

## Testing of Potential Coal Tar Bound Arisings



There could be up to 200-400 million tonnes of coal tar used on roads and pavements in the UK. Maintenance work on roads may therefore involve excavation of materials containing tar. The current version of RPS 211 will be withdrawn in June. From then, all unassessed waste from utilities excavations must be classified as hazardous.

Current guidance indicates that where the concentration of potentially carcinogenic hazardous substances is below 0.1%, waste does not need to be classified as carcinogenic. Benzo(a)pyrene (BaP) is used as a marker compound for carcinogenicity for certain coal tar entries. The assumption within WM3 is that 50 mg/kg (0.005%) concentration of BaP correlates to 1000 mg/kg (0.1%) coal tar. Where the concentration of BaP is below 0.005% the amount of coal tar present is considered low enough for the material to be non-hazardous.

The WM3 definition of coal tar is “a complex mixture of hydrocarbons which have to be added together to determine concentrations of coal tar”. Coal tar is more than just hydrocarbons, therefore assessment based on polycyclic aromatic hydrocarbons (PAHs) alone, is no longer considered consistent with guidance on hazardous classification.

Several factors control the chemistry of coal tar. Because of its variability no single test is currently available which directly measures its concentration. The primary aim of the approach developed by ALS is to determine the concentration of BaP along with additional lines of evidence to better support the analysis and identification of coal tar.

If present, the distribution of PAHs and alkylated-PAHs may indicate a petrogenic (bitumen) or pyrogenic (road tar) sources. Road tar is processed from coal tar so does not contain all the chemicals present in coal tar.

In particular, most of the phenols and cresols are usually removed to make other products. Bitumen, the alternative to coal tar, is produced from crude oil. Bitumen is chemically complex and variable. During the production of bitumen, specific classes of compounds present in crude oil are retained. These compounds are referred to as biomarkers and their presence in road top are indicative of petroleum based bituminous material which is typically absent in a coal tar type binder.

Depending on your requirements, ALS can provide the following suite of analysis:

- Gravimetric determination of Solvent Extractable Matter (SEM)
- Fingerprint Analysis by gas chromatography with flame ionisation detection (GC-FID)
- Semi Volatile Organic Compounds (SVOCs) including selected phenols and PAHs by gas chromatography with mass spectrometry detection (GC-MS)
- Biomarkers including sesquiterpanes (m/z 123), steranes (m/z 217 and 218) and hopanes (m/z 191)

This multiple lines of evidence approach is used to assign the correct EWC code:

- Bituminous mixtures containing coal tar (EWC: 17 03 01\*) hazardous
- Bituminous mixtures not containing coal tar (EWC: 17 03 02) non-hazardous

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