MILITARY SPECIFICATION

ROTARY FLAP PEENING OF METAL PARTS

This specification has been approved by the Naval Air Systems Command, Department of the Navy.

1. SCOPE

1.1 Scope - This specification covers procedures and requirements for peening of metal parts with portable bonded-shot rotary flap wheels (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitations for bids or request for proposal, form a part of the specification to the extent specified herein.

SPECIFICTIONS

MIL-S-5002	Surface Treatments and Coatings for Metal Surfaces of Weapons Systems
MIL-I-6866	Inspection, Penetrant, Method of
MIL-I-6868	Inspection Process, Magnetic Particle
MIL-S-13165	Shot Peening of Metal Parts
MIL-W-81840	Wheels, Peening, Rotary Flap

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Equipment - The tools, used for rotary peening, shall conform to MIL-W-81840. The selected tool shall be mounted on a shaft and rotated rapidly while the periphery of the flap ends is forced against the

Metal to be peened. For mounting the tool, a hand-held grinder or flexible shaft driven by an AC/DC (universal) motor, equipped with a speed control may be used. As an alternate, a compressed air operated motor equipped with pressure regulator and speed controller may be selected. The selected motor shall be capable of producing the speed required for the tool used (within ±100 RPM under load) in accordance with Table I. The equipment shall be capable of reproducing consistently the required peening intensities.

TABLE I

TOOL SPEED OPERATION REQUIREMENTS

Tool (MIL-W-81840)	Tool Description	Operation Speed - Revolutions per minute	
		Normal Range	Maximum Allowed
Type I	Rigid core-cast steel shot	1500 to 4000	4500
Type II, Class 1	Mandrel with 2x1 flaps	1500 to 5000	6000
Type II, Class 2	Mandrel with 1-1/4 x 9/16 flaps	2750 to 7000	14000
Type II, Class 3	Mandrel with 1 x 9/16 flaps	2750 to 7000	14000

3.2 Preparation procedure –

3.2.1 Dimensions and conditions of parts - Areas of parts to be peened shall be within dimensional requirements and surface finish requirements before peening. Except as otherwise permitted (see 3.4.3), all heat treatments to meet requirements for mechanical properties, all machining, grinding and required polishing of areas shall be completed before peening. All fillets shall be properly formed, all burrs shall be removed, and all sharp edges and corners to be peened provided with sufficient radii to result in complete coverage without any distortion prior to peening.

3.2.2 Cleaning and stripping - Unless otherwise specified, all areas shall be cleaned in accordance with MIL-S-5002. Procedures for stripping coatings shall be as specified or approved in the contract or order (see 6.12).

3.2.3 Masking - Areas of the part which are designated in the contract or applicable drawing as having critical surface finishes that must be free from peening shall be suitably masked or otherwise handled to protect such surfaces from the rotary flapping action or subsequent damage. Masking shall be optional for areas not requiring peening and whose surface finish is not critical.

3.2.4 Magnetic particle or penetrant inspection – Unless otherwise specified, when magnetic particle or penetrant inspection is required, parts shall be subjected to such inspection in accordance with MIL-I-6868 or MIL-I-6866 before and after peening.

3.2.5 Sustained stress (preload) - Unless otherwise specified, rotary peening shall be accomplished on parts or areas of parts which do not have any sustained stress as the result of applied or induced loads.

3.3 Rotary flap peening procedures -

3.3.1 Peening intensity - Unless otherwise specified on the drawing or in the contract, the peening intensity, as indicated by a specified arc height value based on the stripholder detailed in MIL-S-13165, shall be as listed in Table II for the thickness involved. The intensity, based on the stripholder, detailed in MIL-S-13165, shall be converted to a magnetic stripholder intensity required for rotary peening by using Figure 1.

Table II

PEENING INTENSITY FOR COMPLETE COVERAGE 1/ 2/
(Arc-height-inches)

Material Thickness-Inch	Material			
	Steel - Under 200,000 psi	Steel - Over 200,000 psi	Titanium and Titanium Alloys	Aluminum and Aluminum Alloys
Up to 0.090	0.003 - 0.006A	0.003 - 0.006A	0.003 - 0.006A	-
0.090 to 0.375	0.006 - 0.012A	0.006 - 0.010A	0.006 - 0.010A	0.006 - 0.010A
Over 0.375	0.012 - 0.016A	0.006 - 0.010A	0.006 - 0.010A	0.010 - 0.014A

1/ Based on stripholder specified in MIL-S-13165
2/ The suffix letter A indicates that the values have been determined by use of the test strip A (see 4.2.2). Test strip A is used for arc heights up to 0.024A. For greater intensity test strip C should be used. Test strip N is used if the intensity is less than 0.004A (see 6.10).

3.3.2 Coverage - Areas of parts, rotary flap peened as referenced on applicable drawings, purchase orders or contracts, shall be peened to complete visual coverage (see 4.3.3 and 6.11). Every portion of the critical surface shall show visible evidence of plastic flow to indicate complete coverage and obliteration of the original surface finish as indicated by overlapping peening impressions.

3.3.3 Area limitation - Unless otherwise specified, the variations in boundaries of areas to be peened, when limited, shall be 0 + 1/8 inch.

3.3.4 Operations - For all materials, except titanium and its alloys, either the steel or the tungsten carbide shot bonded flaps may be used for peening. Tungsten carbide shot bonded flaps (Type II of MIL-W-81840) shall be only used for peening titanium and its alloys. The particular bonded shot tool best suited for the specific operation shall be used (see 6.9). Prior to peening of the actual part, the flap tool shall be conditioned for one minute using a suitable piece of the basis metal similar in nature to the part.

3.3.5 Control parameters - Parameters which shall be controlled during rotary peening are flap deflection position (distance from core or mandrel of the tool to work surface) and tool revolutions per minute. Flap deflection shall be within the range as shown in Figures 4 or 5, applicable

to the tool being used. For peening operations, the maximum flap deflection will be found to be the easiest position to maintain. The minimum normal force to obtain flap deflection shall be used. Where possible suitable fixtures shall be constructed and used to obtain reproducible results in accordance with this specification.

3.4 Post-treatments -

3.4.1 Post operations - Manufacturing operations, such as straightening, grinding or etching, which relieve stresses developed by peening or which develop detrimental residual stresses shall not be done after peening. When peened parts are heated after peening as for baking of paints or protective coating systems, hydrogen embrittlement relief after electroplating or other thermal treatment, the temperatures employed shall be limited as follows (see 6.13):

Material	Maximum Temperature
Steel Parts	475°F (246°C)
Aluminum and Aluminum Alloy Parts	200°F (93°C)
Titanium and Titanium Alloy Parts	800°F (427°C)

3.4.2 Cleaning - After penning and removal of protecting masks, any shot fragments or particles of the polymeric flap material shall be removed from surfaces of parts. Only methods which will not erode or scratch surfaces shall be used. Aluminum and aluminum parts which have been peened especially with cast steel bonded flaps shall be cleaned either by an approved cleaning solution or other methods which will not erode, scratch or otherwise damage the surface. This shall also be applicable to titanium and titanium alloy parts. For improving the maximum adhesion of subsequent coatings, the peened surfaces may be treated just prior to coating application with a very fine aluminum oxide abrasive material.

3.4.3 Surface finish improvement - It shall be permissible to improve the surface finish after peening by polishing, lapping, honing or blasting provided the applicable temperature limitations (see 3.4.1) are not exceeded and material removal is less than 10 percent of the standard A intensity arc height (for example, up to 0.0007 inch or 0.7 mil may be removed from a part peened to 0.007A).

3.4.4 Protection from corrosion - Peened parts shall be protected from corrosion during processing and until final coating or packaging (see 5.1) is completed. The method of protection shall be as specified or approved in the contract or order.

3.5 Qualification of peening operator –

3.5.1 Demonstration of proficiency - To achieve qualified status, each rotary peening operator shall demonstrate his skill and proficiency by satisfactorily conducting peening tests in accordance with 4.2.4, using the tools and equipment which he is required for peening parts in production as well as by various production processes.

3.5.2 Record of proficiency - The facility using the peening operator will complete and retain a record of the peening operator's qualification.

3.5.3 Tools - The peening operator shall satisfactorily peen a specimen for each type and class, if applicable, of the peening tool (see MIL-W-) which he is to use in production.

3.5.4 Record of peening variables - Information concerning peening variables shall be observed and recorded while the respective specimens are being peened.

3.5.5 Properties of peened specimens - The peened specimens shall be tested and exhibit properties conforming to all the requirements specified herein.

3.5.6 Eligibility for peening - No peening operator shall be permitted to perform any peening operation in connection with any contract until qualified.

3.5.7 Qualification tests - The qualification tests for peening operators shall consist of peening and inspection of specimens regularly used in production peening of the basis metals. The test shall be as specified in 4.2.4 at various speeds of operation.

3.5.7.1 Acceptance criteria - The peened specimen shall be considered satisfactory when the operator reproduces a coverage curve (see Figures 2 or 3) for the designated speed of the equipment within ±1 Mil Almen A.

3.5.8 Rejection and retest - When the operator fails on one specimen, he shall be permitted to submit two other specimens of the same saturation coverage curve. If either of these two specimens fails to conform to the requirements specified, the operator shall be disqualified. If reexamination is desired after the above tests, the operator shall be required to submit a complete series of saturation curves as specified in 3.5.7. In addition to the above, the operator will be required to submit one additional specimen of the saturation curve which resulted in the dequalification.

3.5.9 Report of tests - Upon successful completion of the specified tests, an inspection test report that contains the essential information shall be signed by a responsible official of the contractor.

3.5.10 Qualification maintenance -

3.5.10.1 Status maintenance - Qualified status of operators may be maintained by a continuing record of satisfactory workmanship in compliance with 3.5.10.3 or by successfully completing reexamination tests every 6 months as specified in 3.5.10.2. Examination or reexamination of an operator will be required whenever there is reason to question the operator's proficiency, equipment operation, or the quality of parts. Periodic reexamination will not be required for operators when records indicate a satisfactory level is being maintained in production peening.

3.5.10.2 Reexamination - This reexamination will be required when a continuous record of workmanship is not maintained. Operators shall be reexamined every 6 months by peening parts representative of production. When the operator fails the above test, he shall be reexamined in accordance with 3.5.8.

3.5.10.3 Continuous record of workmanship - The determination of a satisfactory record of workmanship shall be based on approved, periodical scheduled inspection of parts, or by nondestructive methods normally conducted by the contractor for inspecting production peening capable of disclosing improper coverage and insufficient intensity (4.3).

4. QUALITY ASSURANCE

4.1 Responsibility for inspection - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification when such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Peening intensity -

4.2.1 Sampling - At least one intensity determination as defined in 4.2.4 shall be made to represent each tool and its equipment for each 30 minutes of continuous operation or fraction thereof, and for each change in intensity. In all cases, at least one determination shall be made at the beginning and one at the end of each period of each production run.

4.2.2 Test specimens - One test specimen shall be used for each intensity determination. Test specimens shall be A, C or N type as specified. They shall be made of SAE 1070 cold rolled spring steel properly hardened and then tempered between flats to hardness stated in Table III. All specimens shall be free from carburization and decarburization to the extent that the difference in hardness between the surface and a noncarburized or nondecarburized depth under the surface shall not be more than 2

points on the Rockwell Superficial 30N scale. Specimens shall be flat within the tolerances shown in Table III, when measured with a gage of the form and dimensions shown in Figure 6 of MIL-S-13165. In determining flatness of the N type specimens, compensation for the effect of the gage magnet shall be made by measuring flatness from both faces of the specimen and averaging the results. Sides and ends of the specimens shall be smooth.

TABLE III

TEST SPECIMEN REQUIREMENTS

Specimen	Type A	Type C	Type N
Dimensional-length, in.	3.00 ± 0.015	3.000 ± 0.015	3.000 ± 0.015
-width, in.	0.745 to 0.750	0.745 to 0.750	0.745 to 0.750
-thickness, in.	0.051 ± 0.001	0.094 ± 0.001	0.031 ± 0.001
Flatness, in.	0.000 ± 0.001	0.0000 ± 0.0015	0.000 ± 0.001
Rockwell hardness	C44 to C50	C44 to C50	A72.5 to A76

4.2.3 Magnetic stripholder - The magnetic stripholder (7 inches x 2 inches x 1 inch), as shown in Figure 6, shall consist essentially of a non-magnetic material with three permanent magnets recessed into the top side for holding a test strip. The bottom surface of the holder shall be fared with non skid material. The exposed top surface shall be protected with polyurethane tape. A strip of metal conforming to the requirements of the test strip (see 4.2.2) shall be permanently bonded to the top surface to prevent the test strip from slipping off during peening.

4.2.4 Test procedure -

4.2.4.1 Preparation - The test specimen, selected in accordance with 4.2.2, shall be examined for flatness and set for zero curvature position with a micrometer gage of the form and dimensions conforming to Figure 6 of MIL-S-13165. In using the gage, the central portion of the side of the test strip that will not be peened shill be placed against the indicator stem of the gage. The test specimen shall be attached to the magnetic strip holder so that the surface of the strip which contacted the gage shall be facing down. The end of the test strip shall contact the bonded strip as shown in Figure 6. The holder shall be mounted on a fixture or article so that the rotary peening action of the equipment will tend to push the test strip against the bonded strip.

4.2.4.2 Peening operation - To achieve the required peening intensity for compliance with 3.3.1 and Table II, the speed necessary for the flap equipment shall be determined by referring to Figures 2 or 3 as applicable. The selected type and class, if applicable, of flap equipment (see 3.1 and Table I) shall be mounted so that rotation shall produce the required speed under load. The flap wheel shall be moved over the surface being peened with longitudinal sweeps and transverse oscillation to

provide uniform surface coverage. Sufficient hand pressure shall be applied to the equipment to deflect the flaps as shown in Figures 4 or 5. The strip shall be exposed to the peening action for one minute at the selected tool speed; determined by a suitable speed measuring device. After exposure, the test strip shall be removed from the holder and the amount of deflection shall be measured with the gage, always placing the unpeened side against the gage stem. If desired, arc height may be converted to standard intensity by referring to Figure 1.

4.2.4.3 Coverage - The peening operation shall be repeated for a total of six minutes or more using the same test piece to obtain a series of test points to establish a coverage curve as illustrated in Figure 7. The developed coverage curve shall be compared with the applicable reference curve (see Figures 2 or 3) for the tool and speed used. If the curve sheers an arc height within $\pm$ 1 mil at full coverage point, the speed shall be considered satisfactory. Otherwise the speed shall be increased for higher arc heights or decreased for lower arc heights as illustrated in Figure 7 and the test shall be repeated (see 6.11).

4.2.5 Intensity information - Test specimens shall accompany peened parts and shall be inspected along with the appropriate lot. The following information shall be recorded for each specimen.

(a) Lot number and other production control numbers.

(b) Part number and name.

(c) Number of parts in lot.

(d) Date peened.

(e) Type and class, if applicable of peening tool used (see 3.1 and Table I).

(f) Mounting equipment (see 3.1) and speed (RPM).

(g) Specified peening intensity and actual peening intensity as shown by accompanying test strips.

(h) Length of exposure time to peening.

(i) Percentage coverage.

This information shall be kept on file for the period of the contact. Applicable information shall also be kept on file necessary for qualification of operators (see 3.5.2, 3.5.4 and 3.5.7).

4.3 Inspection of peened articles -

4.3.1 Inspection lot - A lot shall consist of an identifiable quantity of parts or articles of the same metal composition, produced and

formed under the same conditions, approximately of the same size and shape and subject to inspection at one time.

4.3.2 Sampling - Each peened part or article shall be examined to determine conformance to this specification with respect to coverage and workmanship. Examination for area limitations shall be made to insure conformance to the tolerances specified. On approval of the procuring activity, the supplier may use a system of statistical quality control for coverage, area limitation and workmanship examination.

4.3.3 Peened coverage - Articles shall be visually inspected at a magnification of 5X to 10X for compliance with the coverage requirement of 3.3.2. Visual examination shall show a uniform and complete overlapping impression, obliterating the original surface of the article. Holes shall be inspected with a suitable optical instrument. Surfaces of articles shall be bare or coated with a light transparent oil.

4.3.4 Peening - The peening conditions, wheel type and class, if applicable, wheel speed in rpm and peening time per unit area shall be the same for parts or articles being peened as for the test strips (see 4.2.4), except for holes smaller than 1-1/4 inches in diameter. The peening time shall be calculated as follows:

$$T = \frac{T_S A}{A_S}$$

where T = Peening time for parts and holes greater than 1-1/4 inches diameter

T_S = Saturation peening or full coverage test time as given in Figures 2 or 3 (also see Figure 8)

A = Area of part in square inches

A_S = Saturation area (Equal to 2.25 square inches for strip, when flap width of 3/4 inch or less is used. If width is greater than 3/4 inch, multiply effective flap width by 3 inches to obtain A_S)

4.3.4.1 Peening of holes (3/4 to 1-1/4 in. dia) - Type II, Class 2 equipment conforming to MIL-W-81840 shall be used for peening holes 3/4 to 1-1/4 inches diameter. The specified peening intensity shall first be converted to rotary flap peening intensity by referring to Figure 1. The tool speed for peening holes shall be calculated as follows:

$$S_2 = \frac{18\ S_1}{32\ R_2}$$

where S_2 = Required tool speed in rpm

S_1 = Tool speed in rpm for flat surfaces and holes greater than 1-1/4 inches, depending upon intensity as shown in Figure 3

R_2 = Effective tool radius as 32nd of an inch, depending upon hole radius in accordance with Figure 7

4.3.4.2 Peening of holes (1/2 to 3/4 in. dia) - Type II, Class 3 equipment conforming to MIL-W-81840 shall be used for peening holes 1/2 to 3/4 inches diameter. The specified peening intensity shall first be converted to rotary flap peening intensity by referring to Figure 1. The tool speed for peening holes shall be calculated as follows:

$$S = \frac{15\ S_1}{32\ R_2}$$

where S_2 = Required tool speed in rpm

S_1 = Tool speed in rpm for flat surfaces and holes greater than 1-1/4 inches depending upon intensity as shown in Figure 3

R_2 = Effective tool radius as 32nd of an inch, depending upon hole radius in accordance with Figure 7

5. PREPARATION FOR DELIVERY

5.1 Packaging and packing - The preservation, packaging, and packing methods for peened parts on articles employed by a supplier shall be such as to preclude any physical damage during handling and shipment (see 3.4.4).

6. NOTES

6.1 Intended use - Rotary flap peening is intended to induce surface compressive stresses in metal parts such as axles, springs (helical, torsional and leaf), gears, shafting, aircraft landing gear assemblies, wing structures, jet engine support members, helicopter rotor hub assemblies, etc. which are subjected to repeated applications of load pattern for the purpose of improving resistance to fatigue and stress corrosion cracking. Rotary flap peening is also used for applications such as to close porosity in castings and to straighten or form applicable parts. Peening with metal carbide bonded shot flaps should be used where iron contamination of non-ferrous parts or surface finish are particularly important.

6.2 Ordering data - Procurement documents should specify the following:

(a) Title, number and date of this specification.

(b) Type and class, if applicable, of MIL-W- 81840 peening wheel to be used (see 3.1).

(c) Methods for cleaning surfaces, if other than specified (see 3.2.2) and methods for stripping coatings, if applicable (see 6.12).

(d) Designations of locations to be peened, or locations to be free from peening, as applicable (see 3.2.3).

(e) If magnetic particle or penetrant inspection is required on peened parts (see 3.2.4).

(f) If externally applied forces are permissible during peening (see 3.2.5).

(g) Intensity requirements if other than specified (see 3.3.1).

(h) Requirements for coverage or limitations in obstructed areas, boundaries and other peening operations (see 3.3.2 and 3.3.3).

(i) Cleaning solutions for peened parts, if applicable (see 3.4.2).

(j) Method of protecting peened parts from corrosion (see 3.4.4) and packaging (see 5.1).

6.3 Peening effects - Rotary flap peening to have the desired effects, requires that the specified intensity and coverage be achieved on critical areas, where high tension stresses or stress ranges are most likely to cause fatigue or stress corrosion failures in service. Actual experience with service failures or fatigue tests may sometimes be required to discover or form the locations of such areas subjected to critical stressing, as a result of a combination of service, design, and fabricating conditions.

6.4 Sharp edges and holes - Sharp edges of parts, particularly edges of holes should be chamfered or radiused to prevent "roll over" during peening. The chamfer or radius should be as large as practical but should not be less than 1/64 inch. The tendency for "roll over" will increase with increasing intensity of peening.

6.5 Area accessibility - With shot peening in accordance with MIL-S-13165, shielded or partially shielded areas, walls of deep recesses or other areas less accessible to the maximum effects of the blasting will receive less peening as to intensity and coverage than the more favorable

oriented areas. This does not apply to rotary flap peening as all areas may receive equal coverage and intensity. The surface of blind holes to a depth of about 8 inches can be peened with the same coverage and intensity as more accessible areas. With accessory equipment, using a flexible shaft, interior surface fixtures of metal piping and tubes, with an interior diameter as small as 1/2 inch can be peened satisfactorily.

6.6 Thin and small sections - The peening of very thin or small sections to high intensities should be avoided because of the distortion and high residual tensile stresses in the core material that may result from such peening. This is particularly true where the part has surfaces finished after heat treatment, or is used as a tension member.

6.7 Special procedures - Where special procedure is required, applicable drawings or contract must definitely designate such critical areas referred to in 6.3 as required by Section 3. This may be particularly important in instances referred to in 6.5, where such less accessible and unfavorably oriented surface, are, or may contain, areas subject to critical stressing.

6.8 Simple shapes - Relatively simple shapes and many open-pitched helical spring designs may not require special mention as to critical areas since such areas are generally accessible for full peening effect when uniformly exposed to the rotary flaps.

6.9 Tool speed - For essentially smooth exposed areas; fillet with a radii of 1/16 inch or greater and inside of holes greater than 1/2 inch diameter, normal range of operation for the Type II, Classes 2 and 3 wheels of MIL-W- should be suitable for peening. However, for holes smaller than 1-1/4 inches diameter, the tool speed will be higher than for flat surfaces and larger holes to compensate for reduction in effective flap length (see Table I).

6.10 Intensity comparison - For comparisons of the nominal intensity designations, type C test specimen deflection may be multiplied by 3.5 to obtain the approximate deflection of a Type A specimen when rotary peened with the same intensity. Type A specimens are ordinarily used for arc heights up to 0.024 inch; for greater degree of peening type C test specimens are used. For intensities below 0.004A the type N test specimen shall be used. For comparisons of the nominal intensity designations, type A test specimen deflection may be multiplied by 3 to obtain the approximate deflection of a type N specimen when rotary peened at the same intensities (see 4.2.2).

6.11 Coverage - Full coverage can be established by plotting an arc height-exposure curve as shown in Figure 7, and assuring that the correct intensity (determined by the arc height of the test strip) falls on the right side of the knee of the curve. By doubling the time of exposure, the arc height of a test strip should not increase by more than 15 percent.

6.12 Procedures for stripping - Anodic coatings should be stripped from aluminum and its alloys by immersion in a phosphoric-chromic acid solution at 212°F (100°C). The solution shall consist of the following:

Phosphoric acid	4.5 fld. oz.
Chromic acid	2.7 av. oz.
Water, to make	1 gallon

6.13 Temperature limitations - Processing or service limitations of rotary flap peened parts shall be limited to the temperatures in 3.4.1 unless test data for specific applications support the satisfactory use of higher temperatures.

Preparing activity
Navy - AS
Project No. MFFP-N049

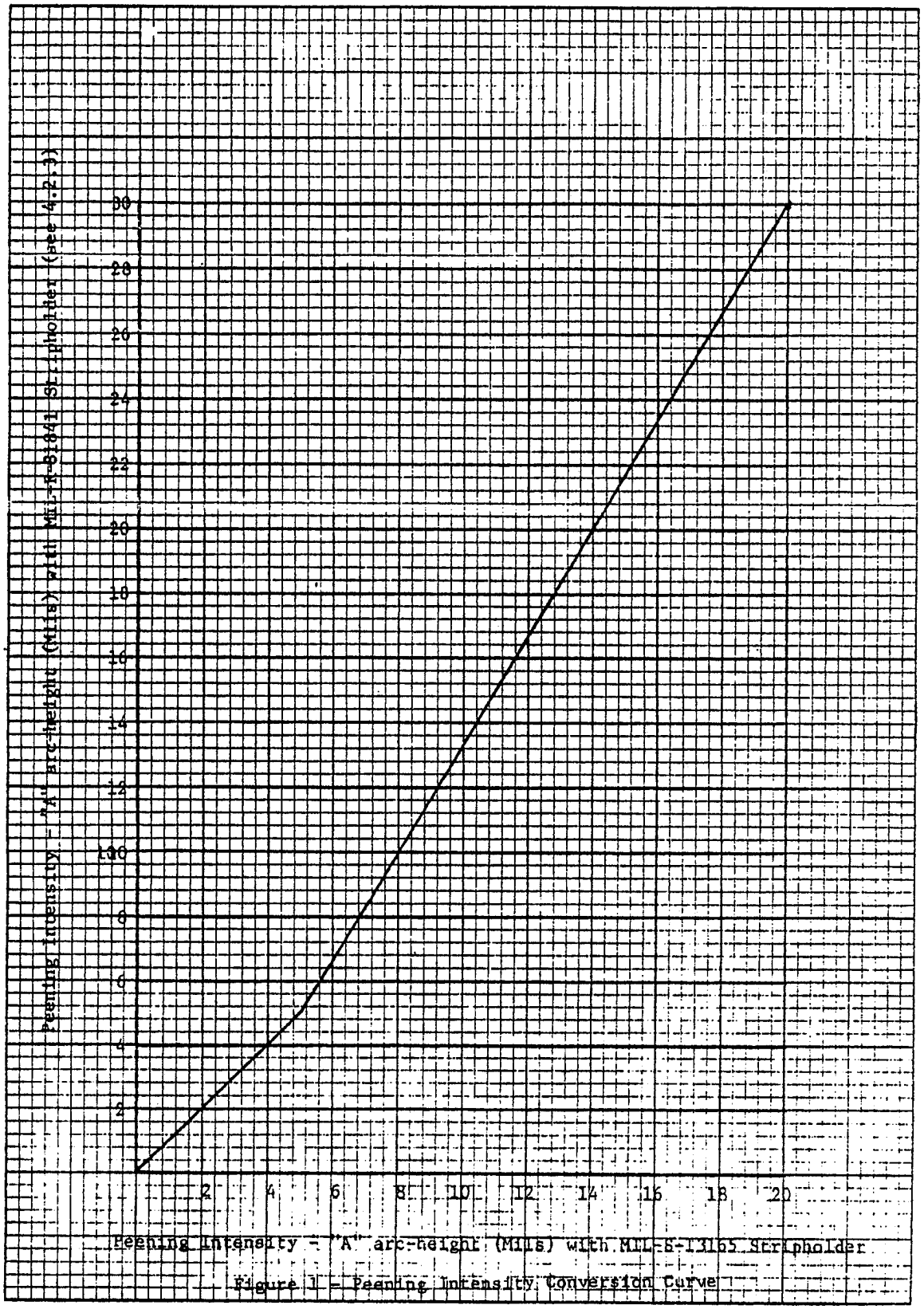

Figure 1 - Peening Intensity Conversion Curve

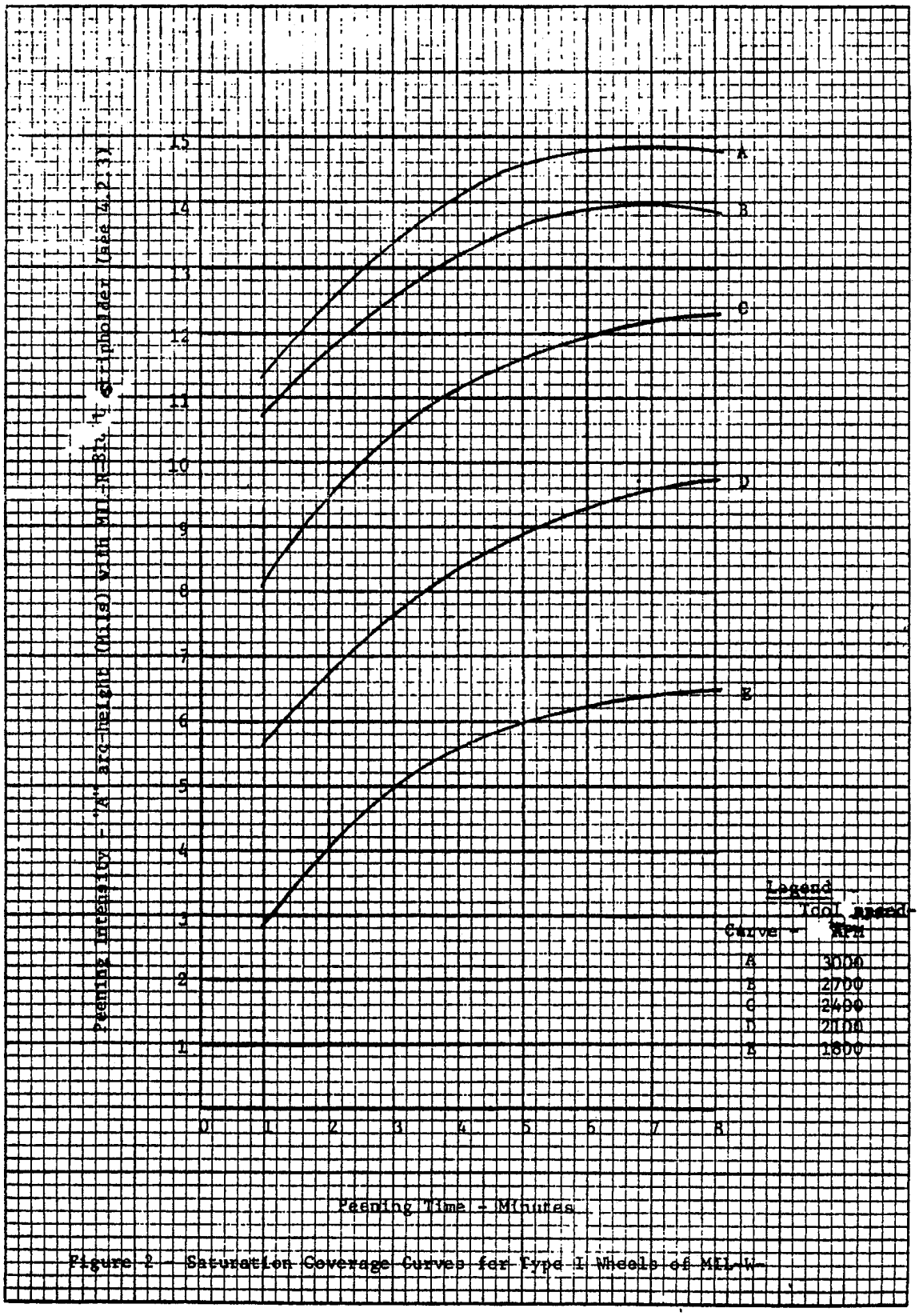

Figure 2 - Saturation Coverage Curves for Type I Wheels of MIL-H-

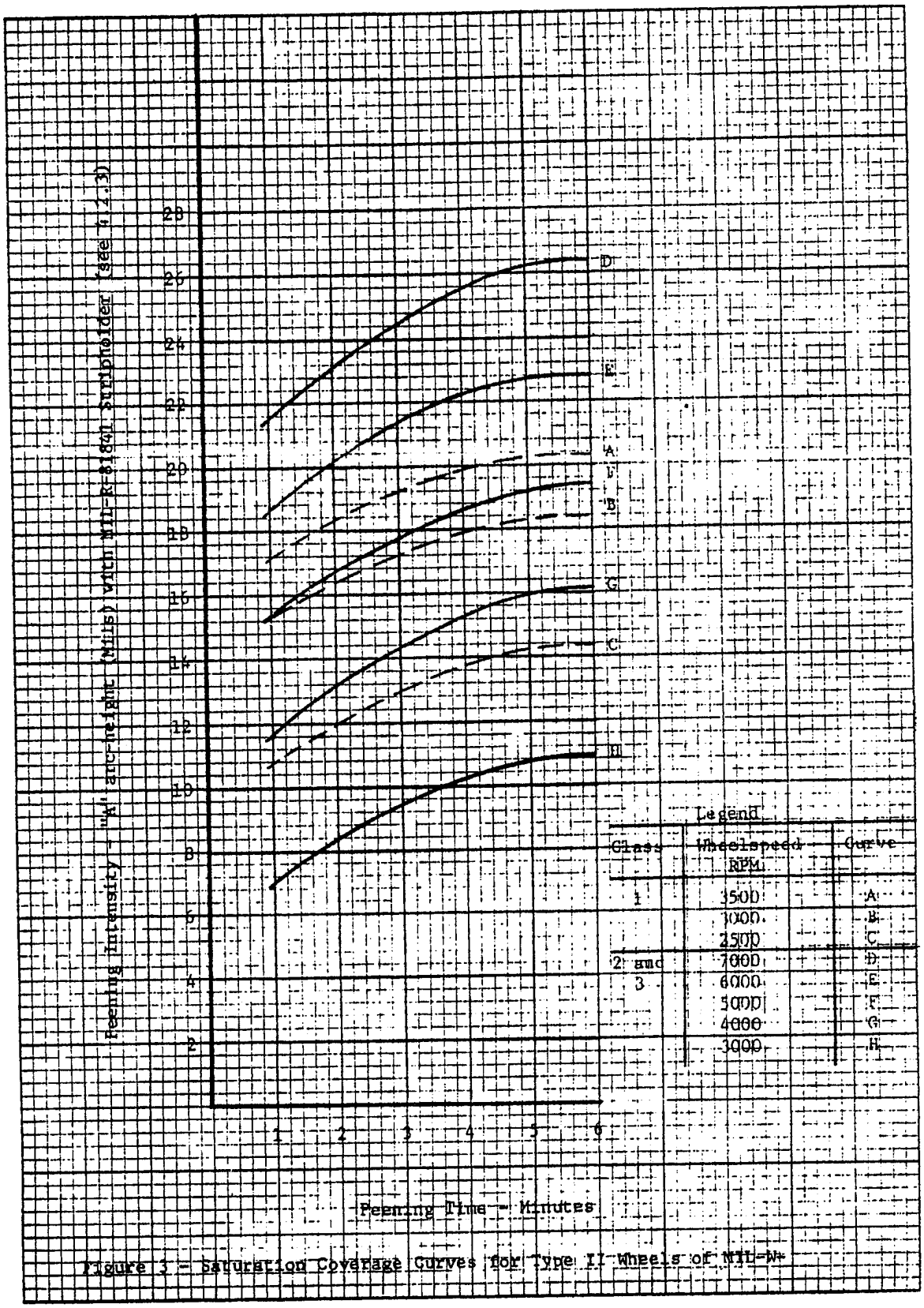

Figure 3 - Saturation Coverage Curves for Type II Wheels of MIL-W-

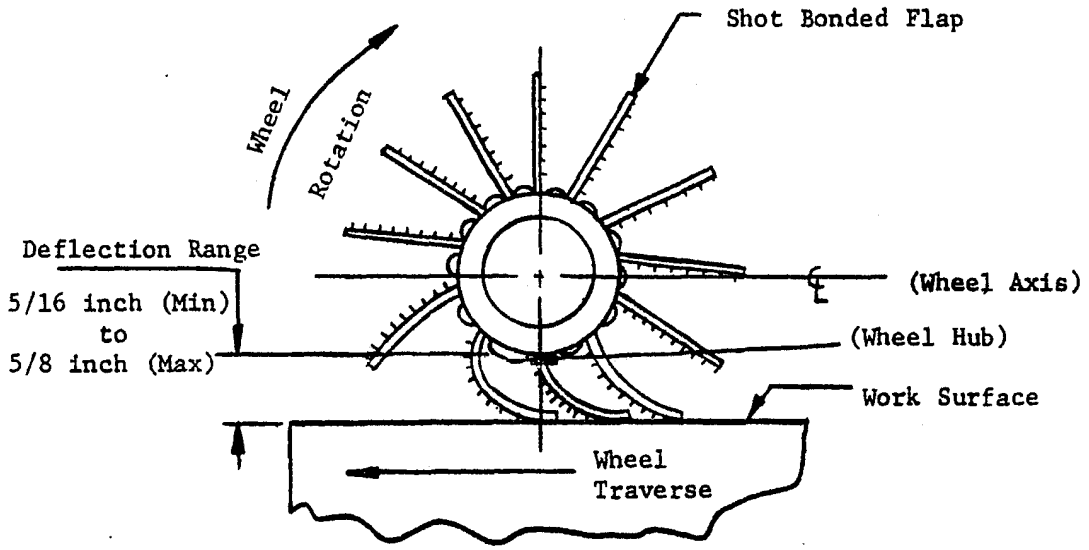

Figure 4 - Flap Deflection Range for Type I Wheel of MIL-W-81840

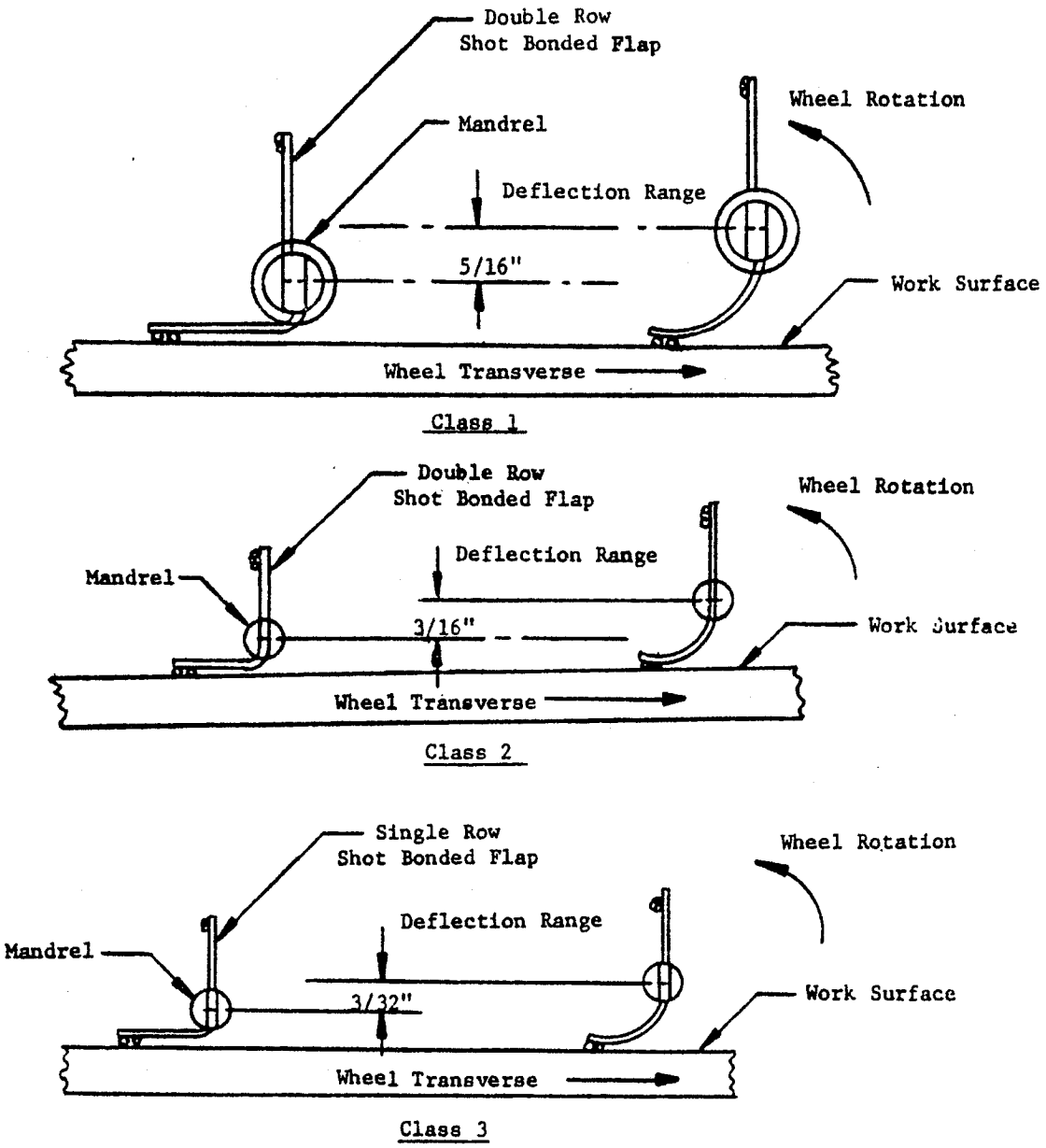

Figure 5 - Flap Deflection Ranges for Type II Wheels of MIL-W-81840

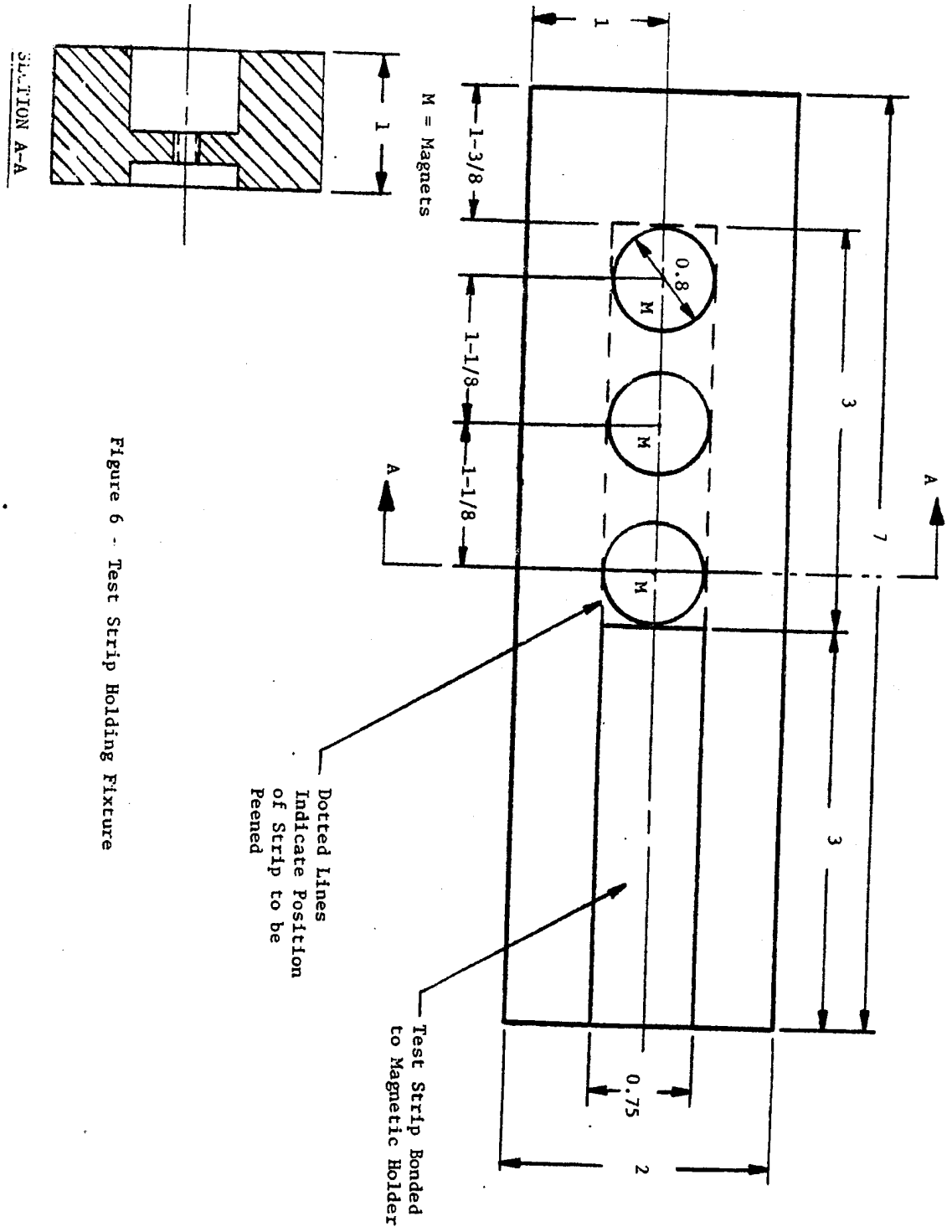

Figure 6 - Test Strip Holding Fixture

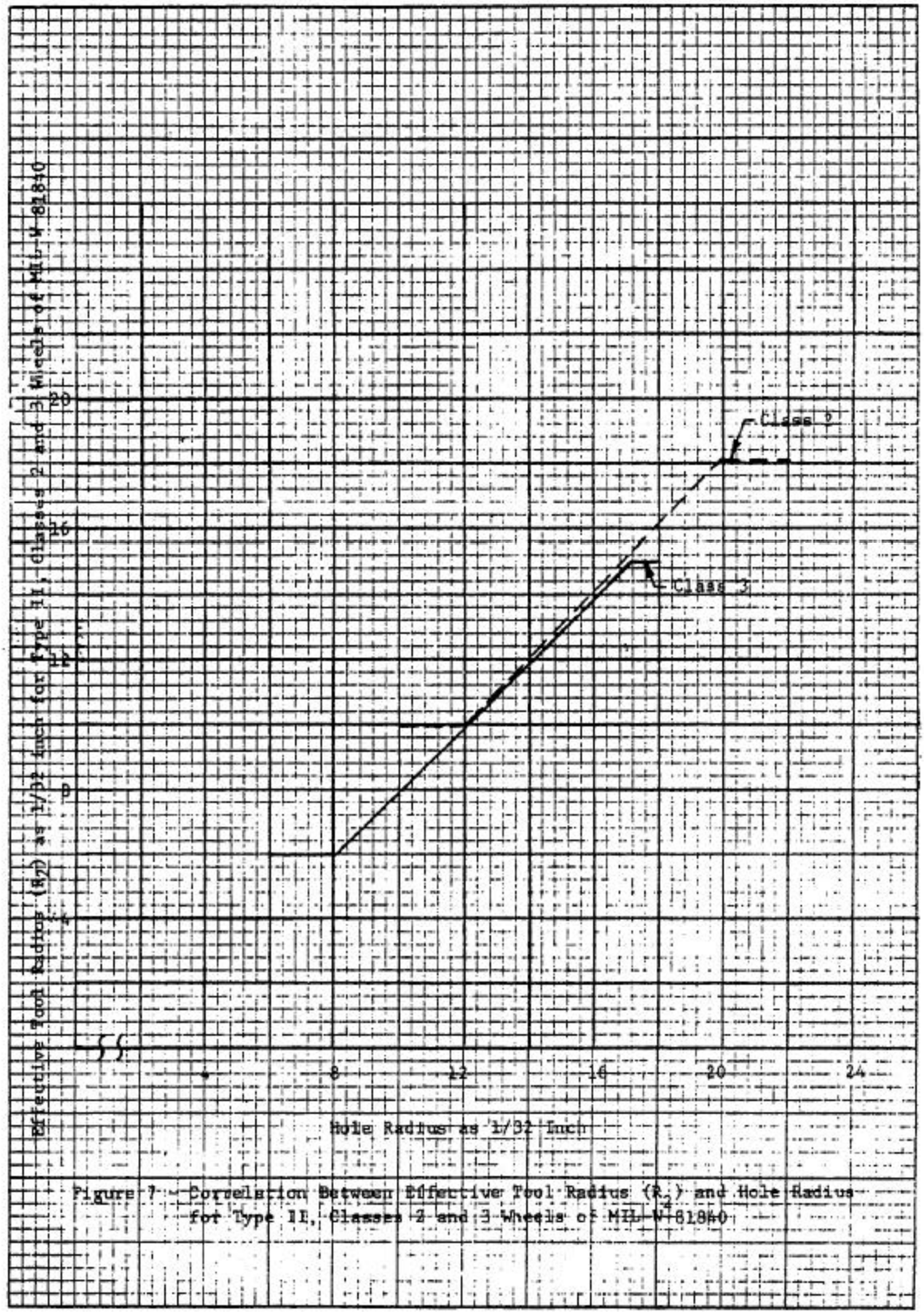

Figure 7 - Correlation Between Effective Tool Radius (R_t) and Hole Radius for Type II, Classes 2 and 3 Wheels of MIL-W-81840

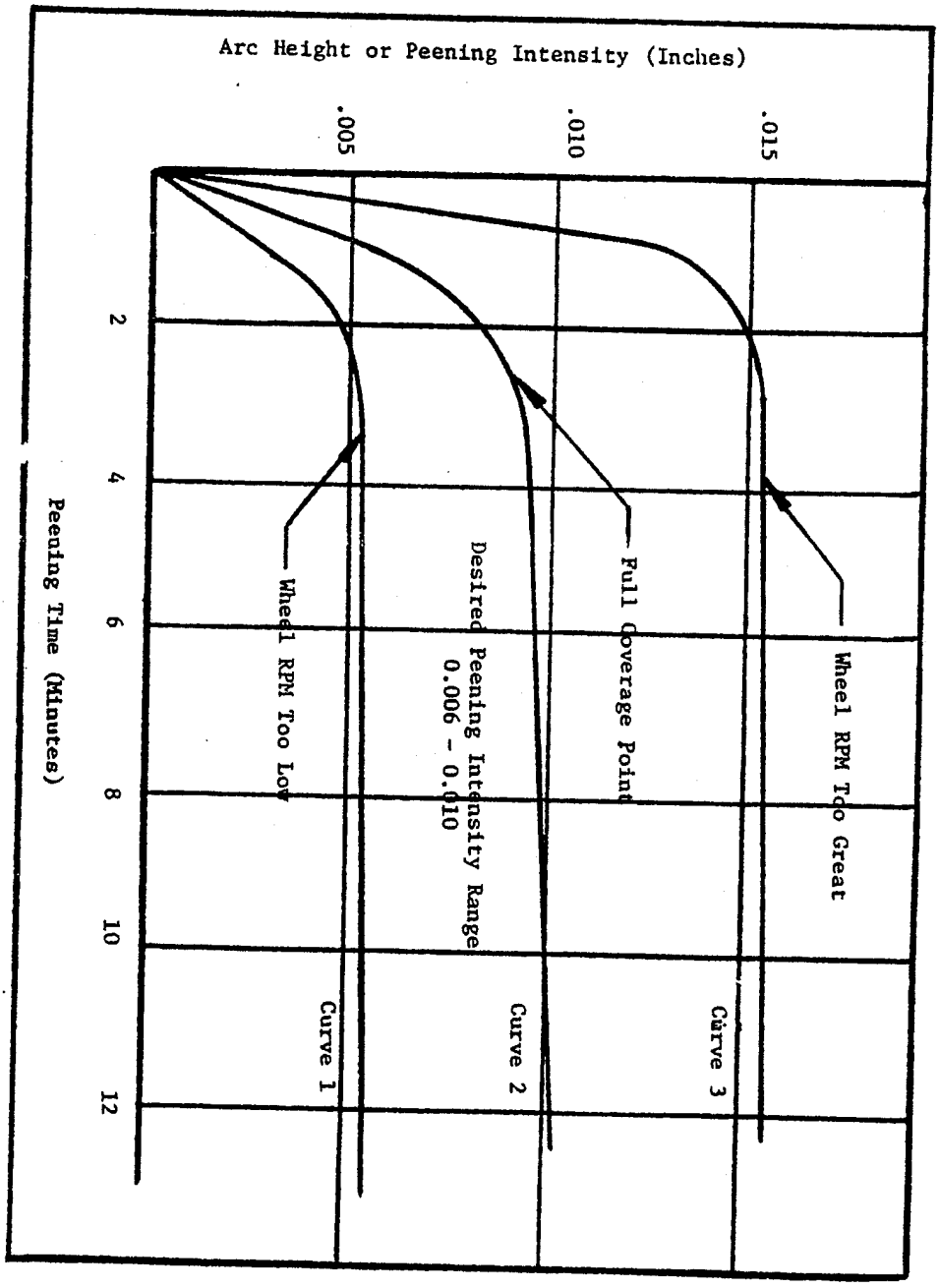

Figure 8 - 100% Coverage (Saturation) - Arc Height - Exposure Curve

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SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 22-R255

INSTRUCTIONS: This sheet is to be filled out by personnel either Government or contractor involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.

SPECIFICATION

MIL-R-81841 (AS) ROTARY FLAP PEENING OF METAL PARTS

ORGANIZATION

CITY AND STATE CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

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