

SoBRA Bursary to Support the Development of a Technical Specification for identification and quantification of asbestos in Construction Products

CEN Committee reference/title: CEN TC 351/WG 5/TG 51 Asbestos

As BSI's nominated UK representative on CEN's Technical Committee 351, Working Group 5, Technical Group 51, which was tasked with developing a Technical Specification for the identification and quantification of asbestos in Construction Products, I was required to attend the last in-person meeting of the TC on 26/4/23 in Houten, the Netherlands.

My attendance in person was necessary as I had submitted numerous technical points for discussion in order to better shape the TS.

I was able to attend the meeting with the assistance of a SoBRA bursary, for which I am very grateful. The benefit of attending in person was significant; I met with a number of the committee members the evening before at dinner and was able to establish a rapport, which enabled me to state my positions effectively in the meeting the following day, which led to all of my technical points being agreed and the draft TS being amended accordingly.

Implications for the UK

It has been suggested that the TS be considered for adoption by the UK's brownfield community as a means by which a unified approach can be taken for the assessment of potential asbestos contamination of recycled aggregate by asbestos.

It is envisaged that this would enhance the ongoing review of the Aggregates Protocol by the Environment Agency and the Mineral Products Association, which is being managed by CL:AIRE ^{1 2}.

It has been suggested that this forms a part of other work that has been conducted by the Joint Industry Working Group (JIWG), but has yet to be published, on guidance on the production of 'asbestos free' recycled aggregate. Consequently, this would form part of the body of work that has been published by CL:AIRE, AGS and SoBRA that meets the aims of the JIWG in providing a robust framework of guidance for assessing and managing the risks from asbestos in soil and construction and demolition materials.

This work would be complementary to ongoing efforts to revise and reissue the 'asbestos in soil Blue Book method', along with an accompanying Client Guide, which is being led by EIC/CL:AIRE.

¹ https://www.claire.co.uk/index.php?option=com_content&view=article&id=1417:waste-quality-

² <https://www.gov.uk/government/publications/waste-quality-protocols-review/waste-quality-protocols-review>

Overview of Technical Specification Methodology

The aim was to develop a method for quantification of asbestos in Construction Products, covering recycled aggregates (RA) potentially contaminated by asbestos-containing materials (ACMs), natural quarried stone and other products entering the market where naturally-occurring asbestos could be present.

The document specifies procedures for the quantitative determination of the asbestos mass fraction in natural, manufactured or recycled large mineral aggregates and construction products of fine mineral particle size material. The methods used to identify asbestos are polarized light microscopy (PLM), scanning electron microscopy (SEM) and transmission electron microscopy (TEM).

The TS focuses on three classes of products:

Classification	Examples
1) Large mineral aggregates potentially contaminated with NOAs and/or commercially added asbestos.	Virgin stones, natural aggregates manufactured from rock, recycled concrete aggregates, recycled ceramic aggregates, recycled asphalt aggregates, recycled mixed aggregates composed of concrete and ceramic obtained from C&D waste.
2) Construction products of mineral aggregates of fine grain size potentially contaminated with NOAs and/or commercially added asbestos.	Floor coverings, plasters, fibre cement, paints, putties, products of artificial stone, fine aggregates.
3) Construction products of monolithic natural stone potentially contaminated with NOAs.	Natural stone tile, marble board

The method presents detailed steps for sampling and sample preparation. Note that the sample size for RA is 5-10 kg and that sieving is required.

Great emphasis is placed on asbestos identification not just by PLM, but also by SEM with energy-dispersive X-ray analysis (EDXA). Asbestos fibres with a width of less than 0.2 µm will be detected by SEM.

Quantitative determination is achieved by a combination of steps. Asbestos in bulk ACMs by reference to 'typical' asbestos content relative to the mass of the fragments, plus calculation of fibre mass based on fibre counts using SEM at various magnifications.

The section on Test Report confirms reporting of results should be on the following basis:

The overall result of the quantification should be assigned to one of the following classes:

1) *asbestos not detected;*

The term 'asbestos not detected' should be reported when no asbestos fibres or fibre bundles are identified after the analysis. The method detection limit shall be indicated. For PLM analysis see definition in [HSG 248, 2021].

Result: asbestos not detected

Asbestos mass content (%): asbestos not detected

2) *traces of asbestos detected;*

If only sporadic or isolated asbestos fibres were observed in the material examined, and the mass asbestos mass content is below the LOD, indicate 'traces of asbestos' and report < LOD. For PLM analysis see definition in HSG 248 [HSG 248, 2021].

Result

Result: traces of asbestos detected

Asbestos mass content (%): < 0,001 %

10) *asbestos detected;*

Indicate the quantification result as mass % in the report.

Result: asbestos detected

Asbestos mass content (%): e.g. 0.12 %

Procedural Update

The latest draft of the TS was circulated to the TG on 22/5/2023, incorporating amendments and addressing comments made by myself and others. I have attached the comments sheet that that was submitted for reference, with 43 items which were discussed and all agreed upon, 'Draft TS 00351050 Asbestos_2023-03-20 commenting_form FORSTER_after 2023-04-26 copy'. All were all submitted by me. The list was updated post-meeting to show the agreed items/actions.

Following the required changes made by the Rapporteur, the revised draft was published in CEN/TC 351/WG 5 and in CEN/TC 351 plenary as an N-document and voting has now closed. The vote was positive.

The final text was delivered to CEN on 30 June, see 'Draft TS 00351050 Asbestos_for OK FV'. NB I have not obtained the FINAL text, incorporating minor editorial changes, so will forward that when I receive it from the Secretariat.

Actions completed after 26/5/2023 included:

1. a final check on CEN rules and on the English language was done in parallel with steps 2 and 3;
2. the latest draft was tabled to the plenary CEN/TC 351 for approval to send to TS Vote (CIB, 1 month voting);
3. this draft was tabled to BSi WG 5 for a last check; and
4. I, as native speaker, proof-checked the English language.

The proof-read document was sent to the Secretary of the TG, and the Rapporteur, on 25/6/2023, see 'Draft TS 00351050 Asbestos_for OK FV - SF Proof'.

The Rapporteur then finalised the document for transmission to CEN on 30/6/23.

Validation

The Rapporteur for the TS was asked to come up with a draft proposal for a validation programme of the CEN/TS (to be covered under a future specific agreement, 'Phase V'), and there was an online discussion in June on whether the planned validation fitted the ideas of the experts.

Note that there were some disagreements on certain aspects of the draft TS, particularly with respect to sample preparation, although the majority of members supported the sample preparation procedure as described in the draft TS as this method has been used successfully by several laboratories. Nevertheless, it remained open for suitable and validated alternative approaches to be put forward in the future for consideration.

Future Work

It is recognised that this TS will not become an EN; as an illustration, for radiation (WG 3), technical improvements were made to the published CEN/TS before JRC executed the 2nd validation step.

If the robustness validation results ask for it, it may be possible to have a revised TS on Asbestos developed before this is progressed to an EN. Remaining questions regarding validation can be seen on the attached file 'Questions regarding Asbestos validation_after 2023-06-21'. This is a possibility under Phase V, which will be the next phase of work on Construction Products, see 'CEN-TC 351-WG 1_N1228_CEN-TC 351 - Inventory on potential items under CEN-TC 351 Phase V'. Topics/ideas for Work Items to be submitted by 1/9/23.

Note that the recycled aggregate industry in Europe, represented by FIR – Fédération Internationale du Recyclage [www.fir-recycling.com] – has voiced concerns regarding the testing burden.

"A first assessment of one of the members indicates that the proposed method is not favourable and will unnecessarily lead to higher workload.

...if we wish to develop a standard that will work, some adjustment will be required later on. I will continue work within our association so that we can provide more information at a later stage."

So, I would expect that this TS will require some development work in the future.

Stephen Forster

Director, Remedia Group Limited

Chair – JIWG

13th September 2023