



WD 950

APPENDIX A

Material and Performance Requirements for Case Hardened Carbon Steel Thread Cutting Screws - Type D

1. SCOPE.

This appendix covers the requirements for Thread Cutting Screws not specified in the body of WD 950. Unless otherwise specified all other requirements of WD 950 apply.

1.1 REFERENCES.

ISO 1502 - General purpose metric screw threads - Gauging.

2. MATERIAL.

Screws shall be made from cold heading quality, killed steel wire suitable for case hardening.

3. METALLURGICAL REQUIREMENTS.

3.1 CORE HARDNESS, SURFACE HARDNESS AND MICROSTRUCTURE. These shall be specified in Clauses 3.1, 3.2 and 3.4 of the specification.

3.2 TOTAL CASE DEPTH. A microhardness test shall be carried out at the thread flank mid-point between crest and root or, in the case of smaller screws up to (M)4, in the root of the thread. The case depth shall be at the point where the hardness exceeds the actual core hardness by HV25 and shall be in accordance with the following:

Screw Size	Total Case Depth
(M)2 and (M)3	0.05 - 0.018mm
(M)4 and (M)5	0.1 - 0.23mm
(M)6 and larger	0.15 - 0.28mm

4. PERFORMANCE REQUIREMENTS.

4.1 DRIVE TEST. Thread cutting screws shall meet the same thread forming requirements as the spaced thread tapping screws when tested in a test plate of the material specified in Clause 4.1 of the specification. Test plate thickness and the diameter of holes shall be as specified in Table 1 of this Appendix.

Table 1. Standard test plate thickness and hole size for drive test inspection of thread cutting screws (Type D) - Metric thread

Thread Cutting Screws ¹⁾	Plate Thickness		Hole Diameter	
	Min.	Max.	Min.	Max.
(M)4	1.85	2.06	3.3	3.35
(M)5	3.1	3.23	4.2	4.25
(M)6	4.67	5.05	5.5	5.55
(M)8	4.67	5.05	6.8	6.85
(M)10	5.5	6.2	8.5	8.55
(M)12	6.5	7.2	10.2	10.25

1) Although the designation for these screws are M4, M5, M6 etc., the thread form dimensions vary from ISO metric screws. However, the female thread formed by these screws must meet the requirements of the 6H gauging system specified in ISO 1502.



WD 950

APPENDIX A

Material and Performance Requirements for Case Hardened Carbon Steel Thread Cutting Screws - Type D

4.2 TORSIONAL STRENGTH TEST.

Using the same method and equipment detailed in Clause 4.3 of the specification, the torque to cause failure of the thread cutting screw shall equal or exceed the minimum value shown in Table of this Appendix for the size of screw being tested.

Table 2. Torsional strength requirements for thread cutting screws

Thread Cutting Screw ¹⁾	Minimum Torsional Strength (NM)
(M)4	5.2
(M)5	10.5
(M)6	17.7
(M)8	43
(M)10	87
(M)12	152

- 1) Although the designation for these screws are M4, M5, M6 etc., the thread form dimensions vary from ISO metric screws. However, the female thread formed by these screws must meet the requirements of the 6H gauging system specified in ISO 1502.