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CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Schedule
of
METALLIZING SYMBOLS

This schedule is cancelled since it is no longer of significant interest to federal government agencies.



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CANADIAN GOVERNMENT SPECIFICATIONS BOARD

SCHEDULE

OF

METALLIZING SYMBOLS

23 - GP - 5A

14 NOVEMBER 1957

SUPERSEDES 23 - GP - 5

18 NOVEMBER 1949

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THIS SCHEDULE PROVIDES A STANDARD SET OF SYMBOLS BY WHICH METALLIZING INFORMATION CAN
BE CONVEYED FROM ONE LOCATION TO ANOTHER (E.G. FROM DESIGN OFFICE TO THE SHOP)
WITH ASSURANCE THAT THE SPECIFIED METALLIZING REQUIREMENTS WILL BE MET

NATIONAL RESEARCH COUNCIL, OTTAWA, CANADA

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CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Schedule
of

METALLIZING SYMBOLS

1. SCOPE

This schedule provides a standard set of symbols by which metallizing information can be conveyed from one location to another (e. g. from design office to the shop) with assurance that the specified metallizing requirements will be met.

These symbols are intended to specify the extent and nature of each operation of the metallizing process required. They are not intended to provide all details as to procedures to be used for each operation. Proper control of these operations should be carried out by the use of written proven procedures that are followed in the shop.

2. BASIC SYMBOLS

2.1 Elements of a Metallizing Symbol - A metallizing symbol shall consist of the following elements, or such of these elements as are necessary to prescribe the required operations.

Reference Line
Arrow
Surface Preparation Symbol
Dimensions and other data
Supplementary Symbols
Finish Symbols
Tail
Metallizing Designator (M)
Specification, process, or other references

2.2 Standard Location of Elements of a Metallizing Symbol - The elements of a metallizing symbol shall have standard locations with respect to each other as shown in Fig. 1.

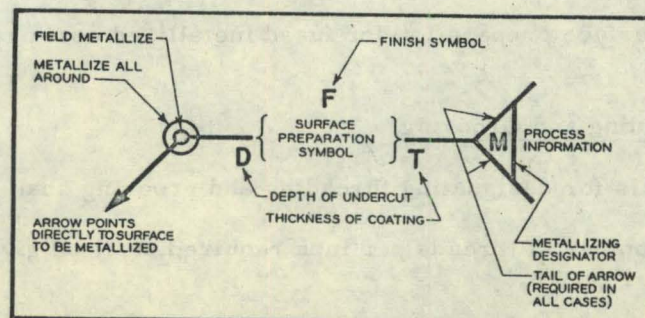


Fig. 1—Standard Location of Elements of a Metallizing Symbol

2.3 Location Significance of Arrow - The arrow of the metallizing symbol shall always touch the surface to be metallized. The area to be metallized shall be clearly indicated on the drawing by dimension lines or other suitable means.

2.4 Use of Inch and Degree Marks - Inch and degree marks may or may not be used, as desired.

2.5 Methods of Drawing Symbols - Symbols may be drawn mechanically, free-hand or rubber stamped, as desired.

3. SURFACE PREPARATION SYMBOLS

3.1 Undercutting

3.1.1 Symbols for designating undercutting shall be as shown in Fig. 2. An undercut to be made with a square shoulder shall be designated by the symbol shown in Fig. 2A. An undercut to be made with a dovetailed shoulder shall be designated by the symbol shown in Fig. 2B.

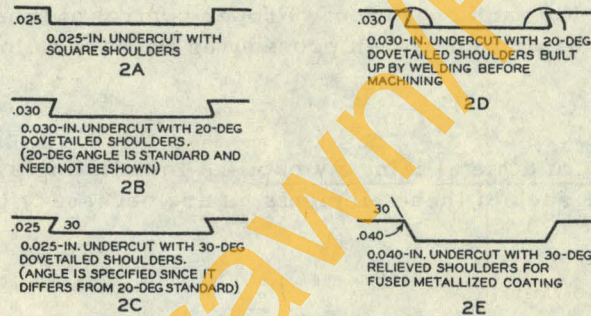


Fig. 2—Surface Preparation Symbols for Undercutting

3.1.2 The depth of undercut, in inches, shall always be shown to the left of the undercut symbol regardless of which side of the reference line the arrow is placed.

3.1.3 Undercuts to be made with dovetailed shoulders shall have a 20-degree angle unless otherwise dimensioned, as shown in Fig. 2C.

3.1.4 Where a shoulder is to be built up by welding prior to cutting, this shall be designated as shown in Fig. 2D.

3.1.5 The surface preparation for fused metallized coatings shall be as shown in Fig. 2E.

3.2 Threading and Grooving

3.2.1 Symbols for designating threading and grooving shall be as shown in Fig. 3.

3.2.2 The number of threads per inch required shall be given under the threading symbol as shown in Fig. 3A.

3.2.3 Where rough threading is required this shall be designated by placing the prefix R before the number of threads per inch as shown in Fig. 3B.

3.2.4 Standard groove dimensions shall be as shown in Fig. 3C. Surfaces prepared in this manner may be cut continuously like a screw thread, or by cutting a number of separate grooves side by side.

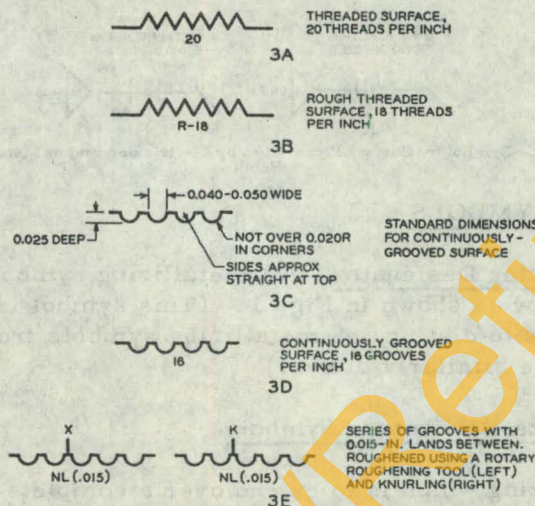


Fig. 3—Surface Preparation Symbols for Threading and Grooving

3.2.5 A continuously grooved surface shall be designated by the symbol shown in Fig. 3D. The groove dimensions shall be as shown in Fig. 3C, unless otherwise dimensioned. Dimensioning of the groove, when required, shall include the width, depth and radius. (The width of the land is determined by the number of grooves per inch.)

3.2.6 Surfaces to be prepared by cutting a number of separate grooves side by side shall be designated as shown in Fig. 3E. Since these grooves are essentially no-lead screw threads, the letters NL are to be inserted where the number of threads per inch would otherwise be specified. The width of land between the separate grooves shall also be specified.

3.2.7 Grooved or threaded surfaces which are to be further processed with a rotary roughening tool shall be designated by an X, as shown in Fig. 3E; further preparation by knurling shall be designated by a K, as shown in Fig. 3E.

3.3 Blasting

3.3.1 The symbol for designating blasting shall be as shown in Fig. 4.

3.3.2 The blasting procedure shall be indicated in the tail of the arrow or in notes.

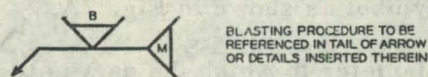


Fig. 4—Symbol for Surface Preparation by Blasting

3.4 Electric Bonding and Metallic Spray Bonding

3.4.1 The symbols for designating electric bonding and metallic spray bonding shall be as shown in Fig. 5A and 5B respectively with the letters EB or MSB inserted in the tail of the arrow.

3.4.2 Where a degree of roughness is required, this shall be designated in the tail of the arrow by use of the letters F (fine), M (medium), C (coarse) or other suitable means. (Fig. 5A.)

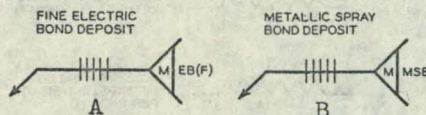


Fig. 5—Symbol for Surface Preparation by Electric Bonding or Metallic Spray Bonding

4. SUPPLEMENTARY SYMBOLS

4.1 Metallizing Designator - All metallizing symbols shall include an M located in the tail of the arrow as shown in Fig. 1. (This symbol is known as the metallizing designator and serves to distinguish metallizing symbols from welding symbols or other symbols which may be similarly drawn.)

4.2 Metallize-All-Around Symbol

4.2.1 Metallizing which is to extend over a complete surface between abrupt changes in dimension shall be designated by use of the metallize-all-around symbol, as shown in Fig. 6.

4.2.2 Where more than one surface of a member or part is to be metallized, each such surface shall be designated by a separate metallizing symbol showing the extent of metallizing, or by the use of arrows extending to each such surface from a common reference line.

METALLIZE ALL AROUND	FIELD METALLIZE	MACHINE FLAT

* INDICATE HERE WHETHER GROUND (G), MACHINED (M), WIRE BRUSHED (WB) OR BUFFED (B)

Fig. 6—Supplementary Symbols

4.3 Field Metallize Symbol - Metallizing to be done on a member or part which is installed and in service shall be designated by use of the field metallize symbol shown in Fig. 6.

4.4 Thickness of Sprayed Metal

4.4.1 The thickness of the sprayed metal coating shall be placed to the right of the surface preparation symbol as shown in Fig. 7A.

4.4.2 Where the diameter to which the part is to be built up, rather than the thickness of coating, is to be specified, this dimension shall be placed to the right of the surface preparation symbol followed by the letter D as shown in Fig. 7B.

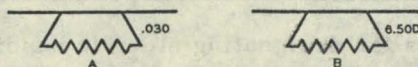


Fig. 7—Thickness of Coating

4.5 Finishing Symbols

4.5.1 All metallized surfaces shall be left as metallized unless the machined flat symbol shown in Fig. 6 is used.

4.5.2 Where the machined flat symbol is used it shall be placed above the surface preparation symbol, as shown in Fig. 8, together with one of the following letters designating how the surface is to be finished: G - Ground; M - Machined; WB - Wire Brushed; B - Buffed.

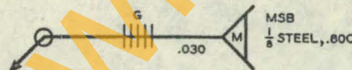


Fig. 8—Use of Finishing Symbol

4.6 Procedure Information - The procedure to be followed in metallizing, including wire size, rate of spraying, type of flame, and spraying distance shall be identified by placing a reference in the tail of the arrow to that procedure. Alternatively, all details of the procedure may be placed directly in the tail of the arrow.

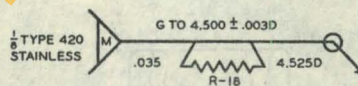
5. APPLICATIONS

Figures 9 through 13 illustrate typical examples of the application of standard metallizing symbols.



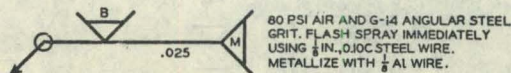
This symbol specifies: No undercut. Metallic spraybond surface preparation. Spray all around with 1/8 in. diam., 0.80 carbon steel wire to a thickness of 0.030 in. Finish by grinding.

Fig. 9—Example of Use of Metallizing Symbols



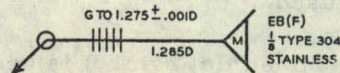
This symbol specifies: 0.035-in. undercut. Rough threading, 18 threads per in. 20-deg dovetailed shoulders. Spray to 4.525 in. diam. with 1/8-in., Type 420 stainless steel wire. Grind to 4.500 ± 0.003-in diam.

Fig. 10—Example of Use of Metallizing Symbols



This symbol specifies: Pressure blast with 80 psi air and G-14 angular steel grit. Flash spray immediately after blasting using 1/8-in., 0.10 C steel wire. Metallize all around 0.025-in. thick with 1/8-in. aluminum wire.

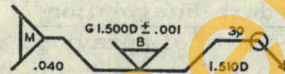
Fig. 11—Example of Use of Metallizing Symbols



This symbol specifies: No undercut. Electric bond (fine) surface preparation. Spray all around to 1.285-in. diam. with $1/8$ -in., Type 304 stainless steel wire. Finish grind to 1.275 ± 0.001 diam.

Fig. 12—Example of Use of Metallizing Symbols

GRIT BLAST WITH 25-MESH ANGULAR STEEL GRIT. PREHEAT TO 600F, BUILDUP WITH NO. 66 ALLOY POWDER, FUSE WITH OXY-ACETYLENE TORCH



This symbol specifies: Undercut 0.040-in. deep with 30 deg. relieved shoulders. Grit blast with 25 mesh angular steel grit. Buildup to 1.510-in. with powder metallizing using number 66 alloy after preheating to 600° F. Fuse with oxyacetylene flame. Finish grind to 1.500 ± 0.001 diameter.

Fig. 13—Example of Use of Metallizing Symbols

Correspondence regarding this schedule should be addressed to the Secretary, Canadian Government Specifications Board, National Research Council, Ottawa 2, Canada.