

“Carto PMAi” project : workers and public exposure risk to EMPi

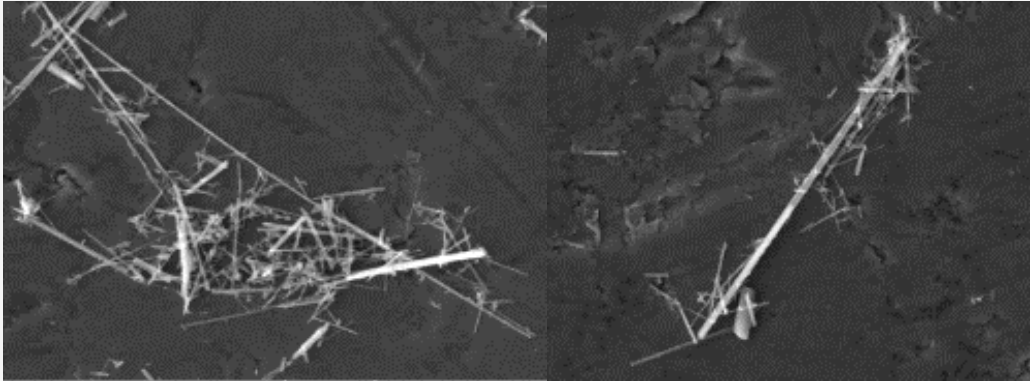
Erell Léocat¹, Christine Deneuvillers¹

¹ Technical Direction, French construction industry body for occupational health and safety, Paris, France



1 – The Elongate Mineral Particles (EMP)

Asbestos EMP (Asbestiform habit)



Shape of fiber, fibril... mainly thin.

Cleavage fragment EMP (Non asbestiform habit)

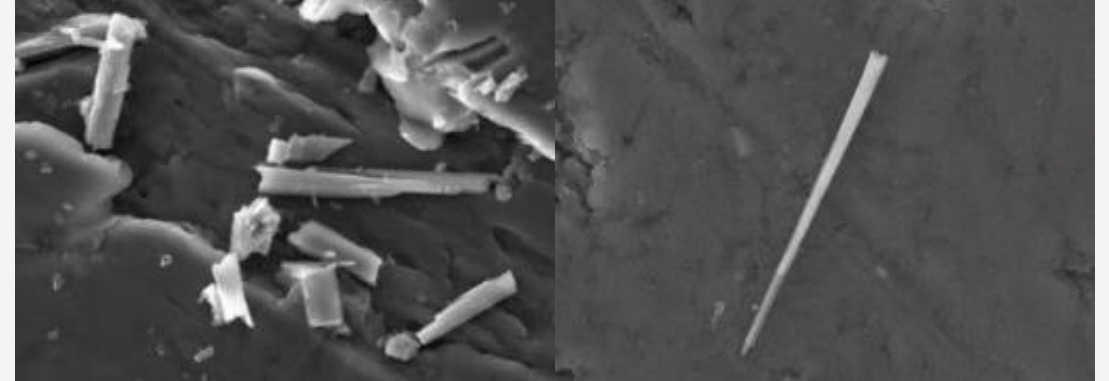
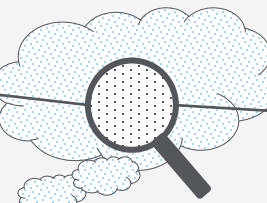


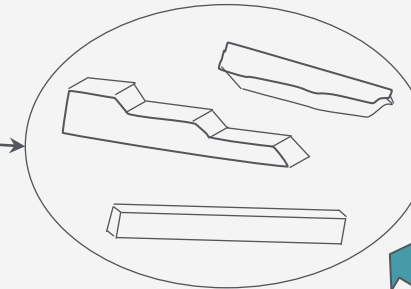
Photo
source :
BRGM,
SEM
method

Shape of prism, blade, fiber ... mainly wide and thick

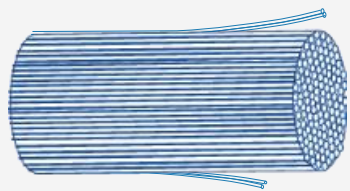
Mineral dust



Rock crushing



Single mineral



Asbestiform fibers bundles

1 – Elongate Mineral Particles of interest (EMPi)

The elongate mineral particles are particles that have Length/Width ratio (L/w) > 3:1. Airborne measured particles are respirable particles with width < 3 µm and length > 5 µm

The EMPi are the EMP of the 11 mineral species

Regulatory asbestos (asbestiform)	Non asbestiform (non regulatory)	Others mineral species
Chrysotile	-	Antigorite
Asbestos actinolite	Actinolite	Winchite
Asbestos tremolite	Tremolite	Fluoro-edenite
Asbestos anthophyllite	Anthophyllite	Richterite
Amosite (asbestos grunerite)	Grunerite	Erionite
Crocidolite (asbestos riebeckite)	Riebeckite	



Development of a tool to check automatically results of the excel spreadsheet (Locock, 2014) based on IMA classification of amphiboles (Hawthorne *et al.*, 2012)

1 – Setting and objectives

- Since 2014, the French government is facing with the **cleavage fragment** issue identified in aggregates of manufactured materials during laboratory testing.
- As we do not know the health effect of the cleavage fragments, the ANSES* agency recommended apply the asbestos regulation to the 11 minerals particles having the dimensions of regulatory fibers.
- Because of the lack of data on the exposure risk to EMPi, it also recommended to lead an exploratory campaign to assess this issue.
- The purpose is to provide recommendations to the 3 ministries on risk management to allow them legislating proportionally to the risk in case of exposure.

*ANSES : French Agency for Food, Environmental and Occupational Health & Safety

Protocol #1 :

Exploratory measures of mineral species in materials susceptible to liberate EMPi

Sampling by a geologist

Analytical methods : PLM (thin section and refractory index) and TEM (+ SEM and microprobe)

Protocol #2 :

Exploratory measures of EMPi in the air

Workers

Mobil pump, ~4h ; Analytical method : TEM

Work places

Static pump and CATHIA sampler, 4 to 8 hours

Analytical method : TEM

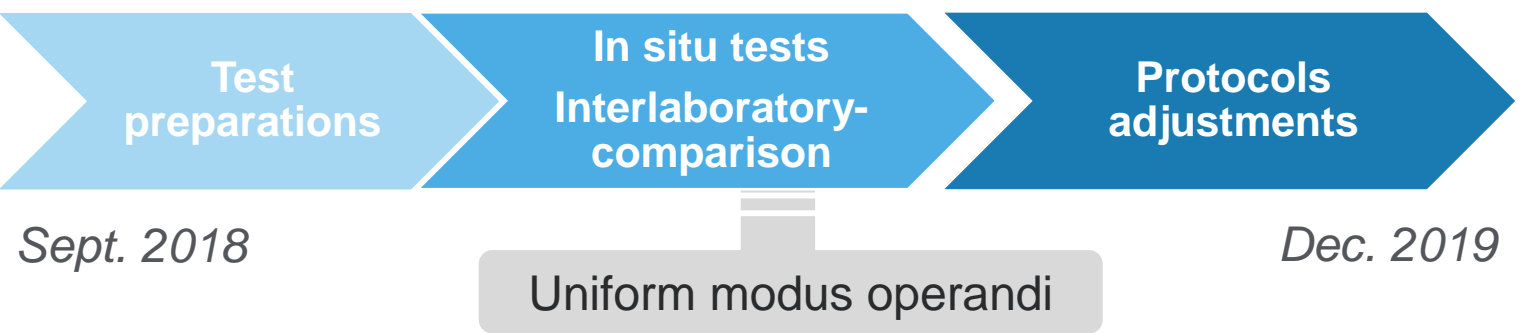
Public population

Static pump and CATHIA sampler, 8h or 24h

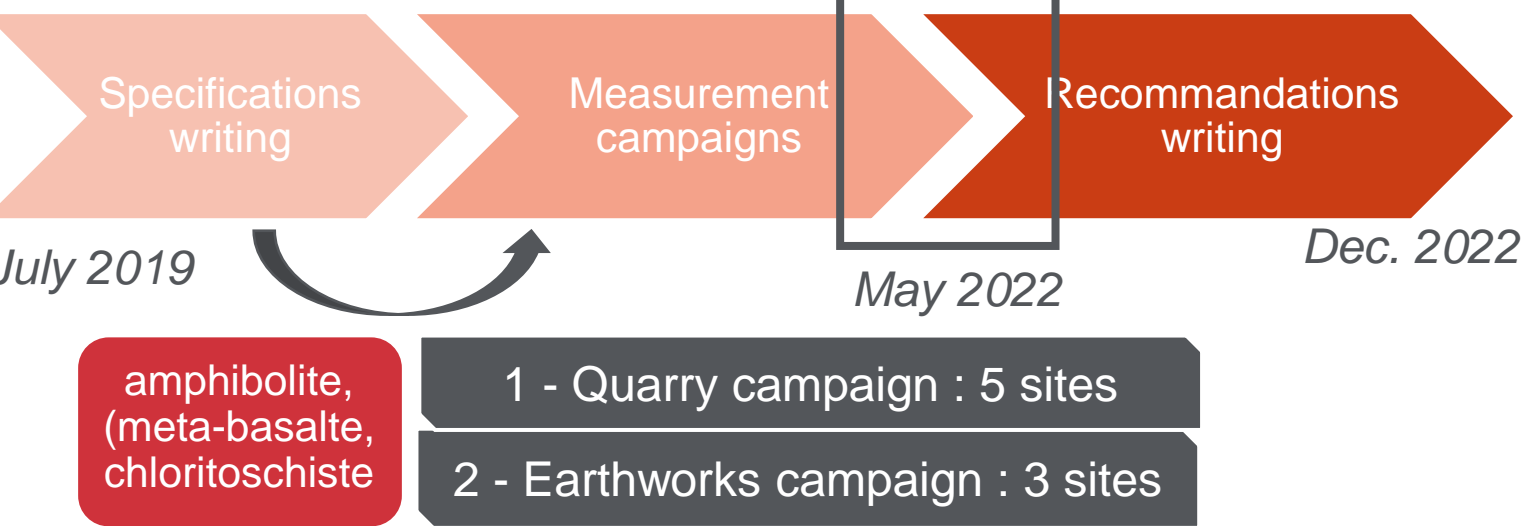
Analytical method : TEM

2 - Phase 1 and 2 of the project

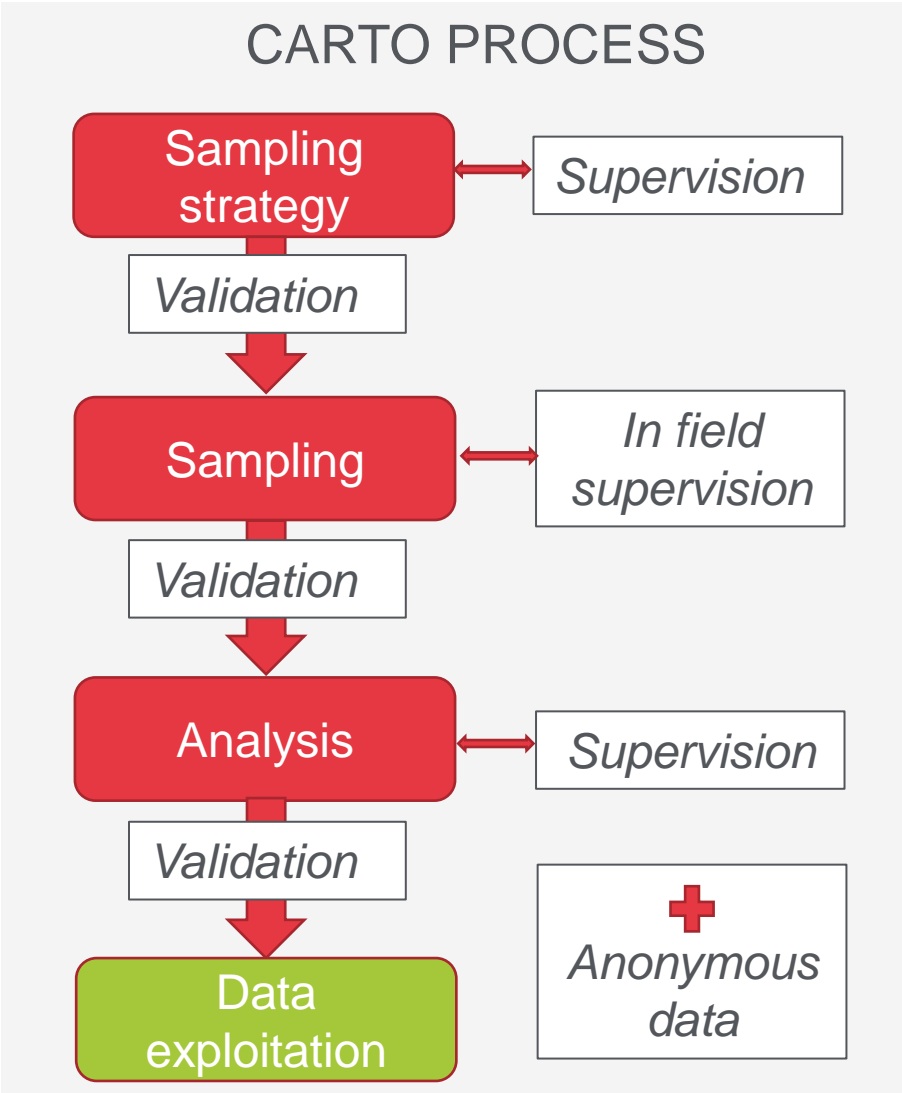
Protocols finalization



Exploratory campaign



CARTO PROCESS



3 - Take home messages

- Assessment of workers and public population exposure risk to EMPi
 - Two experimental and complex protocols tested in the field ;
 - The measurements focus on the most emissive situations, i.e. materials and actions that are susceptible to liberate the most of EMPi.
- Recommendations on risk management
 - Upstream to the health, work and environment regulations ;
 - Impact on wide economical sectors from quarries to recycling.

Partners

Pilot committee

Coordinator

Technical committee

3 ministries

OPPBTP

Scientific Institutions



Work



Environment



Health



Independant experts

Thank you for your attention



Operation manager

Erell Léocat

0614799233

erell.leocat@oppbtp.fr

Project manager

Christine Deneuvillers

0660327953

christine.deneuvillers@oppbtp.fr

Technical direction

OPPBTP

OPPBTP

Organisme Professionnel de Prévention
du Bâtiment et des Travaux Publics

preventionbtp.fr

