What is a composite sample?

A composite sample involves the "grouping" of multiple samples or results in some way. There are different types currently in use in the industry including surface, field and laboratory composites. The NZS 8510:2017 *Testing and decontamination of methamphetamine-contaminated properties* permits the use of field and laboratory composites for screening assessments and the use of laboratory composites for post-decontamination assessments. Surface composites are not permitted by the NZS 8510:2017.

What is the difference between field and laboratory composites?

A **field composite** involves the collection of individual surface wipe samples which are grouped together in the same sample vial. The vial is then sent to a laboratory and analysed as a single sample. The result obtained is the *cumulative total methamphetamine concentration* of each of the surfaces tested. If this number is less than the decontamination level recommended in the NZS 8510:2017, then all the individual surfaces sampled can be assumed to be under the recommended level as well. If the resulting concentration is greater than the decontamination level then it is possible that the concentration on one or more of the surfaces tested exceeds the recommended decontamination level. When a field composite exceeds the decontamination level, it is recommended that a sampler conducts a detailed assessment consisting of the collection of discrete wipe samples (individual results for individual surfaces).

A **laboratory composite** involves the collection of discrete (individual) surface wipe samples which are placed in individual sample containers. The laboratory will then make a composite sample by taking a small amount of solution from each sample container. The result of a laboratory composite is the *average methamphetamine concentration* of all the samples included in the composite. This average result should not be directly compared to the recommended decontamination level in the NZS 8510:2017 as it must be adjusted first. The adjustment determines a **theoretical maximum** concentration that could be in one of the samples submitted, and the value of the theoretical maximum can be compared directly to the NZS 8510:2017 decontamination level.

Theoretical maximums of laboratory composites

A theoretical maximum is calculated by taking the methamphetamine concentration of a laboratory composite and multiplying that result by the number of samples that made up the composite. For example:

Where a laboratory composite made up of *five* discrete samples has a result of 1.0 µg/100cm², then the theoretical maximum would be 5.0 µg/100cm².

If the theoretical maximum concentration of the laboratory composite yields a result above the NZS 8510:2017 decontamination level, the laboratory can analyse the individual samples separately that made up the laboratory composite ("de-composition"). This is beneficial as an additional site visit is not needed to collect discrete samples to determine where the contamination is located. However for screening assessments, if any concentrations of methamphetamine in the discrete samples are above the decontamination level, an additional site inspection would usually need to be conducted in order to meet the NZS 8510:2017 requirements for a detailed assessment, though the cost of this would be reduced as the de-composited results can supplement the detailed assessment.

Case-study example

Discrete (or de-composited) wipe samples

surface tested	methamphetamine result	images of areas swabbed
kitchen wall	0.45 µg/100cm²	
laundry ceiling	0.22 µg/100cm²	
bathroom window sill	0.31 µg/100cm²	
bedroom floor	0.63 µg/100cm²	

Composite samples

composite type	swabbing description	methamphetamine result	composite description
surface	4 dwelling surfaces with **one** swab one swab placed into **one** containers	detected (qualitative result)	analyse one vial of four surfaces on one swab **not permitted by the NZS 8510**
field	4 dwelling surfaces with **individual** swabs 4 swabs placed into **one** containers	1.61 µg (cumulative result)	analyse one vial of four individual swabs as one sample **cannot de-composite to get individual results**
laboratory	4 dwelling surfaces with **individual** swabs 4 swabs placed into **individual** containers	0.40 µg/100cm² (average result) 1.60 µg/100cm² (theoretical maximum)	analyse one sample consisting of aliquots of four discrete samples **can be de-composited to get individual results**

Theoretical maximum calculation for laboratory composite

(4 samples) x (0.40 µg/100cm²) = 1.60 µg/100cm²

As 1.60 µg/100cm² is above the NZS 8510:2017 decontamination level of 1.50 µg/100cm², de-composition of the laboratory composite is recommended.

