

Filter Breakthrough Indicator Sticker Total Organic Vapors (TOV BTIS LFF) (PN: 114)



Manual



1. Application

The Breakthrough Indicator Sticker (PN: 114) is qualitative (yes/no) colorimetric indicator for the exhaustion and end-of-service life of low-flow filters. The indicator is designed to provide real-time indication of the breakthrough of organic solvents, including:

1. Acetone, 2. Acetonitrile, 3. Acids (i.e. Acetic acid, Hydrochloric acid, Trifluoroacetic acid Trichloroacetic Acid), 4. Acrylonitrile, 5. Aliphatic hydrocarbons (i.e. hexane), 6. Aromatic hydrocarbons (i.e. benzene, toluene and xylenes), 7. Chlorinated hydrocarbons (i.e. carbon tetrachloride, chloroform and dichloromethane (methylene chloride), 8. Ethanol, 9. Ethyl Acetate, 10. Ethyl acrylate, 11. Ethyl ether, 12. Gasoline, 13. HFIP (Hexafluoroisopropanol), 14. Methanol, 15 Methyl acrylate, 16. Naphtha, 17. Phenol, 18. Sulfolane, 19. THF (Tetrahydrofuran).

2.1. Overall Specification

a. Weight:	0.4g (0.02oz)
b. Dimensions:	1.5 mm (0.06 in), ϕ : 19.05 mm (0.75in)
c. Operating temperature:	4°C to 35°C (39°F to 95°F)
d. Operating humidity:	5% RH to 85%RH
e. Minimum detectable limit:	See performance specifications (2.2.)
f. Color change:	Yellow to orange to red
g. Storage temperature:	4°C to 25°C, (39°F to 77°F)
h. Service life:	1 year
i. Shelf life:	1year at 4°C to 25°C, (39°F to 77°F)

2.2. Performance Specification

To determine the sensitivity of the breakthrough indicator, a solution/mixture of 10% solvent in water was bubbled with ambient air at a flow rate of 5cc/min. The breakthrough indicator sticker was exposed to the airflow until a color change was observed. The elapsed time to observe the first noticeable and the final colors for the respective organic solvent is depicted in the table below.

2.3. Cross interferences and limitations

Basic vapors in high concentrations impair the performance of the organic vapors breakthrough indicator sticker. The indicator does not respond to gaseous aliphatic hydrocarbons (i.e. methane, ethane, propane and butane), aldehydes (i.e. formaldehyde) or basic organic vapors (i.e. pyridine and aliphatic amines). No other interferences or limitations are known.

3. Operating Instructions

- Ensure that packaging pouch is intact.
- Open packaging pouch by tearing off the top part from one of side notches
- Remove indicator sticker from the packaging pouch.
- Peel off the protective liner to expose the bottom adhesive (Figure 1).



Caution: Avoid touching adhesive and exposure area

- Hold the sticker from the edges, as shown in Figure 2, and place it on center clean area of the filter's outlet with the reading area (glossy surface) of the sticker facing up.

- f. Press firmly to attach sticker to the filter's outlet (Figure 3).
 g. Replace filter when the reading area of the indicator changes color to orange or dark red.

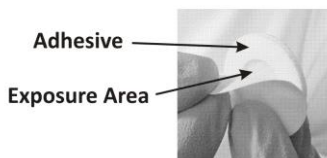


Figure 1



Figure 2



Figure 3

Solvent (10% in Water)	Breakthrough Indication Time	
	First Noticeable Color (min)	Final Color (min)
Acetic acid	6	14
Acetone	10	26
Acetonitrile	10	30
Acrylonitrile	7	42
Benzene	2	5
Carbon tetrachloride	10	30
Chloroform	12	30
Dichloromethane	5	15
Ethanol	10	30
Ethyl Acetate	2	5
Ethyl acrylate	7	39
Ethyl ether	>1	5
Gasoline	14	60
Hexane	7	15
HFIP (Hexafluoroisopropanol)	1	4
Hydrochloric acid	> 1	4
Methanol	2	5
Methyl acrylate	4	36
Naphtha	10	30
Phenol	20	6 hours
Sulfolane	8	17
THF (Tetrahydrofuran)	10	20
Toluene	2	8
Trifluoroacetic acid	4	30
Xylenes	14	60