Sunset Yellow FCF (E 110)

Catalogue No. ASD-630

1. Identification

Chemical name	Disodium 6-hydroxy-5-[(4-sulfonatophenyl)diazenyl]naphthalene-2-sulfonate
Synonyms	Sunset Yellow FCF; Orange Yellow S; CI Food Yellow 3; FD&C Yellow No. 6 (US name for FDA-certified batches)
C.I. number	15985
E number	E 110
CAS number	2783-94-0
EC number	220-491-7
Molecular formula	$C_{16}H_{10}N_2Na_2O_7S_2$
Molecular weight	452.37 g/mol
Dye class	Monoazo, anionic (acid) dye

2. Intended Use

E 110 reference colour, spectrophotometric standard, model azo dye for analytical and environmental research, and teaching reagent.

For laboratory, research, education and quality-control use. Not intended for human or veterinary therapeutic use, diagnosis, or direct consumption. Food-grade (E 110) material. For food-industry supply, contact Ausamics for suitability and regulatory documentation.

3. Mode of Action

The two sulfonate groups make Sunset Yellow FCF anionic and freely water-soluble. Its phenylazo-naphthol chromophore absorbs blue light at about 480 nm, which gives the orange-yellow colour.

4. Physical & Chemical Properties

Appearance	Orange-yellow powder
Colour of 1 % aqueous solution	Orange-yellow
Absorption maximum (λmax)	approx. 480 nm in water
Solubility	Freely soluble in water; slightly soluble in ethanol
Moisture at 110 °C	Max. 2.0 %
Stability	Good stability in normal laboratory conditions; protect from sunlight, heat and moisture

5. Specifications

Parameter	Specification

Parameter	Specification
Pure dye content (E 1 %, 1 cm at 480 nm)	Min. 85.0 %
Appearance	Orange-yellow powder
Hue of 1 % solution	Orange-yellow
Loss on drying at 135 °C (as sodium salts)	Max. 15.0 %
Moisture at 110 °C	Max. 2.0 %
Water-insoluble matter	Max. 0.20 %
Subsidiary colouring matters	Max. 1.0 %
Organic compounds other than colouring matters	Max. 0.5 %
Unsulfonated primary aromatic amines (as aniline)	Max. 0.01 %
Ether-extractable matter	Max. 0.2 %
Arsenic (As)	Max. 1 ppm
Lead (Pb)	Max. 1 ppm
Mercury (Hg)	Max. 0.05 ppm
Cadmium (Cd)	Max. 0.1 ppm
Chromium (Cr)	Max. 2 ppm
Copper (Cu)	Max. 30 ppm
Zinc (Zn)	Max. 50 ppm
Heavy metals (as Pb)	Max. 5 ppm

6. Solution Preparation

1. Stock solution (1 % w/v): weigh 1.0 g of Sunset Yellow FCF.
2. Add to about 80 mL of purified water and stir until fully dissolved.
3. Make up to 100 mL with purified water.
4. Store closed at room temperature, away from light. Dilute for use according to your method.

7. Applications

- Food Colour QC: Reference material for E 110 identification, HPLC and spectrophotometric assay of yellow and orange food colours.
- Spectrophotometry: Stable orange-yellow dye (λmax ≈ 480 nm) for absorbance calibration and Beer–Lambert teaching.
- Analytical Method Development: Widely studied model azo dye for chromatography, electrochemical sensing and dye-removal studies.
- Environmental Research: Test compound in adsorption, photocatalysis and wastewater decolourisation experiments.
- Education: Intense, water-soluble orange-yellow for chromatography, colour-mixing and diffusion practicals.
- Formulation Development: Orange-yellow colourant for prototype buffers, gels and visual tracer solutions in research.

8. Storage & Shelf Life

Store at 15–25 °C, dry, tightly closed and protected from sunlight, heat and moisture. Shelf life 36 months from the date of manufacture.

9. Literature / References

5. Commission Regulation (EU) No 231/2012, Annex: E 110 Sunset Yellow FCF, Orange Yellow S. Specifications for food additives.
6. FAO/WHO JECFA. Sunset Yellow FCF: Combined Compendium of Food Additive Specifications. ADI 0–4 mg/kg body weight.
7. EFSA ANS Panel (2014). Reconsideration of the temporary ADI and refined exposure assessment for Sunset Yellow FCF (E 110). EFSA Journal 12(7):3765.
8. Regulation (EC) No 1333/2008 on food additives, Annex V: additional labelling for foods containing E 102, E 104, E 110, E 122, E 124 and E 129.
9. US Code of Federal Regulations, 21 CFR 74.706: FD&C Yellow No. 6 (batch certification required).
10. Horobin R.W., Kiernan J.A. (eds) (2002). Conn's Biological Stains, 10th ed. BIOS Scientific Publishers, Oxford.

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