# DIN EN 16523-1:2018-12 (E)

## Determination of material resistance to permeation by chemicals - Part 1: Permeation by potentially hazardous liquid chemicals under conditions of continuous contact (includes Amendment A1:2018)

## Contents

Page


European foreword ..... 4

Introduction ..... 5

1 Scope ..... 6

2 Normative references ..... 6

3 Terms and definitions ..... 6

4 Test principle ..... 9

5 Collecting media ..... 9
5.1 Gaseous collecting medium ..... 9
5.2 Liquid collecting medium ..... 9

6 Apparatus ..... 10
6.1 Permeation cells ..... 10
6.1.1 Standard permeation cell ..... 10
6.1.2 Alternative permeation cells ..... 12
6.2 Temperature controlled room, cabinet or water bath ..... 12
6.3 Supply of gas for gaseous collecting medium (dry air or nitrogen) ..... 12
6.4 Liquid pump and stirrer (in case of a liquid collecting medium) ..... 12
6.5 Equipment for the quantitative determination of the challenge chemical or its components in the collecting medium ..... 12
6.6 Time measuring device ..... 13

7 Test specimens ..... 13

8 Procedure ..... 13
8.1 Calibration ..... 13
8.2 !Assembly of test specimens in the cells" ..... 13
8.3 Test procedure ..... 14
8.4 Calculation of results ..... 15
8.4.1 Open loop system: Permeation rate (PR) ..... 15
8.4.2 Closed loop system Permeation rate (PR) ..... 15
8.5 Expression of results ..... 16
8.6 Uncertainty of measurement ..... 16

9 Test report ..... 17

Annex A (informative) Types of permeation behaviour ..... 18

Annex B (informative) Physical assessment of the samples ..... 20

B.1 General ..... 20
B.2 Visual appearance ..... 20
B.3 Thickness ..... 20
B.4 Mass ..... 20

**B.5 Hardness ..... 20**

**Annex C (informative) Example of appropriate technique for the detection of chemicals ..... 21**

**DIN EN 16523-1:2018-12 EN 16523-1:2015+A1:2018 (E) Annex D (informative) !Possible techniques to assess flow and stirring for permeation with liquid collecting medium" ..... 23**

**D.1 For the open loop system ..... 23**
**D.2 For open and closed loop system ..... 23**
**D.3 For open and close loop system ..... 24**

**Annex E (informative) Example of permeation cell ..... 25**

**Annex F (informative) Results of the interlaboratory trials ..... 27**

**Bibliography ..... 29**