

# Turbidity Standards



## Summary of Features & Benefits:

- Non toxic and non carcinogenic
- Highly accurate
- US EPA approved
- 2 year shelf life for all values
- Traceable to NIST
- Ready to use - our range covers the full turbidity measurement range

Reagecon's turbidity standards for ratio and non-ratio instruments are composed of suspended polymer microspheres. These turbidity standards remove the handling, stability and accuracy problems associated with traditional Formazin turbidity standards; (for detailed comparison, see Table 1).

## Turbidity Measurement

Accurate and precise laboratory or online analytical measurement can be influenced by the following 6 key parameters:

- Measuring Instrument
- Measuring Accessories
- The Sample
- The Operator
- Standards and Reference Material
- Measuring Environment

The technical validation, comparability, quality control/assurance, proficiency testing and traceability of any analysis require significant attention to detail of all these parameters. Turbidity measurement is no different in this respect.

## The Standard / Reference Material

The nephelometric turbidity meter is designed to be routinely standardised with a known light scattering standard. As with all analytical standards or reference materials, a turbidity standard should fulfil the following criteria:

- Provide traceability.
- Demonstrate the accuracy of results.
- Calibrate the equipment and methodology.
- Monitor the user performance.
- Validate the test.
- Facilitate comparability i.e. to ensure that when the correct procedures have been followed the same analysis of the same materials will produce results that agree with each other whenever they are performed.

Standards and Reference materials should be produced and characterised in a technically competent manner, should be homogenous, stable, certified and have available a known uncertainty of measurement. Presently, there are only two types of standards recognised and approved by the USEPA, Standard Methods, ASTM and other regulatory agencies, these are formazin or formazin derived standards and suspended polymer microspheres.

## Table 1: Comparison of Reagecon Polymer Microsphere & Formazin Turbidity Standards

Feature	Reagecon Polymer Microspheres	Formazin
Toxicity	Non-toxic. No special handling or disposal requirements	Very toxic, contains a known carcinogen. Requires special handling and disposal
Particle shape & size	Well defined spherical shape. Mean diameter is 0.06µm with a distribution between 0.01 and 0.2µm.	Irregular shape and distribution. Mean diameter is 3µm with a distribution between 1 and 20µm.
Shelf life	Does not deteriorate or settle out. A long stable shelf life at all concentrations.	Flocculates and deteriorates. Lower concentrations change value within days, or hours, after preparation.
Particle suspension	Particles stay in suspension. Mixing is discouraged as it entrains air.	Particles settle quickly, suspension must be continuously mixed. Mixing induces shearing.
Traceability	Certified traceable to NIST Reference Material 1690	Non traceable
Precision (batch to batch)	Mean of SD's 0±0.00	Mean of SD's 0.9±0.2
Inter-instrument reproducibility	0.5 ±0.0	0.8±0.2
Stability	0.1 – 4000 NTU (1 year)	4000 NTU (3 months). Need for dilutions to be prepared daily or weekly.
Accuracy	Highly accurate for Reagecon Polymer Microspheres	±10% (4000 NTUs) up to ±30% for dilute working standards.

Description	Product No. Ratio 100ml	Product No. Ratio 500ml	Product No. Non Ratio 100ml	Product No. Non Ratio 500ml
Turbidity Std 0.0 NTU	CRSR-0-100	CRSR-0-500	CRS-0.0-100	CRS-0.0-500
Turbidity Std 0.1 NTU	CRSR-0.1-100	CRSR-0.1-500	CRS-0.1-100	CRS-0.1-500
Turbidity Std 0.2 NTU	CRSR-0.2-100	CRSR-0.2-500	CRS-0.2-100	CRS-0.2-500
Turbidity Std 0.4 NTU	CRSR-0.4-100	CRSR-0.4-500	CRS-0.4-100	CRS-0.4-500
Turbidity Std 0.5 NTU	CRSR-0.5-100	CRSR-0.5-500	CRS-0.5-100	CRS-0.5-500
Turbidity Std 1 NTU	CRSR-1-100	CRSR-1-500	CRS-1-100	CRS-1-500
Turbidity Std 2 NTU	CRSR-2-100	CRSR-2-500	CRS-2-100	CRS-2-500
Turbidity Std 4 NTU	CRSR-4-100	CRSR-4-500	CRS-4-100	CRS-4-500
Turbidity Std 5 NTU	CRSR-5-100	CRSR-5-100	CRS-5-100	CRS-5-500
Turbidity Std 10 NTU	CRSR-10-100	CRSR-10-500	CRS-10-100	CRS-10-500
Turbidity Std 20 NTU	CRSR-20-100	CRSR-20-500	CRS-20-100	CRS-20-500
Turbidity Std 40 NTU	CRSR-40-100	CRSR-40-500	CRS-40-100	CRS-40-500
Turbidity Std 50 NTU	CRSR-50-100	CRSR-50-100	CRS-50-100	CRS-50-500
Turbidity Std 60 NTU	CRSR-60-100	CRSR-60-500	CRS-60-100	CRS-60-500
Turbidity Std 90 NTU	CRSR-90-100	CRSR-90-500	CRS-90-100	CRS-90-500
Turbidity Std 100 NTU	CRSR-100-100	CRSR-100-500	CRS-100-100	CRS-100-500
Turbidity Std 200 NTU	CRSR-200-100	CRSR-200-500	CRS-200-100	CRS-200-500
Turbidity Std 400 NTU	CRSR-400-100	CRSR-400-500	CRS-400-100	CRS-400-500
Turbidity Std 500 NTU	CRSR-500-100	CRSR-500-500	CRS-500-100	CRS-500-500
Turbidity Std 800 NTU	CRSR-800-100	CRSR-800-500	CRS-800-100	CRS-800-500
Turbidity Std 1000NTU	CRSR-1000-100	CRSR-1000-500	CRS-1000-100	CRS-1000-500
Turbidity Std 4000 NTU	CRSR-4000-100	CRSR-4000-500	CRS-4000-100	CRS-4000-500