

Quantum

SOLUTIONS[®]

QDot™ PbS Quantum Dots, oleic acid capped, emission (em) type

Technical Data Sheet

Introduction and product highlights

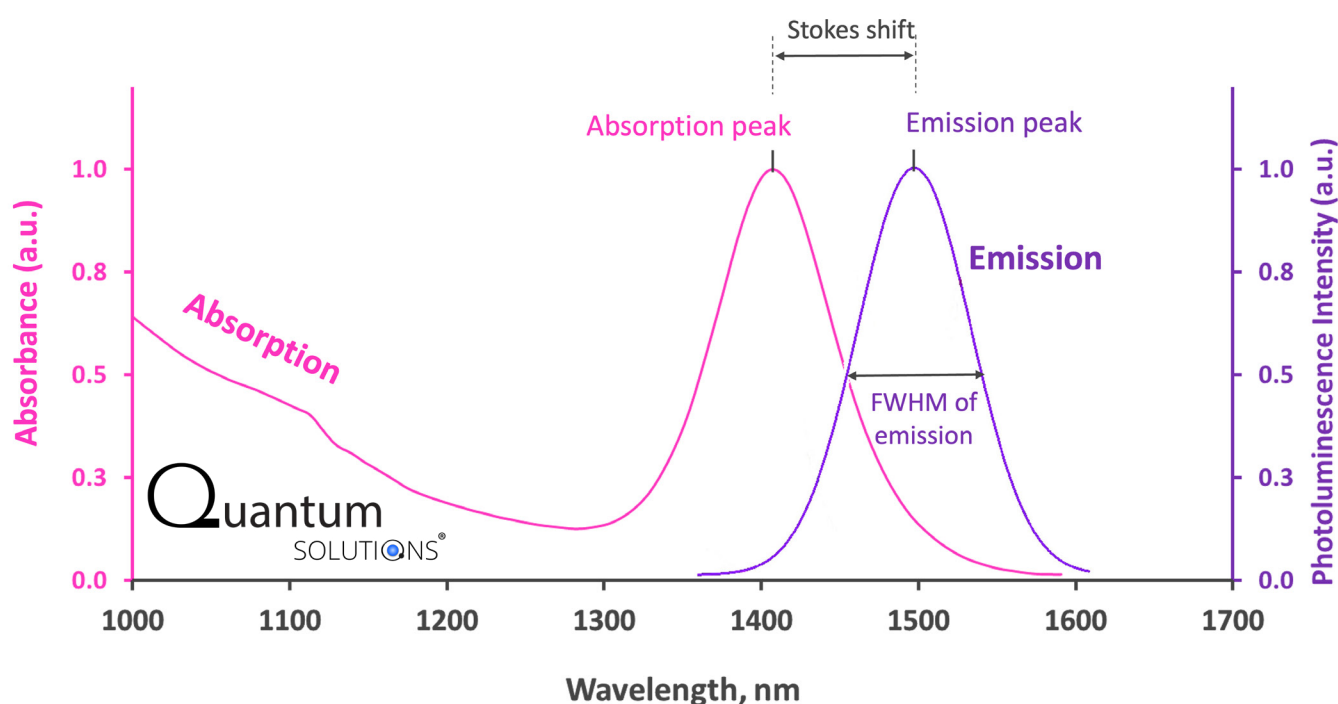
QDot™ PbS (Lead Sulfide) Quantum Dots absorb light from UV and visible up to infrared spectral range and re-emit in infrared range. The emission wavelengths can be precisely tuned from 900 to 1600 nm simply by

changing the nanoparticle sizes from 3 to 6 nm. This material has outstanding photoluminescence properties and can be suitable as infrared emitting inks, probes or used for infrared LEDs.

QDot™ PbS Quantum Dots selection guide

QDot™ PbS Quantum Dots have a broad absorption profile, from UV and visible up to infrared spectral ranges and emission in the ranges 900 - 1600 nm. QDot™ PbS Quantum Dots, emissive types, can be categorised according to their emission peak position that varies from 900 nm to 1600 nm. Emission peak is characterised with the emission FWHM and Stokes shift.

QDot™ PbS quantum dots can be supplied as a solid paste/powder form that is easily soluble in octane or any other non-polar solvents (hexane, toluene, chloroform, chlorobenzene, etc.) in a wide range of concentration up to 150 mg/mL. QDot™ PbS quantum dots readily dispersed in octane, toluene or other non-polar solvents are also available.



QDot™ PbS Quantum Dots offer the following advantage

- ✓ Infrared emitters with the tuneable emission peaks from 900 to 1600 nm. Unprecedented absorption/emission peaks accuracy and reproducibility (up to ± 15 nm).
- ✓ Narrow particle size distribution with FWHM of emission < 120 nm and STDV $< 5-10\%$.

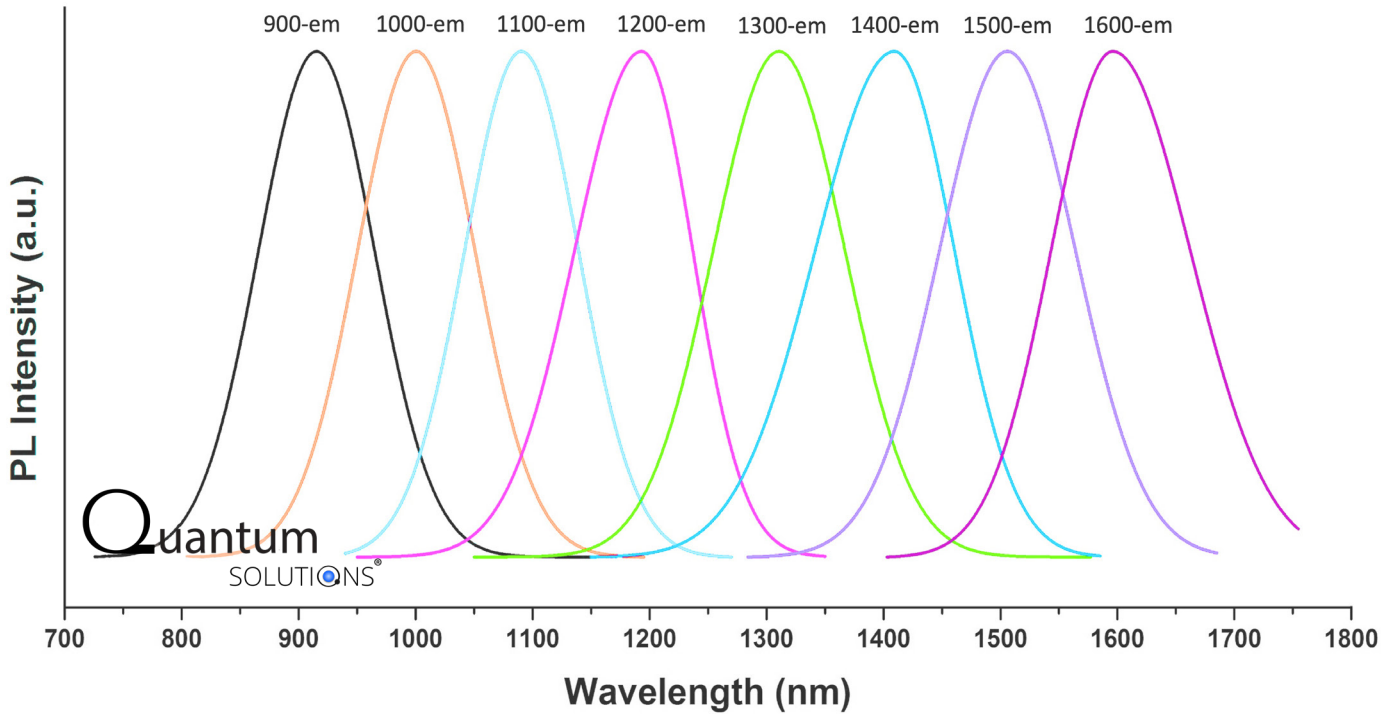
Specification of QDot™ PbS Quantum Dots (em type)

QDot™ Catalogue Number	Core type	Core size	Emission peak	FWHM of emission	PLQY	Stokes shift	Ligand concentration
PbS-900-em	PbS	≈ 2.7 nm	900 ± 25 nm	< 130 nm	$> 40\%$	≈ 120 nm	40-50 wt%
PbS-1000-em	PbS	≈ 3.0 nm	1000 ± 25 nm	< 130 nm	$> 40\%$	≈ 110 nm	35-45 wt%
PbS-1100-em	PbS	≈ 3.3 nm	1100 ± 25 nm	< 130 nm	$> 30\%$	≈ 100 nm	35-45 wt%
PbS-1200-em	PbS	≈ 3.8 nm	1200 ± 25 nm	< 130 nm	$> 20\%$	≈ 90 nm	30-40 wt%
PbS-1300-em	PbS	≈ 4.5 nm	1300 ± 25 nm	< 140 nm	$> 20\%$	≈ 80 nm	30-40 wt%
PbS-1400-em	PbS	≈ 5 nm	1400 ± 25 nm	< 140 nm	$> 15\%$	≈ 70 nm	30-40 wt%
PbS-1500-em	PbS	≈ 5.5 nm	1500 ± 25 nm	< 140 nm	$> 10\%$	≈ 50 nm	25-35 wt%
PbS-1600-em	PbS	≈ 6 nm	1600 ± 25 nm	< 140 nm	$> 10\%$	≈ 40 nm	25-35 wt%

General Specification*	
Quantum dot core type	PbS
Capping ligand	Oleic acid
Appearance	Black powder - for solid forms Black liquid - for dispersion forms
Form available	Solid/powder 50 mg/mL in octane or toluene 10 mg/mL in octane or toluene

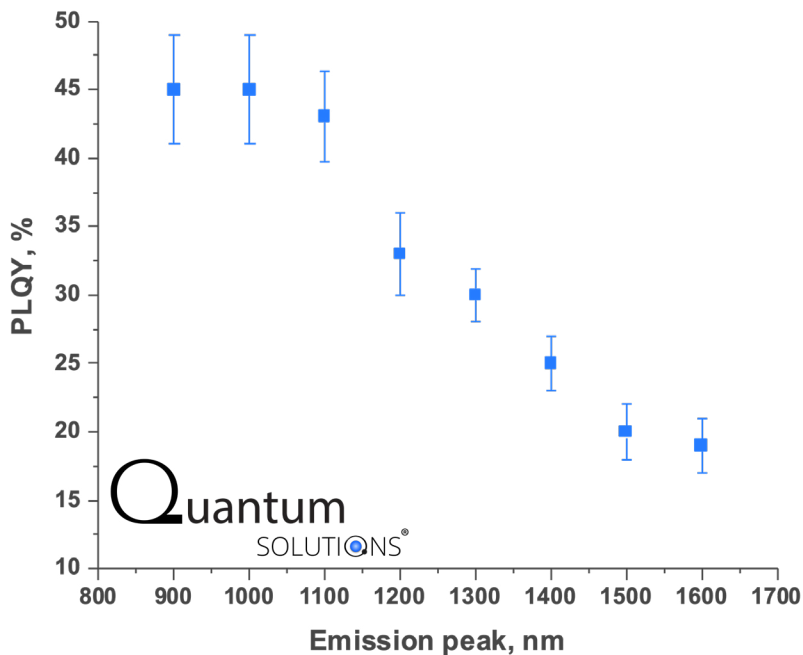
* QDot™ PbS Quantum Dots with different solvents, concentrations, and emission peaks are available upon request

Emission profiles of QDot™ PbS Quantum Dots (em type)



QDot™ is a trademark of QUANTUM SOLUTIONS | 22 December 2023

PLQY map of QDot™ PbS Quantum Dots (em type)



Notes for handling

Shelf Life 12 months. Shipping and storage temperature 4-25 °C. Store in DARK conditions, in original packaging or in airtight, sealed packaging inside a glovebox. Repackage in a glovebox only. Avoid contact with air. Process inside the glovebox or another enclosed inert gas environment.