

MIL-STD-289A
2 December 1968

SUPERSEDING
MIL-STD-289
26 August 1955

MILITARY STANDARD
VISUAL INSPECTION GUIDE
FOR
RUBBER SHEET MATERIAL



MIL-STD-289A
2 December 1968

DEPARTMENT OF DEFENSE
WASHINGTON, D.C. 20301

VISUAL INSPECTION GUIDE FOR RUBBER SHEET MATERIAL

MIL-STD-289A

1. This Military Standard is mandatory for use by all Departments and Agencies of the Department of Defense.

2. Recommended corrections, additions, or deletions should be addressed to the Naval Ship Engineering Center, Department of the Navy, Washington, D. C. 20360.

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FOREWARD

Government material procurement specifications have been primarily concerned with detailing composition, construction and necessary physical requirements. This document is issued as a practical yardstick which inspectors will use to appraise visually the quality of rubber material. In such a diverse industry as that of rubber manufacturing, individual plants vary considerably in their production and quality control techniques. Defects are likely to occur from many causes such as variation in the quality of the basic materials, manufacturing processes, finishing operations, and stowage conditions. Therefore, the quality generalizations used in this document must of necessity cover a considerable range which represents the best available judgement.

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1. SCOPE

1.1 Scope. This document covers only visual defects for conventional rubber sheet material, from which gaskets, and similar items are cut. This standard is not applicable to cellular rubber, coated fabrics, cast plastisol, or latex films.

1.2 Purpose. The primary objective of this document is to present word descriptions and photographs of possible defects in rubber sheet material that may be presented for inspection. In addition it provides a training aid for inspectors.

1.2.1 In general, this document is not intended to take the place of a particular inspection procedure aid which may be provided for inspectors to verify conformance with a particular specification. The quality requirements specified in the basic specification are governing.

2. REFERENCED DOCUMENTS

2.1 The issues of the following documents in effect on the date of invitation for bids form a part of this standard to the extent specified herein.

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-177 - Rubber Products, Terms for Visible Defects of.
- MIL-STD-190 - Identification Marking of Rubber Products.

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. DEFINITIONS

3.1 Defects. The categories, major and minor defects, are as defined in MIL-STD-105.

3.2 Word descriptions. Word descriptions of visible defects used in this standard are in accordance with MIL-STD-177.

4. GENERAL

4.1 Enlarged photographs of representative major and minor defects are included to aid the inspectors. All photographs are listed in order in Table I (Figures Showing Defects and Classification). Table II, (Classification of Visual Defects) is indexed according to type of defect, classification of defect (major or minor), and figure number.

4.2 This standard includes photographs of only the most common surface defects that might occur during fabrication. It is not feasible to obtain examples of all possible defects, the defects mentioned in this standard do not abrogate requirements of a particular specification, contract or order.

5. DETAIL REQUIREMENTS

5.1 Sampling. All sheet material shall be subjected to one or more MIL-STD-105 sampling procedures, as specified by the purchaser, except where the material specification includes a sampling procedure.

5.2 Identification marking. Unless otherwise specified, identification marking shall conform to MIL-STD-190.

5.3 Rejection. Acceptance or rejection of a lot, sub-lot, or batch shall be on the same basis as 5.1. It is recognized that the rejection of a long length of material for one defect may result in an appreciable increase in the cost of production not commensurate with the degree of protection afforded the user. Therefore, provided the concurrence of the technical agency or service concerned (on primes) or the endorsing inspection service (on subs) is obtained, it will be permissible to make a complete transverse cutout to remove major defective materials. Unless otherwise specified, no piece in the roll shall be less than five feet long and there shall be no more than three separate pieces in any one roll.

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Table I - Figures Showing Defects and Classification.

Figure	Defects and Classification
1	Pock mark - major.
2	Pock mark - slightly deeper than a cloth impression - minor.
3	Surface void - face stock missing - major.
4	Surface void - slightly rougher than a cloth impression - minor.
5	Moisture pocket - face stock missing - major.
6	Pick-off - face stock missing - major.
7	Trapped air - face stock missing - major.
8	Trapped air - face stock missing - major.
9	Pricker marks - no internal voids - minor.
10	Liner wrinkle - major.
11	Overlap liner wrinkle - major.
12	Liner wrinkle - minor.
13	Stuck liner - major.
14	Stuck liner - slightly rougher than a cloth impression - minor.
15	Press change (liner) - major.
16	Press change - pattern slightly out of phase - not a defect.
17	Air blister (peg used to accentuate) - major.
18	Broken blister - major.
19	Collapsed blister (void) - major.
20	Heat blister - major.
21	Folded over blister - major.
22	Surface blemish - no voids or protrusions - not a defect.
23	Fold over - major.
24	Surface lumps - major.
25	Foreign material - major.
26	Foreign material - major.
27	Misplaced fabric (top view) - major.
28	Misplaced fabric (end view) - major.
29	Porosity (top view) - major.
30	Porosity (end view) - major.
31	Delamination (end view) - major.
32	Delamination (end view) - major.

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Table II - Classification of Visual Defects.

Defect	Major	Minor	Figure Number
Pock mark	X		1
Pock mark - slightly deeper than a cloth impression		X	2
Surface void - face stock missing	X		3
Surface void - slightly rougher than a cloth impression		X	4
Moisture pocket - face stock missing	X		5
Moisture pocket - face stock missing (small)		X	Not shown but see Figure 9 for size
Pick-off - face stock missing	X		6
Pick-off - face stock missing (small)		X	Not shown but see Figure 9 for size
Trapped air - face stock missing	X		7 and 8
Trapped air - slightly rougher than a cloth impression		X	Not shown
Pricker marks - no internal voids		X	9
Liner wrinkle	X		10
Liner wrinkle - fine surface lines		X	12
Overlap liner wrinkle	X		11
Stuck liner	X		13
Stuck liner - slightly rougher than a cloth impression		X	14
Press change (liner)	X		15
Press change (liner) slightly rougher than a cloth impression		X	Not shown
Press change - pattern slightly out of phase	Not a defect		16
Press change - pattern completely out of phase	X		Not shown
Air blister (delamination)	X		17
Broken blister	X		18
Broken blister - slightly rougher than a cloth impression		X	Not shown
Collapsed blister (void)	X		19
Collapsed blister (void) - slightly rougher than a cloth impression		X	Not shown
Heat blister	X		20
Heat blister - slightly rougher than a cloth impression		X	Not shown
Folded over blister	X		21
Folded over blister - slightly rougher than a cloth impression		X	Not shown
Surface blemish - cured down blister. No voids or protrusions	Not a defect		22
Fold over	X		23
Fold over - slightly rougher than a cloth impression		X	Not shown
Surface lump	X		24
Surface lump - slightly rougher than a cloth impression		X	Not shown
Foreign material	X		25 and 26
Foreign material (small)		X	Not shown but see Figure 9 for size
Misplaced or broken fabric	X		27 and 28
Porosity, any degree	X		29 and 30
Delamination, any degree	X		31 and 32
Misidentification	X		Not shown

Custodians:
 Army - MR
 Navy - SH
 Air Force - 11

Preparing activity:
 Navy - SH
 (Project 9320-0104)

Review activities:
 Army - MR, WC
 Navy - SH
 Air Force - 11, 82

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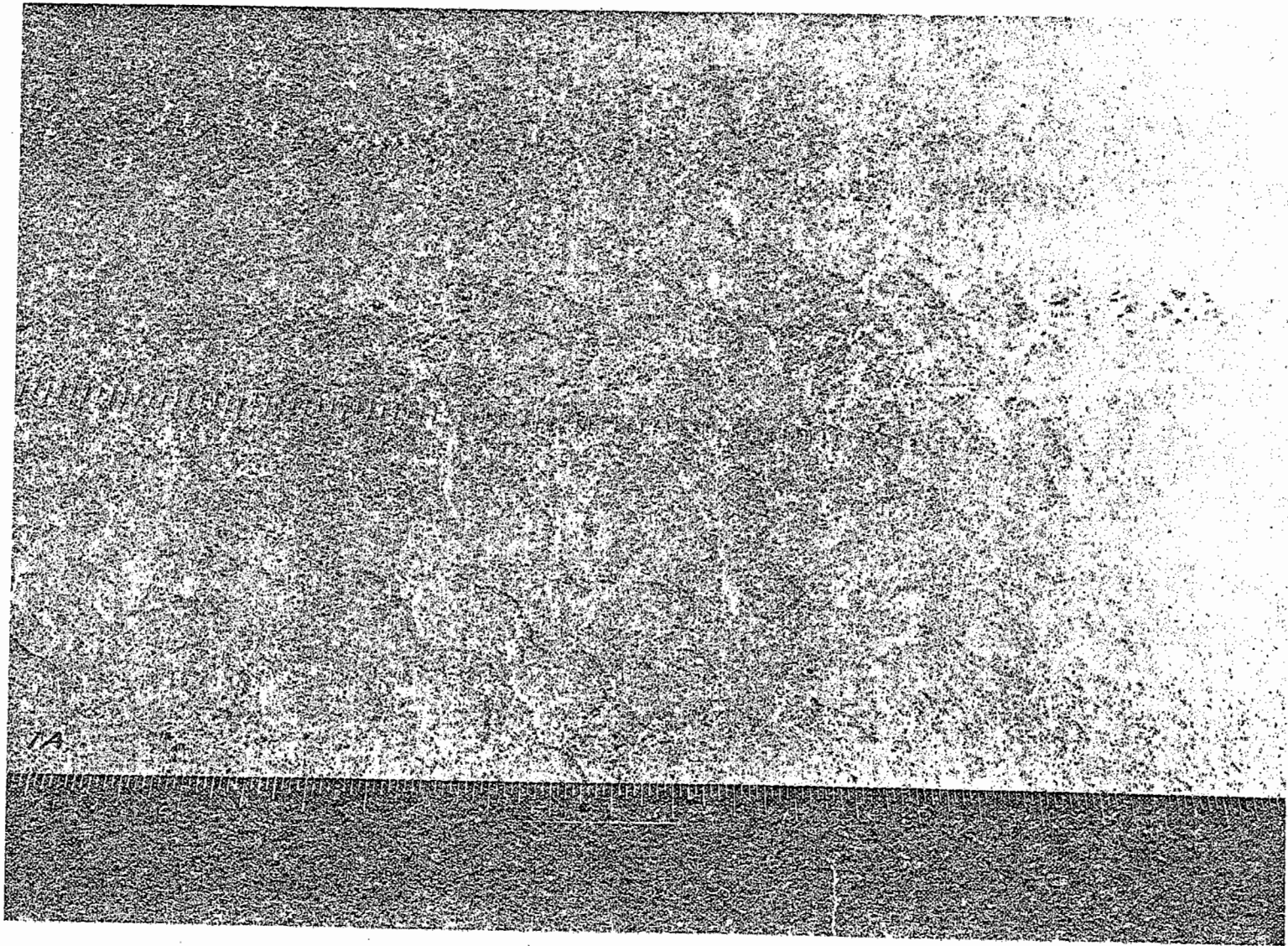


Figure 1 - Pock mark - major.



Figure 2 - Pock mark - slightly deeper than a cloth impression - minor.

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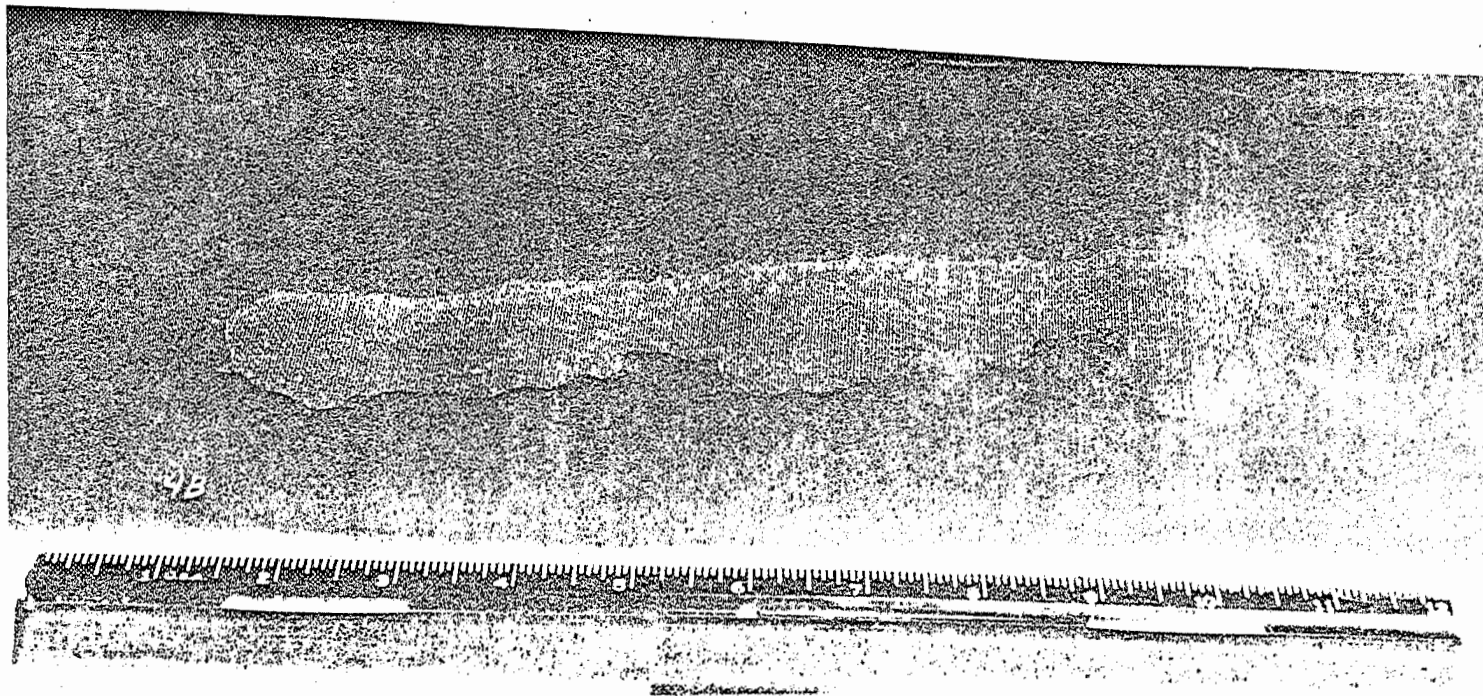


Figure 3 - Surface void - face stock missing - major.

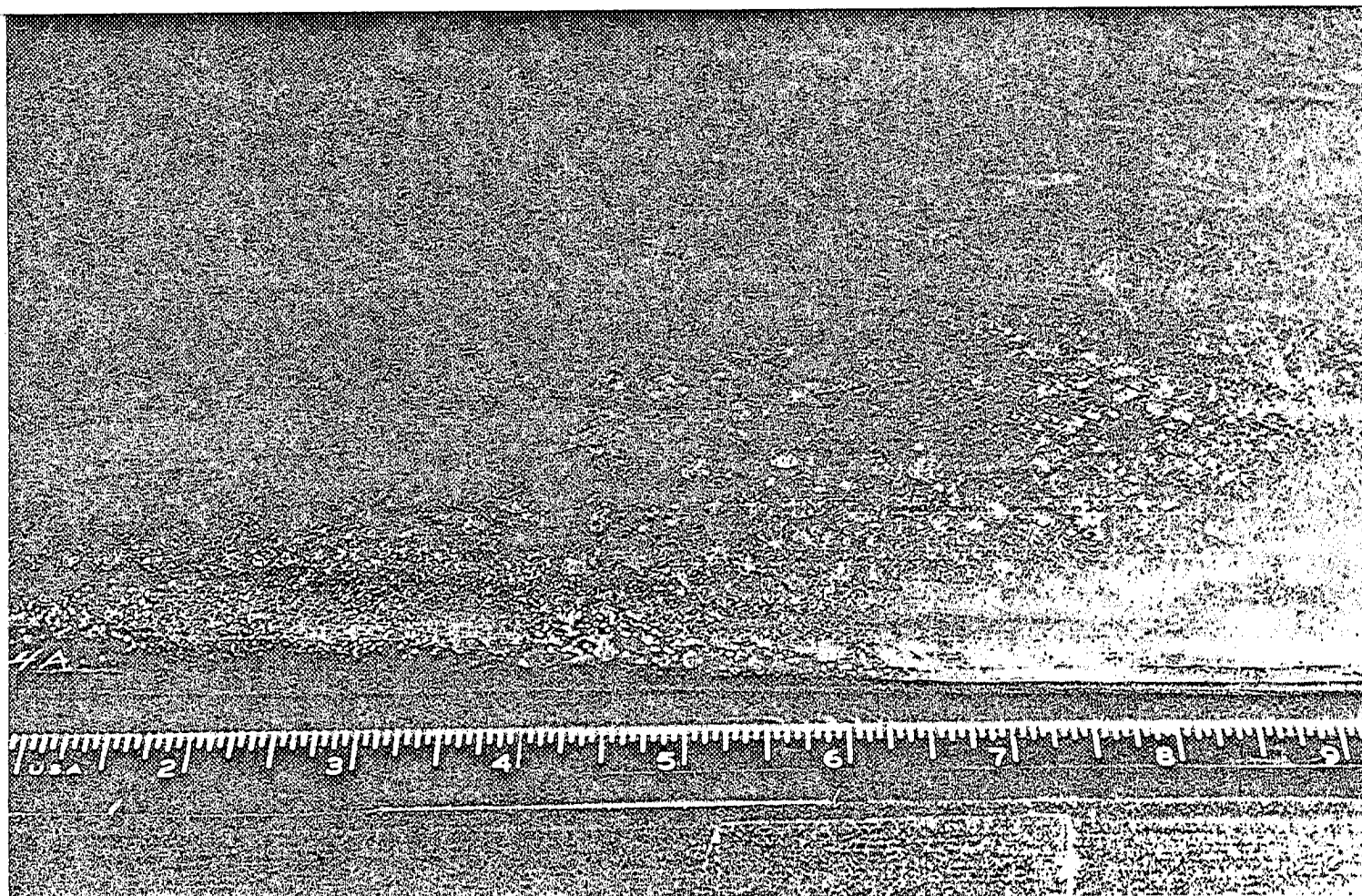


Figure 4 - Surface void - slightly rougher than cloth impression - minor.

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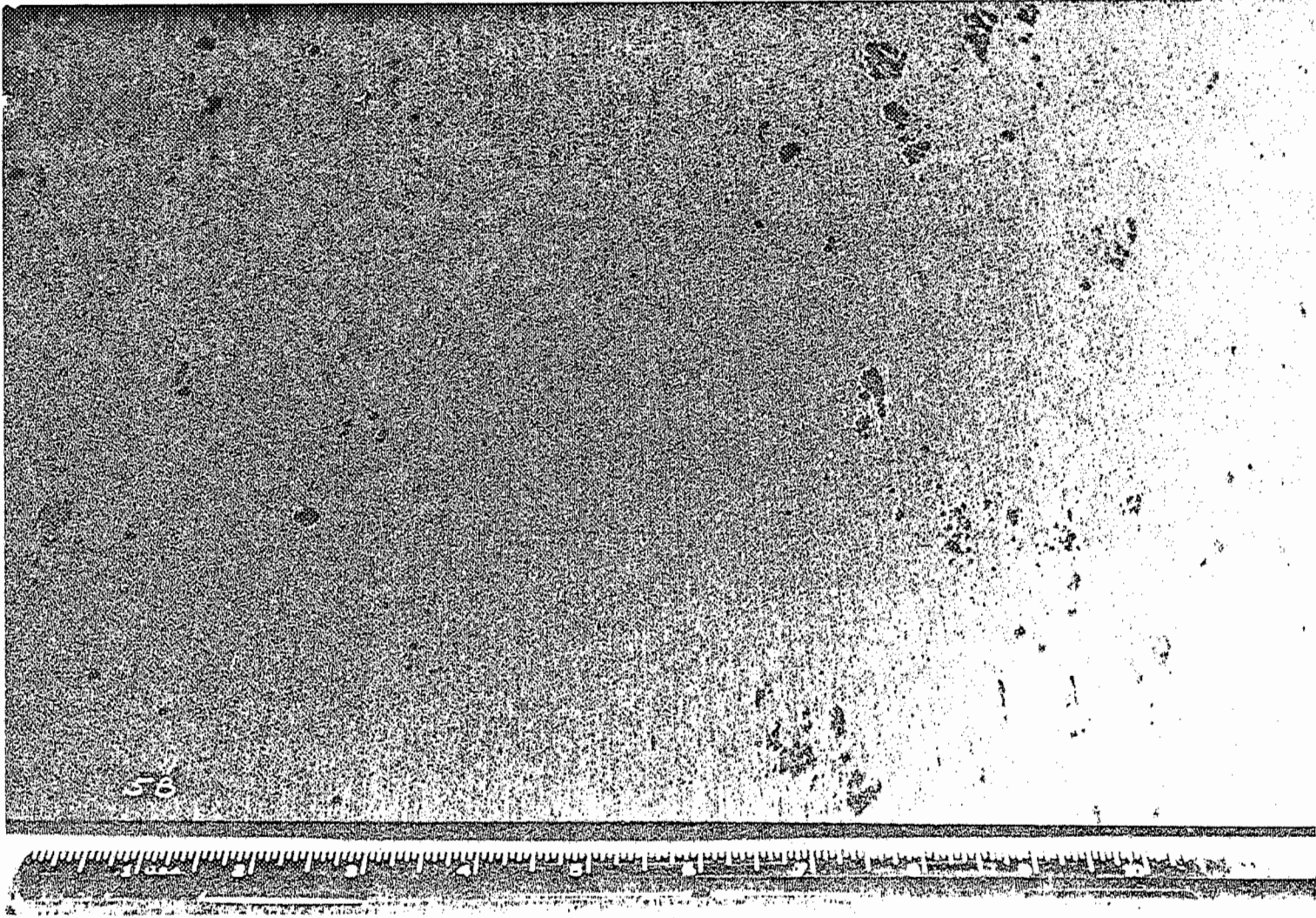


Figure B - Moisture pocket - face stock missing - major.



Figure 6 - Pick-off - face stock missing - major.

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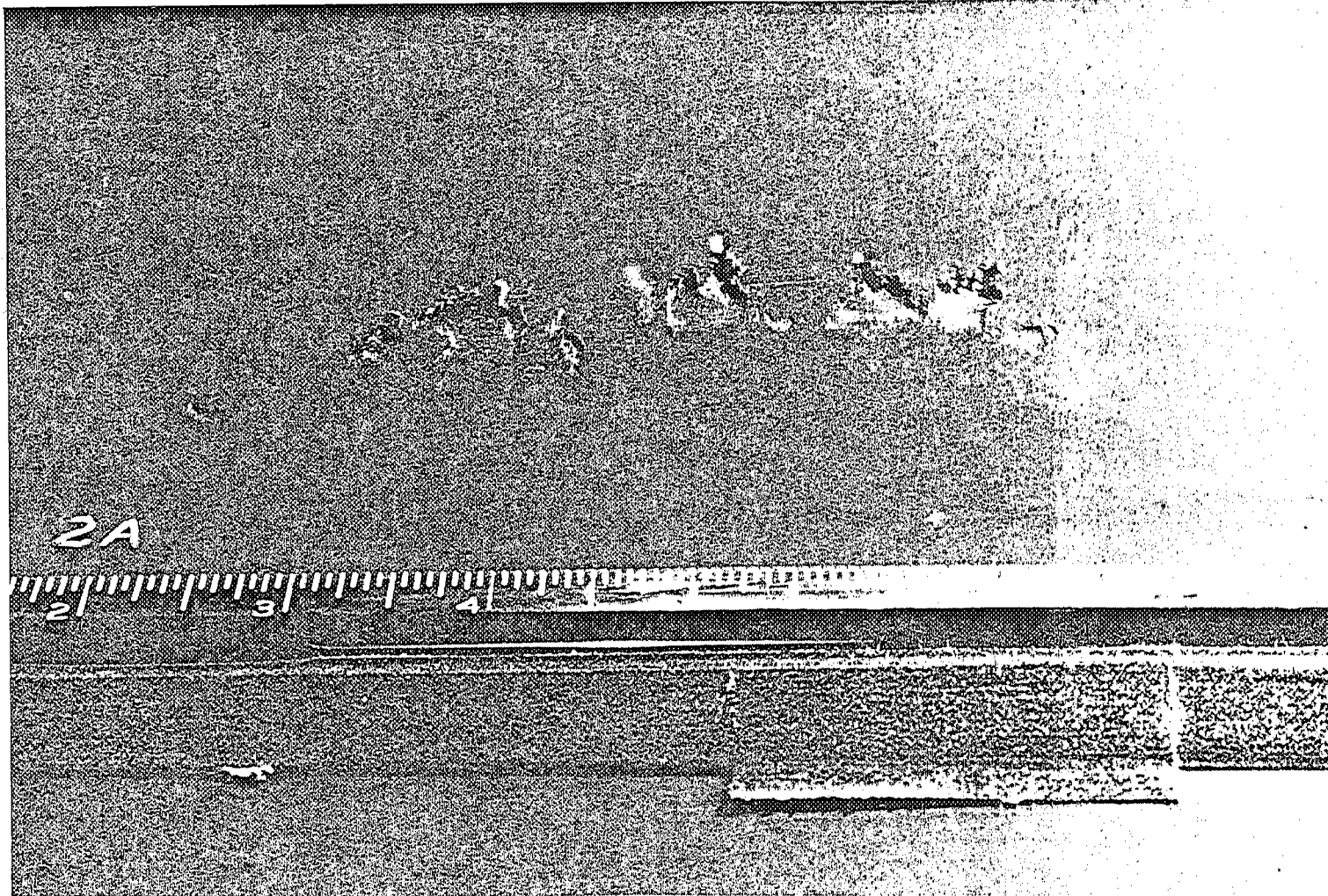


Figure 7 - Trapped air - face stock missing - major.

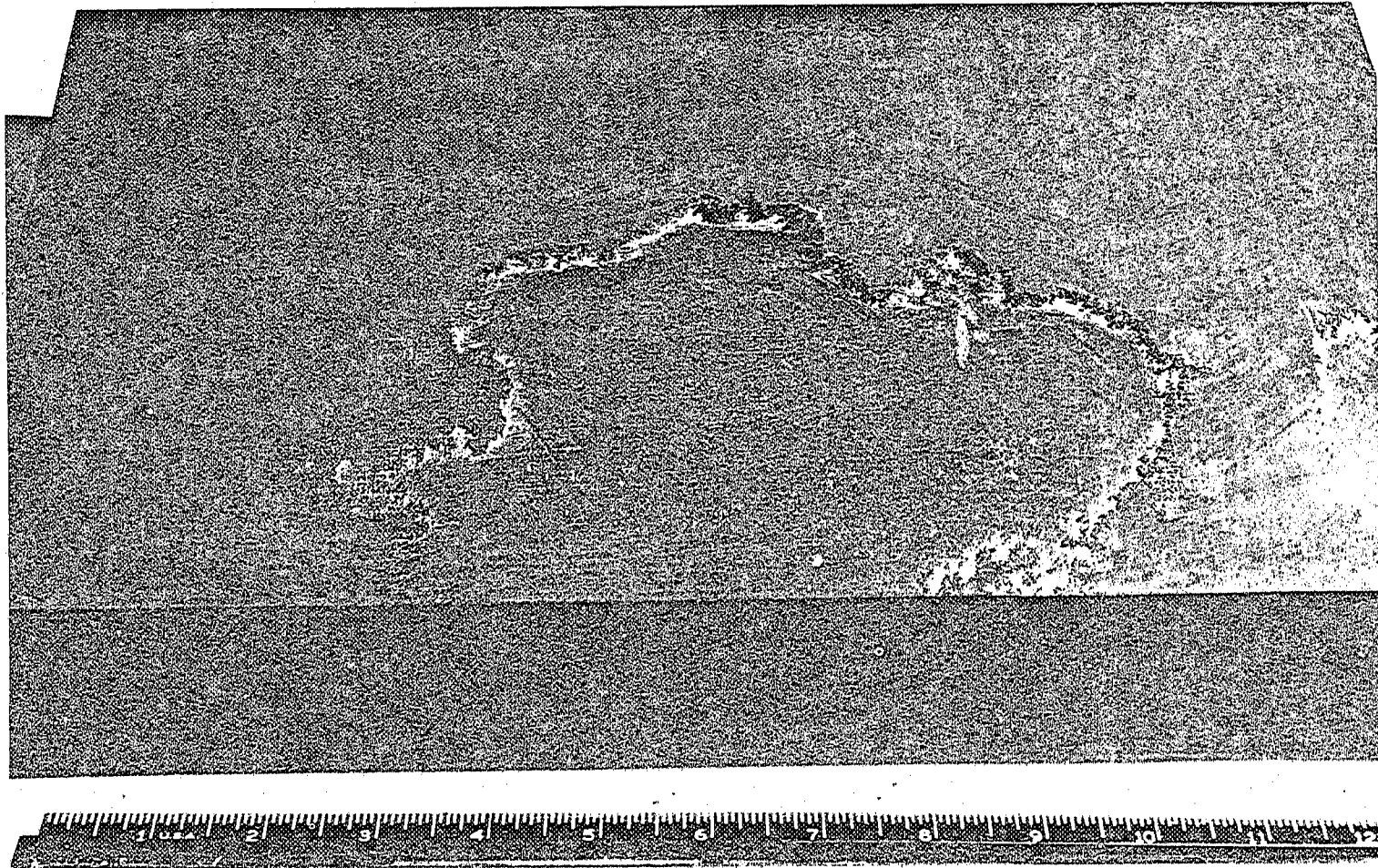


Figure 8 - Trapped air - face stock missing - major.

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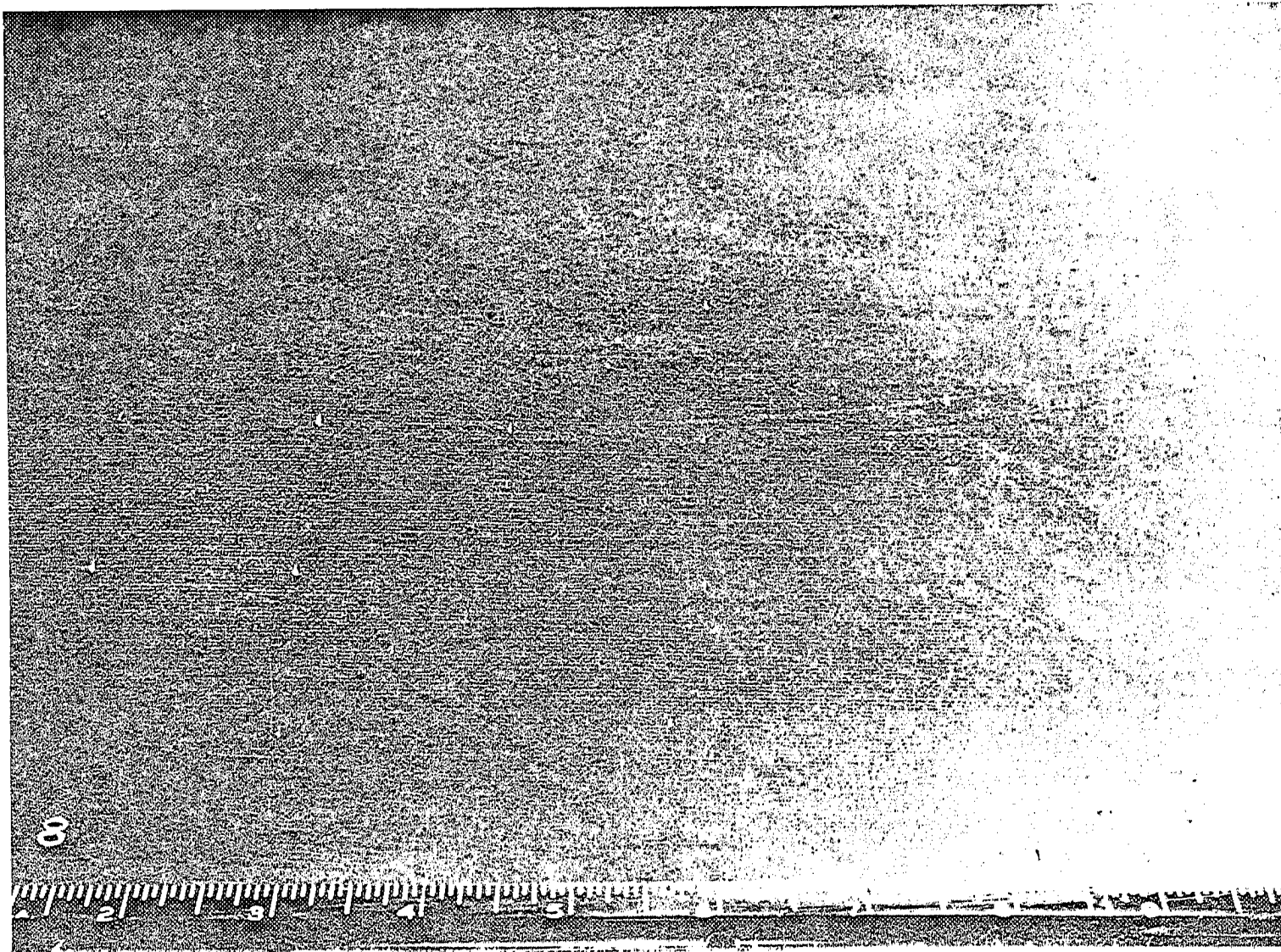


Figure 9 - Pricker marks - no internal voids - minor.

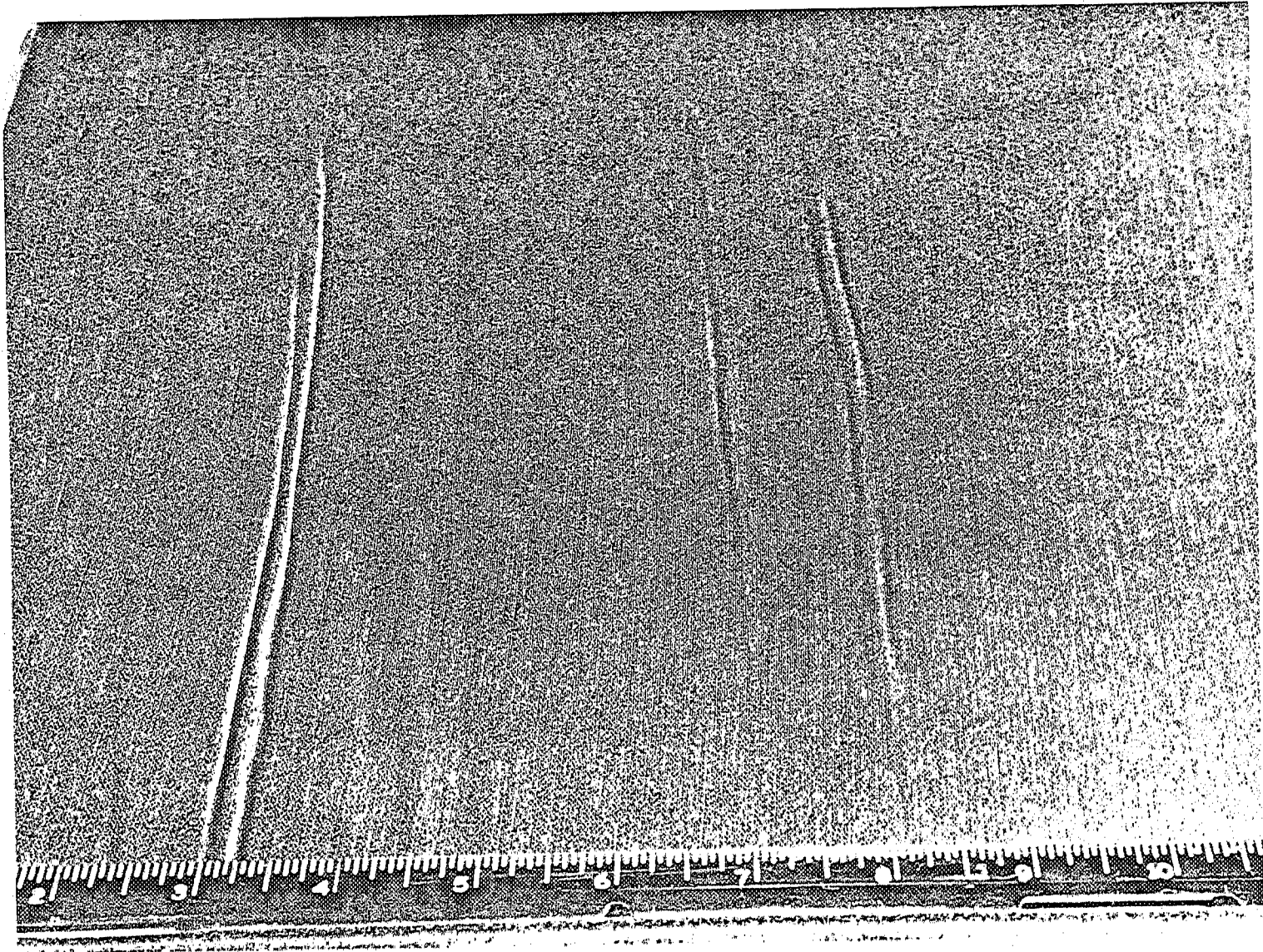


Figure 10 - Liner wrinkle - major.

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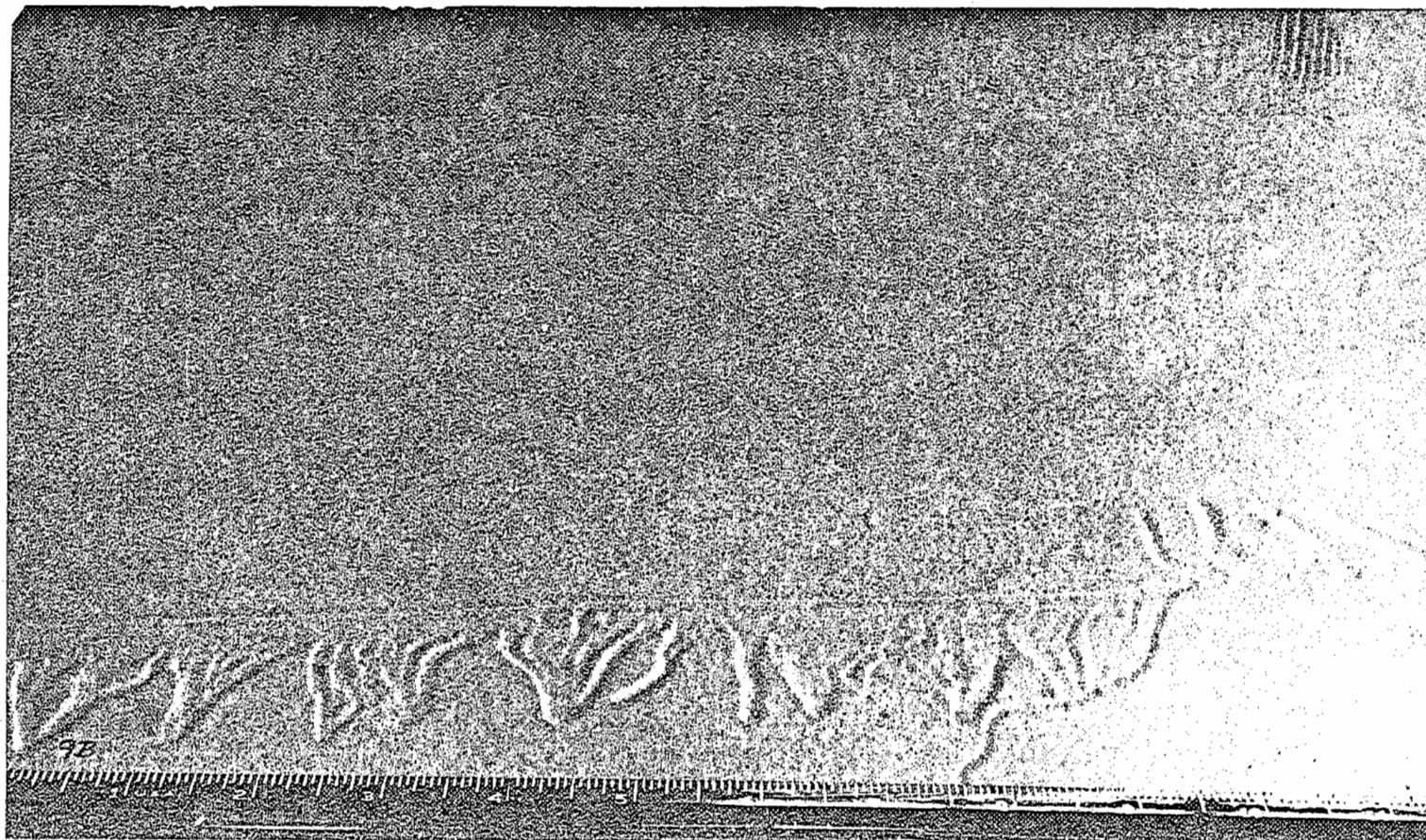


Figure 11 - Overlap liner wrinkle - major.



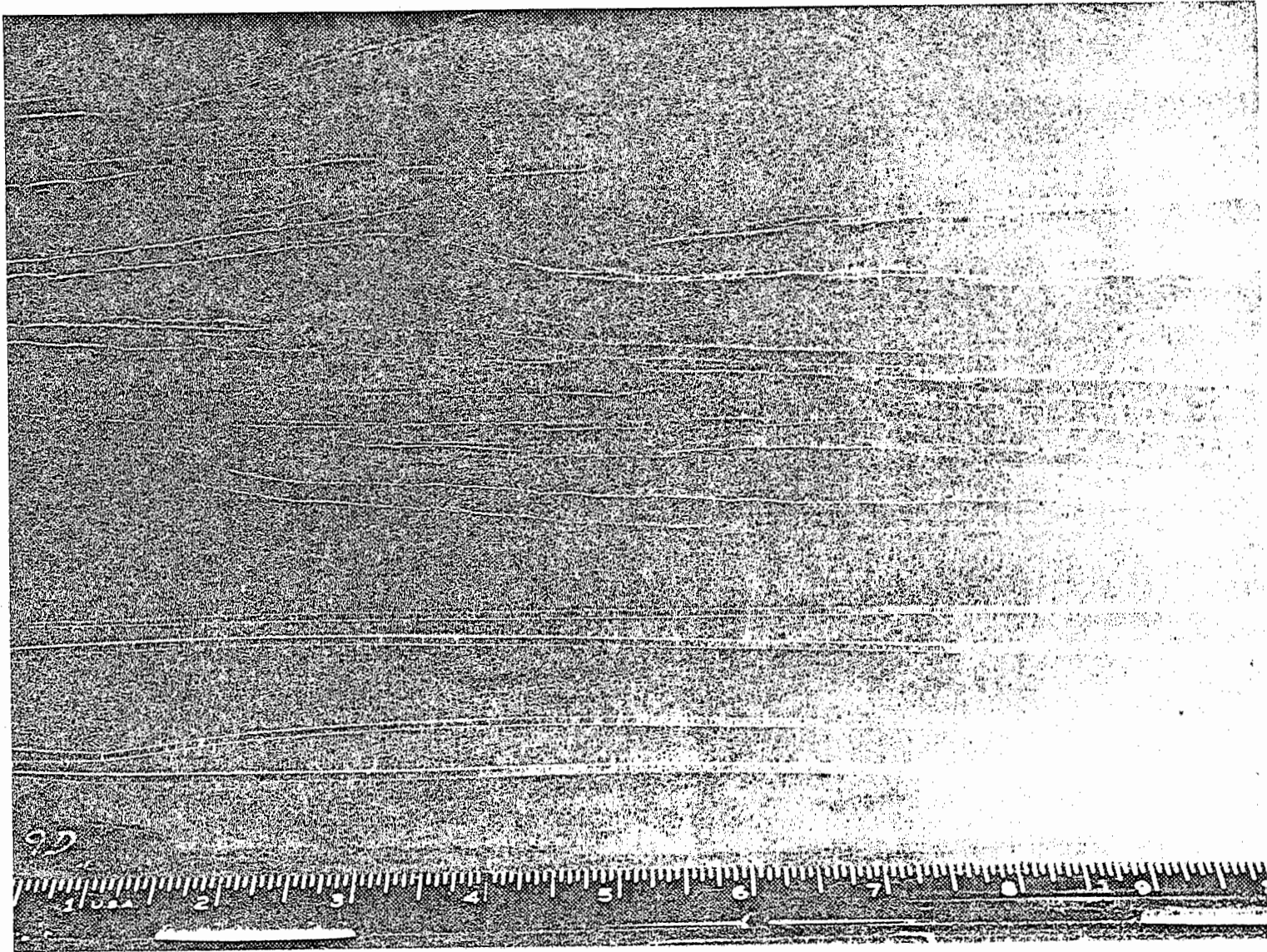


Figure 12 - Liner wrinkle - minor.

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1
2

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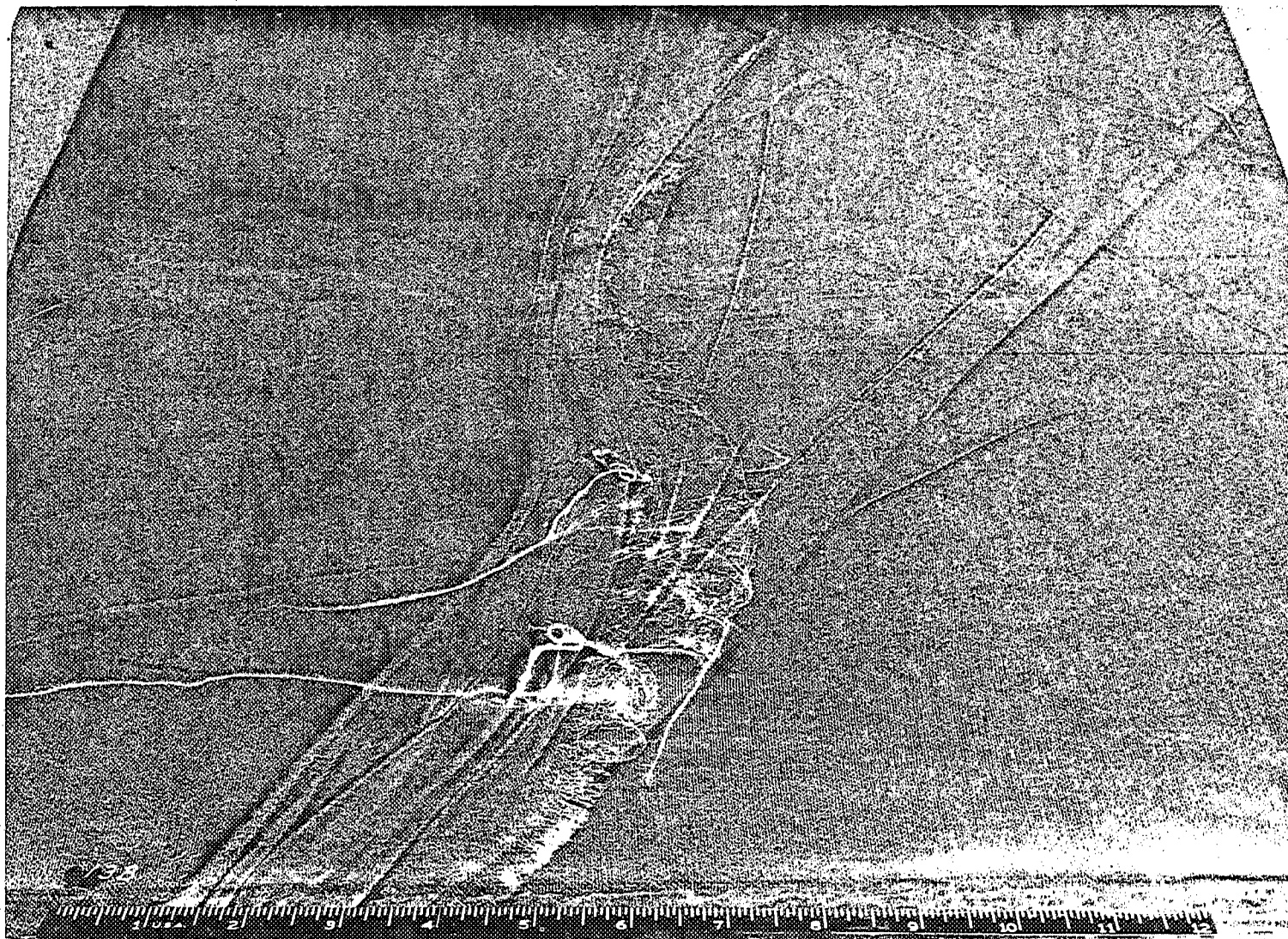


Figure 13 - Stuck liner - major.



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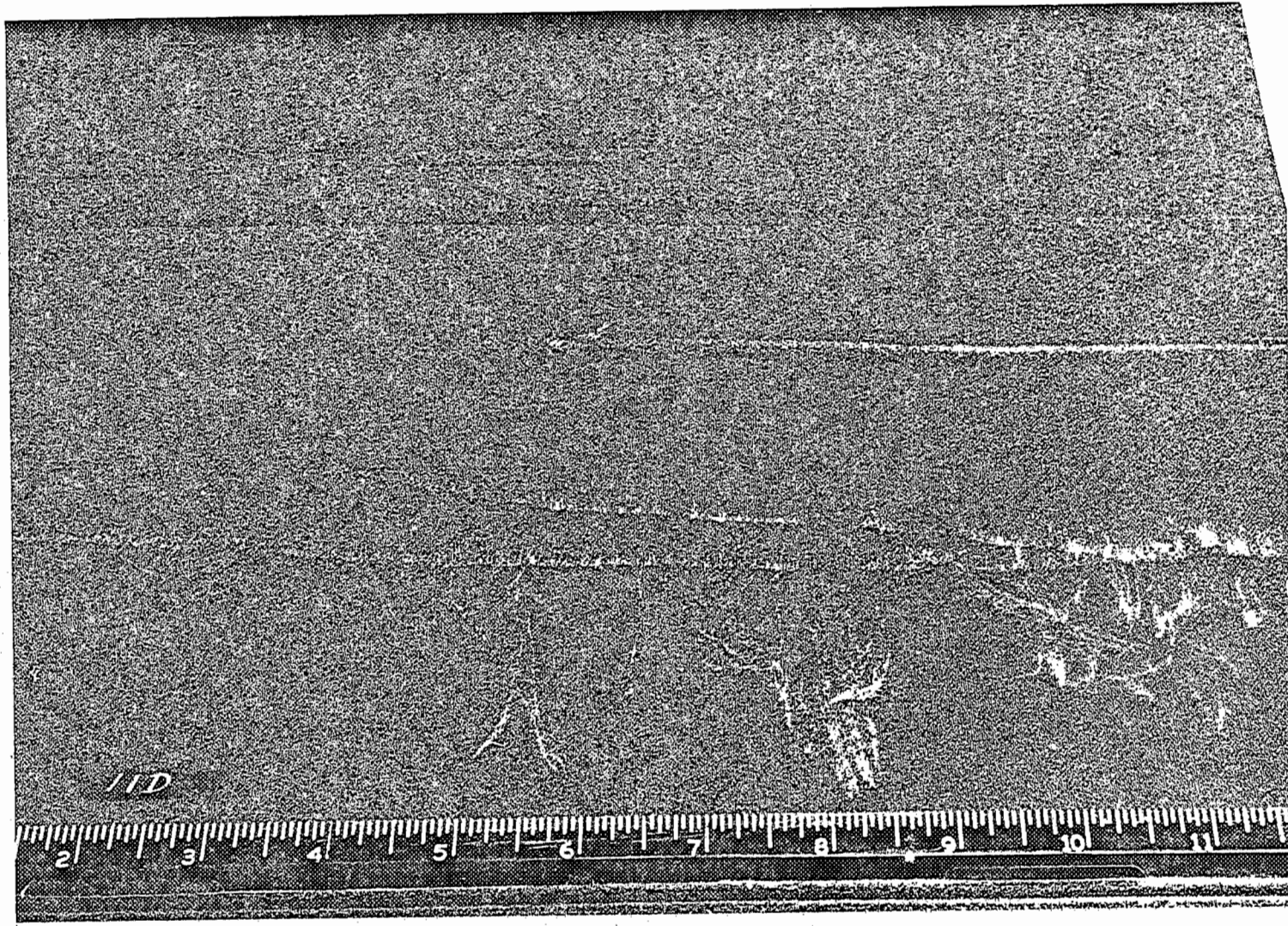
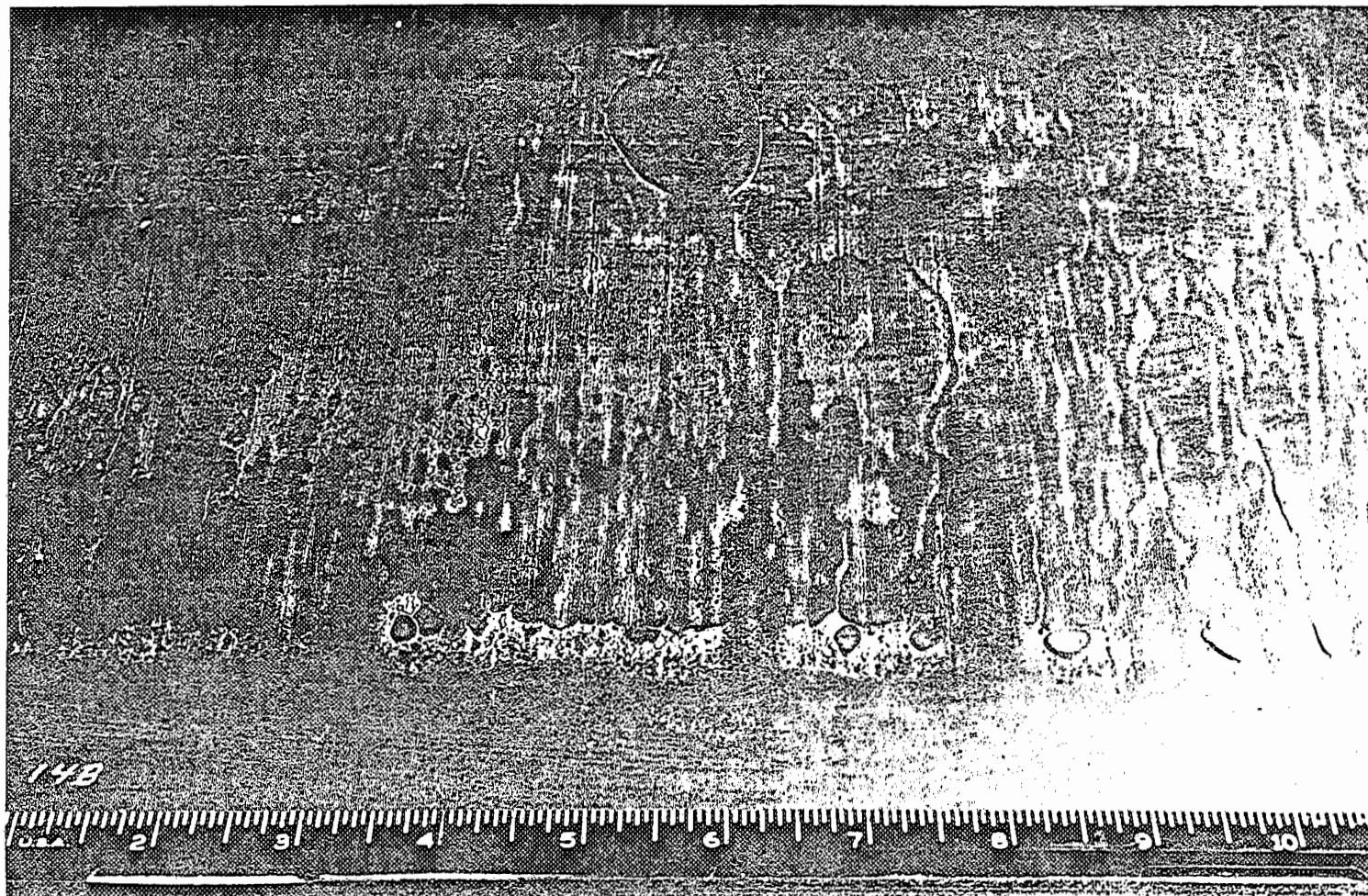


Figure 14 - Stuck liner - slightly rougher than cloth impression - minor.

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Figure 15 - Press change (liner) - major.

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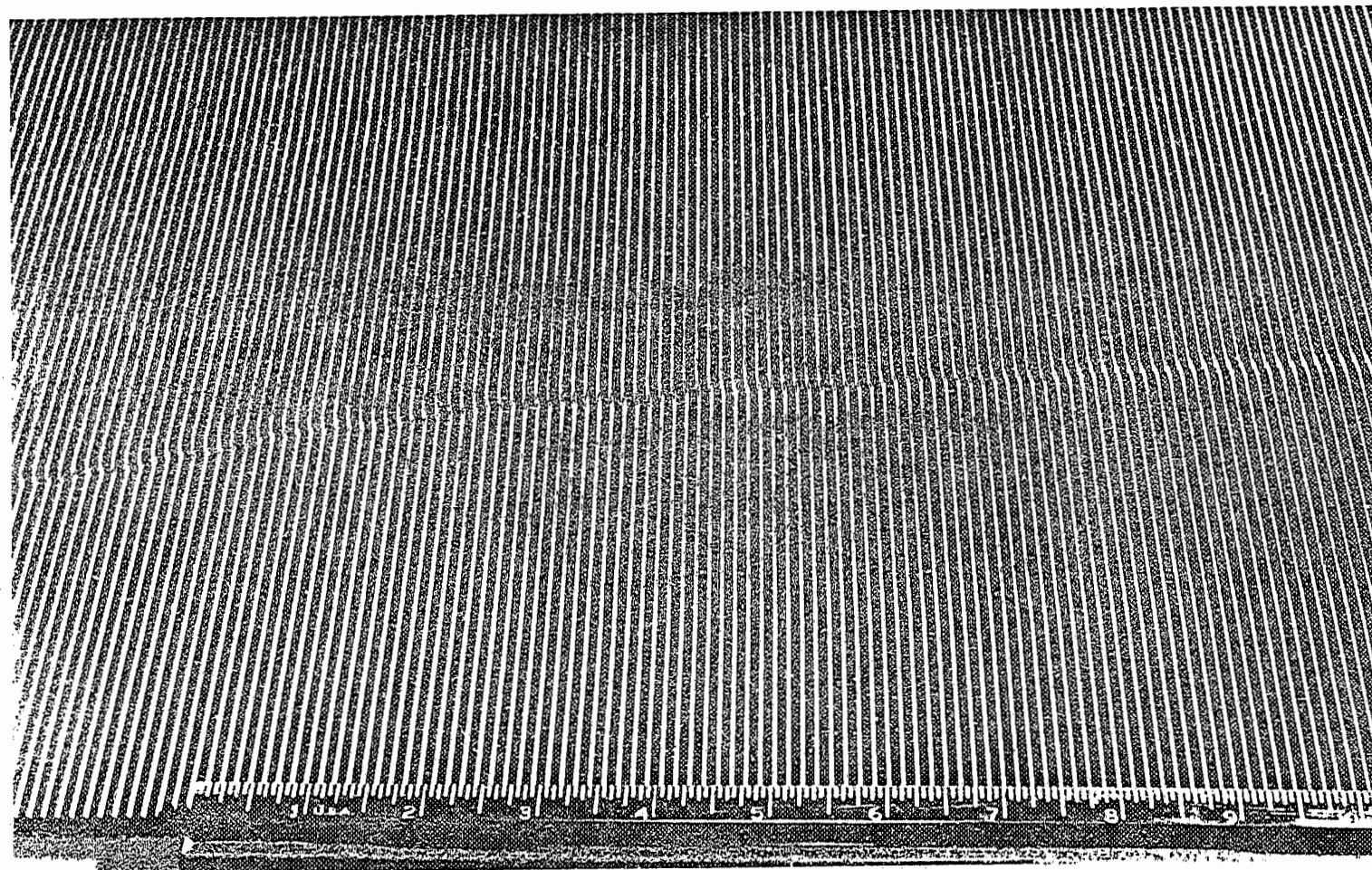


Figure 16 - Press change - Pattern slightly out of phase - not a defect.

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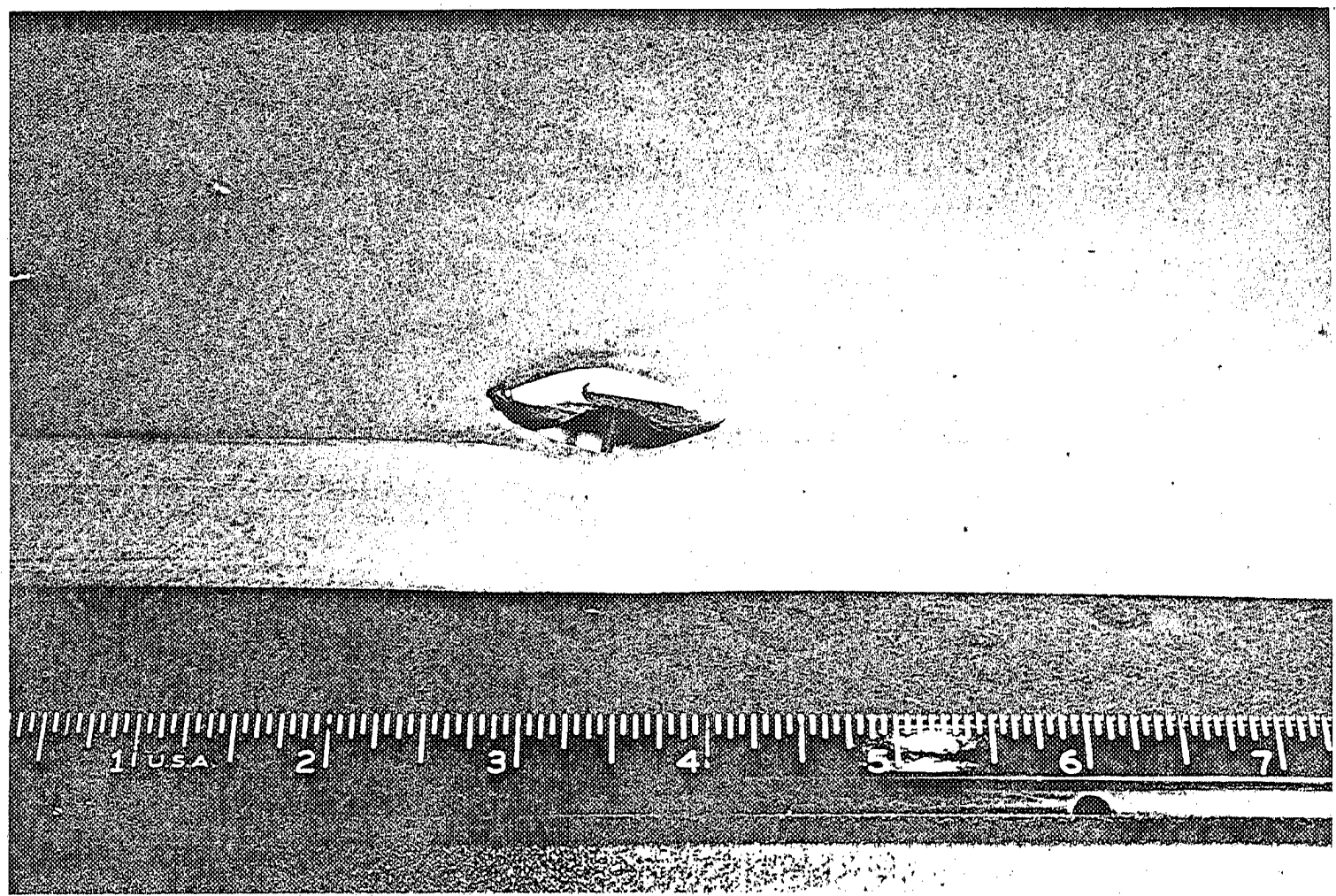
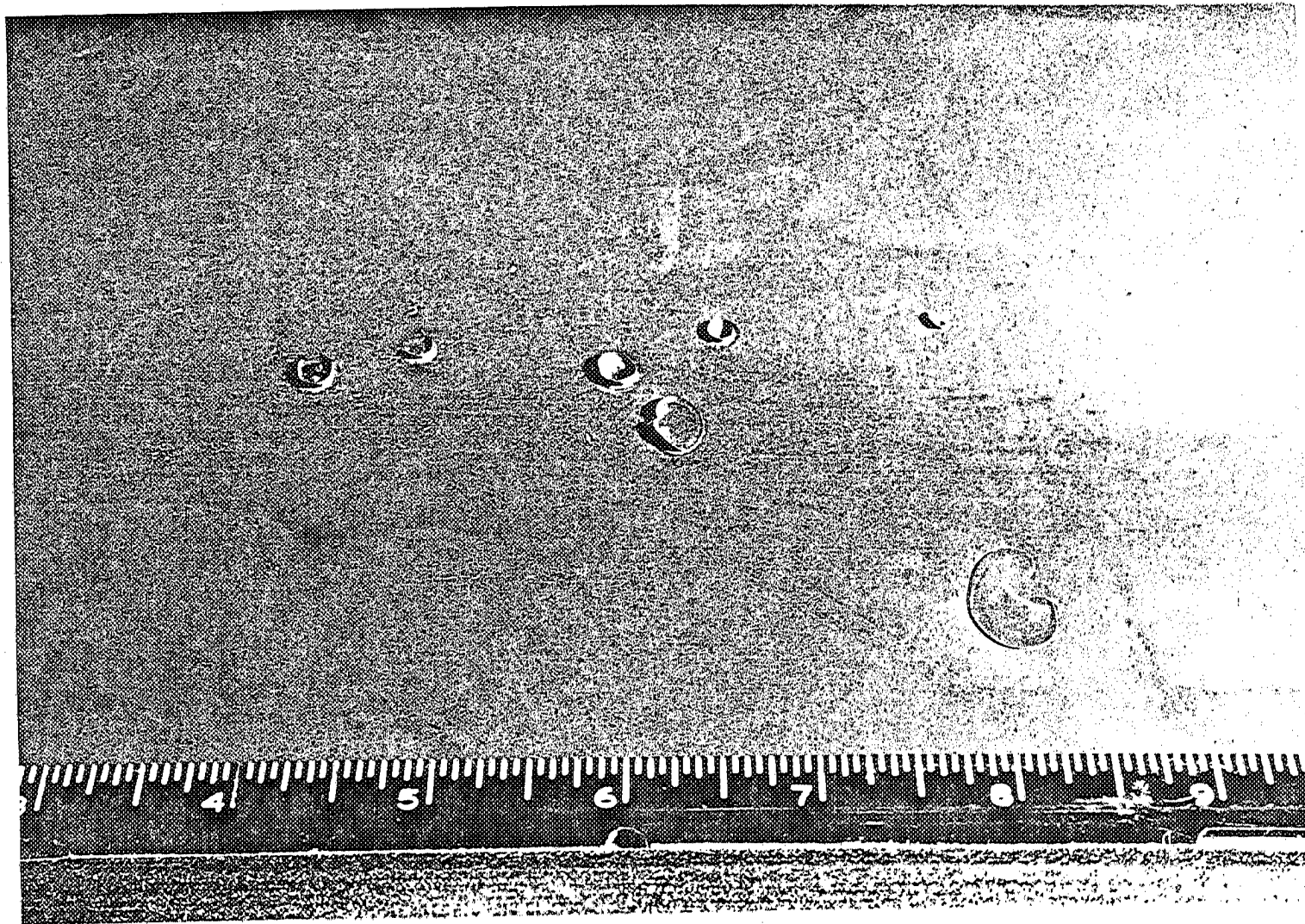


Figure 17 - Air blister (peg used to accentuate) - major.



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Figure 18 - Broken blister - major.

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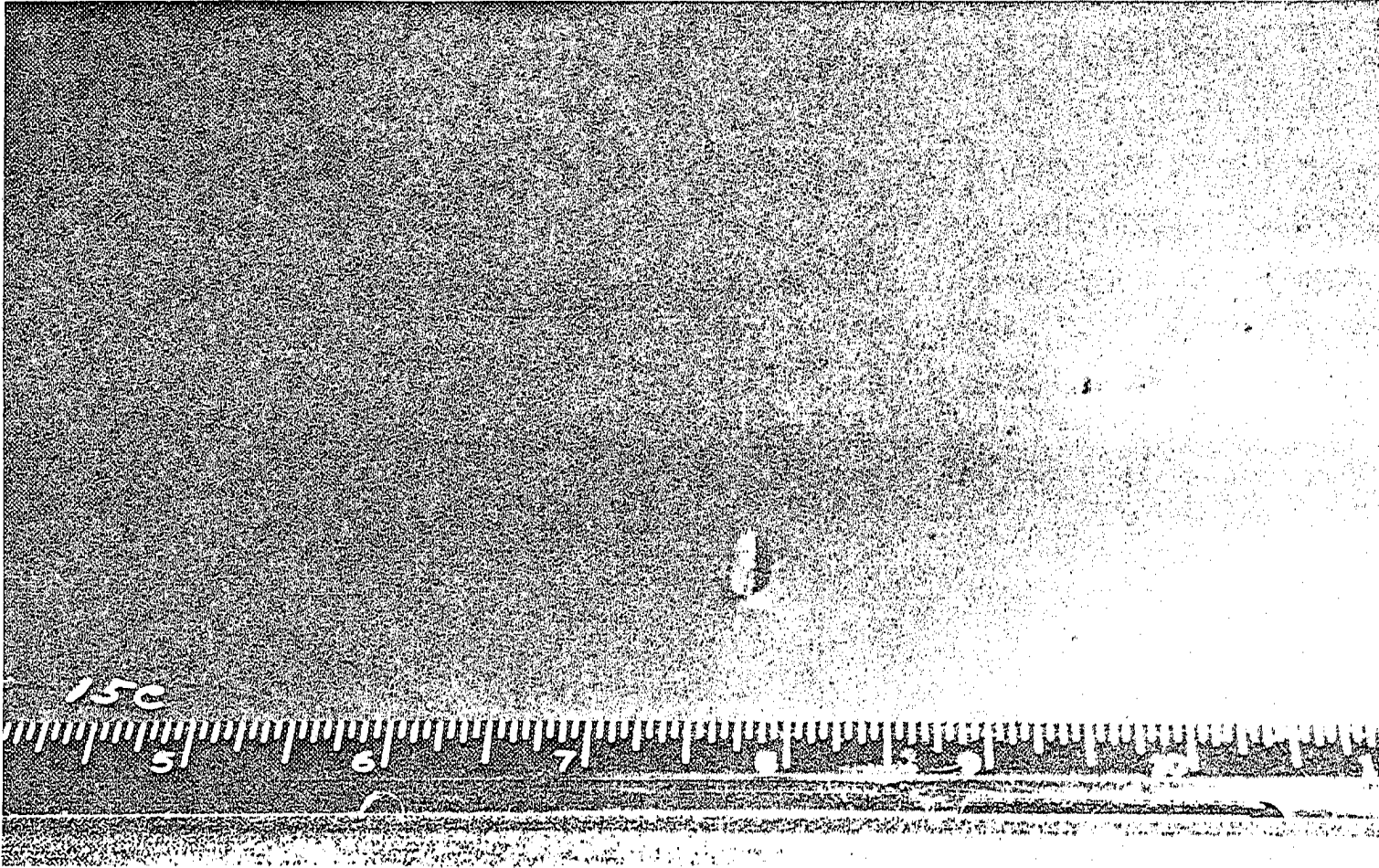
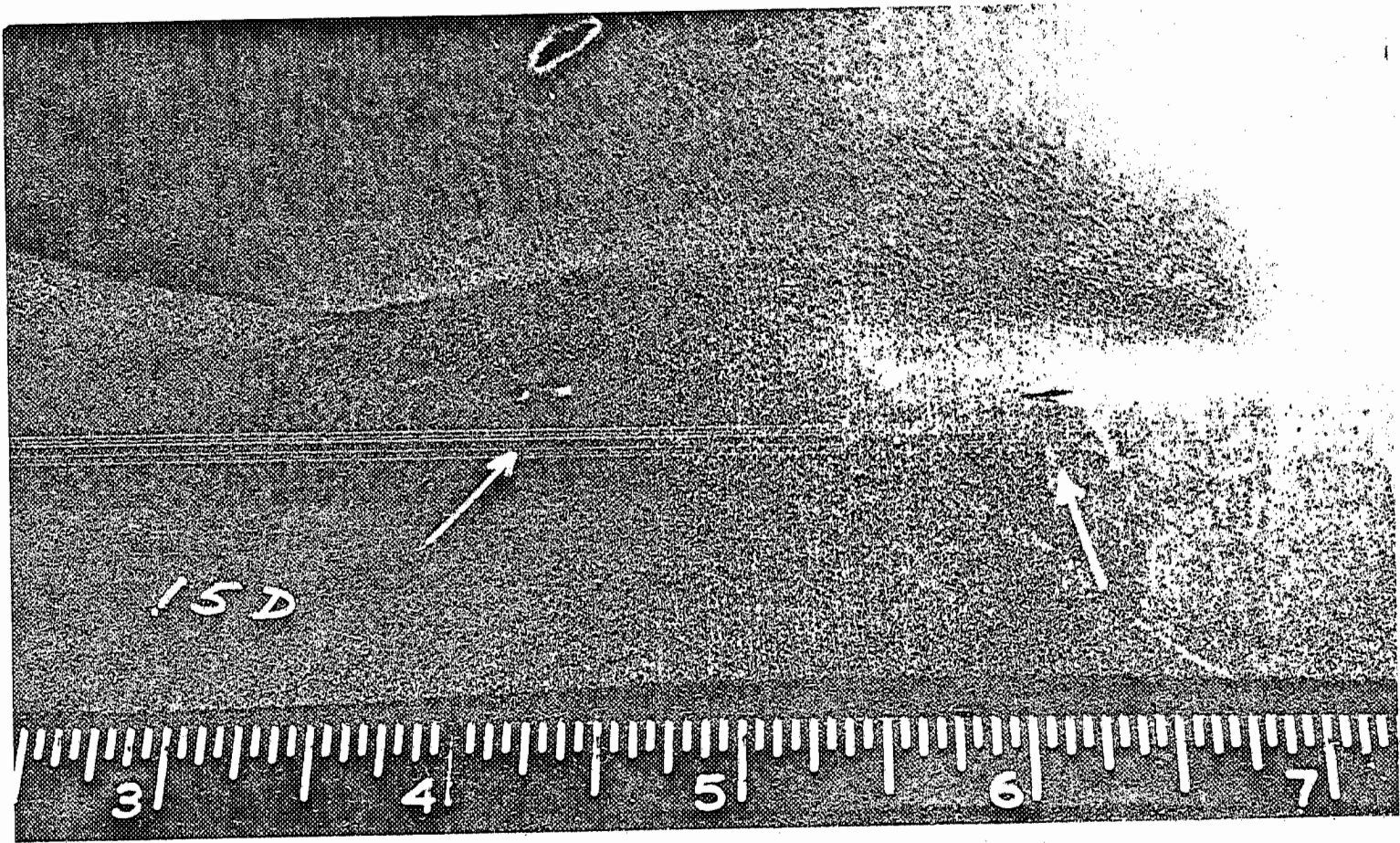


Figure 19 - Collapsed blister (void) - major.



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Figure 20 - Heat blister - major.

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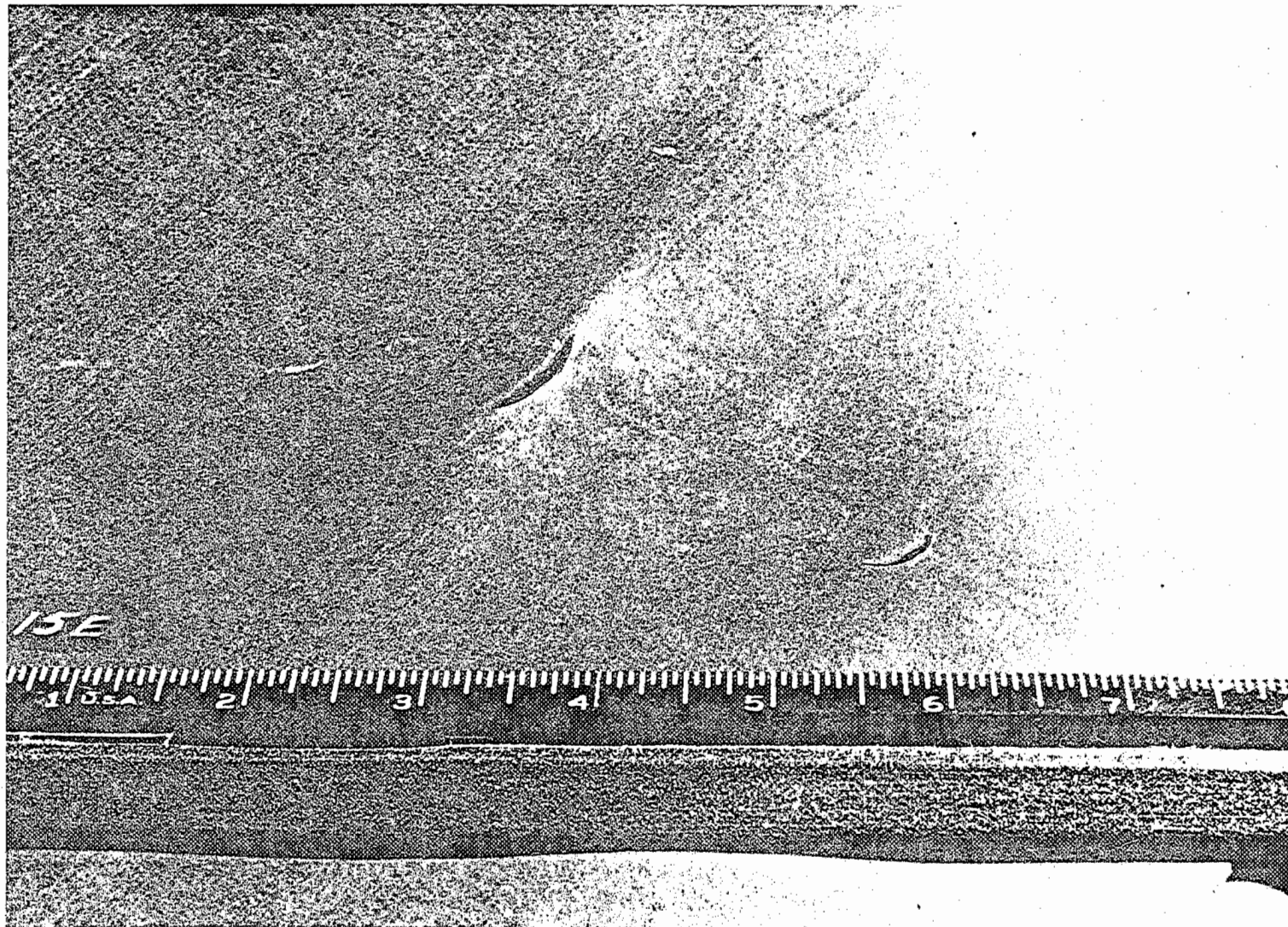


Figure 21 - Folded over blister - major.

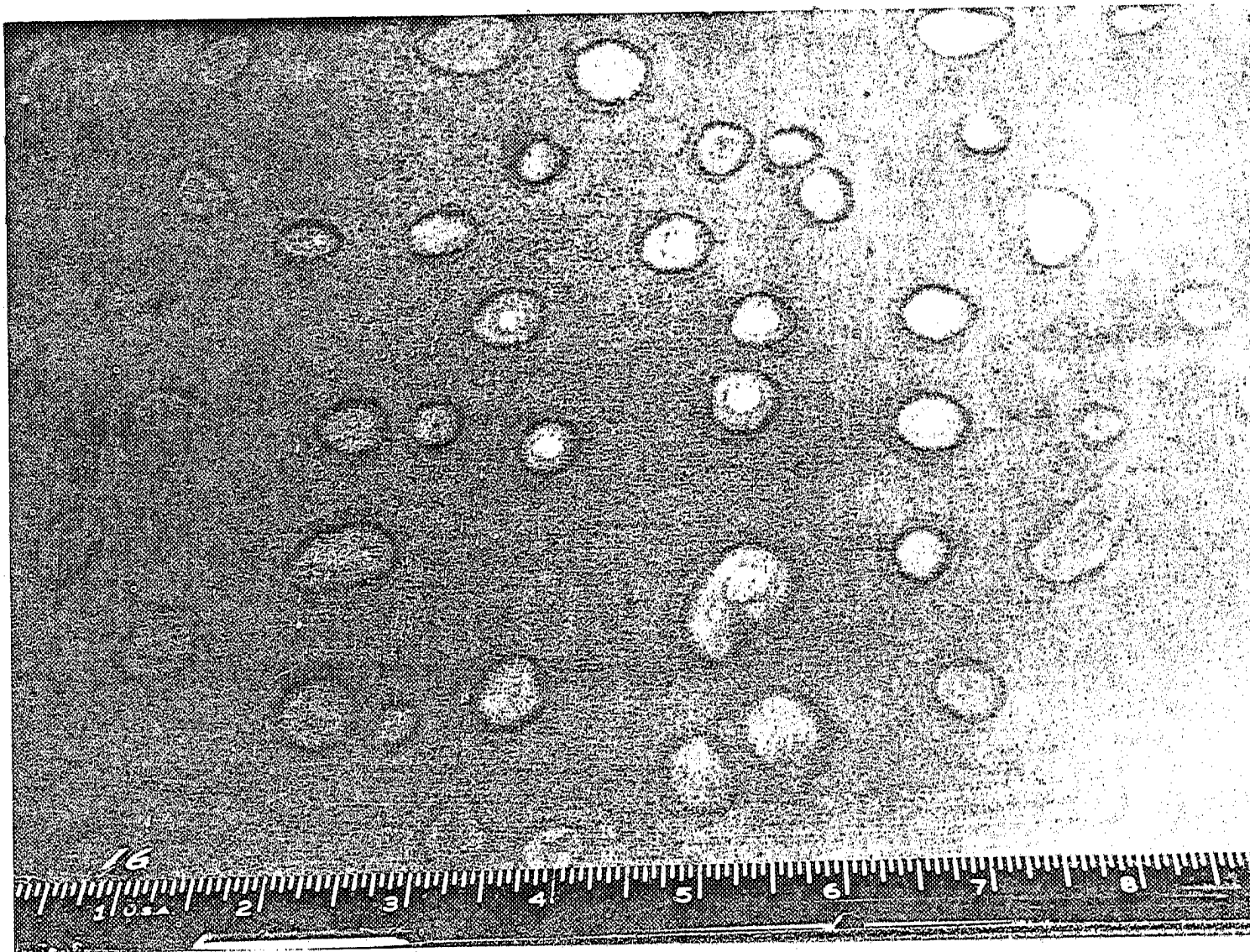


Figure 22 - Surface blemish - no voids or protrusions - not a defect.

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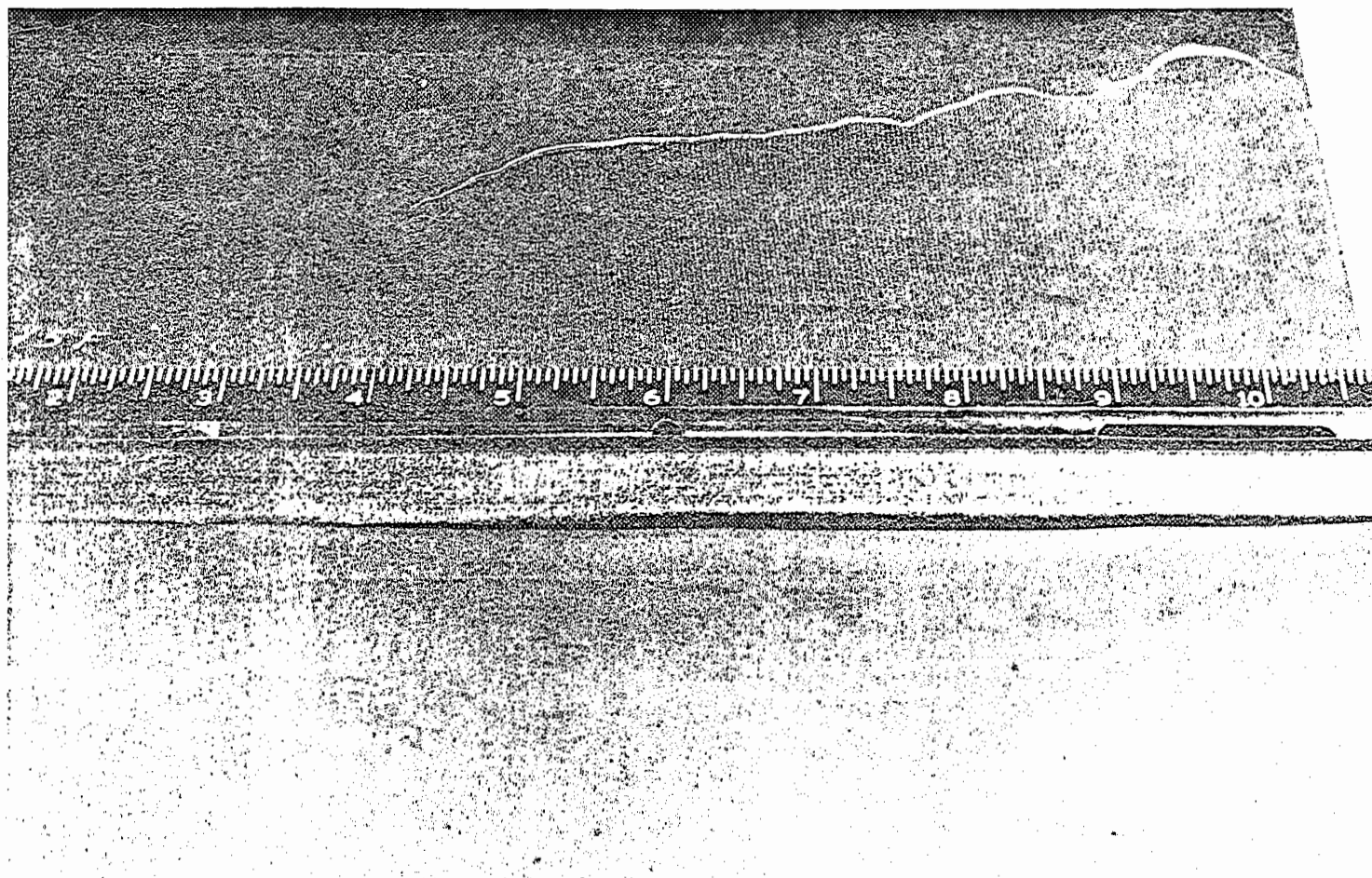
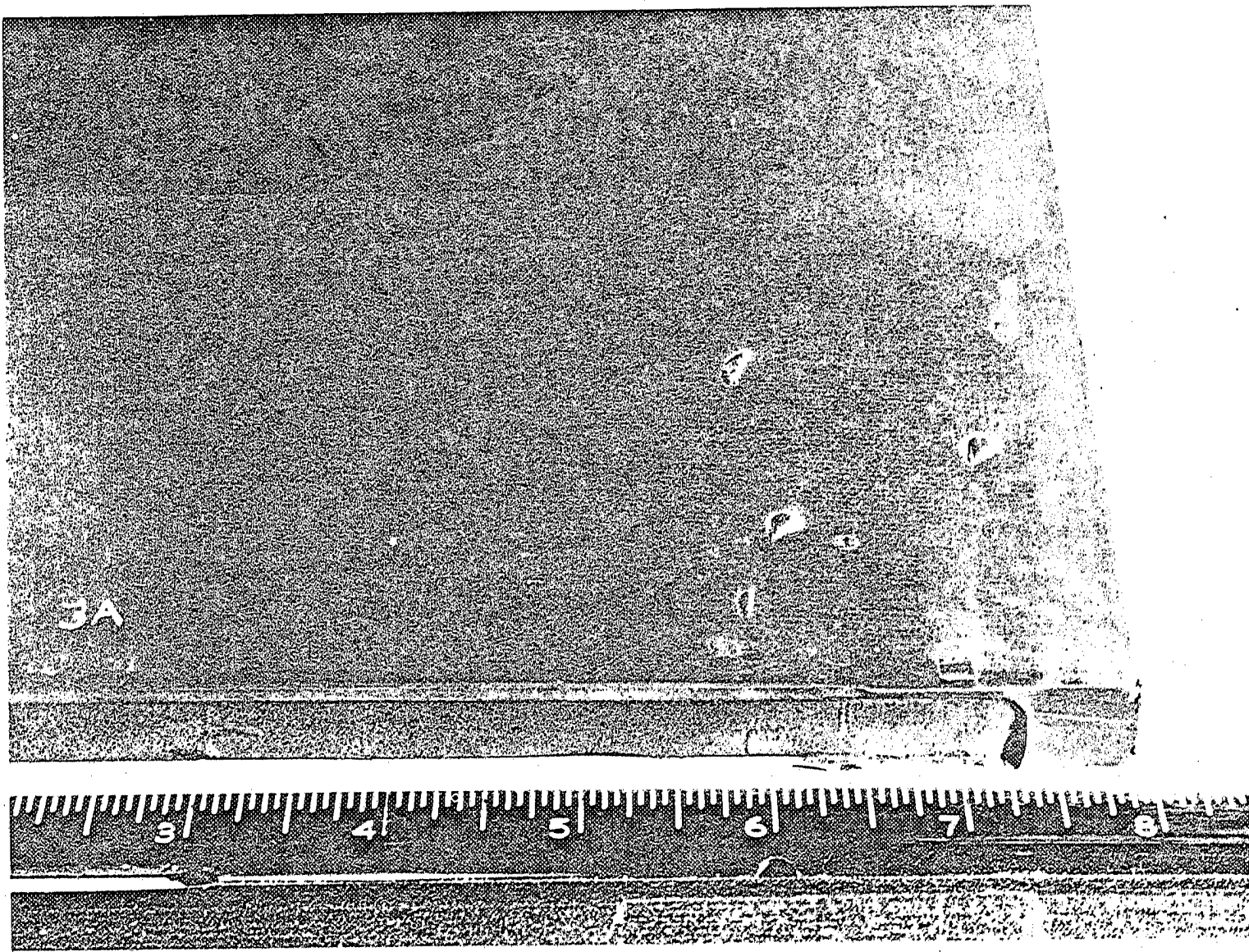


Figure 23 - Fold over - major.



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Figure 24 - Surface lumps - major.

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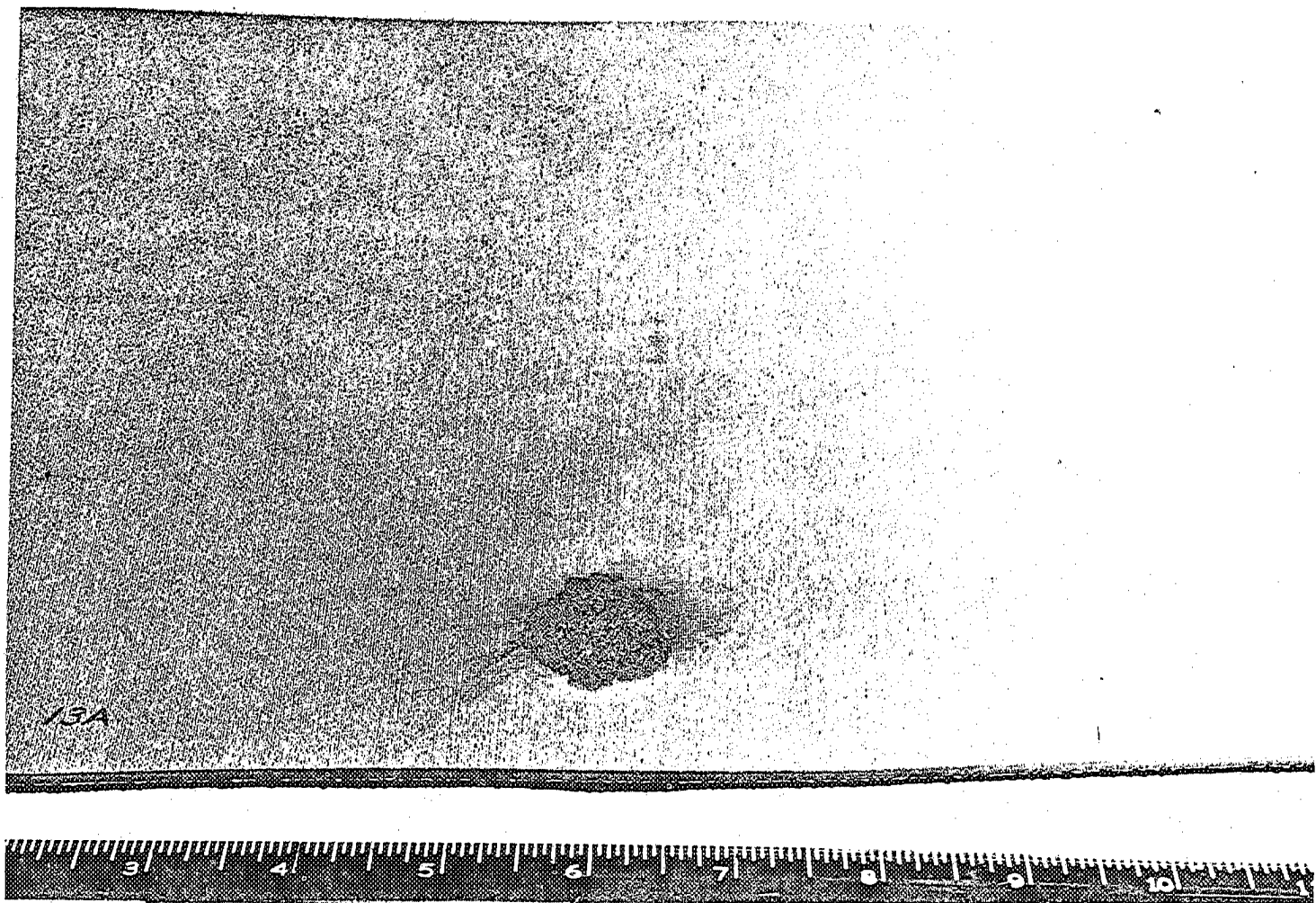


Figure 25 - Foreign material - major.

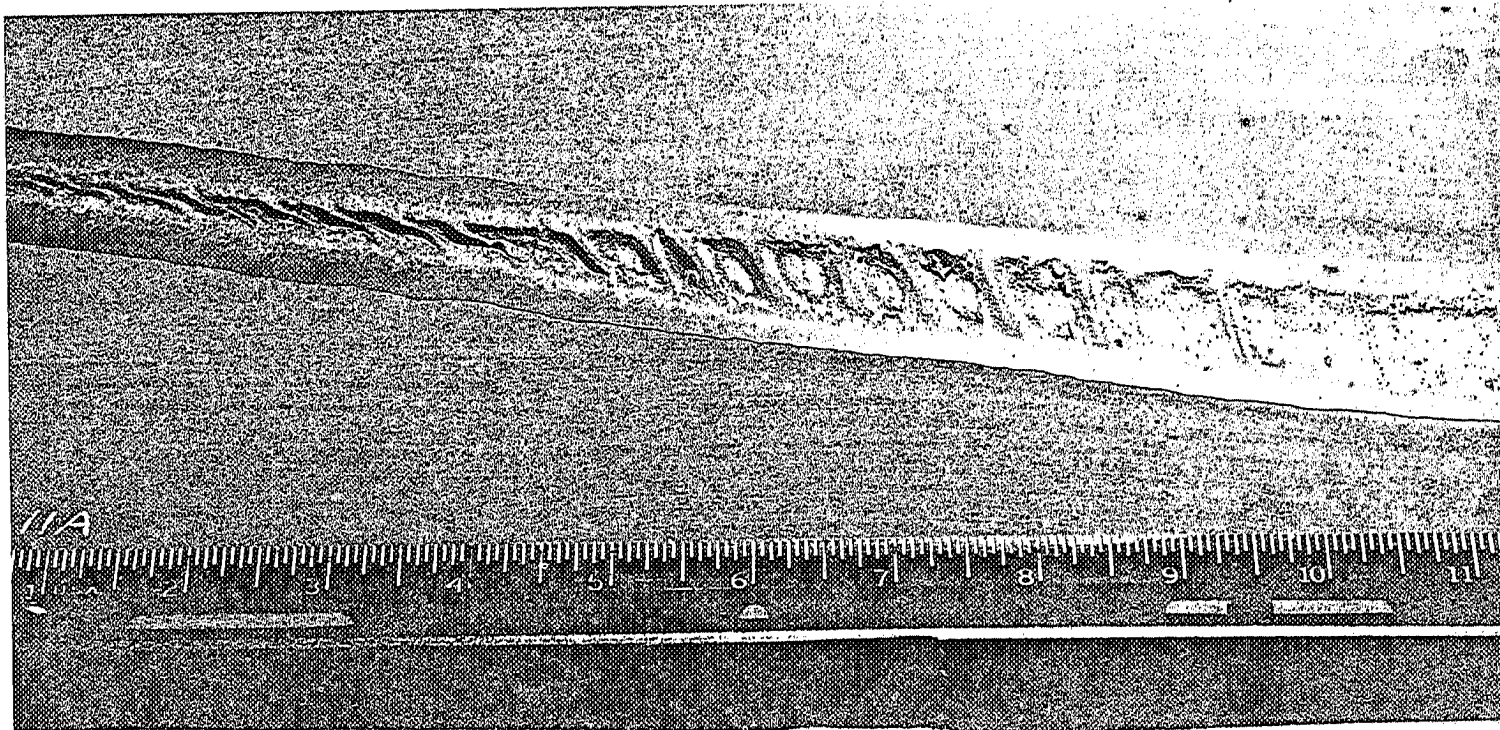


Figure 26 - Foreign material - major.

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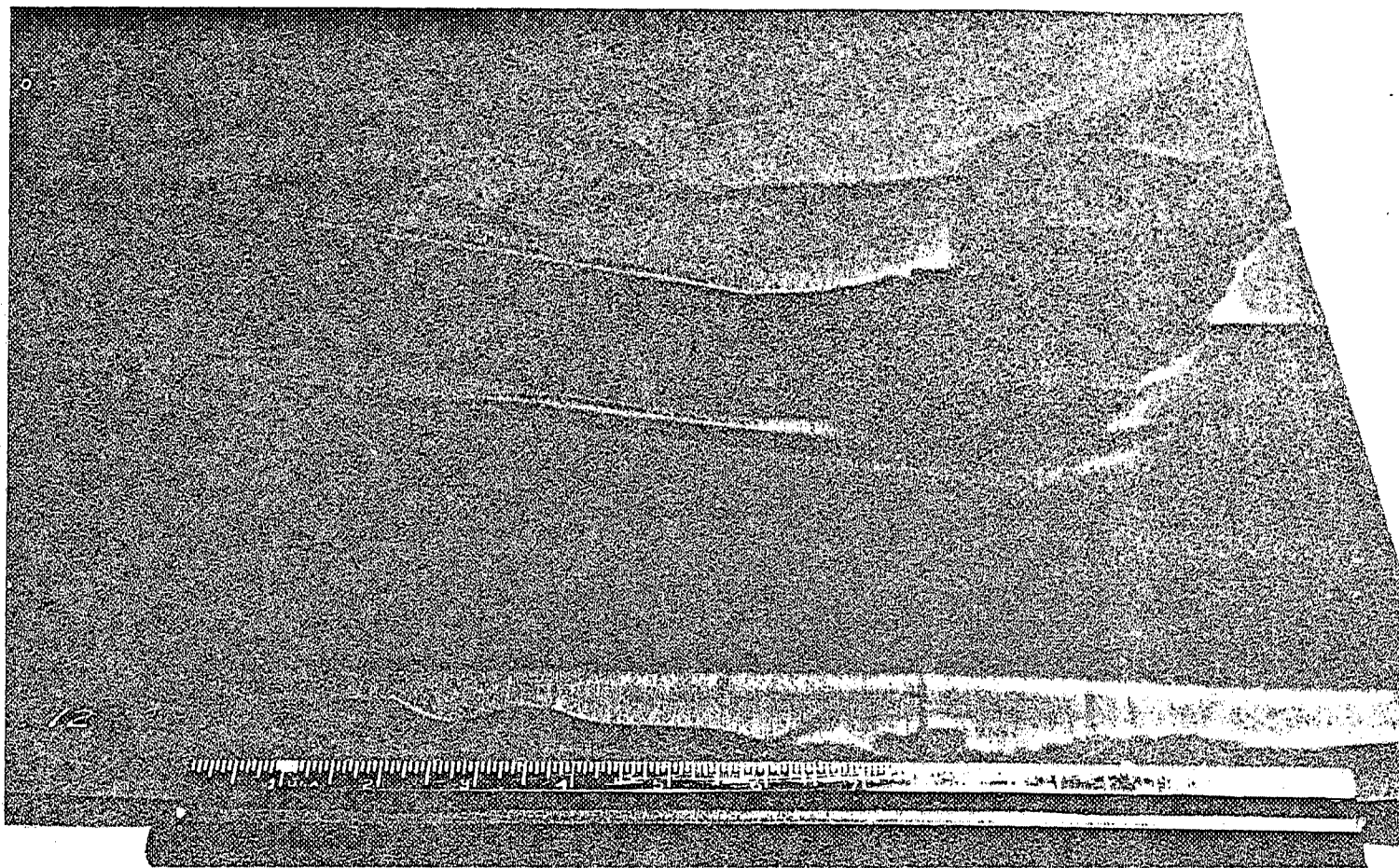


Figure 27 - Misplaced fabric (top view) - major.

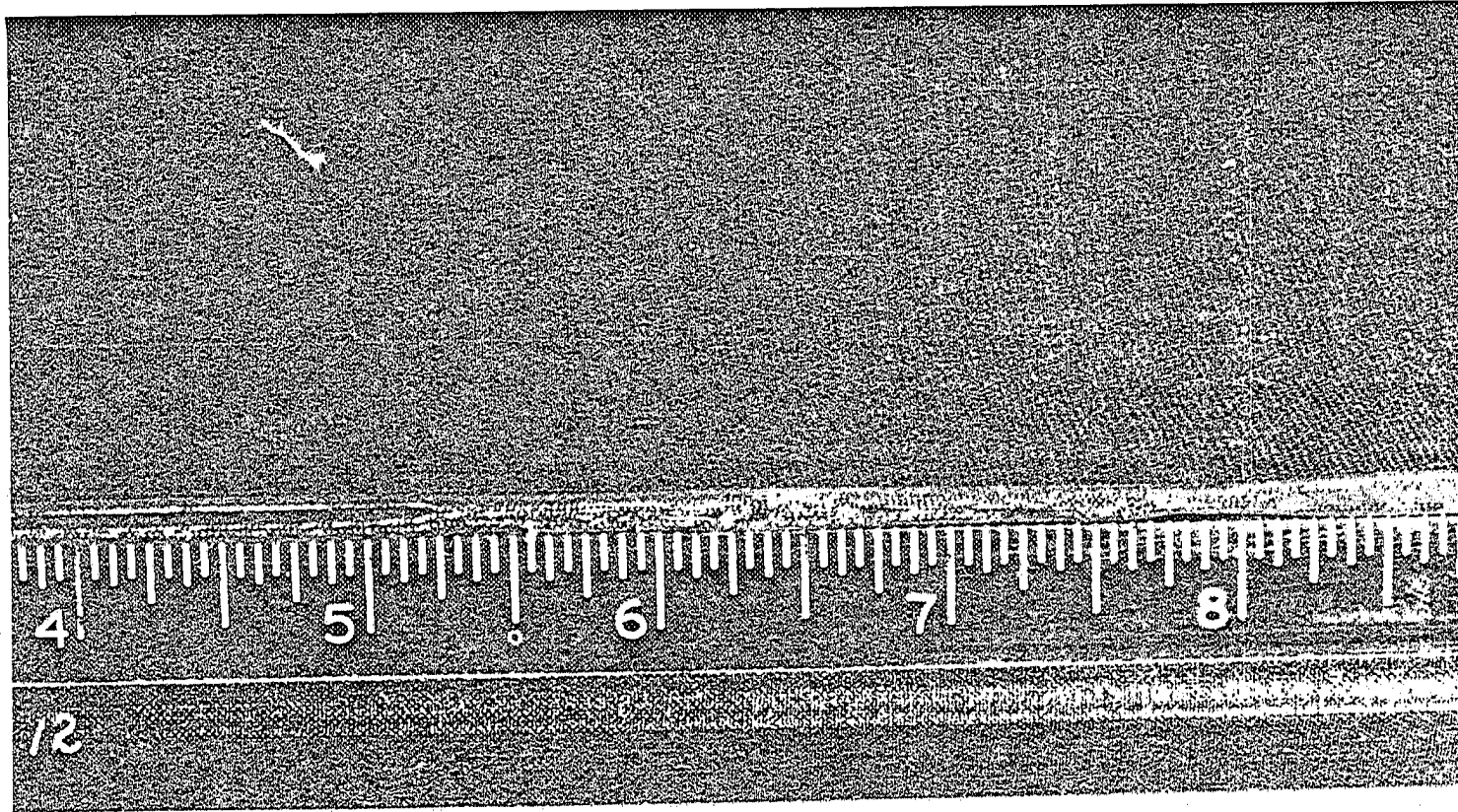


Figure 28 - Misplaced fabric (end view) - major.

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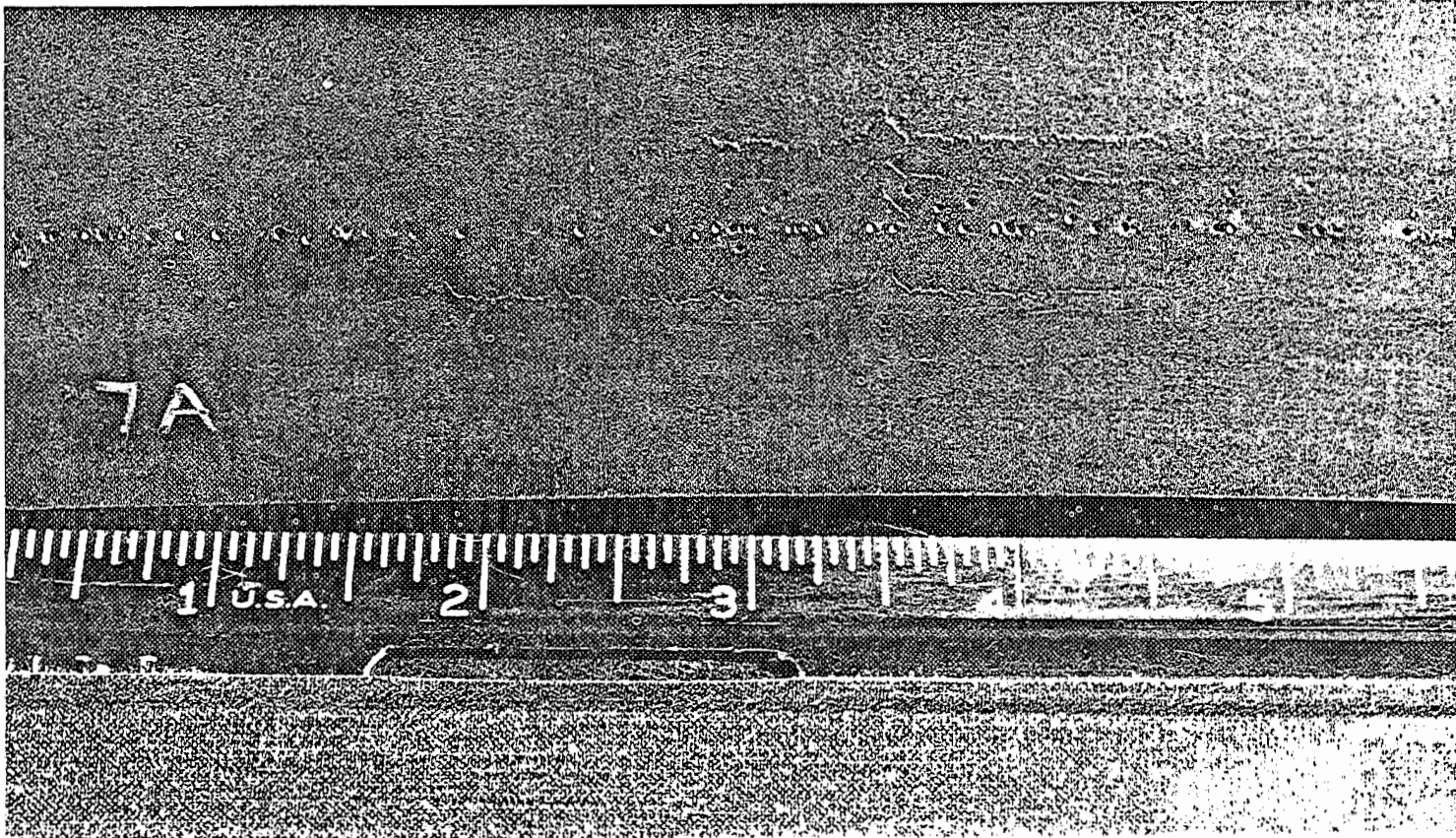


Figure 29 - Porosity (top view) - major.

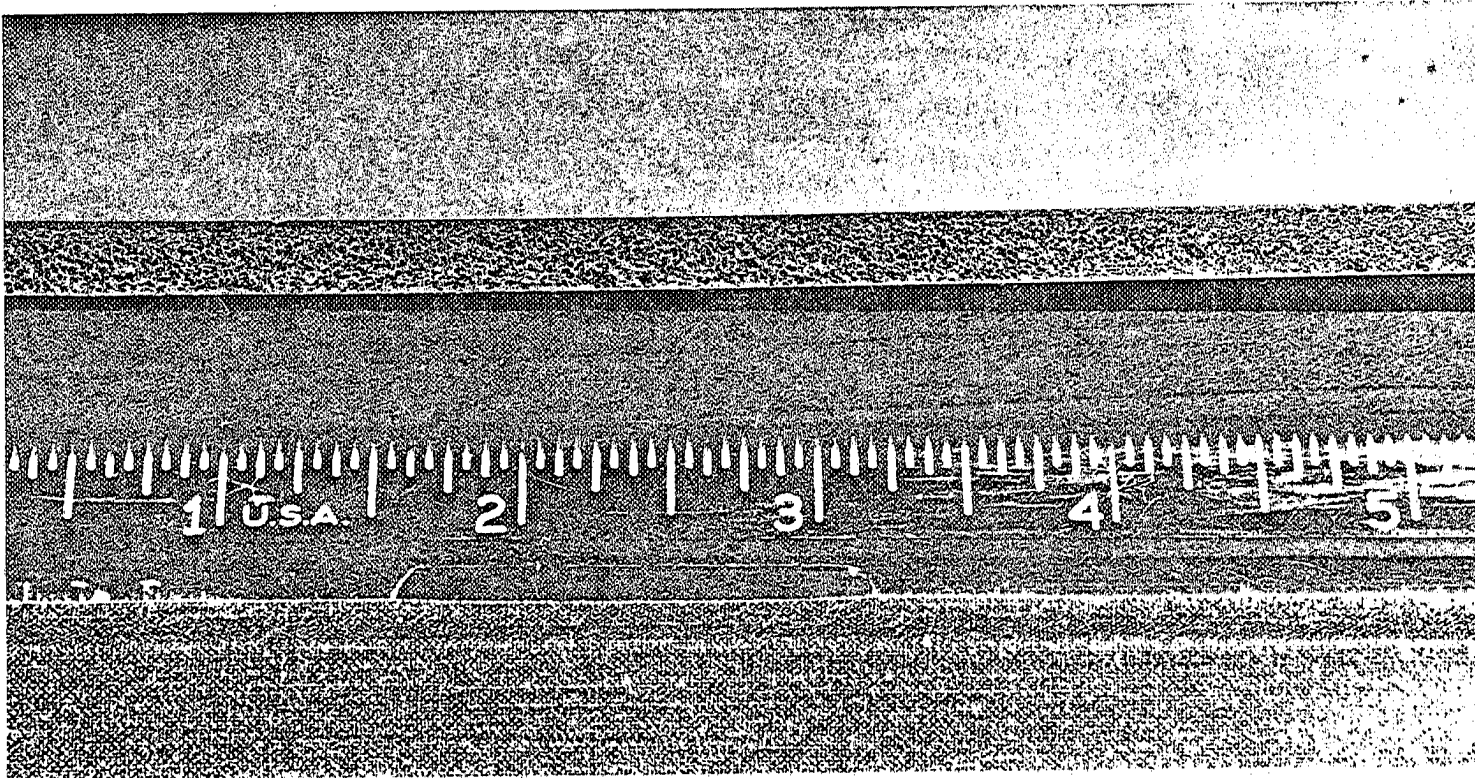


Figure 30 - Porosity (end view) - major.

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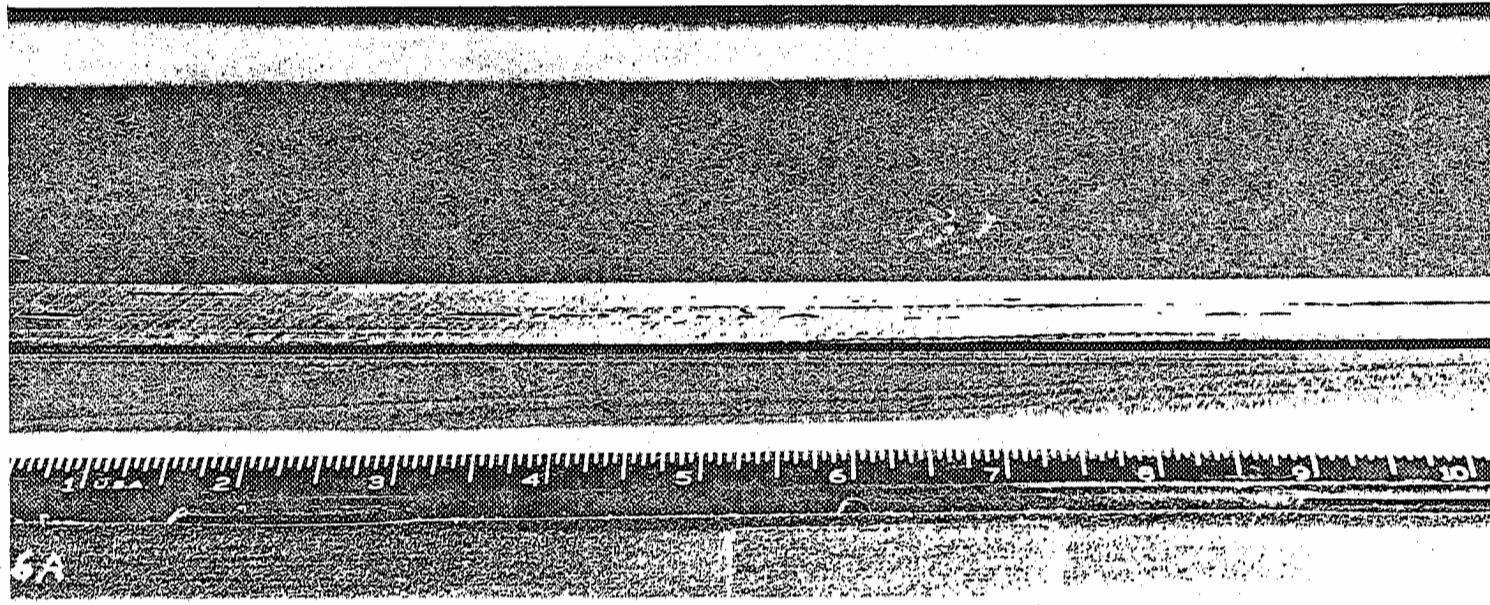


Figure 31 - Delamination (end view) - major.

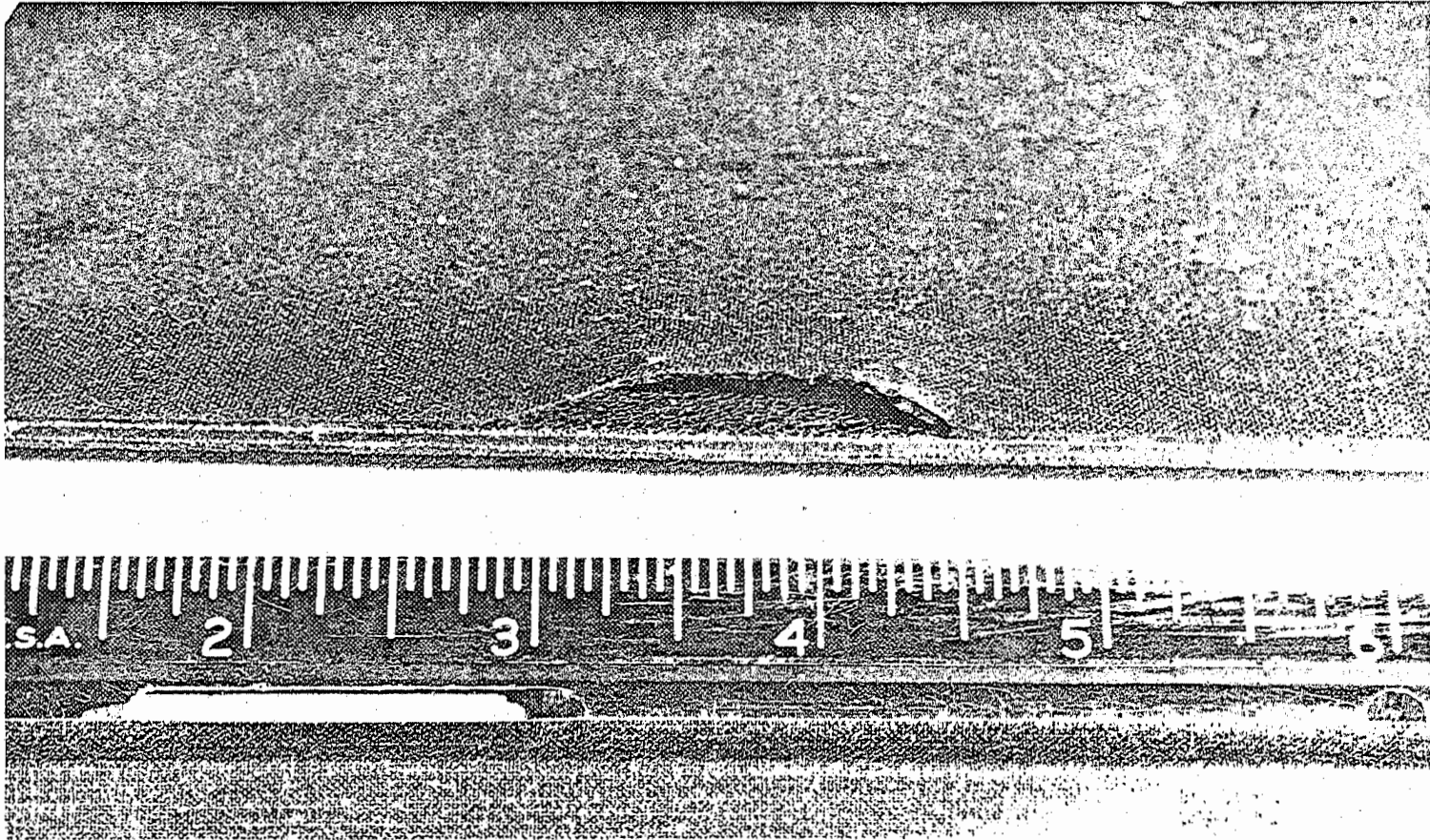


Figure 32 - Delamination (end view) - major.