DIN EN 16602-70-46:2015-06 (E)

Space product assurance - Requirements for manufacturing and procurement of threaded fasteners; English version EN 16602-70-46:2014

Content

page

Foreword 4

1 Scope 5

2 Normative references 6

3 Terms, definitions and abbreviated terms 8

3.1 Terms defined in other standards 8

3.2 Terms specific to the present standard 8

3.3 Abbreviated terms 9

4 Requirements 10

4.1 Fabrication 10

4.1.1 General 10

4.1.2 Raw material 10

4.1.3 Head forming 10

4.1.4 Heat treatment 11

4.1.5 Head-to-shank fillet rolling 11

4.1.6 Threads 11

4.1.7 Identification marking 12

4.1.8 Surface treatment 12

4.1.9 Workmanship, handling and packaging 12

4.2 Dimensional and metallurgical requirements 13

4.2.1 General 13

4.2.2 Nominal dimensions 13

4.2.3 Head-to-shank fillet 13

4.2.4 Non-destructive inspections 14

4.2.5 Metallurgical examination 15

4.2.6 Measurement of hydrogen content 16

4.2.7 Outgassing and offgassing 16

4.3 Mechanical testing 17

4.3.1 General 17
4.3.2 Hardness test 17
4.3.3 Tensile test 18
4.3.4 Shear test 19
4.3.5 Fatigue test 19
4.3.6 Creep test 20
4.3.7 Corrosion test 22
4.3.8 Stress-corrosion test 22
4.4 Quality assurance 23
4.4.1 General 23
4.4.2 Quality requirements 23

Annex A (normative) **Customer specification document for threaded fasteners – DRD 26**

Annex B (normative) **Product conformance report (PCR) – DRD 28**

Annex C (informative) **Inspection levels, acceptance quality limits (AQL) and limiting quality levels (LQ) for inspection of fasteners 30**

Bibliography 32

Figures

Figure 4-1: Tolerance of head-to-shank fillet profile 14
Figure 4-2: Location of microsections for metallurgical examination 15
Figure 4-3: Area delimiting interruptions in grain flow in the head-to-shank region 16
Figure 4-4: Example of a regular grain flow in a threaded surface 16
Figure 4-5: Locations for hardness testing (indicated with cross symbol) 18
Figure 4-6: Loading schematic for tensile testing of threaded fasteners 21
Figure 4-7: Schematic of an example of double-shear loading jigs 22

Tables

Table 4-1: Maximum allowed values of the extension C of the distorted area shown in Figure 4-1 14

Table C- 1: Inspection levels, acceptance quality limits (AQL) and limiting quality levels (LQ) for inspection of fasteners 30