# EV Busbars & Conductive Contacts in Copper Alloys

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This solution looks at how VT machining manufactures **high-current busbars, terminals and conductive contacts for EV powertrain and battery systems** for the automotive & ev sector, and how process and material choices combine to hit demanding requirements. It is written as a starting point for your own design discussion — every part is ultimately quoted and engineered to your drawing.

The natural first choice for this kind of component is C110 Copper (ETP). C110 electrolytic-tough-pitch copper offers ~100% IACS conductivity, making it the default for high-current busbars where electrical performance dominates.

## Why C110 Copper (ETP)?

C110 Copper (ETP) is specified here because of how its properties match the duty of high-current busbars, terminals and conductive contacts for EV powertrain and battery systems. We confirm the exact grade, temper or heat-treat condition with you before machining, and can supply material certificates for traceability. See our dedicated CNC Milling C110 Copper (ETP) capability page for process-and-grade detail.

## Material Alternatives & Substitutions

Depending on cost, corrosion, strength or weight priorities, several alloys can substitute for C110 Copper (ETP). Each links to its machining capability page:

| Alternative | When to choose it |
|---|---|
| C101 Copper (OFE) | oxygen-free for the highest conductivity and weldability |
| C145 Tellurium Copper | free-machining copper retaining ~90% IACS for machined contacts |
| C17200 Beryllium Copper | high strength and fatigue life for spring contacts |
| C260 Brass | lower-cost, free-machining option where conductivity is less critical |

## Recommended Process Routes

For high-current busbars, terminals and conductive contacts for EV powertrain and battery systems, the core shaping operations are usually:

- CNC Milling — primary shaping of the main geometry.
- CNC Turning — primary shaping of the main geometry.
- CNC Laser Cutting — primary shaping of the main geometry.

## High-Tolerance Process Combination

Where the drawing calls for flatness for low-resistance joints, clean burr-free edges and accurate hole patterns for bolted connections, a single operation is rarely enough. We recommend combining processes in sequence so each stage refines the last:

1. CNC Laser Cutting — rough and semi-finish the part close to net shape, leaving controlled stock for finishing.
2. CNC Milling — bring critical features to final size and geometry with a precision finishing pass.
3. CNC Bending — produce the tightest features or hardened-material details that cannot be cut conventionally.
4. CNC Deburring — achieve the final surface finish, edge condition and cosmetic quality.

Sequencing the work this way isolates roughing distortion from the finishing stages, which is how tight tolerances are held repeatably in production. We plan the exact route from your tolerance scheme and first-article results.

## Feature & Secondary Operations

Additional features and finishing are added with:

- CNC Punching
- CNC Drilling
- CNC Tapping
- CNC Polishing

## Related Applications

This solution supports the following application areas — each shows the broader range of parts and materials we make for that industry:

- Automotive Parts
- Electronics & Enclosures

## Standards & References

Relevant standards for this kind of work include ASTM B187 (copper bar), ASTM B152 (copper sheet). These are cited for guidance only; we work to the standards and revisions named on your drawing.

Authoritative public references used in preparing this overview:

- Copper conductor conductivity (IACS) overview
- Beryllium copper spring/contact properties

## Frequently Asked Questions

What is the best material for high-current busbars, terminals and conductive contacts for EV powertrain and battery systems?

C110 Copper (ETP) is the usual first choice because c110 electrolytic-tough-pitch copper offers ~100% IACS conductivity, making it the default for high-current busbars where electrical performance dominates. Alternatives such as C101 Copper (OFE), C145 Tellurium Copper, C17200 Beryllium Copper are used when cost, corrosion or weight priorities differ.

Which processes hold the tightest tolerances for high-current busbars, terminals and conductive contacts for EV powertrain and battery systems?
We combine processes in sequence — typically CNC Laser Cutting, CNC Milling, CNC Bending, CNC Deburring — so roughing distortion is separated from finishing and the critical features are produced last.

Can you machine C110 Copper (ETP) to my drawing?
Yes. Send your CAD or 2D drawing, the grade and condition, the quantity and any finish or inspection requirements, and our engineers will confirm feasibility, pricing and lead time — usually within one business day.

What quality documentation can you provide?
Material certificates, dimensional inspection reports and first-article documentation are available on request, aligned to the standards named on your drawing.

Need high-current busbars, terminals and conductive contacts for EV powertrain and battery systems manufactured to your spec? Send your drawing and quantity for a fast quotation.

Request a Quote