: minimum nominal diameter of 10 mm.	Wire Dia shall be measured using calibrated Vernier Calipers
6	Looping Wire/Helical Spiral Coils (HESCO Style) coating and diameters, mechanical properties	• Looping Wire/Helical Spiral Coils (HESCO Style) made of hot-dip pure Zn-coated galvanized steel wire. The coating thickness shall be a minimum of 280 g/m2. • Low-carbon steel wire with a minimum diameter of 6.0 mm. • Tensile strength >= 500 N/mm^2	• Coating conforming to IS4826(Heavy Coating) • Tensile strength conforming to IS280 • Pitch and free length shall be measured using a calibrated steel rule • Wire Dia shall be measured using calibrated Vernier Calipers

S.No.	Requirement Component	Technical Parameters	Testing standards
7	Mesh Opening Dimensions (AxB)	Rigid square cell layout: 76.2 mm × 76.2 mm, 100 mm × 100 mm, or 150 mm × 150 mm (to match structural loading and local stone fill dimensions) or as per user requirement	A calibrated steel tape shall be used to verify the dimensions
8	Internal Partitions	Rigid internal diaphragms/partitions fabricated from identical Hot-rolled (Smooth) structural Mild steel round bars conforming exclusively to Grade E250 Quality C (fully killed, fine-grained steel) panels to prevent belly bulging under high lateral compaction forces. The Internal partitions (diaphragms) must be placed at every 1-meter interval along the length of the gabion box	A calibrated steel tape shall be used to verify the spacing
9	Anti-Corrosion Finish	Provides a Min. 610 g/m² protective zinc hot dip coating on the smooth structural mild steel round bar to prevent rust and corrosion from moisture, chemicals, and harsh or coastal environments. **Corrosion Resistance:** Crucial for long-term durability. No red rust or significant degradation after specified min 1,000 hours in a neutral salt spray **(IS 9844).**	Conforming to IS4759 Corrosion Resistance conforming to IS9844
10	Dimensional Profiles & Axis Tolerances	Standard outer dimensions (Length x Width x Height): i. 0.610m×0.610m×0.610m ii. 1mx0.6mx1m iii. 1m × 1m × 1m iv. 3m × 1.5m × 1m v. 5m × 1m × 1m vi. 2m × 1m × 1m vii. 4m × 1m × 1m	A calibrated steel tape shall be used to verify the dimensions

S.No.	Requirement Component	Technical Parameters	Testing standards
		viii. 5m × 1.5m × 1m ix. 3m × 1m × 1m x. 4m × 1.5m × 1m Dimensional Tolerance: Maximum ±5% variance acceptable across any linear axis or as per user requirement.	

Note: All standards mentioned above will be the latest one.

3 Fabrication Tolerances & Structural Joint Integrity

To ensure structural integrity against massive blast overpressures or sudden rock movements, joint fabrication must comply with these strict specifications:

3.1 Welding Joint Quality:

All bar intersections must be secured via controlled-heat electric resistance welding or low-hydrogen structural arc welding in accordance with IS 816. Weld joints must be free of structural undercut, visible porosity, or slag inclusion. The welded joint test specimens must achieve a minimum tensile strength equal to the specified tensile strength of the parent smooth structural mild steel round bar min Grade E250 Quality C (410N/mm^2).

3.2 Wire Binding Knots & Lacing Constraints:

Where helical spiral coils cannot be applied (such as custom field splices, internal diaphragm junctions, or multi-tier base tie-downs), adjacent panel edges shall be stitched together via continuous sequential looping using minimum 3.5 mm to 4.0 mm soft-annealed, heavy hot-dip galvanized mild steel lacing wire (IS 280 / IS 4826) rated for -20°C ductility. Each lacing tie shall consist of a minimum of two (2) tightly drawn full turns around both adjacent 10 mm perimeter bars, secured with a mechanical pigtail twist bent flat against the frame to eliminate sharp projections. Parallel edge bars at joined seams shall maintain a tight alignment gap tolerance of 0 mm to +5 mm to prevent stone fill escape under blast vibration.

3.3 Top Access Handling & Locking Systems:

Panels must be integrated with robust MS handles welded directly to the main framing members. The top panel must be designed as an integrated openable lid, incorporating heavy-duty structural sliding bolts or mechanical pin-locking setups to secure stone contents from blast displacement or as per user requirement.

4 Laboratory Material Validation & Testing Standards

All incoming smooth structural mild steel round bar must carry verified test certifications complying with IS 2062. Field units or procurement officers reserve the right to run random destructive tests at certified labs under the following parameters:

4.1 Chemical Composition Testing (Ladle analysis)

Carbon (C): Maximum 0.20% to maximize field weldability without thermal cracking.
Manganese(Mn):Max.1.5%
Sulphur (S): Maximum 0.040% to limit material brittleness under cold conditions.
Phosphorus (P): Maximum 0.040% to prevent microstructural cracking during blast impacts.
Combined S + P Elements: Strictly capped at 0.075% total to preserve advanced seismic and impact energy mitigation.
Silicon(Si):0.40%

4.2 Mechanical Tensile Verification (Universal Testing Machine - UTM)

Conforming strictly to IS 1608 testing conditions:

Yield Strength: Must reach a minimum of 250 N/mm² before exhibiting permanent plastic deformation.
Ultimate Tensile Strength (UTS): Must fulfill standard high-ductility ratio thresholds characteristic of structural mild steel round bar material. The minimum UTS shall be minimum 410 N/mm2.
Elongation Percentage: Minimum 23% total elongation at structural fracture to allow the cage walls to deform elastically without brittle failure during impact.

4.3 Plastic Deformation & Defect Verification

Bend Test (IS 1599): The bar must withstand cold bending to an angle of 180 degrees around a standardized pin diameter without showing any surface fissures, cracking, or longitudinal splitting under visual examination.

Dimensional Weight & Mass Profiles: Individual bars are permitted a maximum negative mass tolerance of 7% from standard cross-sectional profiles. However, the cumulative average weight of the delivered batch must match nominal design mass. Cross-sectional diameters must be checked with calibrated digital Vernier calipers.

5 Tactical Procurement & Special Delivery Clauses

Field Visual Markings & Stock Inspection: All delivered panels and components must possess structural markings stamped or cold-rolled directly onto the metal surface by the manufacturer (indicating mill source brand name and Grade E250 Quality C stamp). Every batch must arrive free of severe scale, active rust pitting, or visible structural micro-cracks.

Flat-Pack Logistics & Tactical Storage: Baskets must be packed and delivered as flat-packed panel modules, bound with high-tensile steel strapping and palletized for immediate field transit.

Units must be sized to maximize deployment payload volume across tactical vehicles or ISO standard container footprints.

6 Installation & Assembly Guide for Field Deployment

Forward field engineering squads must assemble and deploy the structural MS round bar gabion cages using the following structured protocol

Step 1: Footprint Preparation. Clear the targeted barrier footprint of all surface vegetation, large loose rocks, and sharp debris. Level and compact the base soil using handheld manual rammers to prevent structural base tilting.

Step 2: Component Layout. Unpack the flat-pack module and lay out the structural panels (base, front, back, side ends, and inner partitions) flat on the prepared ground.

Step 3: Framework Erection.

All vertical corners, panel intersections, and perimeter boundary joints shall be mechanically hinged using heavy-duty helical spiral coils made of hot-dip galvanized steel wire, designed to match the rigidity of the structural framework. The helical wire binder shall be fabricated from soft-annealed, hot-dip galvanized steel wire with a minimum nominal diameter of 6 mm to prevent shearing, elongation, or structural unzipping under outward rock dilation and blast impact loading. The internal core diameter (inner loop width) of the helical coil shall maintain a minimum clear opening of 25 mm to 30 mm to ensure adequate tolerance clearance for two overlapping minimum 8 mm nominal diameter MS round bars to reside inside the helix and allow the binder to spin freely down the seam without catching on the physical deformations of the MS round bar. The coil pitch shall be set at a loose, uniform spacing of 30 mm to 40 mm to facilitate rapid on-site threading through the 75 mm to 150 mm MS round bars cell openings. Upon complete insertion along the joint profile, the exposed terminal top and bottom tail loops of each helical coil must be mechanically bent inward 90 degrees using an assembly tool to establish a positive mechanical lock against vertical displacement, axial slippage, or rotational unspooling caused by structural vibrations or dynamic blast forces.

Step 4: Unit Alignment & Interlinking. Place the assembled rigid box onto its finalized alignment footprint. If building multi-tiered blast structures, wire-tie the empty base frame securely to adjacent units to form a single, unified barrier wall before adding stone fill.

Step 5: Rock Filling Operations.

Fill the cage manually or using heavy machinery (such as front-end loaders) in uniform layers. Use clean, angular hard stones or quarry rocks (recommended size range: 100mm to 300mm, or slightly larger than the chosen mesh openings). Hand-pack the exterior rock faces to eliminate internal structural air voids and optimize mass distribution.

Step 6: Enclosure Closing & Secure Locking (In case of Gabion basket with lid).

Once stone filling reaches the upper frame brim level (+25mm overfill to allow for natural compaction settling), pull down the heavy top lid panel using the integrated MS handles. Securely engage the sliding mechanical locking bolts or pin systems around all peripheral framing bars to close the gabion unit.

7 Finish and Workmanship

7.1 Fabric Structural Integrity and Alignment

Panel Flatness & Squareness:
All individual panels (base, sides, ends, internal partitions, and lids) shall be custom fabricated to be perfectly flat, true to geometric form, and free from twists, bends, or structural warping. Intersecting bars must form crisp, clean 90-degree right angles with a maximum angular deviation tolerance of ±1.5 degrees.

Burrs and Sharp Projections:
All component steel bars shall be cleanly sheared or saw-cut. All sharp edges, dangerous burrs, metal splinters, or ragged cutting flash must be ground completely smooth before assembly to prevent injury to field troops during manual operational handling.

7.2 Quality of Factory-Welded Intersections

Weld Execution: All bar intersections must be secured via controlled-heat electric resistance welding or low-hydrogen structural arc welding in accordance with IS 816.
Slag Removal: All welding slag, spatter, and flux residue must be mechanically removed using wire brushes or grinding wheels before the base coat primer application to ensure optimal coating adhesion.

7.3 Coating, Corrosion Protection, and Surface Finish

Surface Preparation: Prior to the application of any protective coatings, all fabricated steel frameworks must undergo thorough chemical degreasing, descaling, or mechanical wire-brushing to remove all loose mill scale, surface rust, oil, grease, and industrial impurities in accordance with **IS 2629.**

Coating: Provides a protective zinc hot-dip coating on mild steel round bars to prevent rust and corrosion from moisture, chemicals, and harsh or coastal environments, conforming to IS4759.

Corrosion Resistance: Crucial for long-term durability. No red rust or significant degradation after specified minimum 1,000 hours in a neutral salt spray as per **IS 9844**.

7.4 Hardware, Handles, and Moving Sub-Assemblies

MS Handle and Locking Mechanics (if required): The integrated heavy-duty MS lifting handles and the mechanical top lid locking system must be smoothly aligned and securely welded to the main frame.

Kinematic Functionality: The openable top lid must hinge and swing freely to a full vertical position without binding, jamming, or scraping against the main vertical corner profiles. The locking bars or pins must engage cleanly and securely with manual hand pressure, without requiring heavy field striking tools.

7.5 Spiral Helical Binder Workmanship

Dimensional Consistency: Helical spiral coils must be machine-wound to possess a uniform, continuous pitch (30 mm to 40 mm) and a consistent internal core clearance (26 mm to 30 mm). The spiral coils must be completely free of erratic kinks, local necking, or tight bends that would impede free-spinning rotation during rapid site assembly.

Zinc Coating Integrity: The heavy hot-dip galvanization on the 6.0 mm helical wire must be continuous, smooth, and firmly bonded to the steel core. The coating must show no signs of cracking, flaking, or peeling along the tight bends of the coil profile. Standard: IS 4826.

8 Marking:

Each finished product shall be marked legibly and indelibly with the following details on a metal tag.

(a) Manufacturer's Name
(b) Product Type (eg. Gabion baskets)
(C) Mesh Type (e.g. 100mm x 120mm)
(d) Class of Coating (Zinc or Zinc-Aluminium Alloy)
(e) Wire Diameter (e.g., 2.70 mm inner, 3,00 mm coated)
(f) Dimensions (L× W x H meters)
(g) Batch Number or Date of Manufacture

9 Tests and Standard of Acceptance: -

Gabion basket, materials shall be tested in accordance with the procedure as per technical specifications and relevant IS codes.

10 Certificates:

When specified in the purchase order or contract, a manufacturer's certificate shall be furnished to the purchaser stating that the material has been manufactured, tested, and inspected in accordance with the requirements of this standard and found to conform. Test reports for each batch supplied shall be furnished when specified.

QR/TD OF HESCO BASKET

1 Description: -

A Hesco basket (or Hesco bastion) is a modern, collapsible wire mesh container lined with heavy-duty geotextile fabric, designed for rapid deployment as a protective barrier against floods, erosion, or military threats. Often referred to as blast walls, sand cages, or welded gabion boxes. These units are filled with soil, sand, or gravel using minimal machinery to create sturdy, modular fortification walls.

2 Key Uses and applications

- **Defense/camp Fortification:** Used to build protective walls, security checkpoints, and protective barriers against small arms fire and projectiles.
- **Flood Control & Erosion Protection:** - Deployed as rapid construction leaves, flood walls, and riverbank protection.
- **Security Fencing**: - Used in defensive compounds to secure perimeters.

3 Scope of Work:

Covers the supply of collapsible protection barriers made of galvanized steel wire mesh lined with heavy-duty geotextile fabric. These modular units are deployed rapidly for military force protection, defenses, and emergency flood management. The system is designed to accept locally available earth, sand, or gravel fill to create impact-resistant, structural, and flood-mitigation barriers.

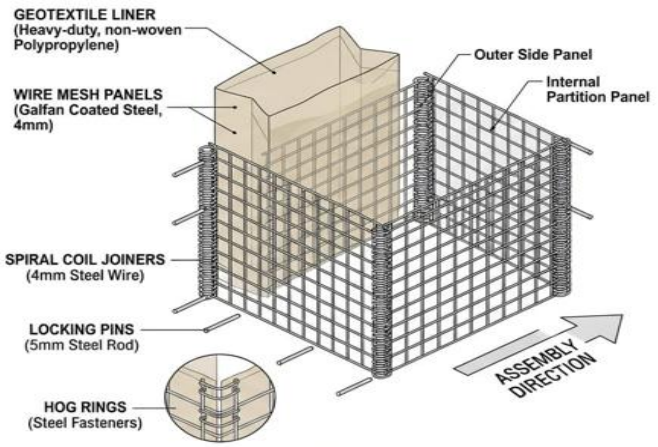

Fig. 1 Assembled Hesco Basket

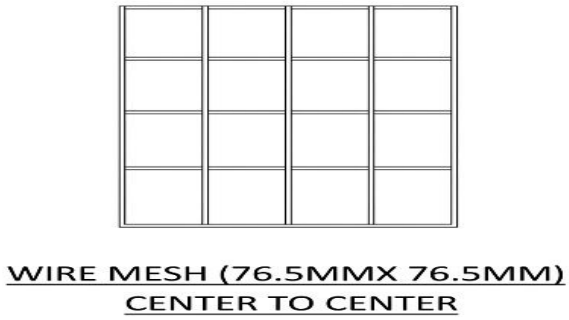

Fig. 2Mesh opening



Fig. 3 Joining pin

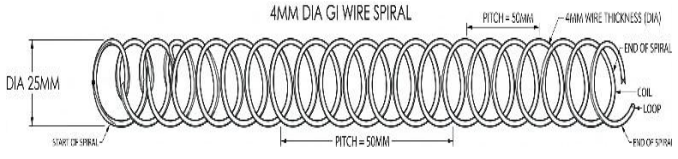

Fig. 4 Vertical Spiral Coil Joiner

4 TECHNICAL SPECIFICATION – HESCO BASKET / WIRE MESH & GEOTEXTILE

4.1 Hesco Basket

Hesco Basket is a collapsible, mechanically woven wire-mesh container lined with heavy-duty geotextile fabric, designed for rapid deployment. It is primarily used for protective barriers, flood control, erosion protection, security fencing and military fortifications. The technical parameters mainly cover dimensions, wire/mesh strength, coating, connection strength and geotextile properties.

Table 1 Hesco Basket Technical details

S.No.	Parameter	Requirements	Technical Parameters	Testing standard
1	Hesco Basket Dimensions	Standard sizes: i. 0.610×0.610×0.61m ii. 0.61 m × 0.76 m × 0.61 m iii. 0.61 m × 0.61 m × 0.46 m iv. 1.00x1.000x1.00 m v. 1.00 m × 1.52 m × 1.00 m vi. 0.76 m × 0.76 m × 1.00 m vii. 1.06 m × 1.06 m × 1.37 m viii. 1.52 m × 1.52 m × 2.12 m ix. 2.13 m × 2.13 m × 2.21 m or as per user requirement.	Measure L×W×H at multiple points; verify against the specified dimensions and a ±5% tolerance.	A calibrated steel tape shall be used to verify the dimensions
2	Mesh wire mechanical properties	Tensile strength ≥ 500 N/mm², Weld shear capacity ≥ 75% of wire breaking strength.	Mechanical properties	• Tensile strength conforming to IS 280. • Weld shear capacity conforming to IS 4948 / IS 16014 guidelines
3	Vertical Spiral Coil Joiner dimensions, materials and coating	Minimum wire Ø 4.0mm, Pitch: 50mm, OD: 25mm, Free Length: As per the length of the vertical edges of the box. Low-carbon steel wire, hot-dip coated with Galfan (Zn-Al alloy) coating to prevent environmental corrosion impact Minimum coating mass: 245g/sqm	Coating mass verification test	• Conforming to IS 16014 • Pitch and free length shall be measured using a calibrated steel rule • Wire Dia shall be measured using calibrated Vernier Calipers
4	Fabric Fastener Hog Rings dimension,	Minimum wire Ø 4.0mm High Carbon Steel, length 300mm. The hog ring must resist a minimum	Mechanical Ring Tensile Pull Test, Coating mass verification	• Mechanical Ring Tensile

S.No.	Parameter	Requirements	Technical Parameters	Testing standard
	mechanical properties, and coating	pull-apart min force of 2.0 kN without springing open or shearing the geotextile fabric. To secure the liner uniformly, hog rings must be mechanically installed using pneumatic tools at intervals of no more than 200 mm to 250 mm along the basket borders. Minimum coating mass: 245g/sqm	test	Pull Test conforming to ISO 8496 • Coating mass verification test conforming to IS 16014
5	Joining pin dimensions, materials, mechanical properties and coating	Minimum wire Ø 5.0mm Cold-drawn high-tensile steel Rod with top pull-loop, The length of the joining pin (locking pin) should match the nominal height of the vertical edge it is securing. Minimum tensile strength:550N/mm² Minimum coating mass: 245g/sqm	Tensile Test Coating Mass Verification	• Mechanical and core steel properties conforming to IS280 • Galfan Coating: Conforming to IS 16014
6	Mesh opening size and measurements	76.2 mm × 76.2 mm (3.0" × 3.0" standard resistance-welded centers). Measurement shall be taken center to center	Measure openings with a precision caliper/similar tool at multiple sections.	A calibrated measuring steel tape shall be used to verify the dimensions
7	Mesh wire diameter, Materials and coatings	4.0 mm Wire diameter, Low-carbon steel wire, hot-dip coated with Galfan (Zn-Al alloy) coating to prevent environmental corrosion. Minimum coating mass: 245g/sqm	Measure wire diameter before/after coating using suitable calibrated measuring instrument. Coating Mass Verification Test	• Conforming to IS 16014 • Wire Dia shall be measured using calibrated Vernier Calipers
8	Galfan coating mass for the metallic components	Minimum: 245g/sqm	All metallic parts must strictly be fabricated using Galfan coating (95% Zn / 5% Al mischmetal alloy)	Conforming to IS 16014
9	Coating adhesion for all metallic components	The mandrel diameter must be 4 times the wire diameter (4d). The sample must complete a minimum of 6 consecutive smooth turns. Coating shall adhere to the wire surface without showing any signs of scaling or peeling, even under tight bends.	Adhesion Test	Conforming to IS 16014

S.No.	Parameter	Requirements	Technical Parameters	Testing standard
10	Corrosion resistance for all coated components	The panels must withstand a minimum of 96 hours of salt spray exposure without showing any signs of red rust (iron oxide degradation). Darkening or superficial white rust is acceptable. The wire samples are continuously exposed to a atomized 5% Sodium Chloride (NaCl) fog at a stabilized chamber temperature of 35°C (±2°C) with a specific pH range between 6.5 and 7.2.	Salt Spray Testing	Conforming to IS 9844

Note: All standards mentioned above will be the latest one.

4.2 Specification of Geotextile Material

Table 2 Geotextile Material Technical details

S.No.	Parameter	Requirements	Testing Parameter / Method	Testing standards
1	Geotextile material	Heavy-duty needle-punch, mechanically /Chemically bonded, non-woven polypropylene; minimum 3 mm thick and minimum 300 GSM	Verify material type, thickness, and GSM; test as per the specified standard.	Conforming to IS 14716
2	Geotextile colour	Olive green / black / Khaki or as per user requirement.	As required by consignee.	Visual inspection against specified colour.
3	Geotextile fit / fold	Pre-fitted into basket; suitable for elongation when filled; 150–200 mm fold over mesh to prevent opening under load; provided on five sides, top open for filling.	Visual and dimensional inspection of fit, fold and five-side installation.	A calibrated steel tape shall be used to verify the dimensions

S.No.	Parameter	Requirements	Testing Parameter / Method	Testing standards
4	Geotextile – Type 1, installation	Grab strength shall be minimum 1300 N; Minimum tear strength shall be 500 N; puncture strength shall be minimum 2750 N; Burst strength shall be minimum 1700 N; elongation at failure <50%.	As per the conforming standards	• Grab strength conforming to IS 13162 Part 5/ASTM D4632. • Tear strength conforming to IS 14293/ASTM D4533 • Puncture strength conforming to IS 13162 Part4/ASTM D6241 • Burst strength conforming to IS1966/ASTM D3786

Note: All standards mentioned above will be the latest one.

5 Quality assurance & mandatory testing protocols:

5.1 Corrosion resistance & coating tests

To guarantee a minimum service life in harsh, humid, or coastal environments, the wire mesh panels, spiral joiners, and locking pins must undergo verification testing:

5.2 Salt Spray Testing (IS 9844):

Representative samples of the welded wire mesh panels (with Galfan / Zn-Al coating) must be subjected to continuous salt spray exposure. The panels must withstand a minimum of 96 hours of salt spray exposure without showing any signs of red rust (iron oxide degradation). Darkening or superficial white rust is acceptable.

5.3 Coating Mass Verification (As per IS 16014):

Weigh-strip-weigh laboratory analysis to verify the exact mass of the protective alloy layer. The protective Galfan coating must maintain a uniform density of ≥ 245 g/m² across all mesh surfaces.

5.4 Tensile Strength Test (IS 280):

Destructive tensile pull testing of base wire samples prior to welding. The low-carbon steel wire must demonstrate a nominal tensile strength of ≥ 500 N/mm².

5.5 Weld Shear Strength Test (IS 4948 / IS 16014 guidelines)

A mechanical shear force is applied directly to the welded intersections of the 3-inch grid lines. The weld must withstand a minimum breaking force equal to $\geq 75\%$ of the wire's total tensile

strength before separating.

5.6 Geotextile liner performance tests

The non-woven Polypropylene (PP) liner fabric must hold fine soil particles under dynamic conditions while letting water drain freely to prevent structural liquefaction:

5.6.1 Puncture Resistance (IS 13162 - Part 4/ASTM D6241):

A 50-mm flat plunger is pushed through the fabric to simulate the dropping of sharp rocks into the cell. The geotextile liner must achieve a minimum puncture resistance of ≥ 2750 N.

5.6.2 Grab Test (Tensile Strength & Elongation) (IS 13162 - Part 5/ASTM D4632/Grab Test):

Tensile machines pull grab samples of the liner to measure breaking force. Minimum grab tensile strength shall be ≥ 1300 N with an ultimate elongation capability of ≥ 50% before tearing.

5.6.3 Tear strength Test (IS 14293/ASTM D4533):

This is an index testing method used to determine the force required to continue or propagate a tear in woven, non-woven, knitted, layered, or felt geotextiles. It simulates real-world conditions where a geotextile fabric undergoes localized damage. The test specimen shall be 76.2 mm × 201.6 mm. Testing speed shall be 300 ± 10 mm/min.

5.6.4 Burst strength Test :(IS1966/ ASTM D3786)

This is a standard testing method used to evaluate a fabric's resistance to multidirectional forces. The burst strength shall be a minimum of 1700 N; elongation at failure <50%.

5.6.5 UV Degradation Resistance (IS 13162 - Part 2/ASTM D4355):

Exposure to intense xenon-arc light apparatus to simulate prolonged desert sunshine. The fabric must retain ≥ 70% of its original tensile strength after 500 hours of continuous ultraviolet exposure.

5.6.6 Flame retardant Test (IS 11871 Method -A):

This methodology determines whether a fabric is capable of self-extinguishing, ensuring it will not propagate or accelerate a fire when used in clothing or general protective textiles. The test utilizes a vertical flame method, where the fabric specimen is suspended vertically inside a controlled flammability chamber. A standardized burner flame is applied directly to the bottom edge of the specimen for a duration of 12 seconds**.**

6 Finish and workmanship:

6.1 General visual and physical appearance

All component of the hesco basket system including welded wire mesh panel, vertical spiral coil joiners, joining pins and fabric fastener hog ring shall exhibit a clean, uniform and workman like appearance free from any physical defects that may impair their structural performance, service life and ease of deployment.

The finished metallic and fabric components shall be entirely free from defects such as structural

cracks, splits, scaling, surface laminations, sharp burrs, kinks, or jagged edges that could compromise the physical integrity of the protective barrier or cause injury to personnel during manual handling and rapid field assembly.

All cut wire ends, loops, and hooks shall be finished neatly to maximize coating containment over the exposed steel substrate, ensuring full compliance with the mandatory 150-250 -hour salt spray corrosion resistance requirement.

6.2 Welded Wire Mesh and Structural Components

All grid intersections of the 76.2 mm × 76.2 mm wire mesh shall be resistance-welded uniformly. The welds shall be sound, clean, and structurally secure**,** showing no evidence of localized overheating, burn-through, embrittlement, micro-cracking, or weld voids.

The vertical spiral coil joiners and joining locking pins shall be formed smoothly to ensure exact geometric alignment with the mesh panels. The units shall collapse and expand seamlessly without binding, jamming, or requiring excessive force, confirming precision in mechanical fabrication.

6.3 Protective Galvanized/Galfan Coating

The protective Galfan (Zn-Al alloy) coating shall be applied uniformly across all metallic components, maintaining a minimum density of 245 g/m² with zero bare spots, patchy coverage, or localized thinning.

The alloy coating shall adhere tenaciously to the underlying low-carbon steel wire base. It shall withstand standard manufacturing bends, spirals, and field assembly manipulation without showing any signs of flaking, peeling, cracking, or blistering**.**

6.4 Geotextile Liner Integration and Fastening

The heavy-duty, non-woven polypropylene geotextile fabric shall be cut cleanly and pre-fitted into the wire mesh containers with true vertical alignment. The liner shall be free from pre-existing tears, punctures, fraying, unraveled stitching, or manufacturing blemishes.

The geotextile liner shall include a secure 150 mm to 200 mm fold-over along the top mesh perimeter. This fold-over must be tailored precisely to allow structural elongation during filling while preventing the fabric from slipping or collapsing under dense structural loads

The fabric fastener hog rings shall be mechanically locked onto the wire mesh lines at rigid, uniform intervals. The nominal spacing shall be maintained at 100 mm and shall strictly never exceed 150 mm, ensuring consistent pull-apart resistance under high-velocity mechanical filling operations.

7 Tools: Following items will be provided with Hesco Bastion/Basket: -

- Pair of hand gloves canvas (as per user requirement).
- Heavy duty staplers with 04 Nos packet of pin – (as per user requirement)

8 Marking:

Each finished product shall be marked legibly and indelibly with the following details on a metal tag.

(a) Manufacturer's Name

(b) Product Type (eg. Hesco baskets)

(C) Mesh Type

(d) Class of Coating (Zinc-Aluminum Alloy)

(e) Wire Diameter (e.g., 4 mm)

(f) Dimensions (L× W x H meters)

(g) Batch Number or Date of Manufacture

9 Tests and Standard of Acceptance: -

Hesco Basket, Geotextile and materials shall be tested in accordance with the procedure as per technical specifications and relevant IS codes.

10 Certificates:

When specified in the purchase order or contract, a manufacturer's certificate shall be furnished to the purchaser stating that the material has been manufactured, tested, and inspected in accordance with the requirements of this standard and found to conform. Test reports for each batch supplied shall be furnished when specified.

18.11.26