

Example of Chemical Banded in Tier 2

This appendix provides an example of a chemical NIOSH has banded by using the Tier 2 process.

Chemical Name: Benzo (k) Fluoranthene

CAS Number: 207-08-09

- Toxicity information for benzo (k) fluoranthene was found for the following endpoints: carcinogenicity, genotoxicity, skin irritation and eye irritation. Determinant scores were assigned as 30, 5, 5, and 5, respectively. No source data were found for reproductive toxicity, respiratory sensitization, skin sensitization, specific target organ toxicity, or acute toxicity. The completed worksheet for the relevant health endpoints follow:

Carcinogenicity (20 or 30 points possible)					
	Band A	Band B	Band C	Band D	Band E
NTP/EPA/IARC/Canada/California (QUALITATIVE)					EPA IRIS B2 - Probable human carcinogen - based on sufficient evidence of carcinogenicity in animals.
EPA IRIS Slope Factor					
EPA IRIS Inhalation Unit Risk					
Health Canada TD05					
Health Canada TC05					
California Slope Factor				1.2 (mg/kg-day) ⁻¹	
California Inhalation Unit Risk				1.1x10 ⁻⁴ (ug/m ³) ⁻¹	

- Cancer data was retrieved from EPA IRIS and CalOEHHA because both qualitative and quantitative data were available, the quantitative data takes precedence for cancer. The endpoint-specific band for cancer is, therefore, **band D** based on the slope factor and inhalation unit risk values. A determinant score of 30 is assigned on the basis of presence of quantitative data.

Genotoxicity (5 points possible)			
Data supports:	Negative Results (Band A)	Mixed Results (Band C)	Positive Results (Band E)

If data available, put data in this row corresponding to the correct band criteria; otherwise leave blank.			Salmonella (023963) Completed : Positive
Source, Rank 1 or 2:			NTP

- One positive in vivo result was found for genotoxicity. The endpoint-specific band for genotoxicity is band E, and a determinant score of 5 is assigned.

Skin irritation/corrosion (5 points possible)				
Data supports:	Non-irritating (Band A)	Mild to moderate irritation; reversible direct effects (Band B)	Moderate to severe irritation; reversible effects OR if results are mixed or indicate irritant potential with severity unspecified (Band C)	Skin Corrosion; irreversible effects OR pH value ≤ 2.0 or > 11.5 (Band E)
If data available, put data in this row corresponding to the correct band criteria; otherwise leave blank.			Irritation, severity unspecified	
Source, Rank 1 or 2:			ECHA/REACH	

- In the REACH database, benzo (k) fluoranthene is described as irritating to the skin, but the severity is not specified. Band C is assigned, and a determinant score of 5 is assigned.

Eye irritation/corrosion (5 points possible)				
Data supports:	Non-irritating (A)	Mild to moderate irritation (B)	Severe irritation; moderate to severe irritation; OR no classification system, no conclusion, or mixed results (C)	Serious or irreversible eye damage (E)
If data available, put data in this row corresponding to the correct band criteria; otherwise leave blank.			Irritation and photosensitivity described. No indication of severity.	
Source, Rank 1 or 2:			HSDB	

- In the REACH database, benzo (k) fluoranthene is described as causing eye irritation and photosensitivity, but the severity is not specified. Band C is assigned, and a determinant score of 5 is assigned.

Result:

Based on the available data, a TDS of 45 is calculated. This TDS exceeds the threshold for data sufficiency (TDS≥30). The most protective band assigned is band E. The final Tier 2 band for benzo (k) fluoranthene is band E, on the basis of genotoxicity.