

HELICOPTER PROCEDURE SPECIFICATION

THE CONTROL OF WALL THICKNESSES IN HELICOPTER PARTS (INCLUDING FLYING CONTROL PARTS)

PUBLICATION NOTICE

WHPS 701 Issue 1 has been amended as indicated, and is published at Issue 2.

IDENTITY:

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1. INTRODUCTION

1.1 It is essential that the minimum wall thickness of drilled, bored, counter-bored and other hollow parts are checked to ensure these holes/bores are not made too deep, eccentric or out of alignment with their axis. This is also applicable to parts that have complex outer profiles where the existence of a thin wall could remain undetected.

1.2 This procedural specification defines the special requirements that shall be applied to ensure particular attention is given to wall thicknesses of drilled, bored, counter-bored and other hollow parts. This procedure is applicable to the Design, Manufacture and Inspection of such parts and provides compliance with the U.K. MOD requirement DEF STAN 05-61 (Part 12).

2. PURPOSE

2.1 To define the special requirements which are necessary to ensure wall thicknesses are adequately controlled.

2.2 To provide clear instructions which shall be followed by WHL and Suppliers dealing with WHL designed parts.

3. SCOPE

3.1 This procedure is applicable to all parts where it is considered that an error in the manufacturing process could lead to a not readily detectable thin wall (and consequent significant loss of strength) unless special inspection requirements are applied.

3.2 Many current drawings specify the methods to be used, these are detailed on a Technique Sheet. This specification however, supersedes this requirement and future methods for these parts shall be established and formalised according to this procedure.

4. REFERENCED DOCUMENTATION

4.1 This specification makes reference to the following documents:

WHPS 000 The Control and Use of Westland Helicopters Limited's Process, Procedure and Material Specifications.

WHPS 648 Radiographic Inspection.

DEF STAN 05-61 (Part 12) Control of Wall Thickness in Design and Manufacture of Flying Control Systems.

MDS P30-1070 Minimum Wall Thickness Drawing Requirements

4.1.1 The above documents shall be used at their latest issue, unless specified to the contrary.

4.2 In the event of conflict between the requirements of this specification and any referenced document above, this specification shall take precedence.

4.3 In addition to the requirements of this specification users shall ensure compliance with any paragraph in WHPS 000, which is applicable to them.

5. DEFINITIONS

5.1 Wall Thickness

The thickness of material surrounding the sides and ends of bores including the material between adjacent bores.

5.2 Primary Inspection Method

The inspection method that shall be applied to all relevant parts.

5.3 Reference Inspection Method

A method of measuring minimum wall thicknesses which is distinctly different from that used for the primary method and which is used to check the validity of the results obtained by the primary method. It is applied less frequently than the primary method (see Paras. 8.3 and 8.4).

5.4 PAD(CP)

Product Assurance Department (Critical Parts).

6. DRAWING REQUIREMENTS

The requirements of MDS P30-1070 shall be applied at the design stage. The design review shall ensure that the need for any additional drawing requirements are identified.

7. MANUFACTURING

7.1 The manufacturer shall ensure that all minimum wall dimensions identified on the drawing are inspected to the requirements of this specification.

7.2 Specific instructions shall be detailed on the process layout. These shall identify the methods and type of equipment to be used. For Vital and Cat. F parts once the layout has been approved and frozen, then these established methods shall not be altered without approval.

7.3 The Process Layout shall identify the requirements for both a Primary and a Reference Method of Inspection (See Para. 8).

7.4 The actual dimensions measured by both the Primary and Reference Methods shall be recorded on the Job Card. Where components are serialised dimensions shall be recorded against the specific serial number.

8. INSPECTION

8.1 To ensure specified minimum wall dimensions have been adequately measured special actions need to be taken.

8.2 All minimum wall dimensions shall be 100% inspected by a Primary Inspection Method.

8.2.1 This method defined by the Process Layout shall be sufficiently explicit to ensure all parts and all batches are inspected in an identical manner.

8.2.2 The method shall identify any special tools that are to be used and where applicable process sketches shall be used.

8.3 To ensure validity of the Primary Inspection Method a Reference Method shall also be established. This shall be applied to the 1st 3 parts manufactured by any facility. The results obtained by both methods shall be compared and a correlation report submitted to WHL PAD(CP) for approval.

8.4 Subsequently, 1 in every 20 parts or 1 part per batch if the batch is less than 20 shall be inspected by the Reference Method.

8.5 If at anytime a satisfactory correlation is not achieved between the two methods then the batch in question shall be quarantined whilst an investigation is made. This investigation may necessitate a destructive examination to determine the true dimensions.

8.6 Methods of Inspection

8.6.1 Wherever possible the Primary and Reference Methods of Inspection shall be distinctly different.

8.6.2 Table 1 details the methods and combinations that may be used.

8.6.3 Where an X-Ray Technique is used then this shall be in accordance with WHPS 648.

8.6.3.1 All radiographs shall be submitted to the WHL Materials Laboratory NDT Section.

TABLE 1

PRIMARY	REFERENCE
Mechanical	Ultrasonic Thickness Gauge
Mechanical	X-Ray
Mechanical	C.M.M
C.M.M	Ultrasonic Thickness Gauge
C.M.M	X-Ray
Ultrasonic Thickness Gauge	X-Ray