

CEN/TC 264/WG 39






Ambient air – Sampling and analysis of airborne pollen grains and mold spores of allergy networks – Volumetric Hirst method

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Agenda

- RNSA  approach to AFNOR in 2011-2012
- Acceptance by AFNOR  European approach CEN
- Project presentation in April 2013 (Michel Thibaudon+AFNOR) to CEN
- Acceptance by CEN  Creation of a WG 39
- Drafting by RNSA (January-October 2013)  Validation by AFNOR
- Meeting of the WG 39 at the end of October 2013 in Lyon (11 people and 6 countries represented)  Drafting of a revised version
- Final meeting in March 2014 in Düsseldorf (VDI)
- CEN proposal for signature during the second quarter of 2014

WG 39
meeting
in Lyon

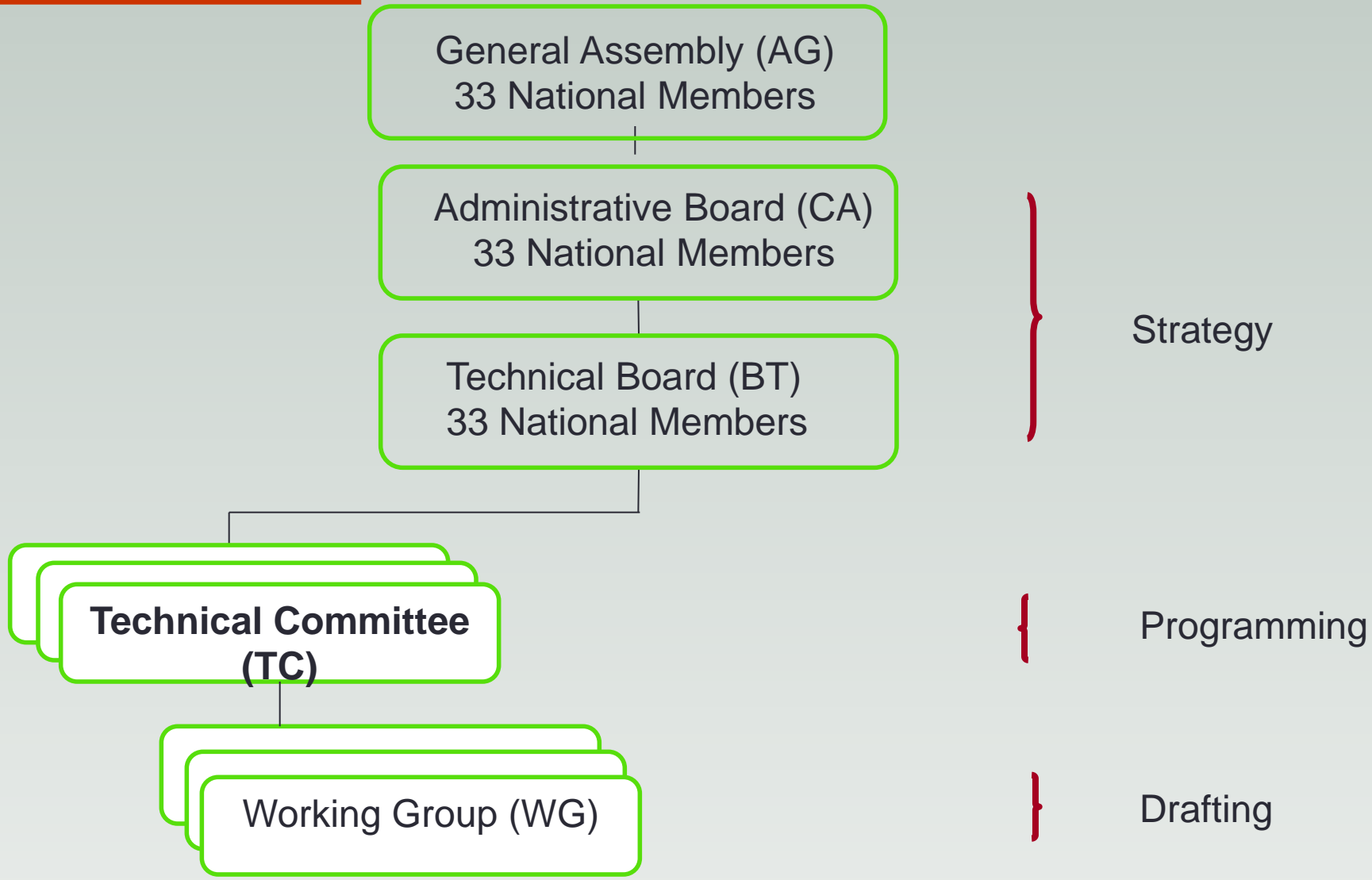


General context

- Biological particles → Health impact (more of 3 Million people in France suffer of allergic rhinitis due to pollen)
- Pollens recognized as « atmospheric pollutant » (i.e. French Environmental Code, § L220-2)
- Increasing number of national aeroallergen networks
- IAA (International Association for Aerobiology) and EAS (European Aerobiology Society) cover issues on:
 - Sampling
 - Analysis
 - Quality control
 - Dissemination of information

⇒ need for a higher quality level of analysis and for a standardization of procedures

Structure of CEN



Structure of CEN

- **Technical Committee (TC)**

- Body who manages the preparation of CEN deliverables

CEN/TC 264 – Air quality

- **Working Group (WG)**

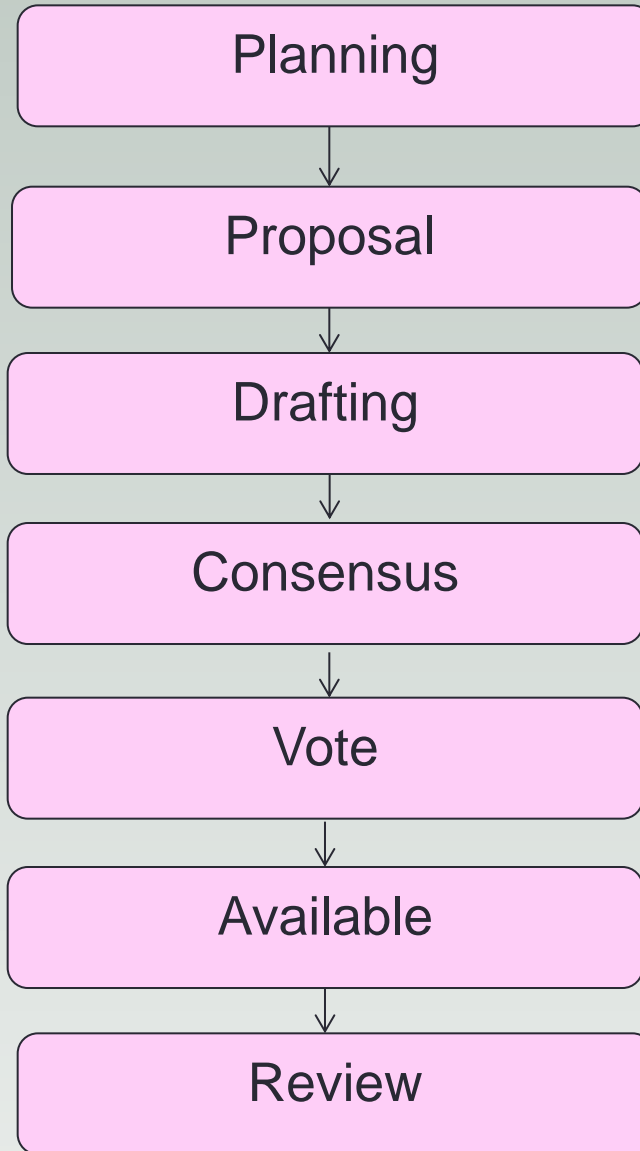
- Group, established by a Technical Committee that undertakes a specific task, usually resulting in the provision of a draft Standard, Technical Specification or Technical report

WG 39 « "Sampling and analysis of airborne pollen grains and fungal spores"

CEN MEMBERS

- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- The Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- The Former Yugoslav Republic of Macedonia
- Turkey
- United Kingdom

Process



CEN – Weighted vote

▪ France		▪ Austria		▪ Former Yugoslav Republic of Macedonia	
▪ Germany		▪ Bulgaria		▪ Cyprus	
▪ Italy	29	▪ Sweden	10	▪ Estonia	
▪ Turkey		▪ Switzerland		▪ Latvia	4
▪ United Kingdom		▪ Denmark		▪ Luxembourg	
▪ Spain	27	▪ Finland		▪ Slovenia	
▪ Poland		▪ Ireland	7	▪ Iceland	3
▪ Romania	14	▪ Lithuania		▪ Malta	
▪ The Netherlands	13	▪ Norway			
▪ Belgium		▪ Slovakia			
▪ Greece		▪ Croatia			
▪ Hungary	12				
▪ Portugal					
▪ Czech Republic					

TOTAL : 405

- ⇒ The TS is adopted if 71 % or more of the weighted votes cast are reached
- ⇒ If the result is negative, only the votes of EEA (European Economic Area) are counted.

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Scope and existing normative references

- **Scope**
- **Continuous** sampling of airborne pollen grains and fungal spores in ambient air (by the **volumetric** Hirst method)
- Analysis in the lab ⇒ number of (specific) pollen grains (per cubic meter of sampled air)
- a 2 step-methodology :
 - ↳ **Sampling**
 - ↳ **Analysis**

Existing normative references

- **UNI 11108 (2004)** « Method for sampling and counting airborne pollen grains and fungal spores »
- **VDI 4252 – 2** « collection of allergy relevant pollen and spores in ambient air according to the Hirst principle » (*work in progress*)

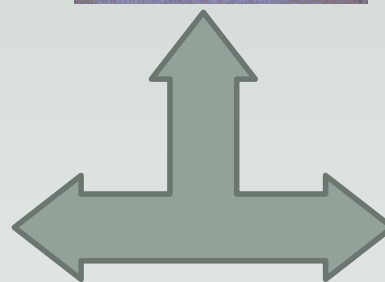
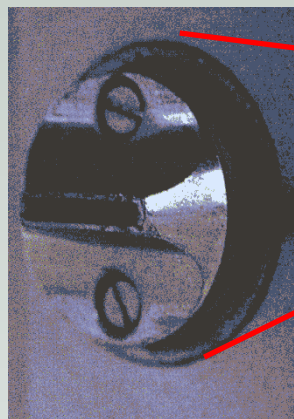
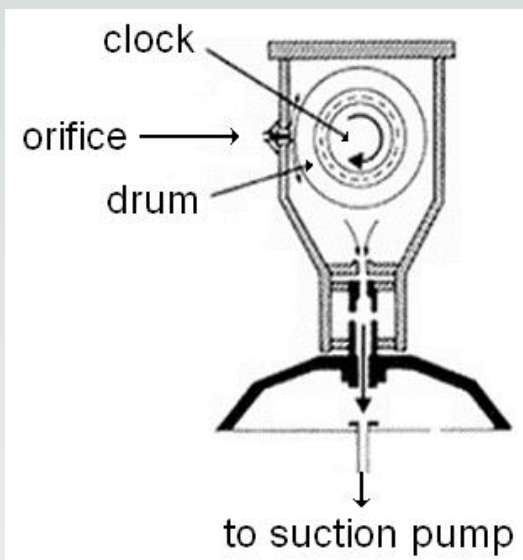
⇒ **Current draft standard at French level**

1st step: SAMPLING

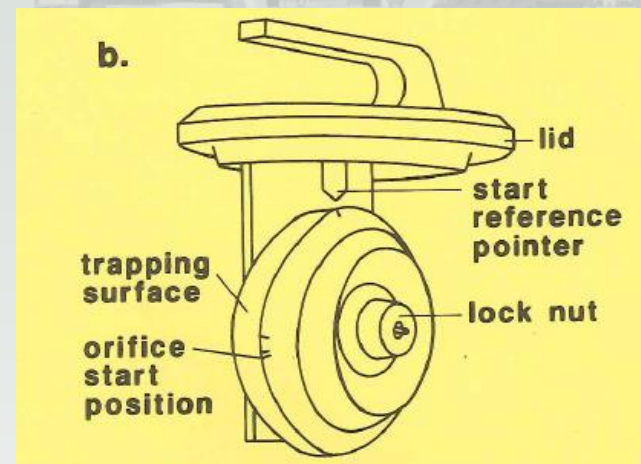
pollen and spore sampler (Hirst type)

- ↪ volumetric
- ↪ continuous

- **Volumetric** : 10 L / min
(± 2 L / min)



- **Continuous** : on-going
impaction on specific
support



Volumetric Hirst sampler

The wind vane and rain shield have 2 functions :

- To allow continuous rotation of the trap inlet so that the orifice faces the wind
- To prevent rain falling on the orifice

Rain shield

Wind vane



The complete trap shall be:

- Resistant to corrosion
- Resistant to wind power
- Well attached
- Horizontal



Siting criteria requirements (for aerobiology network & allergy information)



- **The sampler** shall be located on the roof of a building and on a flat and horizontal surface
- **The sampler** should not be placed in the vicinity of a fixed or mobile source of mass emission of biological or non-biological particles
- **The sensor shall :**
 - Be stable
 - Be well fixed
 - Resist to hard weather conditions
 - Be placed in a position where local atmospheric circulation is not affected by the presence of nearby obstacles

QA/QC procedures

- i.e. Flow rate: to be checked every week

⇒ Well defined SOP's & specifications



Technical specifications for transparent strip

Water-insoluble

Not affected by T_{ambient} (-10 to 50°C)

Not affected by RH_{ambient} (20 to 100%)

Transparent

Technical specifications for coating medium

Vaseline + Toluene

Silicone + CCl_4

Spread the solution on the strip with a brush

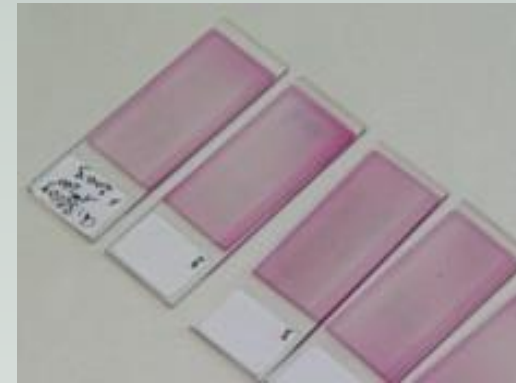
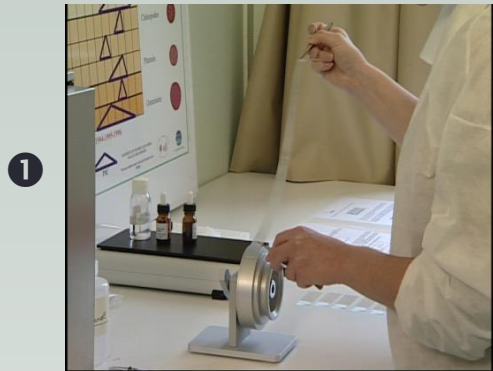
Let it dry under the hood

Analysis : Equipment required

- Microscope
- Magnetic stirrer
- Hot plate or microwave
- Bench
- Utensils to use (tweezer, scalpel, forceps).
- Winding support
- Cutting rule
- Extractor hood
- Bush
- Glass slide
- Cover-slide
- Ethyl alcohol (70%)
- Reagents for coating medium
- Reagents for mounting medium
- Transparent strip
- Drum (with its box)

Analysis

- Preparation of the glass slide for microscopy analysis



④ Procedure **mounting** medium

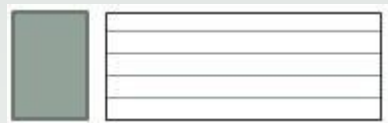
→ Coloration / Fixation

- **Counting method**

12 continuous vertical sweeps

or

2 to 4 or more horizontal sweeps



Analysis – data handling

• Pollen Identification

↳ Use of « Key of determination » (RNSA) since 2005



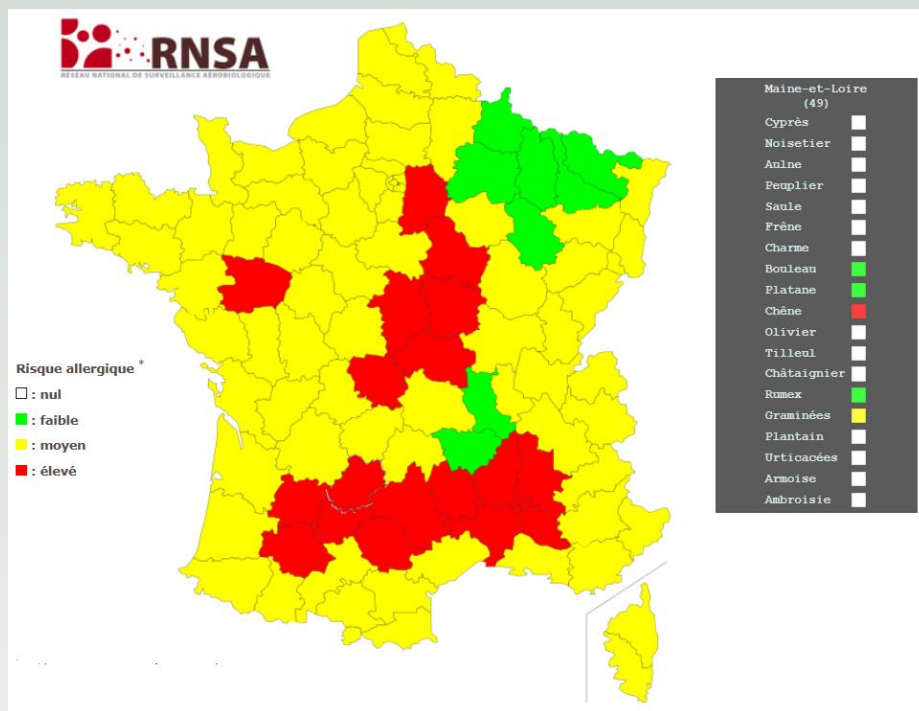
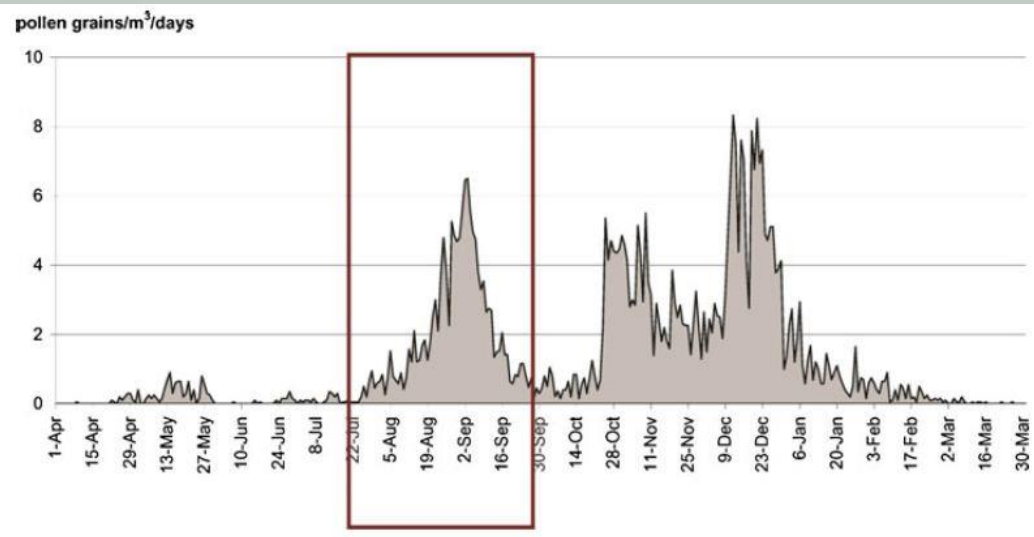
Use of results

• Time series

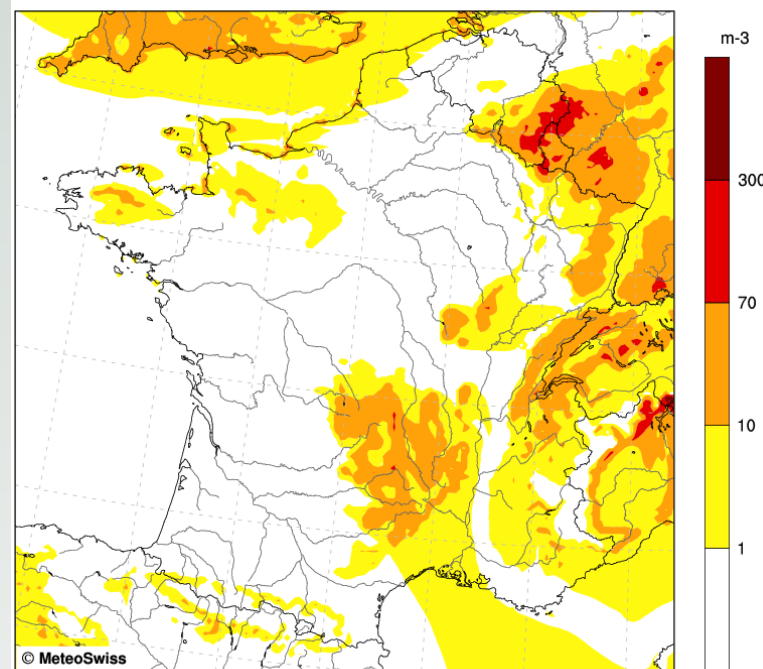
↪ Identification of peak events

• X-day maps of vigilance / forecasts

↪ prevention



COSMO-7 FORECAST Version: 933
Mean Birch Pollen Concentration of the previous 24h
Sun 12 May 2013 00UTC
10.05.2013 00UTC +48h



Concentration of Birch Pollen [m-3]

Max: 505.2 m-3

Thank you for your attention !