Ece®
EMPRESA DE CONTROL DE EROSIÓN

CONTROL DE EROSIÓN
ECE'S OWN LINE



PRODUCTS UNDER ECE'S OWN MARK

CE Line

Tubone® geotubes, Bentone® bentonite barriers, Vitrone® fibreglass geogrids and Hexone® gabions and mattresses — the products Ece specifies, controls and supplies under its own mark, with design and installation included.

Protection of the bridge over the Tembey River — Ece project

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01 ECE'S OWN LINE

Ece began by representing manufacturers. With 8 years in the Paraguayan market, there are products we know so well —because we specify them, install them and watch them work— that we stopped buying them ready-made and started defining them ourselves. That is the **CE line**.

It is not a white label. It is our own specification: **we set the test standard, the minimum value and the quality control**, and the manufacturer produces against that specification. The result arrives with the CE mark, with the batch test certificates and with the backing of whoever is going to install it.

- **A verifiable specification:** every grade is declared with its test standard — ASTM, EN or ISO — and its minimum average roll value
- **Availability:** we plan the stock against the real demand of the Paraguayan market, not against a global catalogue
- **Price with no steps:** a single intermediary between the factory and the site
- **A product matched to the project:** sizes, weights and coatings are defined to order when the volume justifies it
- **One party responsible:** whoever specifies, whoever supplies and whoever installs are the same company

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PRODUCT FAMILIES

CE
ECE'S OWN MARK

Asunción
STOCK AND TECHNICAL SUPPORT

Integrated
DESIGN, SUPPLY, SITE SUPERVISION AND OWN CREWS

Product	What it does	Where it fits
Tubone®	Dewaters and confines	Sludge, dredging and coastal works
Bentone®	Lines	Landfills, ponds and bunds
Vitrone®	Reinforces the asphalt	Overlays and widenings
Hexone®	Contains and lines	Walls, banks and channels

What does not change: the CE line lives alongside the brands we represent. When a project calls for a particular manufacturer's product, we supply it just the same — the own line exists to open up the choice, not to close it.



Gabion wall under construction beside a stream · Ece project

02 TUBONE® — GEOTUBES

A textile tube that separates the water from the solid. The sludge is pumped in with polymer: the solids flocculate and stay confined, the water drains out filtered through the fabric. **No presses or process equipment; just pumping and dosing**. The tube is filled in successive cycles up to the design height and the residue is removed dry.

Filled with **sand dredged in situ**, the same tube becomes a structure: groynes, breakwaters, dyke cores and riverbank protection. Where rock has to be brought from far away, that can be the difference between building the project and not building it.

- More than **99% capture** of solids and up to **90% less volume**
- Circumference and length made to measure
- Minimal civil works: platform, slope and collection channel
- It turns dredged material into construction material



Battery in a dewatering operation



The same tube, filled with sand: protection at the foot of a bank

WHERE IT APPLIES

Treatment plants · Port and channel dredging · Industrial, meat plant and agro-industry sludge · Mine tailings · Remediation of contaminated soils · Groynes and breakwaters · Riverbank and waterfront defence · Cores of protective embankments

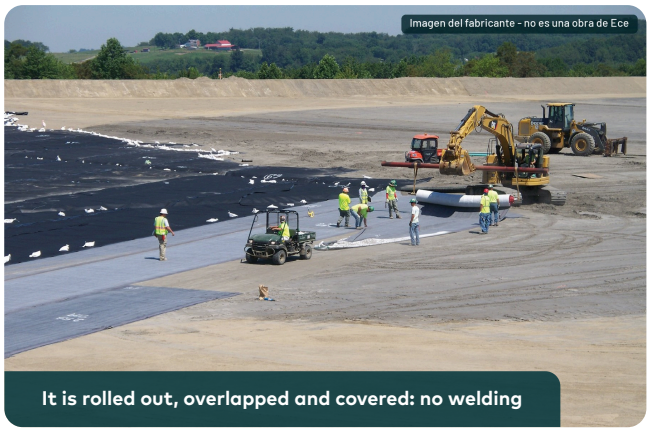
> **Sizes: circumference and length made to measure.** Ece defines the size based on flow rate, solids concentration and available area. The final height depends on the type of sludge and the number of filling cycles.

03 BENTONE® — BENTONITE BARRIERS

Clay that comes in rolls. Bentone encapsulates natural sodium bentonite between a woven and a nonwoven geotextile **needle-punched together**: the internal reinforcement keeps the clay from migrating and holds permeability extremely low under any site condition. On hydration the bentonite swells and seals — it even **self-heals** small punctures.

Bentone **replaces the compacted clay layer**: no quarries, no layer-by-layer compaction testing, no uncertainty about finding a uniform clay soil. It is installed by overlapping —≥15 cm, and 60 cm at the ends with granular bentonite—, without welding, and is covered the same day.

Grade	Bentonite	Flux	Use
Bentone S	≥2.5 kg/m²	2×10^{-8}	General lining
Bentone R	≥3.5 kg/m²	8×10^{-9}	High demand · lower flux
Bentone F	≥3.5 + geofilm	no measurable flux	Caps and liquids



It is rolled out, overlapped and covered: no welding



Sodium bentonite confined between needle-punched geotextiles

> **When it is the right choice:** whenever the project calls for compacted clay and the local soil does not have it, or when the programme does not allow compacting and testing layer by layer.

WHERE IT APPLIES

Landfills, base and cap · Treatment ponds and reservoirs · Irrigation and supply channels · Fuel tank bunds · Industrial and mining basins · Vertical barriers

04 VITRONE® — FIBREGLASS GEOGRIDS

Stiffness exactly where the asphalt needs it. Vitrone is a fibreglass grid with an elastomeric coating for reinforcing asphalt courses to **EN 15381**. With a modulus of **73 GPa** and an elongation of just **2.5%**, it takes up the stress long before the asphalt deforms.

Its job is **to delay reflective cracking**: cracks in the old pavement that within a few months copy themselves into the new overlay. It withstands the temperature of hot-mix asphalt and can be milled and recycled together with the pavement.

- One grade: **Vitrone 115**
- Always combined with a nonwoven geotextile: adds a moisture barrier
- Traffic on the exposed grid: kept to a minimum, at 5–10 km/h
- It does not change the site method: tack coat, grid, course

> **The sum:** an overlay without reinforcement cracks again along the joints of the old pavement within a season or two. The grid does not stop the crack for ever — it multiplies the time until it appears.



The course is laid straight onto the grid


Vitrone: grid on nonwoven geotextile

WHERE IT APPLIES

Overlays on cracked pavement · Milled surfaces · Carriageway widenings and expansion joints · Roads and motorways · Airport runways and aprons · Manoeuvring yards and industrial yards

Grade	MD × CD strength	At 2% strain	Mass	Roll
Vitrone 115	115 × 115 kN/m	95 × 95 kN/m	≥415 g/m²	100 m · 1.5 m (up to 3.0 m on request)

Values for the glass grid. Test ASTM D6637 / EN ISO 10319. Ultimate elongation 2.5 ± 1% and coating stable above 232 °C.

05 HEXONE® — GABIONS AND MATTRESSES

Classic retention, properly done. Hexone confines stone in a hexagonal mesh of **double twist**: if one wire is cut, the mesh does not unravel. Box gabions form gravity walls, mattresses line banks and channels, and sack gabions solve submerged foundations without diverting the water.

The structure is flexible and monolithic: it follows settlement without cracking, **drains by itself** — it builds no uplift pressure behind the wall — and over time it traps sediment and vegetation until it blends into the landscape.



Gabion wall under construction · Ece project

Format	Mesh	Dimensions	Use
Hexone C	8 × 10 cm	1.0 × 1.0 × 1.5–4.0 m	Gravity walls
Hexone M	6 × 8 cm	2.0 m × 3–6 m · 0.17–0.30 m	Banks and channels
Hexone S	8 × 10 cm	Ø 0.65 m × 2–4 m	Submerged foundations

Why double twist: single-twist mesh unravels in a chain when cut; double twist keeps the confinement even if a wire fails, which is why it is preferred in hydraulic works.

Ece project: Protection of the bridge over the Tembey River: 6,800 m³ of gabions, preventive protection of abutments and slope toes.

Never on its own: a gabion without a filter geotextile behind it clogs with the fines of the ground and loses the drainage that justified choosing it.

WHERE IT APPLIES

Gravity retaining walls · Bank and slope-toe protection · Channel lining · Energy dissipators and drops · Submerged foundations · Bridge abutment protection

1 · The stone

1 to 2 times the mesh aperture, angular and sound. Round stone does not interlock and the gabion deforms.

2 · The filter

Nonwoven geotextile across the whole back of the wall: it lets the water through and holds the fines of the ground.

3 · The reinforcement

A geogrid anchored between layers when the height exceeds what gravity alone can hold.

06 FROM THE PROBLEM TO THE PRODUCT

The CE line is not chosen from a catalogue but from the problem to be solved. This is the short route; the sizing is done by our technical department, at no charge.

The problem on site	The answer	What has to be defined
I have sludge and nowhere to put it	**Tubone®**	Flow rate, solids concentration and the area available. Flocculation is tested before sizing.
The river is taking the bank away	**Tubone®** o **Hexone®**	If there is sand to dredge, Tubone. If there is stone nearby and the attack is localised, Hexone.
I need to line it and I have no clay	**Bentone®**	Hydraulic head, slope gradient and the type of liquid contained.
My overlay cracks straight away	**Vitrone®**	The condition of the existing pavement, the design traffic and whether it is milled or not.
I have to retain a slope and there is stone	**Hexone®**	Height, thrust and how aggressive the water is — this sets the wire coating.
The channel erodes with every flood	**Hexone M**	Flow velocity and the grading of the bed. Always with a filter geotextile underneath.

THE CE LINE DOES NOT WORK ALONE

Almost no problem is solved with a single product. A gabion wall needs **filter geotextile** behind the wall; a pond with Bentone needs **puncture protection**; a slope protected with Tubone needs **revegetation** to finish stabilising.

That is why the own line lives alongside the brands we represent:

- **Strata** — reinforcement and drainage
- **Synthetex** — concrete mattresses
- **Profile** — erosion control and revegetation
- **Geo Soluções** — reinforced soil and geomembranes
- **Pietrucha** — sheet piles

WHAT IS INCLUDED

Site visit and survey · Sizing and design calculations · Quantity take-off by product · Technical specification for tender documents · Crew training · Technical supervision during installation · Test certificates for the supplied lot



Each product in the line solves a different stage: contain, dry, line, reinforce

07 ECE — INTEGRATED ENGINEERING COMPANY

8	24	5	Integrated
YEARS IN THE PARAGUAYAN MARKET	PROJECTS COMPLETED AND MORE THAN 4,000,000 M²	COUNTRIES WITH ECE TECHNICAL WORK	DESIGN, SUPPLY, SITE SUPERVISION AND OWN CREWS

We do not sell rolls: we deliver the problem solved. Ece designs, supplies, installs and follows through. That complete chain is what makes it possible to sustain an own line carrying the company's name — and it is what lets us answer for the result, not just for the material.

The experience is not only local: in **Al Khatm, Abu Dhabi — Al Heya project** (United Arab Emirates), Ece did the design, crew training and site supervision for 75,000 m² of slopes, and has worked in **Peru, Colombia and Ecuador**. What is learned in the desert comes back to projects in Paraguay.

Ask us for the sizing before the tender. Most of the cost overruns in a specification involving geosynthetics come from a spec written without knowing the product. Reviewing the specification in time costs nothing and avoids the expensive adjustment later.

The four brands of the CE line

Tubone®	Dewatering geotubes and coastal works
Bentone®	Geosynthetic clay liners
Vitrone®	Fibreglass geogrids for asphalt
Hexone®	Double-twisted gabions and mattresses

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From the treatment plant to the coastal defence: the CE line covers the full cycle of water and soil