ISO 14644-13:2017-06 (E)

Cleanrooms and associated controlled environments - Part 13: Cleaning of surfaces to achieve defined levels of cleanliness in terms of particle and chemical classifications

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 2

3 Terms and definitions 2

4 General methodology 3
4.1 Overview 3
4.2 Methodology 4

5 Object description 6

6 Cleanliness specifications 7

7 Determination of initial contamination level 7
7.1 General 7
7.2 Determination of initial contamination level with respect to particle concentration 7
7.3 Determination of initial contamination level with respect to chemical concentration 7

8 Other requirements 8

9 Selection of a cleaning methodology 8
9.1 Selection procedure 8
9.2 Cleaning methodologies 8
9.2.1 Cleaning method 8
9.2.2 Categories of cleaning techniques 8
9.3 Cleaning process 9

10 Material compatibility check 9

11 Cleaning validation 10
11.1 General 10
11.2 Cleaning efficiency 11
11.2.1 Evaluation 11
11.2.2 Cleaning efficiency with respect to particle concentration 11
11.2.3 Cleaning efficiency with respect to chemical contamination 12
11.3 Cleaning appropriateness 13
11.3.1 Assessment 13
11.3.2 Cleaning appropriateness with respect to particle concentration 13
11.3.3 Cleaning appropriateness with respect to chemical concentration 14

12 Measurement methods 15
12.1 General 15
12.2 Direct measurement methods 15
12.2.1 General 15

12.2.2 Direct measurement methods with respect to SCP 16
12.2.3 Direct measurement methods with respect to SCC 16
12.3 Indirect measurement methods 16
12.3.1 General 16
12.3.2 Indirect measurement methods with respect to SCP 16
12.3.3 Indirect measurement methods with respect to SCC 17

13 Documentation 17

Annex A (informative) Aspects of cleaning 18

Annex B (informative) Cleaning methods 19

Annex C (informative) Material compatibility with cleaning agents 27

Annex D (informative) Cleanliness measurement 29

Bibliography 34