

# Zetasizer Nano S/ZS Specifications DLS Maximum Size Limit 10.0 (d.µm)



## Introduction

For the Zetasizer Nano S or ZS instrument, the maximum size specification (diameter) is a peak mode of 8.9µm with a maximum size of 10µm. This technical note contains details of the experimental procedures and results obtained from measurements of a NIST traceable polystyrene latex standard as demonstration of these maximum size specifications.

## Experimental

### Materials

- 8.9µm polystyrene latex from the Thermo Scientific Duke Standards NIST traceable 4000 series (part number 4209A) supplied at a 1%w/v concentration
- 32.5% w/v sucrose
- Sizing cuvettes

### Method

A 32.5% w/v solution of sucrose was prepared by taking 32.5g of sucrose and making up to 100g with deionised water. The polystyrene latex standard sample was prepared for measurement by adding 400µl of the latex to 600µl of the sucrose solution. This dilution gave a final polystyrene latex concentration of 0.4%w/v in 13%w/v sucrose. This dispersant was chosen to match the density of the latex, which has a density of 1.05, to prevent sedimentation.

The measurements were taken at 20°C using a viscosity of 1.41mPa.s.

## Results

The intensity size distributions obtained from 3 repeat measurements of the 8.9µm polystyrene latex dispersion are shown in figure 1. The sucrose peak is not seen as the scattering is overwhelmed by the scattering from the latex.

Table 1 is a summary of the 3 repeat measurements and shows the z-average diameters (in nanometres) and polydispersity index values obtained, together with the mean and standard deviation values.

The overplot of the three correlation functions, from which the size distributions were derived from, is shown in figure 2. After the decay of the signal, the baseline on the right of the plot, though showing evidence of some noise, does not show the effects of number fluctuations. This would appear as secondary peaks in the correlation function and indicates that the optical design of the Nano S and ZS is inherently capable of measuring particles of this size.

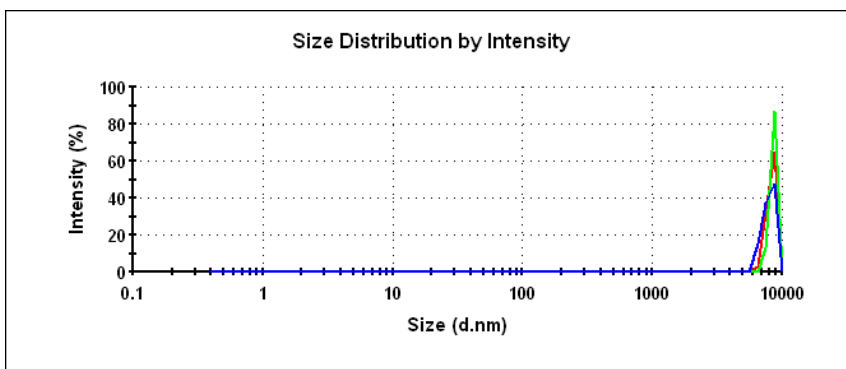
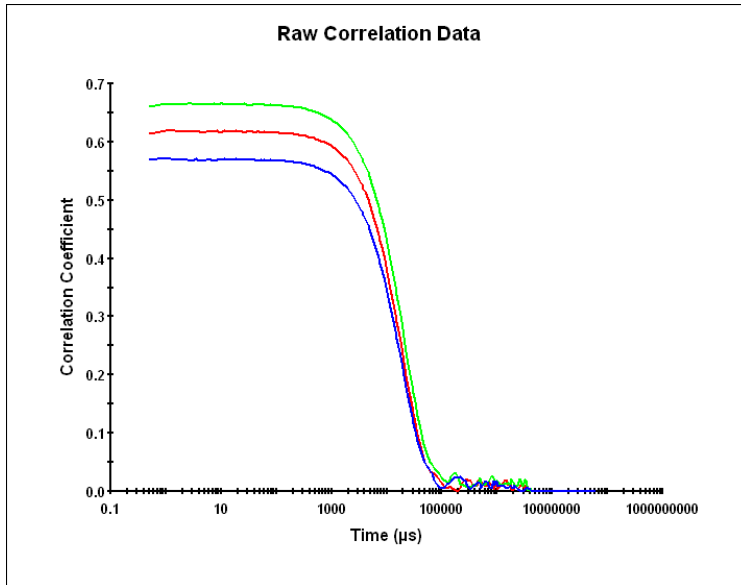
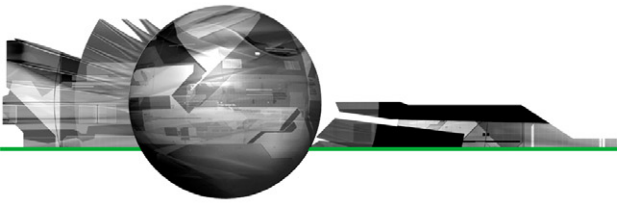


Figure 1: Intensity size distributions obtained from 3 repeat measurements of a traceable 8.9µm polystyrene latex suspended in 13% w/v sucrose solution

Table 1: Summary of the 3 repeat measurements of a traceable 8.9µm polystyrene latex suspended in 13% w/v sucrose solution

Record	z-Average Diameter (nm)	Polydispersity Index
1	8839	0.022
2	9793	0.247
3	8691	0.257
<b>Mean (SD)</b>	<b>9108 (598)</b>	<b>0.175 (0.133)</b>



**Figure 2:** Correlation functions obtained from 3 repeat measurements of a traceable 8.9µm polystyrene latex suspended in 13% w/v sucrose solution

## Conclusions

The results reported in this technical note confirm that the maximum size capability (diameter) for the Zetasizer Nano S or ZS is a peak mode of 8.9µm with a maximum size of 10µm.

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