

Application Guide: LaserMark-SF

Sb-Free Laser Marking for Light-Colored Plastics

1. Positioning Statement

LaserMark-SF is a Black TiO₂-based laser-responsive additive designed for antimony-free laser marking on white and light-colored polymers.

It provides a regulatory-friendly alternative to ATO-based systems while maintaining stable and repeatable laser marking performance.

2. What LaserMark-SF Is – and Is Not

LaserMark-SF IS:

- An inorganic laser-responsive additive based on Black TiO₂
- A solution for Sb-free laser marking
- Suitable for applications with regulatory or customer restrictions on antimony

LaserMark-SF IS NOT:

- A color pigment for bulk coloration
- A conductive filler
- A colored laser marking additive (black/gray marks only)

3. Typical Problems It Solves

LaserMark-SF is selected when customers face:

- Regulatory or customer bans on antimony-containing additives
- The need to replace ATO without reverting to carbon black
- Carbon black causing:
 - unwanted conductivity
 - migration or blooming
 - contamination of light systems
- Requirements for clean, non-conductive marking

4. How It Works (Mechanism Level Only)

LaserMark-SF absorbs laser energy and converts it into localized surface modification on the polymer.

Compared with ATO, Black TiO₂ offers a different absorption profile while remaining antimony-free and inorganic.

(Mechanism described at a functional level; no formulation details disclosed.)

5. Suitable Application Window

Polymers

- PP
- ABS
- PC
- PET
- PA

Base Color

- White
- Light gray
- Pastel shades

Laser Types

- Fiber laser
- Nd:YAG laser

Processing

- Standard compounding
- Masterbatch incorporation

6. Typical Use Level

- Below 1 wt% in most polymer systems
- Exact dosage depends on:
- polymer matrix
- part thickness
- laser power and speed

Final optimization should be performed by the user.

7. Performance Benefits

- Sb-free laser marking solution
- Stable and repeatable marking performance
- No electrical conductivity introduced
- Good durability under aging and environmental exposure

8. When NOT to Use LaserMark-SF

LaserMark-SF is not recommended when:

- Maximum contrast is required and Sb-containing additives are allowed
- Colored or green laser marks are required
- Carbon black is acceptable and lowest cost is the only driver

9. Comparison with Common Alternatives

Solution	Limitation
Carbon black	Conductivity, migration, poor aesthetics
ATO-based systems	Contains antimony
Organic pigments	Burning, fading

LaserMark-SF addresses these limitations within Sb-free application requirements.

10. Technical Support

LaserMark-SF is supplied with application guidance.

Formulation-specific optimization can be supported under NDA when required.

11. Summary

LaserMark-SF (Black TiO_2 -based) provides a regulatory-friendly, antimony-free solution for laser marking of light-colored plastics.

It is selected when compliance, stability, and non-conductive behavior are prioritized.