

ThermaGraph-D vs. Castrol ON

A graphene-enhanced dielectric for single-phase immersion. Live boards, not glycol loops. Carrier: Drakeol white mineral oil, CAS 8042-47-5.

- SINGLE-PHASE
- 0.05–0.20 WT%
- DRAKEOL DIELECTRIC
- MADE IN USA

When the architecture is a tank, water is the wrong fluid. ThermaGraph-D is graphene at 0.05–0.20 wt% in Drakeol white mineral oil, built for single-phase immersion of live boards. It is not ThermaGraph (the water loop SKU). Two-phase boiling is a different conversation — and a different TDS. Grade of Drakeol is selected per order (typical discussion: Drakeol 10 NF through Drakeol 35 USP).

ARCHITECTURE	LOADING	CARRIER	THE INCUMBENT
Single-phase tank The board is in the fluid. Not a cold plate, not LC25.	0.05–0.20 wt % Graphene in Drakeol. Low enough to protect pumps, filters, and BDV.	Drakeol CAS 8042-47-5 White mineral oil. Not water. Not glycol. Grade on the COA.	Castrol ON DC 15/20 Synthetic single-phase dielectrics. That is the job we have to beat.

THERMAGRAPH-D · VS. CASTROL ON DC 15 / DC 20

PROPERTY	ThermaGraph-D	Castrol ON DC 15 / DC 20
Job	Single-phase immersion of live boards. Graphene-enhanced Drakeol.	Specified synthetic dielectric for single-phase tanks
Heat transfer	Versus the unfilled dielectric on the signed lab sheet — same T, same method.	Baseline unfilled fluid in the same tank
Electrical	Formulated as a dielectric. BDV and conductivity on the signed TDS only.	Castrol publishes conductivity <35–50 pS/m and BDV >25 kV on DC 15
Loading	0.05–0.20 wt% graphene (COA).	Unfilled base fluid
Viscosity / flash	Lot-specific. Mineral-oil grades are typically thicker than DC 15 (7.5 cSt @ 40 °C). Drakeol 35 flash COC ~240 °C.	KV 7.5 mm ² /s @ 40 °C; flash COC 166 °C (Castrol PDS)
Stability	Months of visible suspension; particle count + filter ΔP in the 30-day protocol.	Specified long-term stability
Materials	Coupons (copper, soldermask, elastomers) with every pilot. No Castrol-package claim until coupons return.	Castrol: compatible with most commercial elastomers
Best application	Single-phase tanks — HPC, edge, dunked servers — where ΔT is the constraint.	Single-phase immersion tanks. Proven, widely specified.

WHAT WE MEASURED
Dielectric formulations. Hot-metal, pumped-loop, and passive-convection tests on the carrier we actually ship. Breakdown voltage, conductivity, k, and viscosity stay on the signed TDS. Patent pending. Made in the USA.

THE ASK
Request a 30-day tank sample. Baseline BDV, conductivity, k, viscosity, ΔT, particle count; dose; repeat at 7 / 14 / 30; coupons and filter inspection. You keep the data. Do not energize boards until lot electricals are on the signed sheet.

Castrol ON electricals are Castrol published data (pS/m, not μS/m). Drakeol is a Calumet / Petroco trademark used here as the named carrier. Not a spec until the signed lab sheet. Do not mix drums.