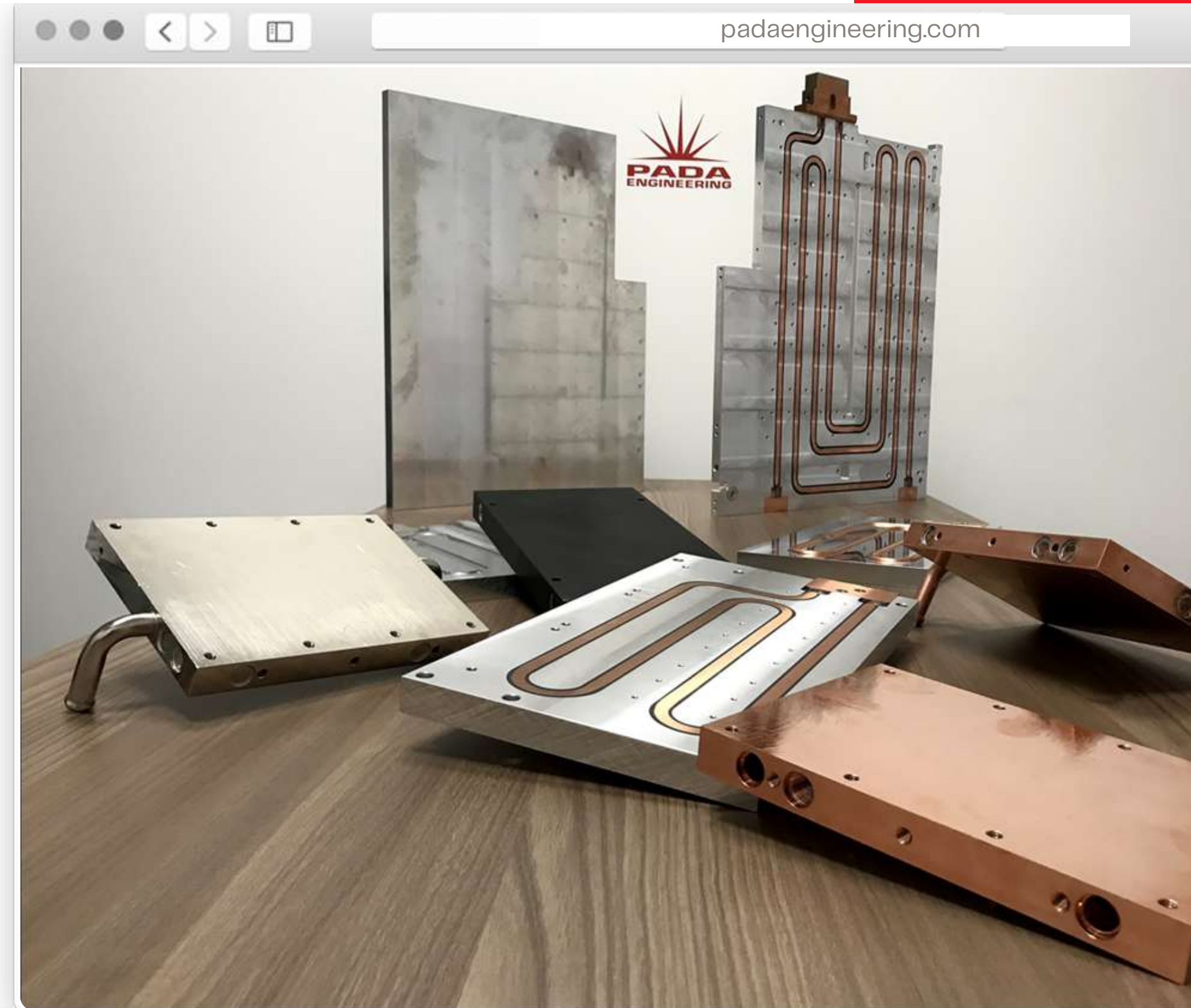


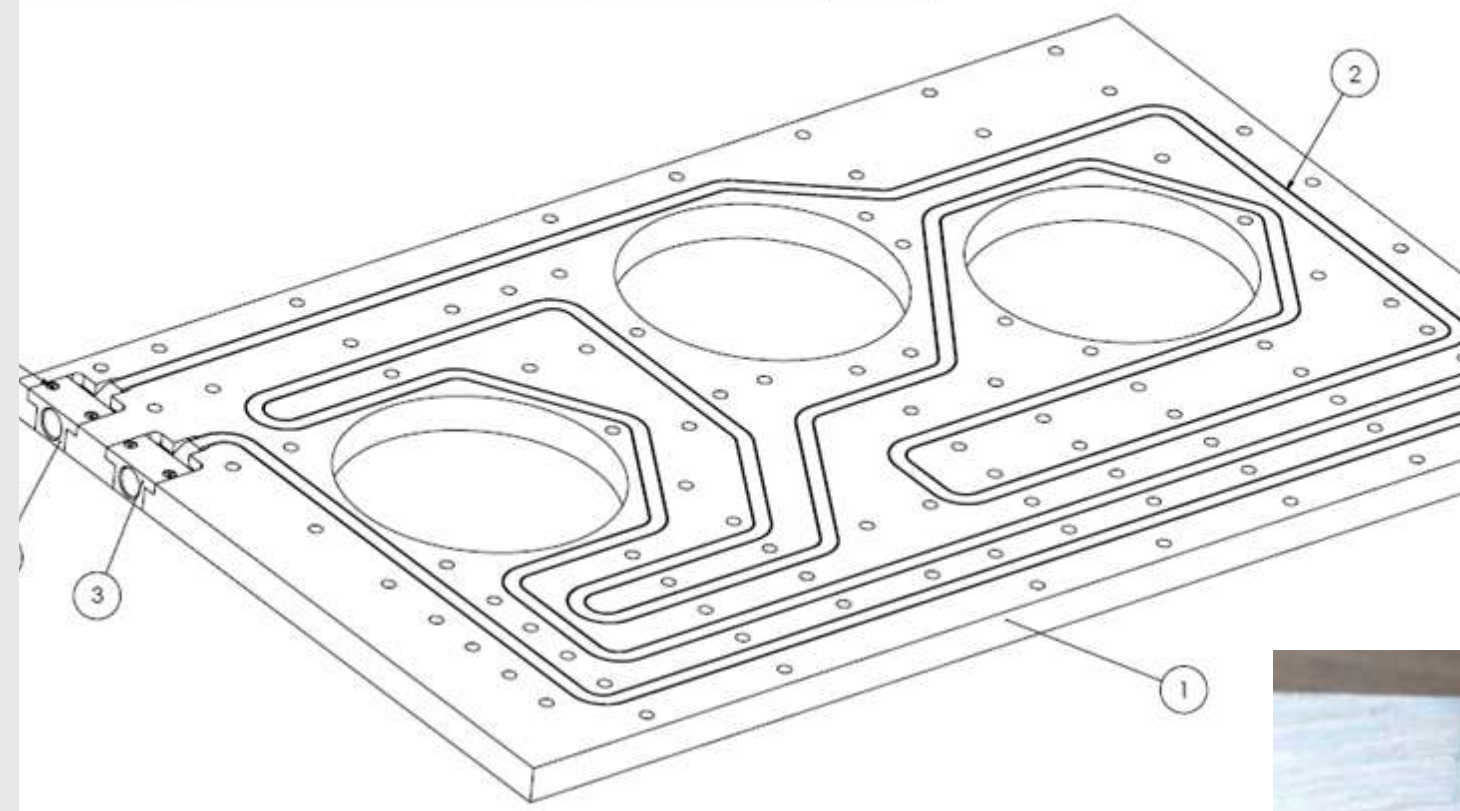


# Cold plates



## With pressured tubes on the surface ( copper, stainless steel, aluminium )

| num. parte | Descrizione                   | Materiale  | Quantità |
|------------|-------------------------------|------------|----------|
| 10531302   | PLATE 530x25/870/G DIS.       | EN AW 5083 | 1        |
| 1053A1302  | SERP CU Ø12x0,9 26CR18/6150mm | COPPER     | 1        |
| 1053B1254  | BRASS BLOCK 50X25/30          | BRASS      | 2        |
| 00005049   | VITE TSPEI M4x12 ZINC.BIANCA  | STEEL      | 4        |



Safe and correct thickness →



### → Cold plate with copper tubes (Ø6x0,9 - Ø8x0,9 - Ø10x0,9 - Ø10x1,5 - Ø12x0,9 - Ø12x1,2 - Ø12,7x1)

- Relatively low cost
- Both small and large production batches
- Tubes geometries can be also quite complex
- Wide choice of pipe diameter/thickness combinations
- Wide choice of copper/brass in/out fittings

### → Cold plate with stainless steel tubes (Ø8x1 - Ø10x1 - Ø12x1)

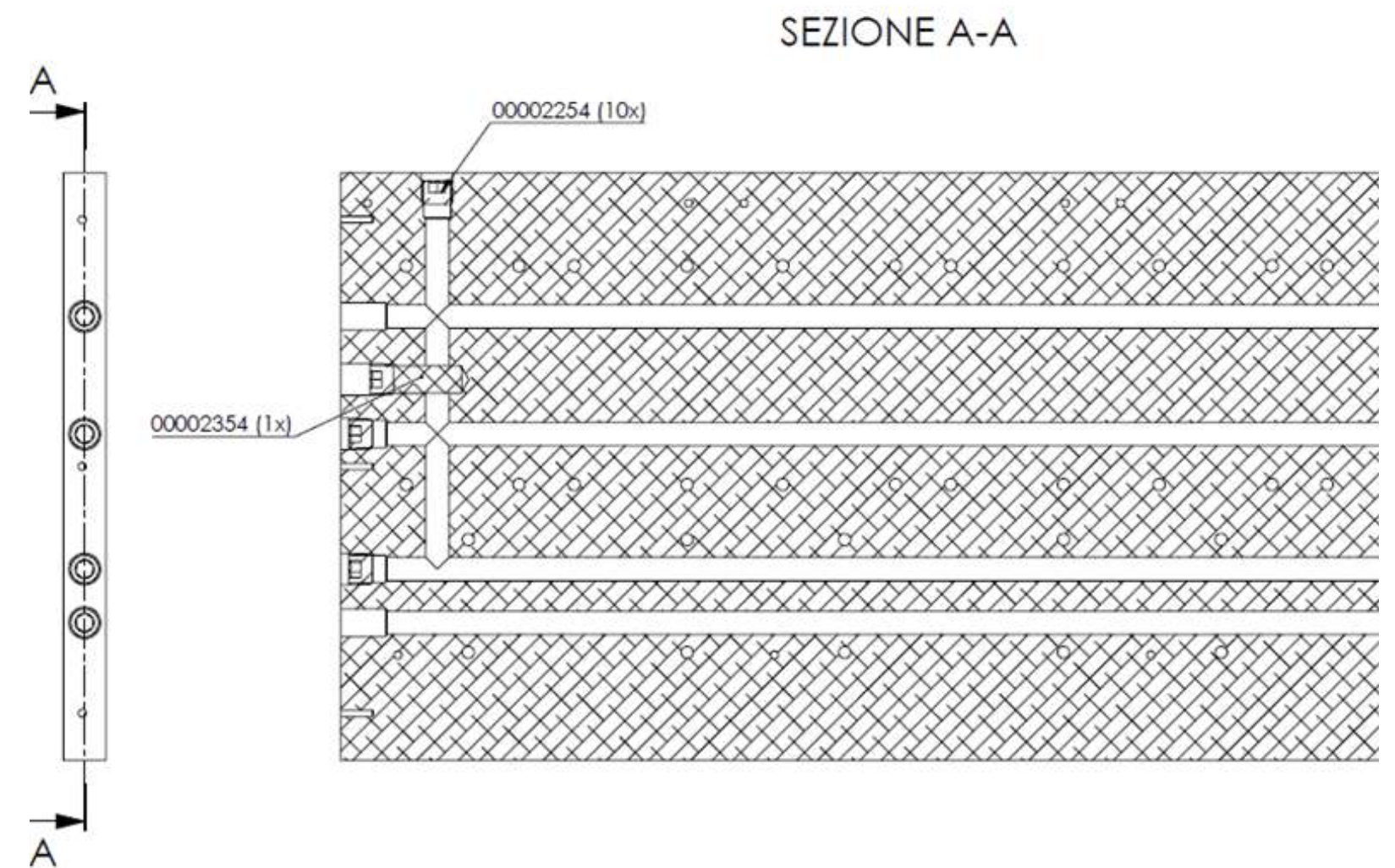
- Ok for corrosive liquids
- High cost due to the difficulties in machining (milling, bending, welding) of the stainless steel
- Not too complex coil geometries

### → Coldplate with aluminium tubes (prototype for charger cooling under construction)

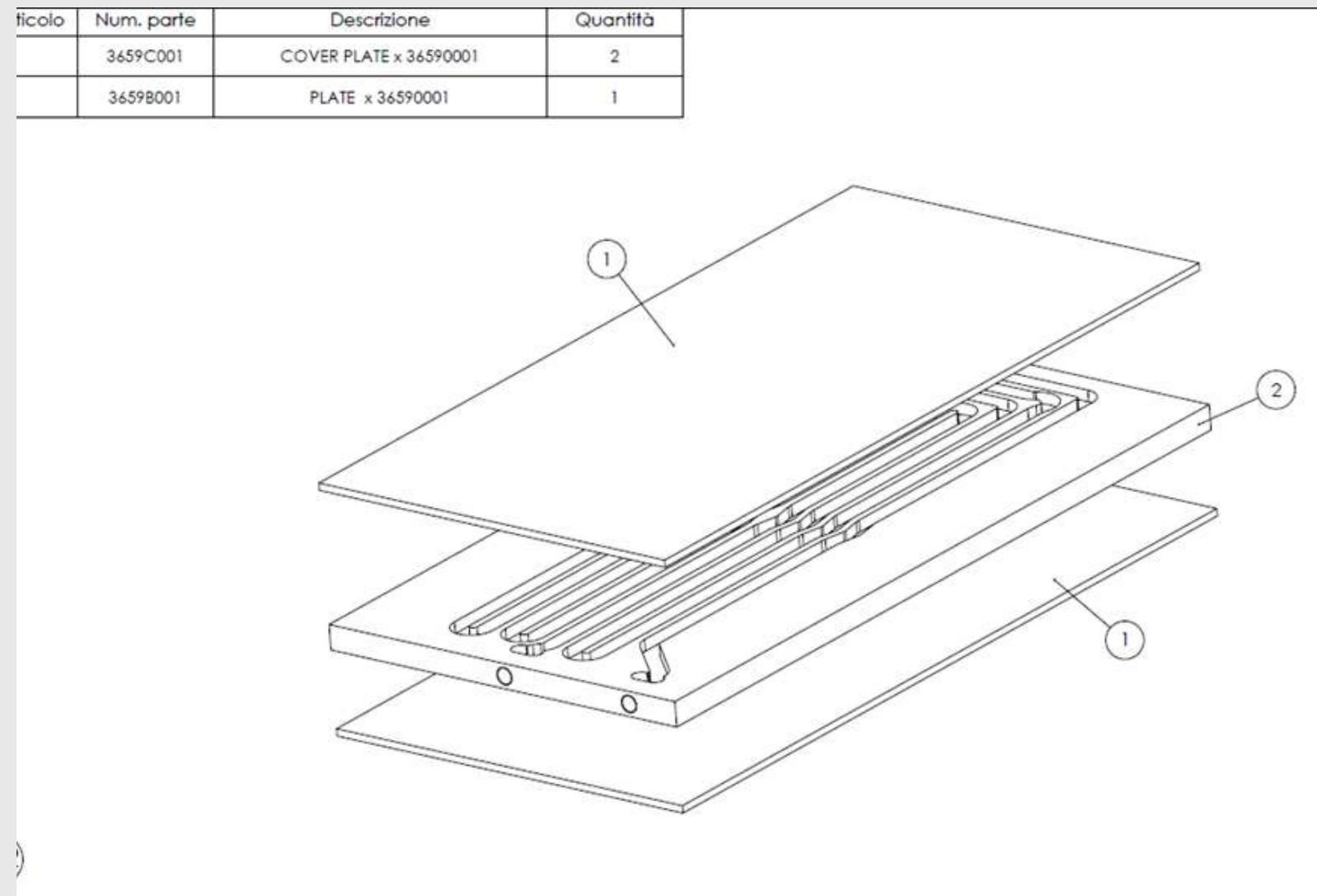
- Relatively low cost
- Both small and large production batches
- Not too complex coil geometries
- Low choice of pipe diameter/thickness combinations
- To be verified welding / brazing fittings
- Dissipation efficiency limited by coil - plate contact resistance
- Technology in any case should be reviewed after making a series production

**Coldplate with deep drilling**

- Equal cooling circuit, better dissipation than coldplates with tubes (no contact resistance)
- Both small and large production batches
- Relatively simple cooling circuit geometry
- Low production cost in case an extrusion die can be made with longitudinal through holes (less deep drilling time)



**Deep drilling**



### Vacuum brazed welding Coldplate

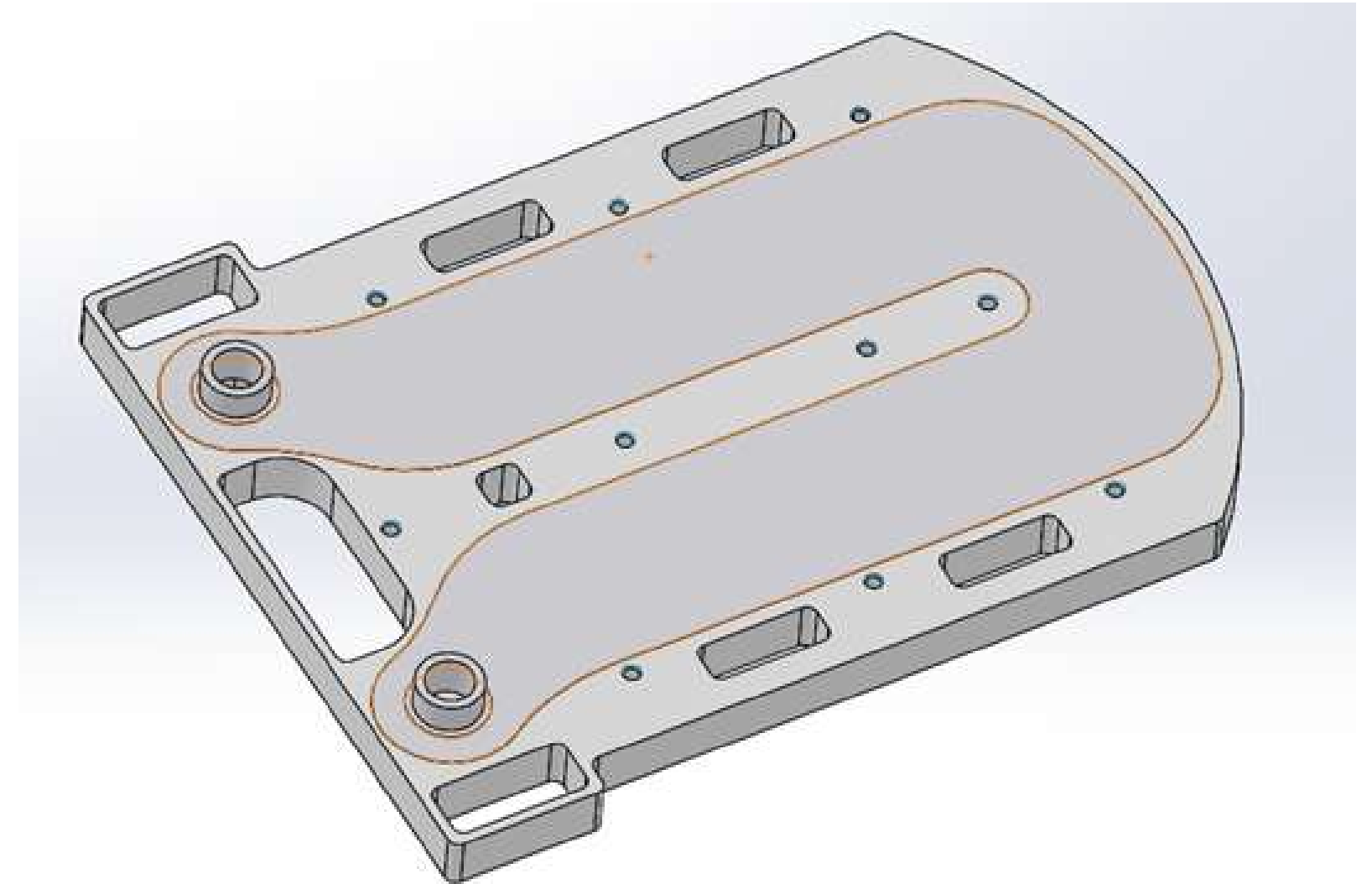
- Maximum dissipation efficiency due to the absence of contact resistance and maximum freedom in the realization of the cooling circuit
- Need for dedicated brazing equipment
- No small production batches
- Constraints on the types of aluminum alloys that can be used

## Vacuum Brazed Welding

### Friction Stir Welding Coldplate

- No contact resistance, good degree of freedom for the realization of the cooling circuit
- Possibility to create coldplate even with big thickness
- Need for dedicated welding equipment
- No small production batches

## FSW Coldplate ( Friction Stir Welding )





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