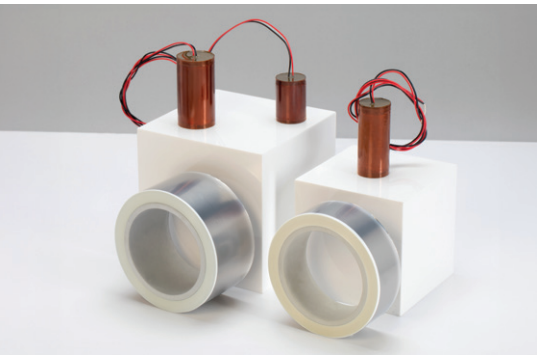
GORE® High Temperature Film
For Capacitors in Oil & Gas Power Electronics

Increase Downhole Tool Reliability



Features & Benefits

- Increases tool reliability and reduces risk of unexpected failures
- Withstands high temperatures, voltage spikes, shock, vibration
- Enables stable, predictable capacitance with minimal loss
- Reduces overall electrical stress on other components
- Simplifies system design and installation

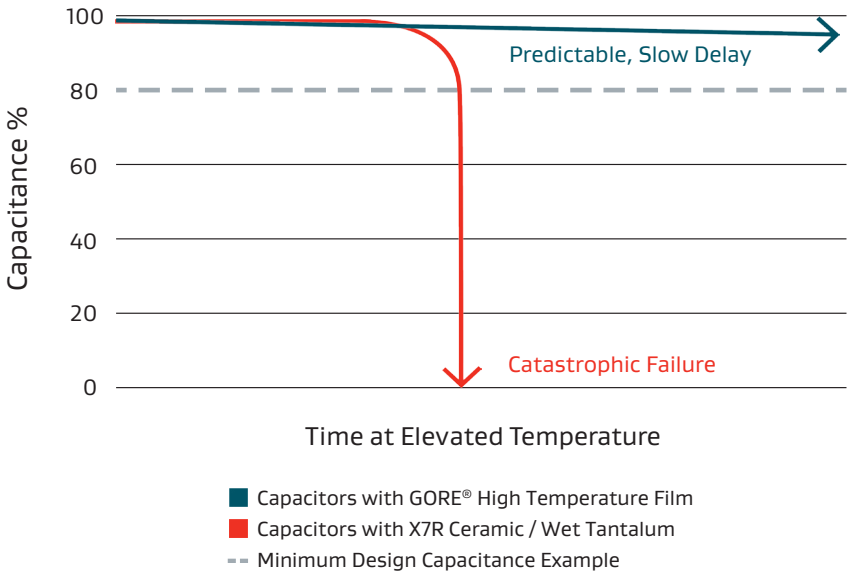
Gore offers an innovative capacitor film technology that increases downhole tool reliability, unlike a multi-layer ceramic capacitor (MLCC) prone to fracture.

GORE® High Temperature Film in capacitors reduces the risk of sudden and complete tool failure for more predictable downhole drilling operations (Table 1). Capacitors featuring our unique film deliver stable voltage and capacitance with minimal loss at elevated temperatures in power electronics, significantly extending tool life (Figure 1).

Table 1: Key Film Attributes

Property	Value
Temperature Range °C (°F)	- 55 to +200 (-67 to +392)
Material Construction	Engineered Fluoropolymer
Thickness µm	4
Dielectric Constant	2.1
Loss Tangent (Tanδ)	0.0002
Insulation Resistance MΩ x µF at 25 °C	7,000,000

Figure 1: Capacitance Over Time at Elevated Temperatures Comparison



Together, improving life

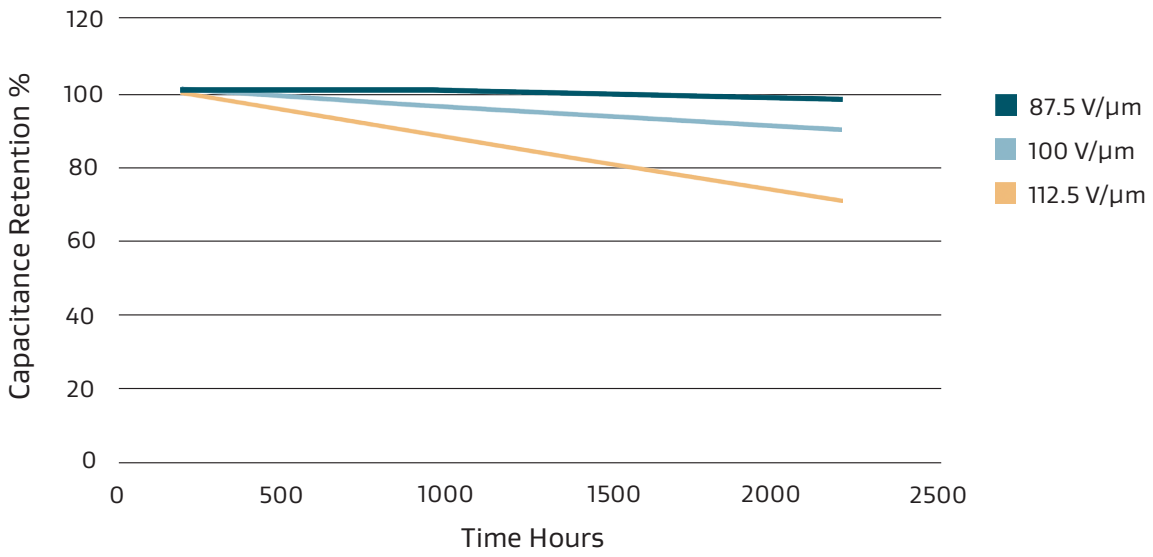
GORE® High Temperature Film

Stable & Reliable Capacitance for Extended Term

Commonly used MLCC capacitors are brittle and susceptible to shorting from shock and vibration. Other capacitor technologies, such as wet tantalum, can fail short due to transient voltages. With self-healing or self-clearing technology, GORE® High Temperature Film offers more capacitor reliability without failure in challenging downhole drilling environments.

Self-clearing is a predictable and measurable phenomenon that can and should be modeled to predict real-world performance accurately. Therefore, Gore tested the temperature and voltage accelerated life performance of their capacitor film technology. Results validated that GORE® High Temperature Film endures higher temperatures, ensuring stable and reliable performance over extended periods without failure to meet demanding downhole drilling profiles (Figure 2).

Figure 2: Voltage Endurance[a] at 200°C of GORE® High Temperature Film



a. Results from 150 finished-good capacitors. Data represents lower 10 percentile at 90% confidence

Simplified Design & Installation with Minimal De-Rating

Traditional capacitors require substantial de-rating to meet high capacitance and voltage requirements at high temperatures. Therefore, engineers must use excessive amounts of small capacitors, which can complicate system design, cause numerous potential failure points, and increase installation costs.

Alternatively, capacitors featuring GORE® High Temperature Film deliver stable capacitance with minimal de-rating under high-temperature and voltage conditions (Figures 3–5). System designs no longer have to rely on excess capacitance to accommodate de-rating, which reduces failure points, facilitates easier assembly, and decreases overall electrical stress on other components.

Figure 3: Capacitance Stability across Temperatures Comparison

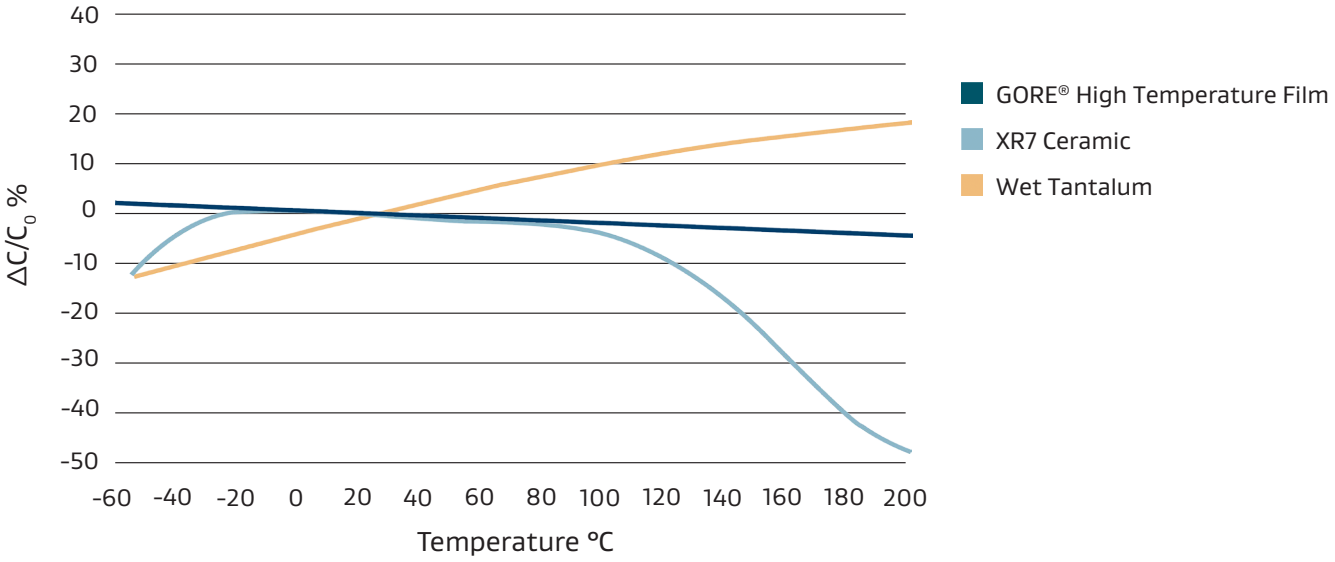
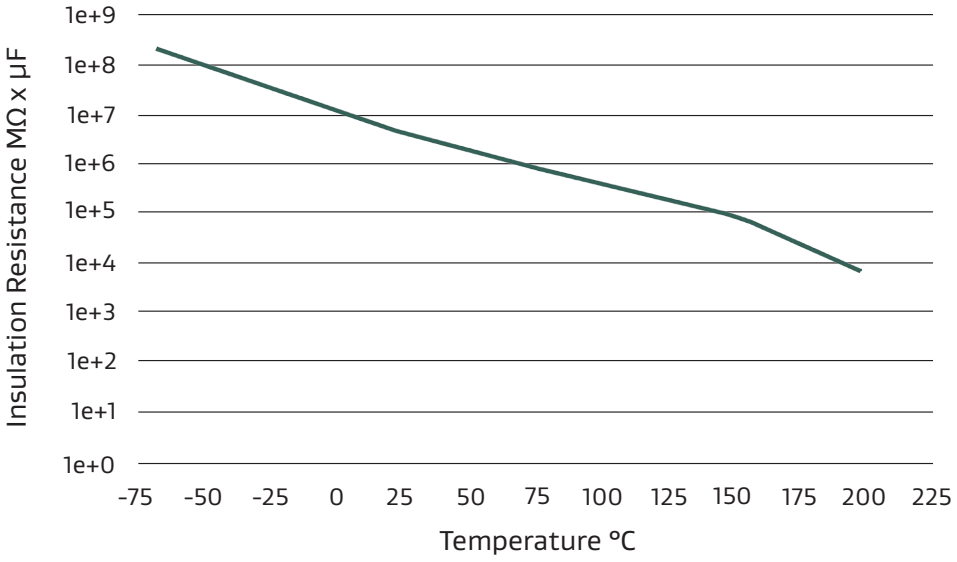
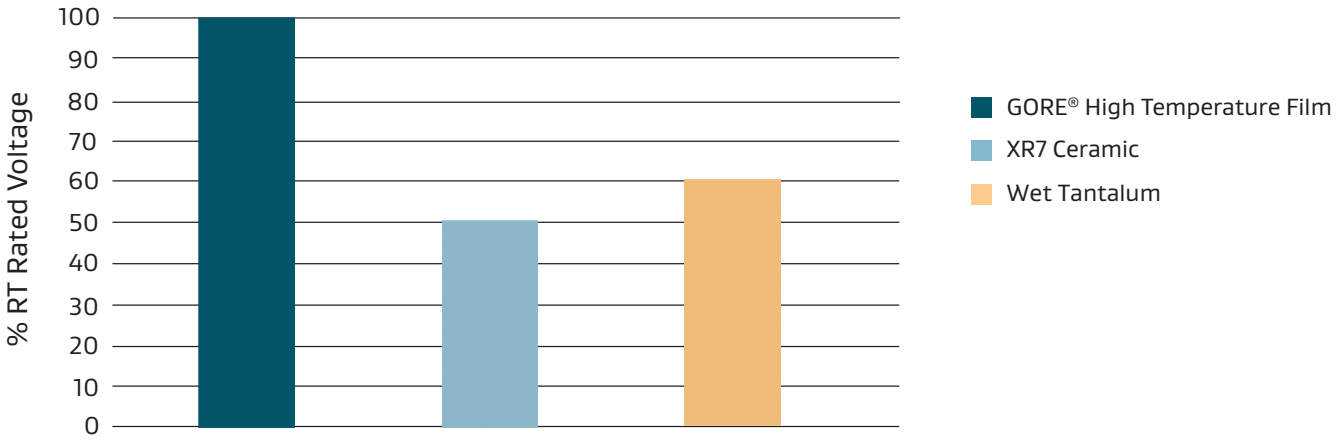


Figure 4: Insulation Resistance across Temperatures[a] of GORE® High Temperature Film



a. Gore's 4-µm film tested at 300 V.

Figure 5: Category Voltage at 175°C & 200°C Comparison



Ordering Information

Gore has partnered with leading manufacturers to supply high-performance capacitors featuring GORE® High Temperature Film for oil and gas power electronics.

For more information about our innovative film technology and to place an order for finished capacitors through these manufacturers, contact a Gore representative.

W. L. Gore & Associates
gore.com

HTF-1056-R1-DSH-US-JUN25