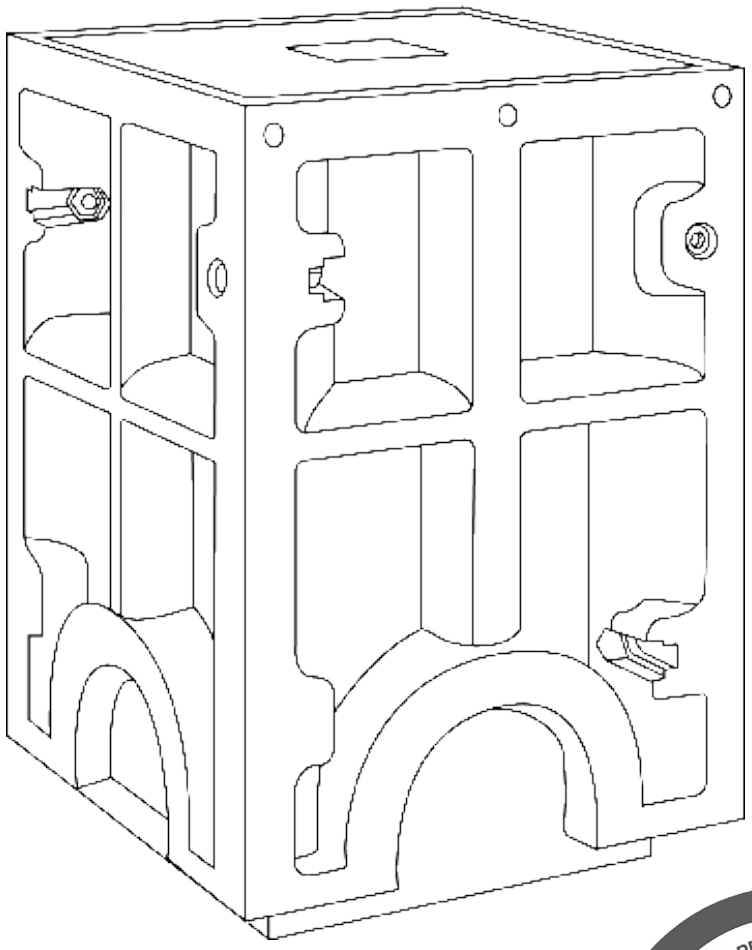
Charge-M8 EV KUBE

Ground Anchor Block



UK PATENT PENDING NO. GB2514214.2

PATENT PENDING

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Specification and Installation Manual

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Pre-Installation Notes

Thank you for purchasing a Charge-M8 EV Kube®

Please read the instructions carefully, to ensure correct installation of the EV Kube.

This manual serves as a guidance document, and every reasonable effort has been made to ensure the accuracy of the information provided at the time of publication. Installers are advised to follow appropriate manual handling procedures as outlined by the HSE when assembling components. Additionally, a sound understanding of groundwork is essential, as the method used to secure the Kube will depend on the ground substrate in which it is installed. Installers should carefully assess site-specific factors—including the risk of ground heave or soil movement—that could affect long-term stability. The choice of fill and anchoring method must be suited to the local conditions to ensure safe and secure installation.

The table provided at section 4, page 11 details the recommended back-fill options and product performance at benchmark windspeeds in different substrate types. The table is derived from testing compiled by The University of Manchester and is intended to be used as a guide to augment the installers own site risk assessment.

If you have any queries regarding Charge-m8® charging equipment, please contact us.

WARRANTY

Charge-M8 Limited provide a 3-year manufacturer's warranty from the date of purchase, conditional upon the installation being compliant with these guidelines and all local regulations, subject to installation in line with the manufacturer's instructions and site ground condition risk assessment

Technical support can be obtained by contacting the customer team on sales@charge-m8.com or calling +44 333 242 3328



Signed on behalf of Charge-M8 Limited:

J Smith

Name: Julian Smith

Position: Managing Director

Date: 01st August 2025

1. Introduction

The Charge-M8 EV Kube® is a ground anchor for freestanding and post-mounted EV chargers and payment terminals. Its robust construction delivers a secure foundation without the need for wet-pour or heavy pre-cast concrete — cutting installation time, cost, and site disruption. The Kube's modular design allows fast efficient assembly with integrated fixings and alignment guides.

**All Charge-M8 EV Kube models are designed for single-person assembly, with all individual components weighing under 20kg. This is based on in-trench assembly as specified in the installation methodology detailed within this manual. However, site-specific factors such as access, terrain, and health and safety considerations may necessitate additional personnel.*

a. Product Appearance



b. Box Contents

1. Kube side panels x 4
2. Kube cover x 1
3. 8 x M10 side panel bolts
4. 4 x M12 Cover bolts

c. Kube Specification

Side panels - Bulk Moulded Compound (BMC)

The four side panels of the Charge-M8 Kube® are moulded from high-performance Bulk Moulding Compound (BMC), a composite material known for strength and durability in demanding environments.

Key material properties:

- 30% Unsaturated Polyester Resin: Excellent mouldability, chemical/weather resistance
- 26% Fibreglass Reinforcement: Structural strength and wear resistance
- 34% Calcium Carbonate ($CaCO_3$): Reinforces mechanical strength and stability
- 10% Additives: Includes shrink agents, styrene, curing agents, and mould-release compounds

Top Cover - Dough Moulded Compound (DMC)

The top cover is made from Dough Moulded Compound (DMC), a thermosetting resin with chopped glass fibres and mineral fillers.

Advantages:

- - High surface finish and dimensional stability
- - Excellent thermal, UV, and moisture resistance
- - Strong dielectric and mechanical properties

Fixings & Fasteners

All fixings are AISI 304 stainless steel (A2 grade), suitable for outdoor applications.

- - Side Panel Bolts: M10 x 45mm Hex Socket, 8mm key, 50g per set
- - *Cover* Bolts: M12 x 65mm Torx55 security pin, 80g per set

Component Weights & Packaging

SKU	Kube w x d x h - mm	Total Weight (kg)	Contents
470-0300	300 x 300 x 450	35.5	4 sides + 1 cover (3 Packages)
470-0430	450 x 300 x 450	44.25	4 sides + 1 cover (4 Packages)
470-0450	450 x 450 x 450	54	4 sides + 1 cover (5 Packages)
470-6300	600 x 300 x 450	56.00	4 sides + 1 cover (4 Packages)
470-6601	600 x 600 x 450	80.50	4 sides + 1 cover (5 Packages)

d. Storage, Transportation & Recycling

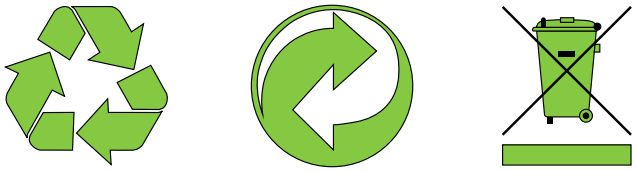
The Charge-M8 EV Kube is robust and well-suited for transportation, supplied in heavy duty 5-ply packaging with corner protection. Care should be taken to minimise excessive handling and avoid impact damage. When unpacking, inspect all components and fixings to ensure they are complete and undamaged before installation.

Packaging materials should be recycled where facilities exist.

The EV Kube is manufactured from Bulk Moulding Compound (BMC) and Dough Moulded Compound (DMC), which can be recycled by crushing and reused either as a filler in new production or used in cement kilns as fuel. Up to 15% of this recycled material can be reintroduced into the manufacturing process without compromising strength or performance. Our policy is to reuse the highest level of recycled material where production parameters and recycled material availability permits.

Approximately 66% of the Kube's raw materials are inorganic, locally sourced, and non-scarce, making it less reliant on crude oil. In addition, some resin content is now being replaced with biobased alternatives, retaining all the physical and mechanical properties of traditional oil-based resins. Our policy is to improve the recycled and inorganic material levels in our products as processes improve.

As responsible manufacturers, Charge-M8 offer a return to depot recycling scheme for end-of-life EV Kube products. Scheme details can be viewed on the following link: www.charge-m8.com/evkube-recycle-scheme



2. Installation



a. Before You Start

Before commencing installation, it is essential that the installer assesses the suitability of the proposed installation area. A competent person should evaluate the ground conditions to ensure they are appropriate for anchoring the Kube and for supporting the intended EV charging equipment or payment terminal kiosk.

Once ground conditions have been assessed and deemed appropriate, the installer should carry out all preparatory excavation works to the required depth and dimensions, taking into account factors such as ground stability, drainage, and potential for ground heave or movement.

The installer must also ensure that a suitable backfill material is selected in line with the ground substrate, taking note of the manufacturers guidance offered in the table provided at section 4, page 11. This is critical for ensuring long-term stability and load-bearing performance. Options for backfill vary depending on soil type, moisture content, and site-specific requirements.

Charge-M8 is not responsible for assessing site suitability or undertaking groundwork. It is the responsibility of the installer to ensure that all preparatory works are compliant with industry best practices and any applicable local regulations.

b. Installation Guide



Site preparation

1. Site Risk & Ground Condition Assessment

- Evaluate the suitability of the installation area, taking into account:
    - Ground stability
    - Substrate Type
    - Drainage

2. Locate and Mark All Underground Services

- Use appropriate detection equipment to identify and clearly mark the location of:
    - Electrical cables
    - Gas lines
    - Water mains
    - Communication or fibre optics

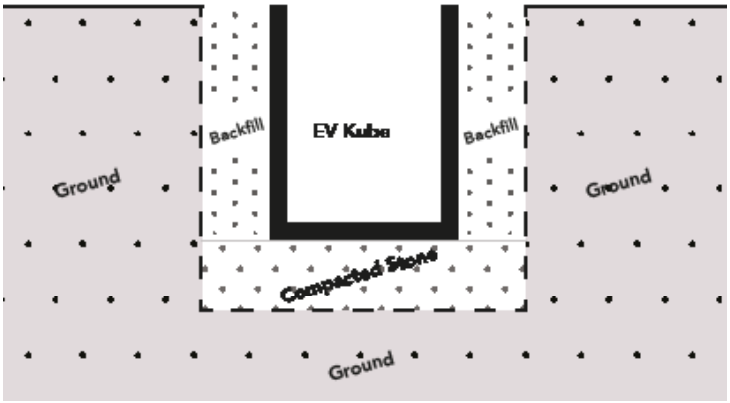
Always refer to updated utility plans and seek formal clearance from relevant authorities when required.

3. Excavate to the Required Dimensions

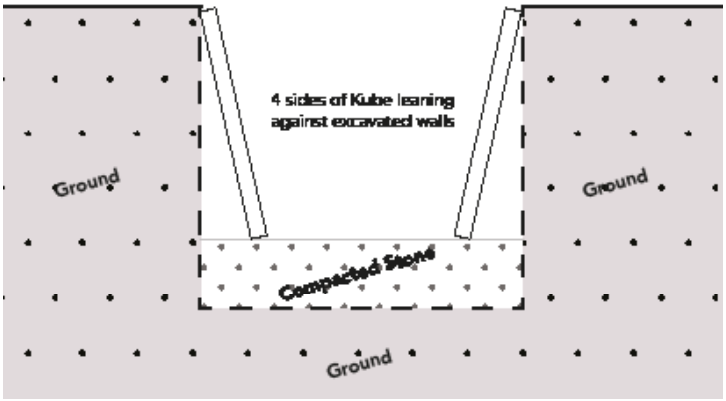
- Excavate the area to suit the dimensions of the selected Charge-M8 Kube model plus 150mm on each side to accommodate the chosen backfill material, allowing extra width and depth where deemed necessary by the site risk assessment. To avoid frost-related ground movement (frost heave) it is suggested that depth of excavation should be around 600mm (if the site is exposed or known for hard frosts, increase to 750mm)

- The size of the excavation may vary depending on site conditions, but must ensure adequate space for:

    - Assembly of the EV Kube within trench
    - Positioning of the unit
    - Ensure the excavation base is flat, level, and well-compacted with crushed stone to a minimum depth of 150mm.



4. Assemble the Charge-M8 Kube in the Trench
    - Carefully unpack all Kube components and ensure all parts and fixings are present.
    - Position the four side panels of the Kube into the trench, leaning each one against the bank of the excavation in preparation for assembly.
    - Once all four sides of the Kube have been positioned against the trench bank, identify which panels require cable/conduit entry or exit. Use a suitable saw to carefully 'cut out' the pre-marked sections located at the base of the Kube, being careful not to cut through the main support structure.



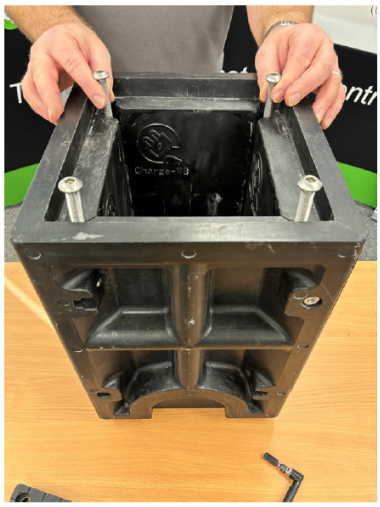
Assembly Process:

i. Prepare the cover bolts and nuts by loosely attaching the nuts to the bolts sufficiently for them to remain in place:

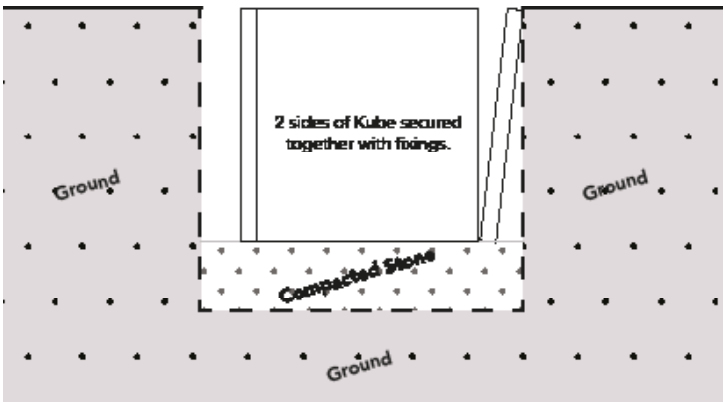








ii. Holding the cover bolt & nut by the head, form the first corner by bringing two side panels together at their mitred edges and bring together ensuring the cover nut seats correctly in its locator position
iii. Secure the joint using the two supplied fixing bolts to lock the panels firmly in place.
iv. Repeat the process for the remaining two sides, bringing the remaining mitred joints together and fastening to complete the Kube's rectangular form.
v. Once fully assembled, adjust the Kube's position within the trench as needed, ensuring it is level with the finished ground:



vi. The EV Kube can be stacked for greater rigidity and use in deeper excavations. Once the sides of each Kube are assembled, one can be lifted in place on top of the other and secured using the stainless-steel fixing plate kit (available separately). A risk assessment should be conducted where EV Kubes are to be stacked to ensure safe assembly and handling.

Recommended Torque Settings

- M12 Cover Bolts: 40Nm / 29.5 ft-lbs
- M10 Side Bolts: 30Nm / 22.13 ft-lbs

Mounting Stands To The Cover

i. If not using specific EV Kube compatible mounting plates/posts, the EV Kube cover can be drilled to allow direct fixing of mounting posts. As the EV Kube does not contain metal reinforcement, the cover can be easily drilled on site to suit your requirements.
ii. To drill holes in the EV Kube composite covers, use a high-speed steel (HSS) or a specialised composite drill bit at a moderate speed, starting with a pilot hole and increasing the size incrementally. Support the material with sacrificial wooden blocks to prevent delamination and use a coolant, such as water, to keep the bit and material cool.

Tips For Preventing Damage

i. Reduce Cutting Forces: Specialised drill bit geometry can reduce the cutting forces that cause delamination. These bits cut the fibers on the outer diameter first, then the material inside.
ii. Use High Rotational Speeds: High speeds are often recommended for drilling composites. Combined with a coolant, this can lead to a better finish and longer bit life.
iii. Apply Back Pressure: Clamping the workpiece with wooden blocks provides compressive stress that prevents the delamination and stress concentrations that can occur during drilling.

Handling

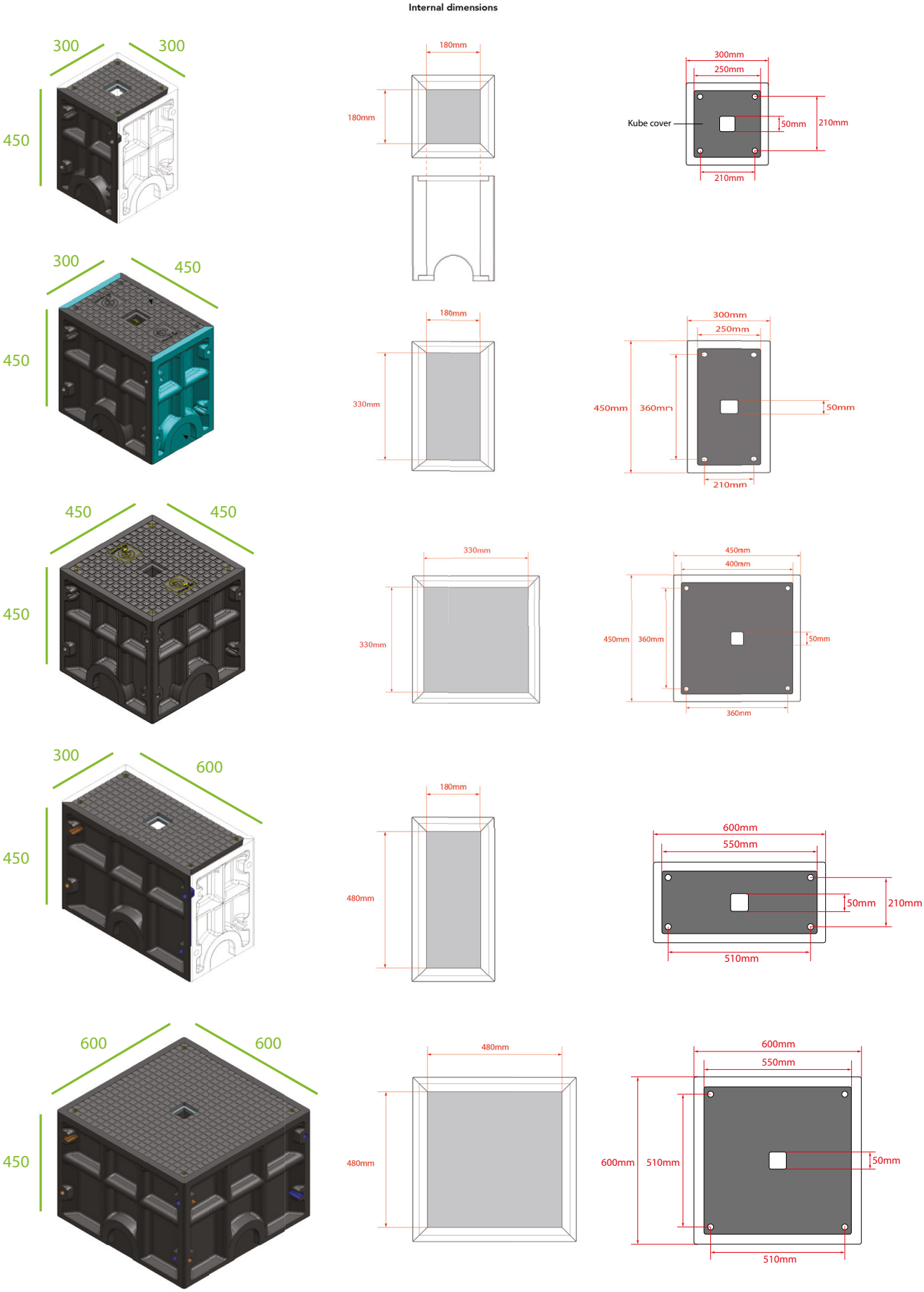
Cut-resistant level 5 gloves are recommended when handling the EV Kube components, especially when drilling the cover or cutting out cable conduit entry points.

5. Select a Suitable Backfill Material for Your Ground Type

- Avoid using excavated spoil as backfill unless it meets performance criteria and is free from contaminants or debris.
- Choose an appropriate backfill to suit the ground conditions and application, taking in to account the site risk assessment observations and guidance in the table provided at section 4, page 11. The EV Kube backfill options include wet-pour concrete, post mix & MOT 1 mixture, or MOT Type 1 only — ensuring proper compaction and adequate drainage.

3. Technical Information

a. Dimensional Drawing



b. Material Composition

Raw Material	Approx %	Specification	Key Properties
Unsaturated Polyester Resin	30	(C8H4O3·C4H10O3·C4H2O3·C3H8O2)x	Unsaturated polyester resins are known for their: Ease of moulding: They can be easily shaped into various forms, making them suitable for a wide range of applications. Strength and durability: They can be reinforced with materials like glass fibre to create strong and durable composites. Chemical resistance: They offer good resistance to various chemicals, making them suitable for applications where corrosion resistance is needed. Weather resistance: Certain types of unsaturated polyester resins, especially those used in gelcoats, exhibit good weather resistance.
Fiberglass	26	of which: SiO2-50~60% Al2O3-23.5~26.5% MgO-10~19.5% Li2O-0~1.0% Fe2O3-~0.5~1.5% B2O3-0~4.0%, CeO2-0.5~8.0%	 Strength: enhances properties like strength and wear resistance Technical grade ceramic Hard, wear-resistant Excellent dielectric properties from DC to GHz frequencies Resists strong acid and alkali attack at elevated temperatures Good thermal conductivity Excellent size and shape capability High strength and stiffness High Strength Glass Fiber: In glass fiber, MgO is a key component, and the 10-19.5% range likely refers to its contribution to the overall strength and properties of the glass fibre. Inorganic chemical compound Enhanced Mechanical Properties: Fe2O3 nanoparticles or microparticles are incorporated into polymer matrices like polypropylene (PP) to increase Young's modulus and tensile strength. Reinforcing effect which is attributed to the strong interfacial bonding between Fe2O3 and the polymer matrix, which helps transfer stress and resist crack propagation. PP/Fe2O3 composites show a significant increase in tensile strength. Boron Oxide: B2O3 influences the microstructure by reducing grain sizes and promoting the formation of a glassy phase at grain boundaries, which affects mechanical properties like strength. B2O3 contributes to smaller grain sizes and a glassy phase, increasing flexural strength.

Raw Material	Approx %	Specification	Key Properties
Calcium Carbonate	34	$CaCO_3$	Reinforcing Composites: $CaCO_3$ whiskers are used to enhance the mechanical properties of various composite materials.
Others	10	of which:	
		EM116	4% Low Shrink agent 40% styrene solution 3% low ripple agent 0.8% Curing Agent
		Mould release spray formula	2% - Zinc Stearate acting as a lubricant to facilitate easy release from moulds.
		Thickening Agent	0.2% - Improves strength, microstructure, and corrosion resistance

c. Backfill Table

		EV Kube Model							
		300x300		600x300		470-6600			
Substrate	Clay Soil							Concrete	Backfill
	Clay Soil							Postcrete & MOT 1 Mix	
	Clay Soil							MOT 1 Only	
	Sandy Soil							Concrete	
	Sandy Soil							Postcrete & MOT 1 Mix	
	Sandy Soil							MOT 1 Only	
		67 m/s - 149.9mph	32.5 m/s - 72.7mph	67 m/s - 149.9mph	32.5 m/s - 72.7mph	67 m/s - 149.9mph	32.5 m/s - 72.7mph		
		Wind Speed							

The above table summarises the resisting performance of Charge M8 EV Kube foundation models (470-0300, 470-6300, and 470-6600) under different backfill methods, surrounding soils, ground-water conditions and two different windspeeds. The evaluation was carried out by The University of Manchester and detailed in their report of the 22nd August 2025.

The resisting moments were assessed against overturning moments induced by wind loading and vehicular impacts. The results demonstrate clear trends that inform both design choices and installation practices:

- Among backfill methods, the resisting performance follows a clear hierarchy: Concrete with surrounding clay soil provides the highest resistance, followed by MOT1+Postcrete with clay, Concrete with sandy soil, MOT1+Postcrete with sandy soil, and finally MOT1 alone.

Against wind-induced loads, concrete backfills (with both sandy and clay surrounding soils) and MOT1+Postcrete backfills in clay soil provide sufficient resistance for all foundation models under the design-speed baseline, corresponding to a maximum bulk mean velocity of 67 m/s (approxi-mately 149.9mph).

Under the logarithmic-reference baseline, with a maximum bulk mean velocity of approximately 32.5 m/s (approximately 72.7mph), all configurations are adequate except the 470-0300 model with MOT1 backfill.

- Groundwater significantly reduces resisting moments, with fully submerged conditions be-ing most critical. Under full-submerged groundwater, the critical cases are model 470-6600 with Concrete+Sandy soil and 470-6600 with MOT1+Postcrete+Sandy soil. Under half-submerged conditions, the critical cases are model 470-6300 with Concrete+Sandy soil and 470-6300 with MOT1 backfill.
- For vehicle impacts, all foundations withstand IK08, and all except 470-0300 with MOT1 backfill withstand IK10. Realistic EV impacts exceed the resistance of most configurations. Protec-tive measures such as barriers or bollards are recommended for full compliance.



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