

Requirements for DSC Measurements to be Analyzed with Proteus® Now Quantify

To ensure that results are accurate, reproducible and quantifiable with *Proteus® Now Quantify*, the following measurement conditions and sample preparation rules must be met:

Requirement	Details / Why Important
Sample type & preparation	Prefer pellets (homogenized, representative). If only flakes/re-grind available → repeat with several samples, check repeatability – flakes may vary widely.
Crucible & atmosphere	Use an Al Concavus® crucible with pierced lid. Use default settings for the nitrogen atmosphere (e.g. for DSC 300 Caliris: protective 60 ml/min, purge 40 ml/min) to avoid oxidation and ensure stable heat transfer.
Calibration	Heat-flow calibration (sensitivity) and temperature calibration (TempCal) must be valid. <i>Be-Flat®</i> (baseline calibration) needs to be turned on as well. Regular calibration (e.g. monthly or after maintenance) is recommended.
Sample mass	10 mg ± 1 mg. This is the mass range used to train Quantify's ML models — deviations affect signal strength or peak shape.
Heating/Cooling rate	10 K/min for semi-crystalline thermoplastics — matches the standard used in Quantify's training dataset and balances resolution vs speed. (Conditions for amorphous thermoplastics not yet defined.)
Temperature limits (start / end)	Start temperature: ≈ 50 °C below the first expected transition. End temperature: at least ≈ 30 °C above the last expected transition — but must stay below decomposition onset. For unknown recyclates: choose a wider range but avoid unnecessary decomposition. Example ranges (common packaging polymers, at 10 K/min): LDPE / LLDPE / HDPE/ PP: -20 °C → 200 °C
Post-measurement check	After measurement: check final sample weight (loss may indicate evaporation or decomposition), inspect DSC curve for smooth baseline, clear transitions, no excessive noise or signs of decomposition. If doubtful — repeat measurement with another sample.
Accounting for fillers (if present)	If inorganic fillers are present — they do not produce a DSC “fingerprint” and the enthalpy appears smaller. Filler fraction must be determined separately (e.g. via TGA or muffle-furnace ash analysis) and subtracted from sample mass before analysis.