

CHOOSE A

GREENER, MORE SUSTAINABLE ALTERNATIVE FROM YOUR PCB SUPPLIER



PROCESS STEPS

ELECTROLESS COPPER

15+ horizontal or vertical steps

SHADOW/BLACKHOLE DIRECT METALLIZATION

~6 horizontal steps
89% Reduction in process time



CHEMICAL CONSUMPTION

Constant chemical breakdown and high chemical consumption

No chemical breakdown, minimal chemical usage
97% Reduced chemical consumption



OPERATION

High temperature, high water usage

Low Temp, minimal rinsing
57% Reduced power usage, 80% Reduced water usage



RATE OF CHANGE

Requires constant chemical addition to maintain plating

Non-dynamic process chemistry
Consistent product, consistent quality

WATER CONSUMPTION

72,667

14,667

Electroless
Copper

Direct
Metallization

Liters/Day

POWER CONSUMPTION

88,260

40,900

Electroless
Copper

Direct
Metallization

KWH/Month

CHEMICAL CONSUMPTION

20,663

704

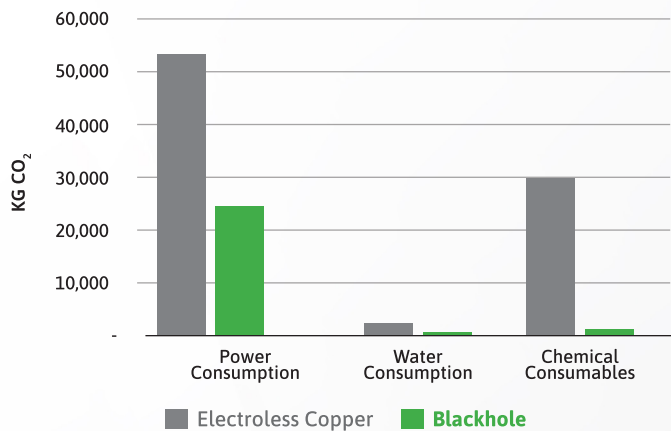
Electroless
Copper

Direct
Metallization

L/Month

Automated processing, low temperature, stable chemistry, and fewer process steps **reduce energy consumption** and **increase the value** obtained from using direct metallization.

ELECTROLESS COPPER VS. DIRECT METALLIZATION



**2m/min lines, 240,000m² per year lines
CO₂ equivalent emissions reduced by:**

- 57% for power consumption
- 80% for water consumption
- 97% for transportation
- 97% for packaging
- 97% for chemical consumables



macdermidalpha.com

© 2023 MacDermid, Inc. and its group of companies. All rights reserved. "(R)" and "TM" are registered trademarks or trademarks of MacDermid, Inc. and its group of companies in the United States and/or other countries.

LEARN MORE

