

# DIN EN 12697-1:2020-05 (E)

## Bituminous mixtures - Test methods - Part 1: Soluble binder content

---

| <b>Contents</b>         |  | <b>Page</b> |
|-------------------------|--|-------------|
| European foreword ..... |  | 5           |
| Introduction .....      |  | 7           |
| 1                       | Scope .....  | 8           |
| 2                       | Normative references .....   | 8           |
| 3                       | Terms and definitions .....  | 8           |
| 4                       | Preparation of laboratory samples .....                            | 10          |
| 5                       | Determination of binder content .....                              | 10          |
| 5.1                     | General principles of test .....                                   | 10          |
| 5.2                     | Binder extraction .....  | 10          |
| 5.2.1                   | Solvent .....  | 10          |
| 5.2.2                   | Apparatus .....  | 11          |
| 5.2.3                   | Procedure .....  | 11          |
| 5.3                     | Separation of mineral matter .....                                 | 11          |
| 5.3.1                   | Apparatus .....  | 11          |
| 5.3.2                   | Procedure .....  | 11          |
| 5.4                     | Binder quantity .....  | 12          |
| 5.4.1                   | Apparatus .....  | 12          |
| 5.4.2                   | Procedure .....  | 12          |
| 5.5                     | Calculation and expression of results .....                        | 12          |
| 5.5.1                   | General .....  | 12          |
| 5.5.2                   | Binder content determined by difference .....                      | 12          |
| 5.5.3                   | Binder content by total recovery .....                             | 12          |
| 5.5.4                   | Binder content by recovery from portion (volume calculation) ..... | 13          |
| 5.5.5                   | Binder content by recovery from portion (mass calculation) .....   | 13          |
| 6                       | Drying to constant mass .....                                      | 14          |
| 6.1                     | General .....  | 14          |
| 6.2                     | Apparatus .....  | 14          |
| 6.3                     | Procedure .....  | 14          |
| 7                       | Reporting of results .....   | 14          |
| 7.1                     | Results .....  | 14          |
| 7.2                     | Test report .....  | 15          |
| 8                       | Precision data .....   | 15          |
| 8.1                     | General .....  | 15          |
| 8.2                     | Precision -- Experiment 1 .....                                    | 15          |
| 8.3                     | Precision -- Experiment 2 .....                                    | 16          |
| 8.4                     | Precision -- Experiment 3 .....                                    | 17          |
| 8.5                     | Precision -- Experiment 4 .....                                    | 17          |
| 8.6                     | Precision -- Experiment 5 .....                                    | 17          |
| Annex A (informative)   | Guidance on the determination of binder content .....              | 18          |
| A.1                     | Evaluation of the results .....                                    | 18          |
| A.2                     | Effect of water content .....                                      | 19          |

|  |  |           |
|--|--|-----------|
| A.3  | Choice of test equipment and the sequence of operations .....            | 19        |
| A.4  | Determination of total binder content .....                              | 19        |
| <b>Annex B (normative) Use of equipment for the determination of binder content .....</b>  |  | <b>21</b> |
| B.1  | Binder extraction .....  | 21        |
| B.1.1  | Hot extractor (paper filter) method .....                                | 21        |
| B.1.2  | Hot extractor (wire mesh filter) method .....                            | 26        |
| B.1.3  | Soxhlet extractor method .....   | 27        |
| B.1.4  | Bottle rotation machine method .....                                     | 29        |
| B.1.5  | Centrifuge extractor method .....  | 32        |
| B.1.6  | Cold mix dissolution of bitumen by agitation .....                       | 34        |
| B.1.7  | Automatic extractor method .....   | 35        |
| B.2  | Separation of mineral matter .....                                       | 36        |
| B.2.1  | Continuous flow centrifuge .....   | 36        |
| B.2.2  | Pressure filter .....  | 38        |
| B.2.3  | Bucket type centrifuge -- Type 1 .....                                   | 39        |
| B.2.4  | Bucket type centrifuge -- Type 2 .....                                   | 41        |
| B.3  | Soluble binder content .....   | 41        |
| B.3.1  | Method by recovery from a portion using a volume calculation .....       | 41        |
| B.3.2  | Method by recovery from a portion using a mass calculation .....         | 44        |
| <b>Annex C (normative) Determination of residual mineral matter in the binder extract by incineration .....</b>                      |  | <b>45</b> |
| C.1  | General .....  | 45        |
| C.2  | Method 1 .....   | 45        |
| C.2.1  | Apparatus .....  | 45        |
| C.2.2  | Reagent .....  | 45        |
| C.2.3  | Procedure .....  | 45        |
| C.3  | Method 2 .....   | 46        |
| C.3.1  | Apparatus .....  | 46        |
| C.3.2  | Procedure .....  | 46        |
| <b>Annex D (informative) Guidance on determination of soluble binder content of mixtures with<br/>polymer-modified binders .....</b> |  | <b>48</b> |
| D.1  | General .....  | 48        |
| D.2  | Preparatory treatment of laboratory samples of bituminous mixtures ..... | 48        |
| D.3  | Determination of binder content .....                                    | 48        |
| D.3.1  | General principles of test .....   | 48        |
| D.3.2  | Binder extraction .....  | 48        |
| D.3.3  | Separation of mineral matter .....                                       | 50        |
| D.3.4  | Binder quantity .....  | 51        |
| D.3.5  | Calculation and expression of results .....                              | 51        |
| D.4  | Drying to constant mass .....  | 51        |
| D.5  | Reporting of results .....   | 51        |
| D.6  | Precision data .....   | 51        |
| <b>Bibliography .....</b>  |  | <b>52</b> |