



Technical Data Sheet

TDS-ASD-628
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Product Identification

Product Name	Patent Blue V, Patent Blue V calcium salt (C.I. 42051)
Catalog No.	ASD-628
CAS No.	3536-49-0
C.I. No.	42051
EC No.	222-573-8
Lot No.	PBV260301
Mfg. Date	March 2026
Retest Date	March 2028
Grade	High-Purity Biological Stain / Colorant Grade

Chemical Identity

Chemical Name	Patent Blue V calcium salt
IUPAC Name	Ethanaminium, N-[4-[4-(diethylamino)phenylmethylene]-2,5-cyclohexadien-1-ylidene]-N-ethyl-, inner salt, calcium salt (2:1)
Molecular Formula	$C_{27}H_{34}CaN_2O_7S_2$
Molecular Weight	602.77 g/mol
Dye Class	Triphenylmethane (triarylmethane) — anionic synthetic dye
Other Names	Acid Blue 3; Food Blue 5; E131; Sulphan Blue (pharmaceutical); C.I. 42051
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Physical & Chemical Properties



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Property	Value	Notes
Appearance	Dark blue to green crystalline powder	Colour may vary slightly between lots
Physical Form	Solid; hygroscopic	Store with desiccant
Solubility — Water	Up to 20.98 g/L at 20 °C	Highly soluble; aqueous stock 10–50 mg/mL
Solubility — Ethanol	Slightly soluble	Sparingly soluble in organic solvents
Absorption Maximum	~640 nm (aqueous, neutral pH)	Molar absorptivity ~35,000–40,000 L·mol ⁻¹ ·cm ⁻¹
Colour (dilute aq.)	Intense blue	
Colour (concentrated)	Blue-green	
Dye Content	High purity — see COA for lot-specific value	Determined by spectrophotometry
pH Stability Range	Stable pH 3–10	Colour may shift at extreme pH
Charge	Anionic at neutral/alkaline pH	Binds cationic sites in tissue
Melting Point	Decomposes on heating (>200 °C est.)	Do not incinerate without scrubbing
Hygroscopicity	Hygroscopic — absorbs moisture readily	Use desiccant storage

Spectroscopic Data

Absorption Maximum (λ_{\max}) ~640 nm in aqueous solution (neutral pH)

Secondary Absorption ~420 nm (minor shoulder)

Molar Absorptivity (ϵ) ~35,000–40,000 L·mol⁻¹·cm⁻¹ at λ_{\max}

Beer-Lambert Range Linear up to ~50 mg/L for standard colorimetric use

Fluorescence Non-fluorescent under standard conditions



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Recommended Solvent Purified water or phosphate-buffered saline (PBS)

Preparation & Use Guidelines

Stock Solution	Dissolve 10–50 mg in 1 mL purified water. Vortex gently until fully dissolved. Filter through 0.22 µm if required for cell culture or injectable preparations.
Working Dilution	Typically 0.1–5 mg/mL for biological staining; consult specific protocol for application
pH Adjustment	Aqueous solution pH ~4–6; adjust with PBS or appropriate buffer for physiological applications
Filtration	0.22 µm sterile filtration recommended before diagnostic/injectable use
Stability (solution)	Aqueous solutions stable for several weeks at RT protected from light; freeze at –20 °C for long-term storage
Incompatibilities	Strong oxidising agents; strong reducing agents; concentrated acids/bases

Quality Control Specifications

Parameter	Specification	Method
Appearance	Dark blue to green crystalline powder; no visible impurities	Visual inspection
Identity (IR/UV-Vis)	Absorption maximum at 635–645 nm (aqueous, pH 7)	UV-Vis spectrophotometry
Dye Content	See lot-specific COA — high purity grade	Spectrophotometric assay
Solubility	Complete dissolution at 20 mg/mL in purified water	Solution test
Loss on Drying	≤ 10.0% w/w (hygroscopic material)	105 °C / 2 h (gravimetric)
Heavy Metals	Complies with permitted limits (Pb, As, Hg)	ICP-MS / AAS
Microbiological Quality	Total aerobic count ≤ 1000 CFU/g; absent pathogens	USP <61>/<62> (where applicable)



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Technical References

Dye Classification	Society of Dyers and Colourists / AATCC — C.I. Acid Blue 3, C.I. 42051
Food Regulation (EU)	Regulation (EC) No. 1333/2008 — Patent Blue V as E131
JECFA Monograph	FAO/WHO Joint Expert Committee on Food Additives — Patent Blue V evaluation
Diagnostic Use	Sentinel lymph node mapping — EMA/TGA registered product (Bleu Patenté V, Guerbet)
Pharmacopoeia	European Pharmacopoeia (Ph. Eur.) monograph reference for Patent Blue V (injectable grade)

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