

Measurement Accuracy of the rUNT Disposable Cuvette

Background: The pUNK dynamic light scattering (DLS) system from Unchained Labs uses the 5µl rUNT disposable sample cuvettes and is also capable of utilizing a wide range of standard, square walled measurement cuvettes. It is important to be sure the accuracy and quality of the measurement results comply with the requirements of ISO22412:2008 the International Standard for dynamic light scattering. In this Technical Note, we show how the results obtained from a rUNT comply with the standard and are the equal of traditional square walled disposable cuvettes but use only a tiny fraction of the sample volume.

Sample Preparation: A preparation of 100nm and 200nm diameter NIST traceable certified size standards (Thermo Scientific 3100A & 3200A) was dispensed into 5µl rUNT and 4.5ml square walled disposable cuvettes (Kartell brand #1960).

Measurement: The prepared cuvettes were each placed into the temperature controlled sample holder of the pUNK DLS system and allowed to stabilize at 20°C. A series of acquisitions according to ISO22412 were obtained for each cuvette type and the averages calculated.

| Cuvette Type | Certified Mean Diameter | Measured Mean Diameter | Pd Index (<0.1) |
|---------------------|--------------------------|------------------------|-----------------|
| 5µl rUNT | 93.1-108.1 | 99.9 | 0.017 |
| 4.5ml Kartell #1960 | (100nm nominal diameter) | 98.0 | 0.090 |
| 5µl rUNT | 192.1-210.1 | 203.9 | 0.071 |
| 4.5ml Kartell #1960 | (200nm nominal diameter) | 198.0 | 0.044 |



Results: The mean size measured in each cuvette type was found to be within the specified size range according to the ISO standard. The Polydispersity Index values do not exceed the maximum permitted value of 0.100.

Summary: The pUNK DLS system is supplied with 5µl rUNT disposable cuvettes as standard. The accuracy of the measurement results comply with ISO22412:2008, the International Standard for dynamic light scattering.