

NWL Capacitors Application Note #101

Integrated Water-cooled Capacitors Provide High Current and Small Footprint

The Situation

Advancements in capacitor design and manufacturing have greatly increased the energy densities of metallized film capacitors over the past decade. Among the factors contributing to this phenomenon are:

- Improved dielectric breakdown strength
- Self-healing electrode properties
- Enhanced impregnation processes
- Higher purity materials

The Problem

Renewable energy inverters and transportation drive systems have benefited from these higher energy densities, but this performance comes with a cost - more demanding thermal management. To complicate matters further, inverter designs seek to reduce the overall equipment volume. This combination of high current and small footprint creates extremely challenging heat dissipation and component sizing issues.

The Solution

Direct water cooled capacitors can provide high current carrying capability in a very compact package compared to dry versions. The rendering at right shows a single water cooled capacitor, and the corresponding dry capacitor bank with equivalent performance characteristics.

On average, water cooled capacitors use up to 60% less space than dry capacitors. For more information on this subject, please call or email us.

