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CANCELLATION
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CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Schedule

of

RECOMMENDED METHODS FOR INSPECTION
OF METALLIZING

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

RECOMMENDED METHODS FOR INSPECTION OF METALLIZING

23-GP-8

6 AUGUST 1953

ARCHIVES COPY

THIS SCHEDULE DESCRIBES THE METHODS RECOMMENDED FOR THE INSPECTION OF PRACTICES EMPLOYED IN PREPARING BASE MATERIALS AND APPLYING METALLIZED COATINGS.

NATIONAL RESEARCH COUNCIL, OTTAWA, CANADA

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6 August 1953.

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Schedule
ofRecommended Methods
for

INSPECTION OF METALLIZING

1. DEFINITION

This schedule describes the methods recommended for the inspection of practices employed in preparing base materials and applying metallized coatings.

2. APPLICABLE PUBLICATIONS

The following publications form an important part of this schedule:

2.1 23-GP-3: Schedule of Recommended Methods for Metallizing Shafts or Similar Objects.

2.2 23-GP-4: Code for Metallizing Operators' Qualification Procedure.

2.3 23-GP-7: Schedule of Safety Recommendations for Metallizing.

3. OPERATORS' QUALIFICATION

All operators of metallizing equipment shall produce evidence that they have successfully complied with the test requirements of Code 23-GP-4: "Metallizing Operators' Qualification Procedure".

4. PRECLEANING OF SURFACE

The area to be metallized and the adjacent areas shall be clean and free from moisture, oil, absorbed oil, scale and oxides or other foreign matter. (Cleaning may be done by the use of heat, chemical solvents, sand blasting, wire brushing, grinding, etc. See Schedule 23-GP-3).

5. UNDERCUTTING

5.1 Shaft Application - For shaft applications that require undercutting, such undercutting shall comply with the recommendations of Table I, as follows:

TABLE I - RECOMMENDED DEPTHS OF UNDERCUT

Diameter of Shaft (In.)	Depth of Undercut Measured on Radius for Various Types of Service. (In.)		
	CLASS A SERVICE ^a	CLASS B SERVICE ^b	CLASS C SERVICE ^c
Under 1		0.020	0.010
1 to 2	0.040	0.030	0.010
2 to 4	0.050	0.040	0.010
4 to 6	0.060	0.050	0.020
Over 6	0.070	0.060	0.020

^aClass A Service: For shafts or journals operating under a heavy bearing load such as diesel crankshafts or rolling mill journals; for pump sleeves, piston rods and hydraulic rams subject to severe service and high pressure; where a maximum safety factor is required.

^bClass B Service: For normal duty lubricating bearing service; for standard pressure pump rods and sleeves, where a normal safety factor is required.

^cClass C Service: For restoring a shaft to size where a gear, flange wheel or other part will be pressed on and the sprayed surface will not act as a bearing.

The values given above do not apply where the metallic spray bonding method is used, since undercutting may not always be required with metallic spray bonding.

6. SURFACE PREPARATION

6.1 The inspector should inspect all surface roughening with a 10X magnifying glass and shall compare the roughened surface with master photographs as illustrated in Figures 1 to 5.

6.2 Abrasives - If blasting methods are used for surface roughening, the inspector shall inspect the abrasive to insure that it is clean, dry, sharp and angular. Generally, the recommended abrasives are angular steel grit, aluminum oxide, angular quartz, or flint sand. The size of the abrasive shall be equivalent to G14, G18, G25 as defined by S.A.E. Blast Cleaning Grit Numbers and screening tolerances contained in Table II. River sand, beach sand, or sand containing salt, loam or foreign matter shall not be permitted, neither shall wet sand or soft crushed rock be used.

7. WIRE SPEED

The spraying speed shall not exceed that recommended by the manufacturer of the metallizing gun being used nor shall it be less than 80% of that speed. By calculation the inspector may compute the spraying speed in seconds per foot of wire through the gun, by means of the following formula:

$$M = \frac{3600W}{x}$$

Where M = metal sprayed, lb./hr.
W = weight of wire, lb./ft. (See Table III Page 4)
x = time in sec. to feed one ft. of wire.
3600 = number of sec. per hr.

TABLE II - BLAST CLEANING GRIT NUMBERS AND SCREENING TOLERANCES

Grit Number	High Limit Screen		Nominal Screen		Low Screen Limit	
	Grit Retained Per Cent Max.	Screen Number and Aperture	Grit Retained Per Cent Max.	Screen Number and Aperture	Grit To Pass Per Cent, Max.	Screen Number and Aperture
G 10	0	7(.111)	80	10(.0787)	10	12(.0661)
G 12	0	8(.0937)	80	12(.0661)	10	14(.0555)
G 14	0	10(.0787)	80	14(.0555)	10	16(.0469)
G 16	0	12(.0661)	75	16(.0469)	15	18(.0394)
G 18	0	14(.0555)	75	18(.0394)	15	25(.0280)
G 25	0	16(.0469)	70	25(.0280)	20	40(.0165)
G 40	0	18(.0394)	70	40(.0165)	20	50(.0117)
G 50	0	25(.0280)	65	50(.0117)	25	80(.0070)
G 80	0	40(.0165)	65	80(.0070)	25	120(.0049)
G 120	0	50(.0117)	60	120(.0049)	30	200(.0029)
G 200	0	80(.0070)	55	200(.0029)	35	325(.0017)
G 325	0	120(.0049)	20	325(.0017)	--	-----

Percentages given are on the basis of weight as determined by tests under SAE Recommended Practice, Shot for Peening, in the 1947 edition of the SAE Handbook.

TABLE III - WEIGHT OF WIRE

TYPE OF WIRE	11 Ga.		1/8"		3/16"	
	lb/ft.	ft/lb.	lb/ft.	ft/lb.	lb/ft.	ft/lb.
Aluminum	.00750	133.33	.01410	70.92	.03173	31.52
Babbitt Tin Base	-	-	.03960	25.25	.08910	11.22
Babbitt Lead Base	-	-	.05000	20.00	.11250	8.89
Machineable Brass	.02410	41.49	.04550	21.98	.10238	9.77
Naval Brass (Tobin Bronze)	.02410	41.49	.04550	21.98	.10238	9.77
Commercial Bronze	.02300	43.48	.04320	23.15	.09720	10.29
Manganese Bronze	.02366	42.26	.04447	22.49	.10058	9.94
Phos. Bronze	.02500	40.00	.04730	21.14	.10643	9.39
Alum. Bronze	.02060	48.54	.03910	25.58	.08800	1.14
Copper	.02520	39.68	.04740	21.10	.10665	9.38
Lead (chemically pure)	-	-	.06050	16.53	.13613	7.35
Nickel	.02430	41.15	.04580	21.83	.10305	9.70
Nickel Copper Alloy (Monel)	.02520	39.68	.04750	21.05	.10688	9.36
Carbon Steel	.02220	45.04	.04170	23.98	.09383	10.66
13% Chromium Steel	.02220	45.04	.04170	23.98	.09383	10.66
18-8 Stainless	.02220	45.04	.04170	23.98	.09383	10.66
Tin	-	-	.03920	25.51	.08820	11.34
Zinc	.02000	50.00	.03760	26.60	.08460	11.82

8. SPRAYING PROCEDURE

The spraying procedure shall be in accordance with recommended practices as given in Para. 3 of Schedule 23-GP-3: Recommended Practices for Metallizing Shafts or Similar Objects, noting that gun is held 3 to 10 in. away, depending on equipment and size of wire used.

9. FINISHING PROCEDURE

The finishing procedure shall be in accordance with the recommended practices given in Para. 4 of Schedule 23-GP-3: Recommended Practices for Metallizing Shafts or Similar Objects.

10. SAFETY PRECAUTIONS

The inspector should insure that metallizing operators comply with all safety recommendations given in Schedule 23-GP-7: Safety Recommendations for Metallizing. The inspector should check that at the time of the lighting of the gun, the gun is directed away from the work.

PREPARATION METHOD

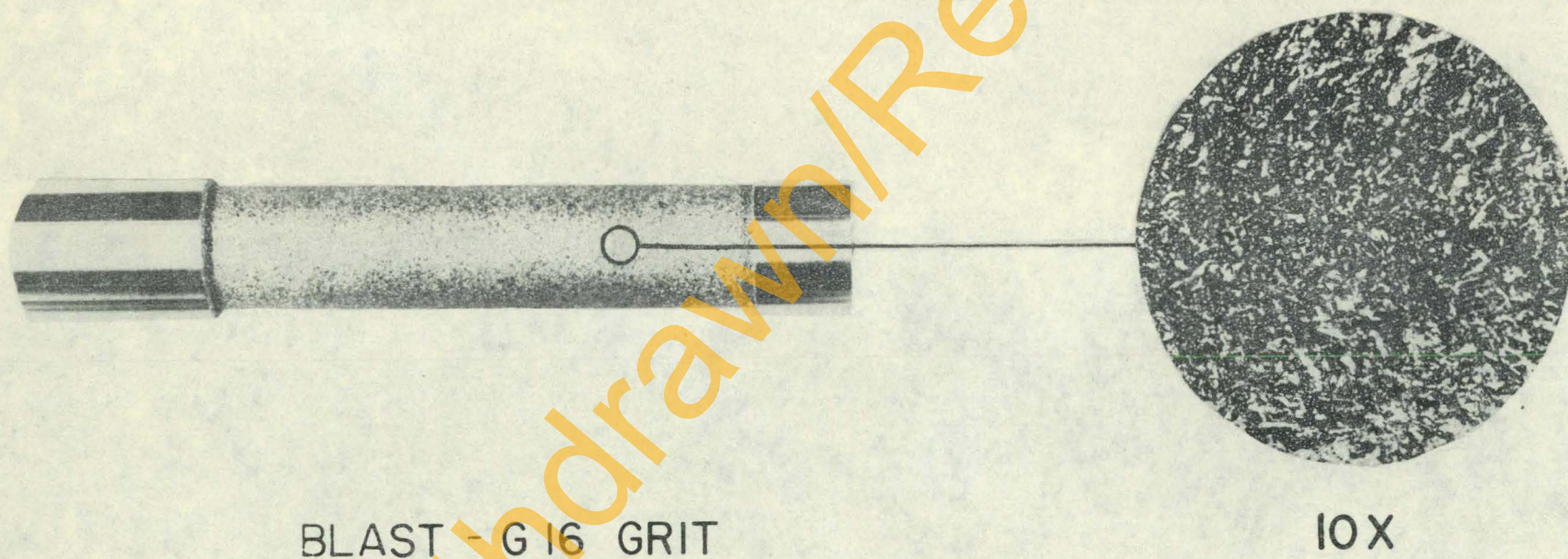
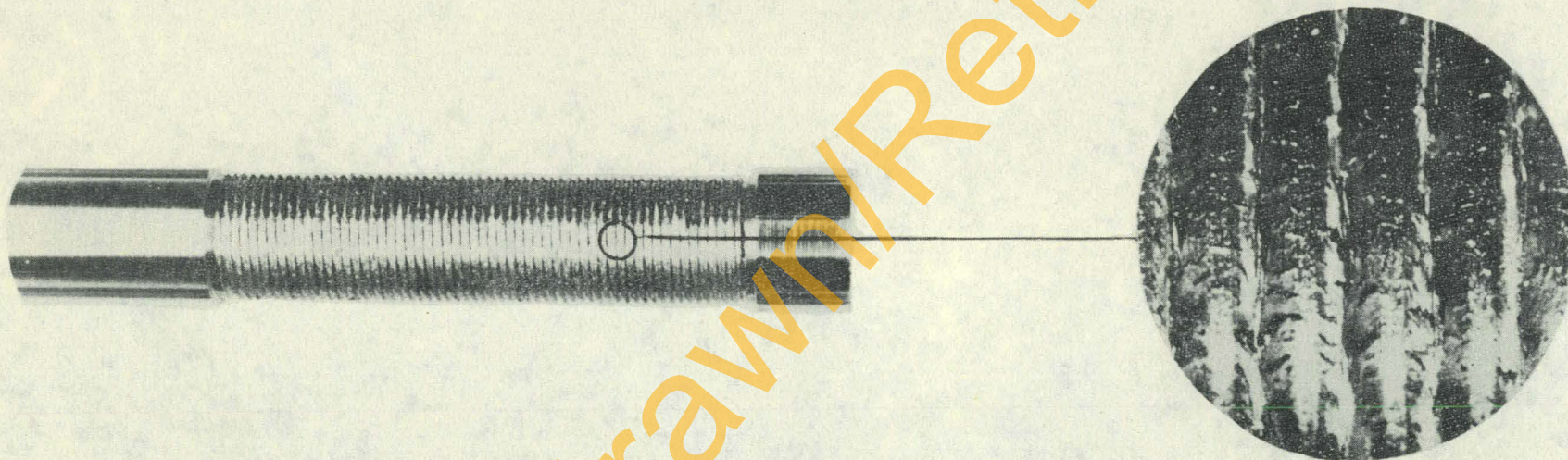


FIG 1

PREPARATION METHOD

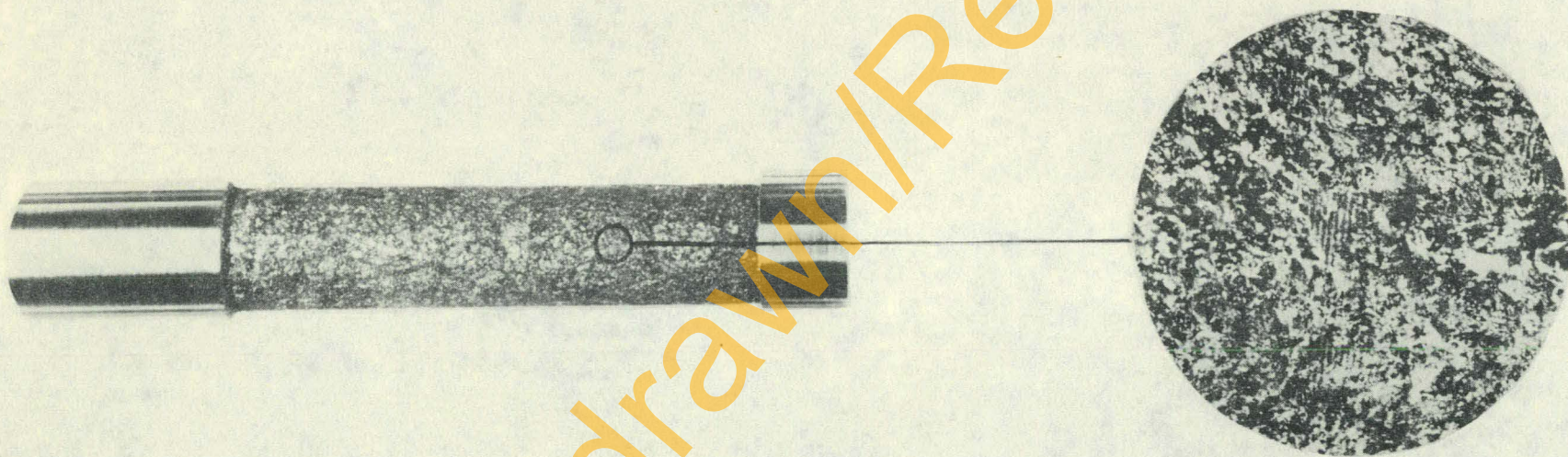


ROUGH THREAD - 20 THDS./IN.

10X

FIG 2

PREPARATION METHOD

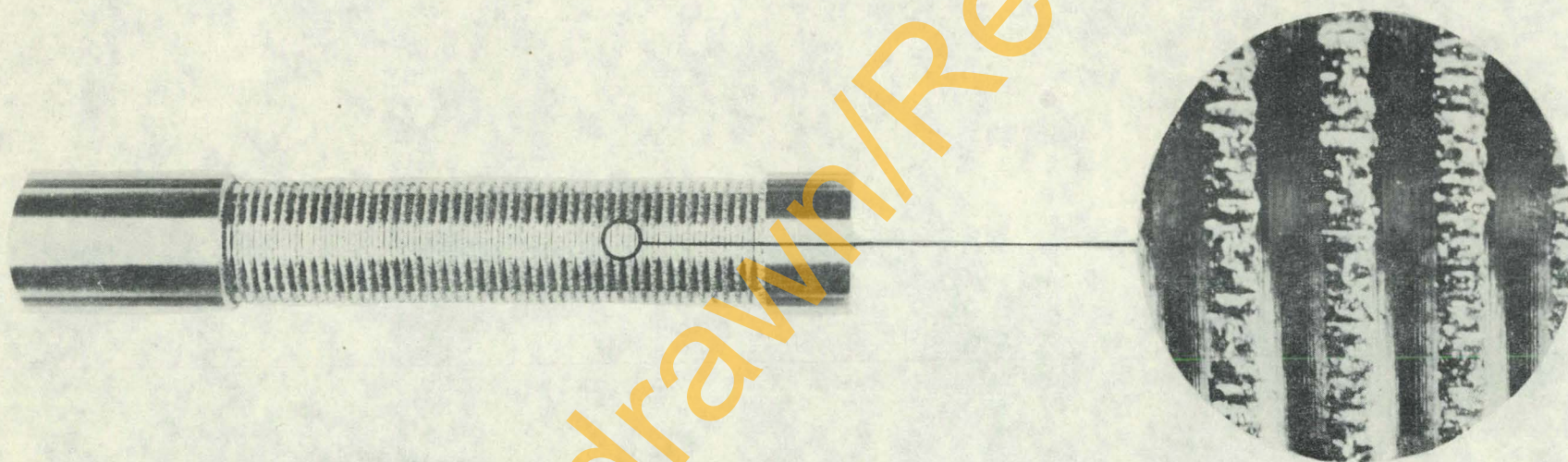


ELECTRIC BONDING 1 & 3 TAPS
(Over rough cut surface)

10X

FIG 3

PREPARATION METHOD



GROOVING PLUS ROTARY SHAFT
PREPARATION TOOL

10X

FIG 4