CENTRE DE RECHERCHES ROUTIÈRES

ÉTABLISSEMENT RECONNU PAR APPLICATION DE L'ARRÊTÉ LOI DU 30-1-1947

BOULEVARD DE LA WOLUWE 42 - 1200 BRUXELLES, BELGIQUE

Belgian vision on the use of trichloroethylene for the extraction of binder in bituminous mixtures

- Most automatic extraction machines used in Belgium use trichloroethylene as solvent. The machine is available on the market with toluene also. Toluene is however explosive and therefore the cost of these machines is much higher and the risk of handling toluene is higher for the user. Therefore we are in favor of the use of trichloroethylene for automatic extraction machines.

- At this moment manual extraction is also still used by a lot of contractors and laboratories in Belgium. There are several reasons why automatic machines cannot be used in all cases:

    - It is known that the use of automatic machines can have an impact on the grading curve and more in particular on the filler content. This effect is equipment dependent, but depends also on the constituents used and on the procedure applied. In case that the grading curve is to be determined (which is generally the case in Belgium) correction factors have to be determined and have to be followed in time. Therefore some contractors and laboratories have preferred to keep the manual method.
    - Specific binders, such as some highly modified binders or EVA-modified binders, cannot be extracted by automatic machines. Manual procedures, sometimes combined with hot extraction, are needed in order to determine the correct binder quantity.
    - Some types of mixtures with a very high filler content, lead to overfilling in the automatic equipment.

- In case of manual extraction other solvents can be used such as dichloromethane. This product has however other disadvantages:

    - It has a low boiling point. Hence, it is highly volatile.
    - It is more difficult to recycle (losses are more important due to the volatility), the quantities needed are also larger than for trichloroethylene. And hence the risks for exposure again higher.
    - The solubility is less good, which can be a particular problem in case of polymer modified binders. There are risks that fine particles are present in the solution and hence the binder content will not be correct.

    Because of these reasons it is necessary that trichlroethylene can be used in manual extraction as well.

- An alternative to the use of solvents for the determination of the binder content, is the use of the ignition method, by which the binder content is determined by the mass loss during calcination of the binder. However this method gives rise to problems in some cases:

    - The method requires the knowledge of the exact composition. In case of control of conformity this is not possible.
    - The method is not applicable if further characterization of the binder is needed (the binder is calcinated and hence cannot be tested further).

Belgium therefore supports that trichloroethylene can be further used for the extraction of binder from bituminous mixtures. Special precautions are however necessary when using and handling this solvent. We support the recommendations described in document BGI 790-010.

The Belgian delegation in CEN TC227 WG1:

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