

DIN EN ISO 20471:2017-03 (E)

High visibility clothing - Test methods and requirements (ISO 20471:2013, Corrected version 2013-06-01 + Amd 1:2016) (includes Amendment :2016)

| Contents | | Page |
|-----------------|--|-------------|
| | Foreword to ISO 20471:2013 | 4 |
| | !European foreword to ISO 20471:2013/A1:2016 | 5 |
| | Introduction | 6 |
| 1 | Scope | 7 |
| 2 | Normative references | 7 |
| 3 | Terms and definitions | 8 |
| 4 | Design | 9 |
| 4.1 | Types and classes | 9 |
| 4.2 | Specific design requirements | 10 |
| 4.2.1 | Garments covering only the torso | 10 |
| 4.2.2 | Garments covering torso and arms | 11 |
| 4.2.3 | Garments covering legs | 12 |
| 4.2.4 | Garments covering torso and legs | 13 |
| 4.2.5 | Garments covering torso, arms and legs | 14 |
| 4.3 | Size designation | 15 |
| 5 | Requirements for background material, non-fluorescent material and combined performance material | 16 |
| 5.1 | Colour performance requirements of new material | 16 |
| 5.1.1 | Background material | 16 |
| 5.1.2 | Combined performance material | 16 |
| 5.2 | Colour after Xenon test | 16 |
| 5.3 | Colour fastness of background material and all non-fluorescent material layers after test exposure | 17 |
| 5.3.1 | Colour fastness to rubbing | 17 |
| 5.3.2 | Colour fastness to perspiration | 17 |
| 5.3.3 | Colour fastness when laundered, dry cleaned, hypochlorite bleached and hot pressed | 17 |
| 5.4 | Dimensional change of background material and non-fluorescent material | 17 |
| 5.5 | Mechanical properties for background material and non-fluorescent material | 18 |
| 5.5.1 | Tensile strength of woven material | 18 |
| 5.5.2 | Bursting strength of knitted materials | 18 |
| 5.5.3 | Tensile strength and tear resistance of coated fabrics and laminates | 18 |
| 5.6 | Physiological performance -- Water vapour and thermal resistance | 18 |
| 6 | Photometric performance requirements for retroreflective material and combined performance material after physical exposure | 18 |
| 6.1 | Retroreflective performance requirements of new material | 18 |
| 6.2 | Retroreflective performance requirements after test exposure | 19 |
| 6.2.1 | General | 19 |
| 6.2.2 | Separate performance retroreflective material | 19 |
| 6.2.3 | Combined performance material | 20 |
| 6.2.4 | Orientation-sensitive materials | 20 |
| 7 | Test methods | 20 |
| 7.1 | Sampling and conditioning | 20 |

| | | |
|--|---|----|
| 7.2 | Determination of colour | 20 |
| 7.3 | Method of determination of retroreflective photometric performance | 20 |
| 7.4 | Retroreflection after exposure | 21 |
| 7.4.1 | Abrasion | 21 |
| 7.4.2 | Flexing | 21 |
| 7.4.3 | Folding at cold temperatures | 21 |
| 7.4.4 | Exposure to temperature variation | 21 |
| 7.4.5 | Rainfall | 21 |
| 7.5 | Ageing | 21 |
| 7.5.1 | General | 21 |
| 7.5.2 | Washing | 22 |
| 7.5.3 | Dry cleaning | 22 |
| 8 | Marking | 22 |
| 9 | Information supplied by the manufacturer | 22 |
| Annex A (informative) Information concerning risk situations | | 23 |
| Annex B (normative) Positioning of bands of retroreflective material on jackets for industrial wash test only | | 24 |
| Annex C (normative) Method of measuring wet retroreflective performance | | 25 |
| C.1 | Principle | 25 |
| C.2 | Apparatus | 25 |
| C.3 | Procedure | 25 |
| Annex D (informative) Guidelines for the design of high visibility garments | | 27 |
| D.1 | General | 27 |
| D.2 | Visibility from all sides | 27 |
| D.3 | Minimizing fragmented areas | 27 |
| D.4 | Optimized conspicuity through marking the ends of the limbs and recognition of human movement | 27 |
| Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC | | 28 |
| Bibliography | | 29 |