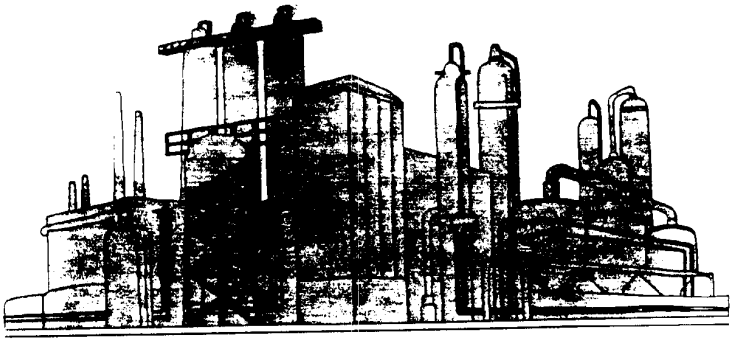
BULLETIN NO. [illegible]

TRANSFORMER

Askarel

Inspection & Maintenance Guide

Monsanto



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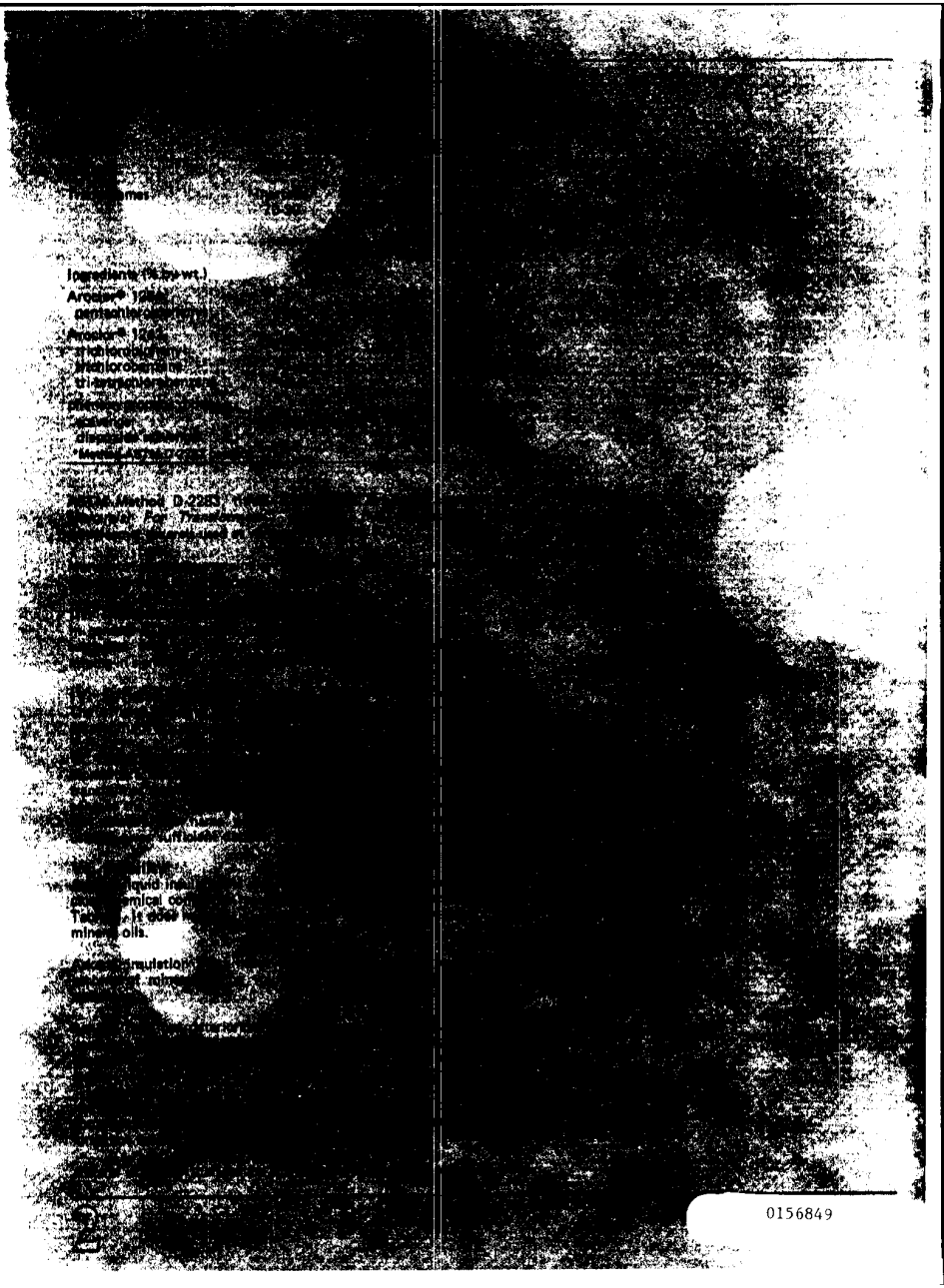

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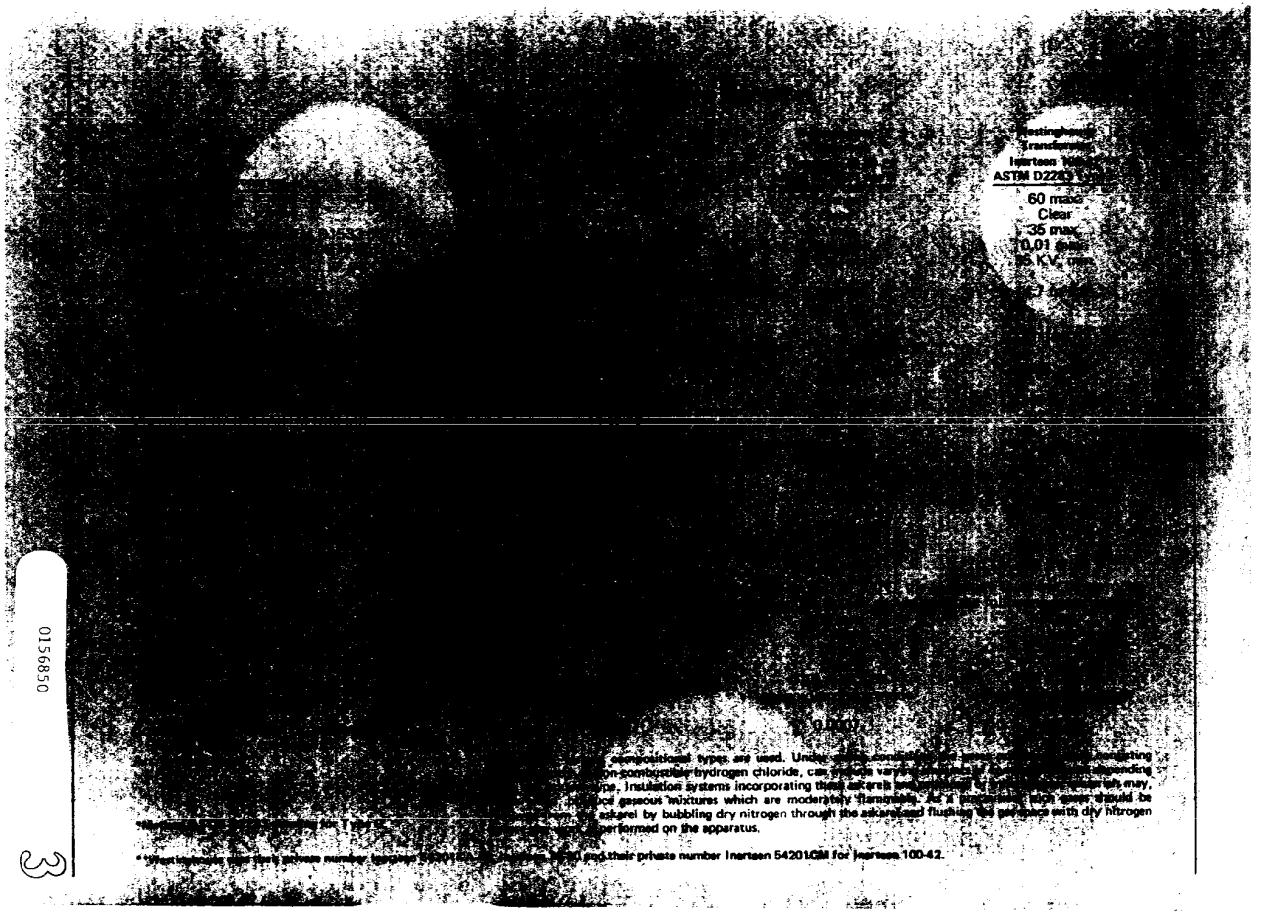

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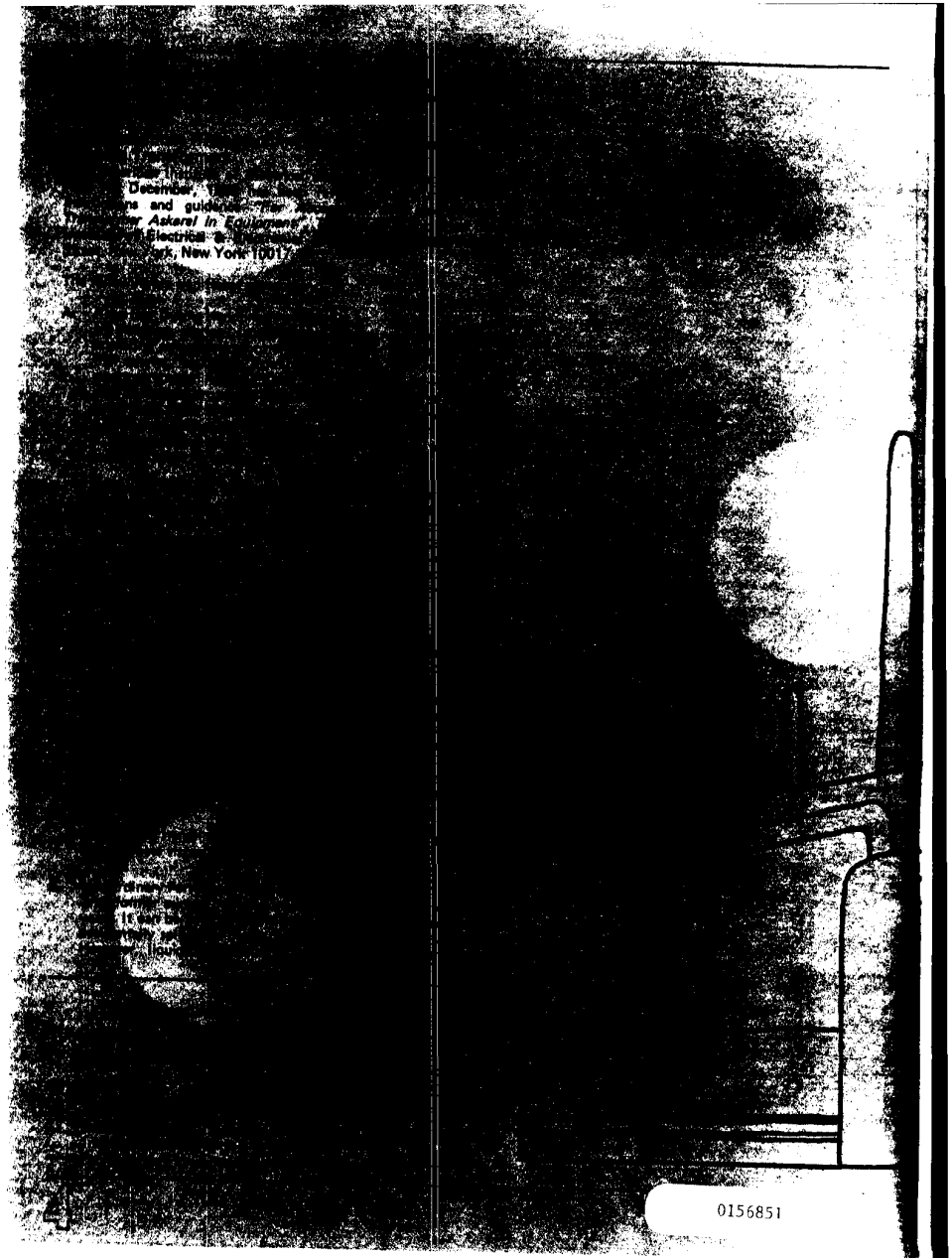

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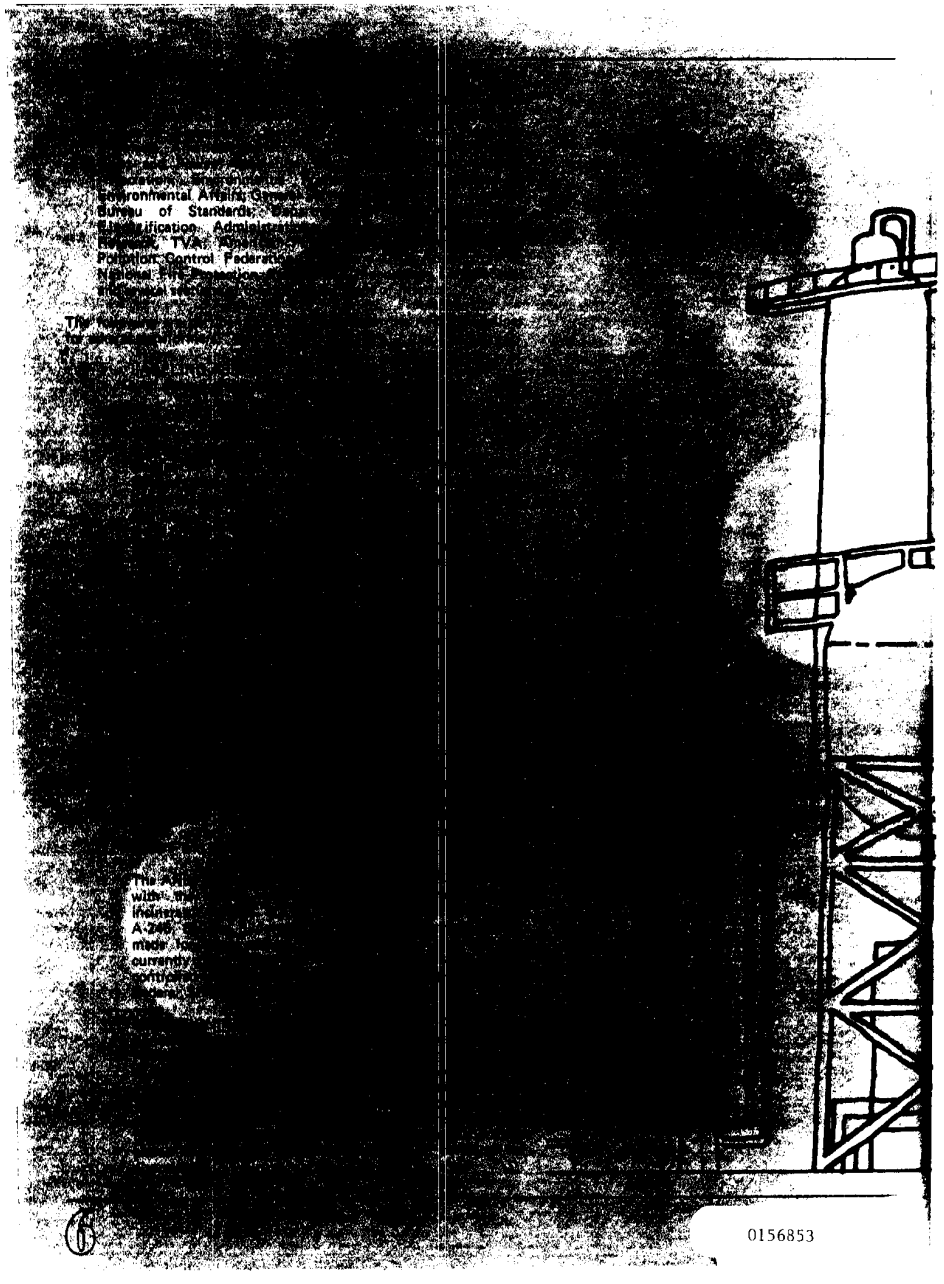

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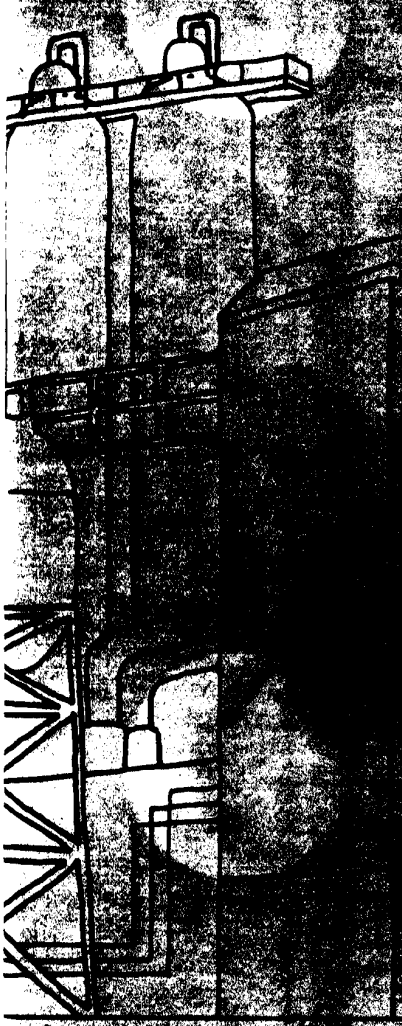

[illegible] TRANSFORMERS FOR REPAIR OR [illegible]

- [illegible] from the unit either into a holding tank [illegible] labeled "Scrap Askarel" for [illegible] sufficient time for all the askarel [illegible]
- [illegible] assembly from the [illegible] floor. Sufficient [illegible] on the floor to [illegible] from the [illegible]
- [illegible] all materials in the appropriate salvage containers during the dismantling for later disposition.
- All used materials including rags, sawdust, tape, etc., regardless of quantity, should be put into the appropriate containers for disposition.

II. TRANSFORMER DISPOSAL

The ultimate disposal of an askarel-filled transformer may be accomplished in [illegible] of two [illegible]

- Complete [illegible] and dismantling with the proper [illegible] askarel liquid and askarel-soaked [illegible] above.
- [illegible] transformers by means of junk or [illegible] avoided unless a transformer is [illegible] soaking of the interior with a [illegible] kerosene. Accumulated liquids [illegible] of as described earlier.

[illegible]

[illegible] and installed askarel [illegible] service for at least 30 [illegible] manufacturers report [illegible] for all units under [illegible] institute's report [illegible] the failure rate for [illegible]

[illegible] General [illegible] pertinent [illegible] Pyranol [illegible]

[illegible] them [illegible]

[illegible] recent [illegible] method [illegible] with the [illegible] closed [illegible]

[illegible] Askarel Fluid

[illegible] as given in the IEEE [illegible] selecting dielectric [illegible] tests to judge [illegible] due to these [illegible] normally [illegible] oil.

[illegible] polar [illegible] their axes [illegible] exhibits [illegible] oil, [illegible] electrical [illegible]

[illegible] solvency power, askarel [illegible] mineral oil to traces of [illegible] consequently the choice of

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... of sooty carbon floating
... be repaired

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... dropped to 26 KV or
... found in excess of 40
... located and corrections

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... of askarel drops
... the moisture content
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... be in a satisfactory
... the transformer

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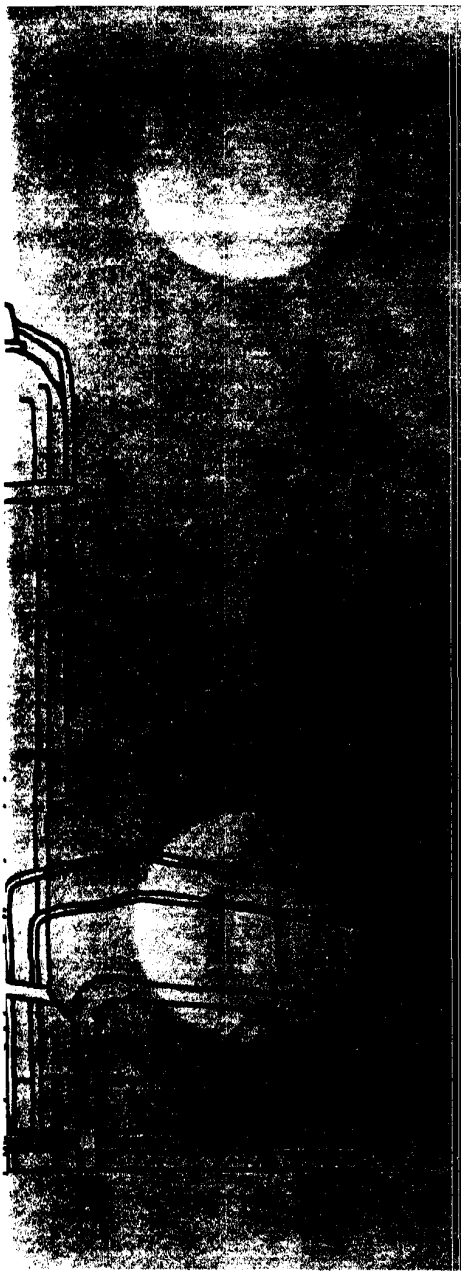

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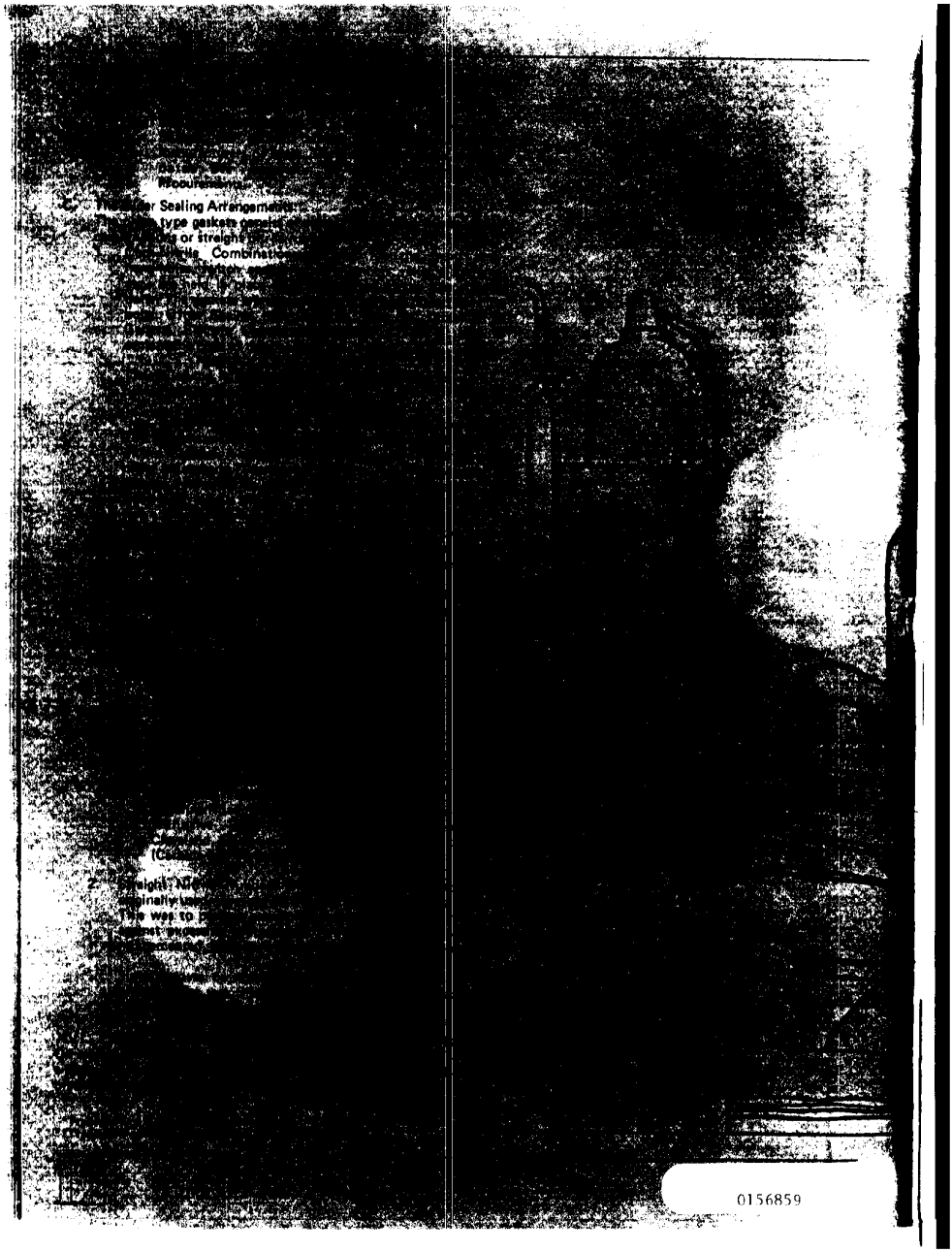

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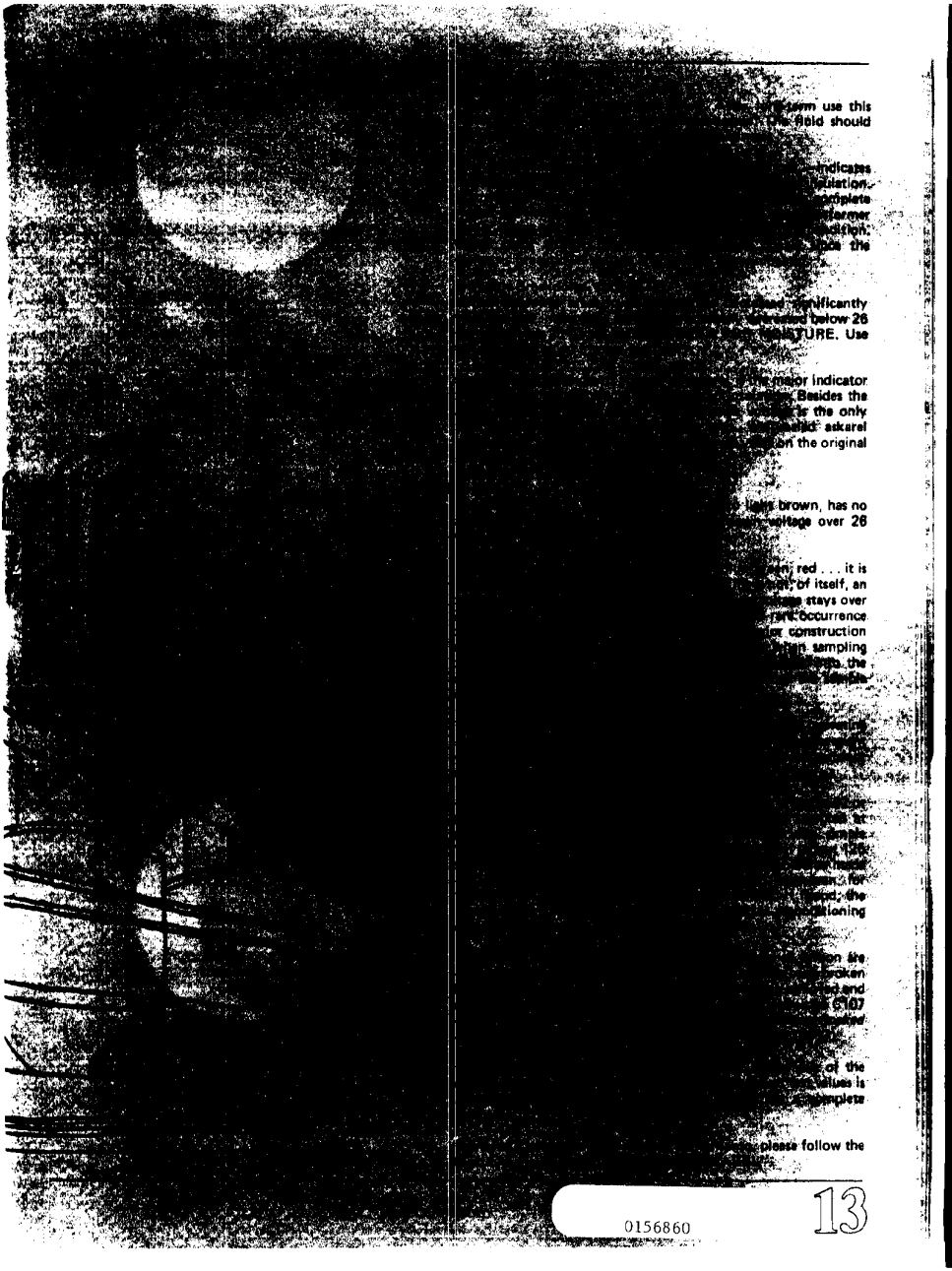

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[illegible] be serious contaminating [illegible]

The power factor test normally used [illegible] in *mineral oil filled* transformers is [illegible] askarel filled transformers, due to the [illegible] soluble polar materials. This increase in power factor as illustrated in Table VI has no adverse effect on dielectric breakdown voltage.

Table VI
Effect of Common Insulation Materials on Power Factor and Dielectric Strength
(Heat Aged 96 Hours in Askarel at 100°C.)

Material Immersed	Askarel After Exposure: Power Factor, Percent at 60 cyc., 100°C	Askarel After Exposure: Dielectric Strength 25°C.
None (control)	1.0	35 KV
Black varnished cloth	85.0	42
Copper	1.5	40
Pressboard	2.0	37
Manila paper	1.5	39
Phenol formaldehyde resins	1.6	41
Shellac	6.0	[illegible]
Iron	5.0	[illegible]
Synthetic rubber	70.0	[illegible]

Similarly, trace contaminants from common [illegible] construction materials can lower the volume-resistivity of [illegible] without affecting its dielectric breakdown voltage. This is shown in [illegible] VII.

Table VII
Effect of Common Insulation Materials on Volume Resistivity of Askarel

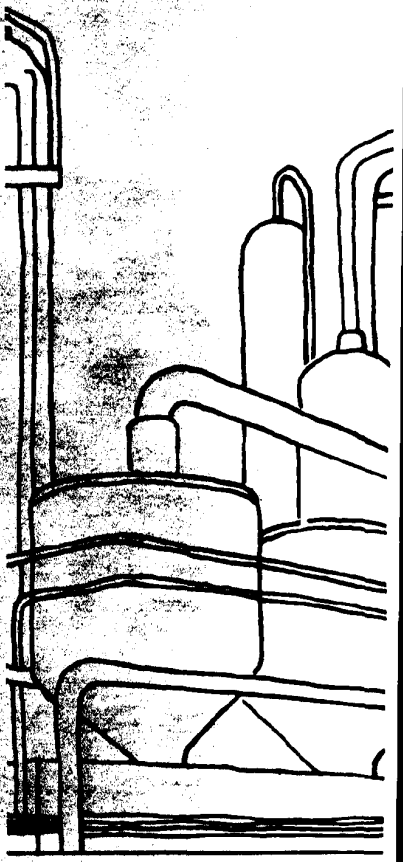
Sample	Volume [illegible]
1. New askarel before heat aging	[illegible]
2. New askarel after heat aging [illegible]	[illegible]
3. After heat aging with 1 sq. inch [illegible]	
a. Phenolic resin tap changer ma[illegible]	[illegible]
b. Paper	[illegible]
c. Grade A pressboard (tan)	[illegible]
d. Grade A pressboard (gray)	500
e. Grade A pressboard, laminated strip	400
f. Cotton wrapping	300
g. Glyptal 1276 cement, cured 48 hrs. at 110°C	100

While trace contamination easily lowers volume resistivity from high levels, it is important to note that heavy contamination (as when arced) does not lower the resistivity below the order of [illegible] at 100°C.

The different behavior of askarel vs. mineral oil in these [illegible] can be summarized as follows:

High power factor and low volume resistivity in transformer mineral oils are commonly regarded as "danger signals" that the oil has deteriorated and broken down chemically or excessive moisture is present.

This is NOT TRUE of askarel liquid insulation unless the dielectric breakdown voltage is low or the moisture content is high.



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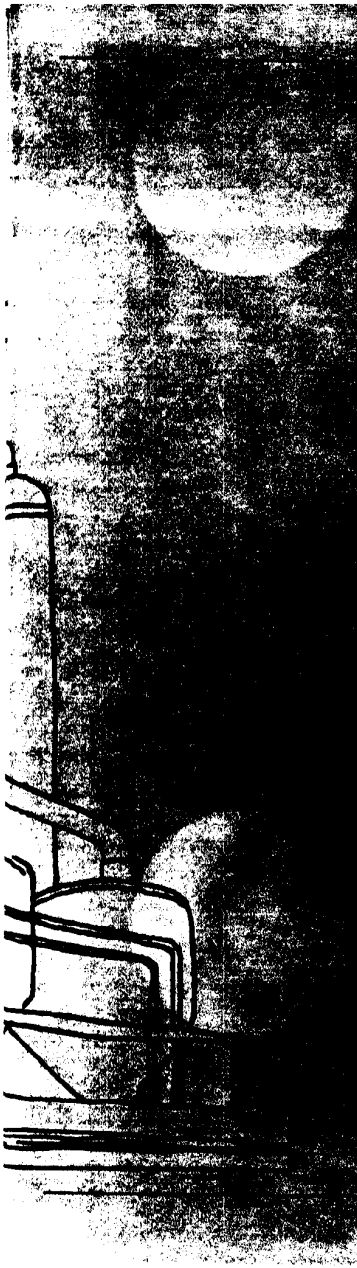

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... heating 168 hours at
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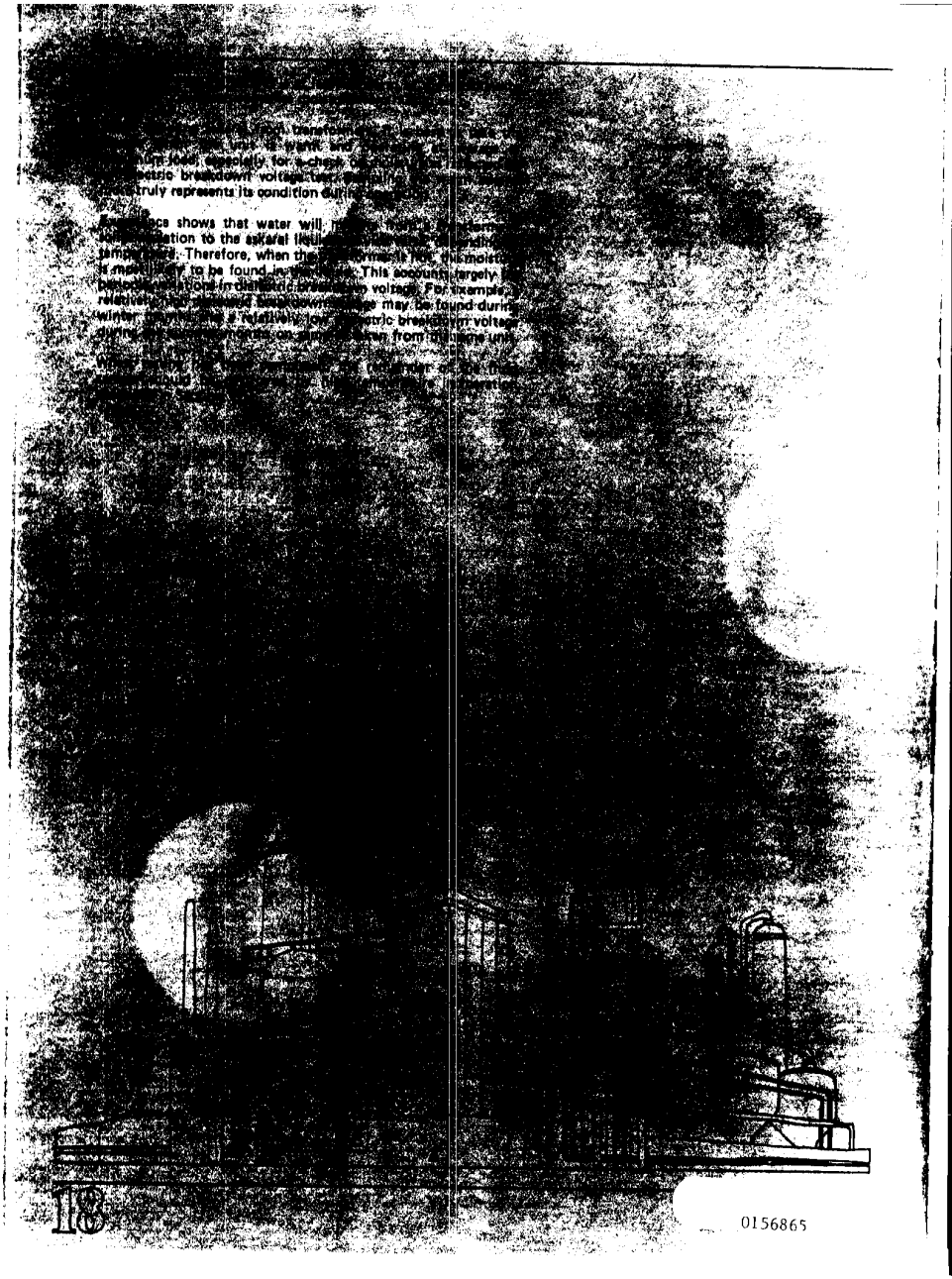

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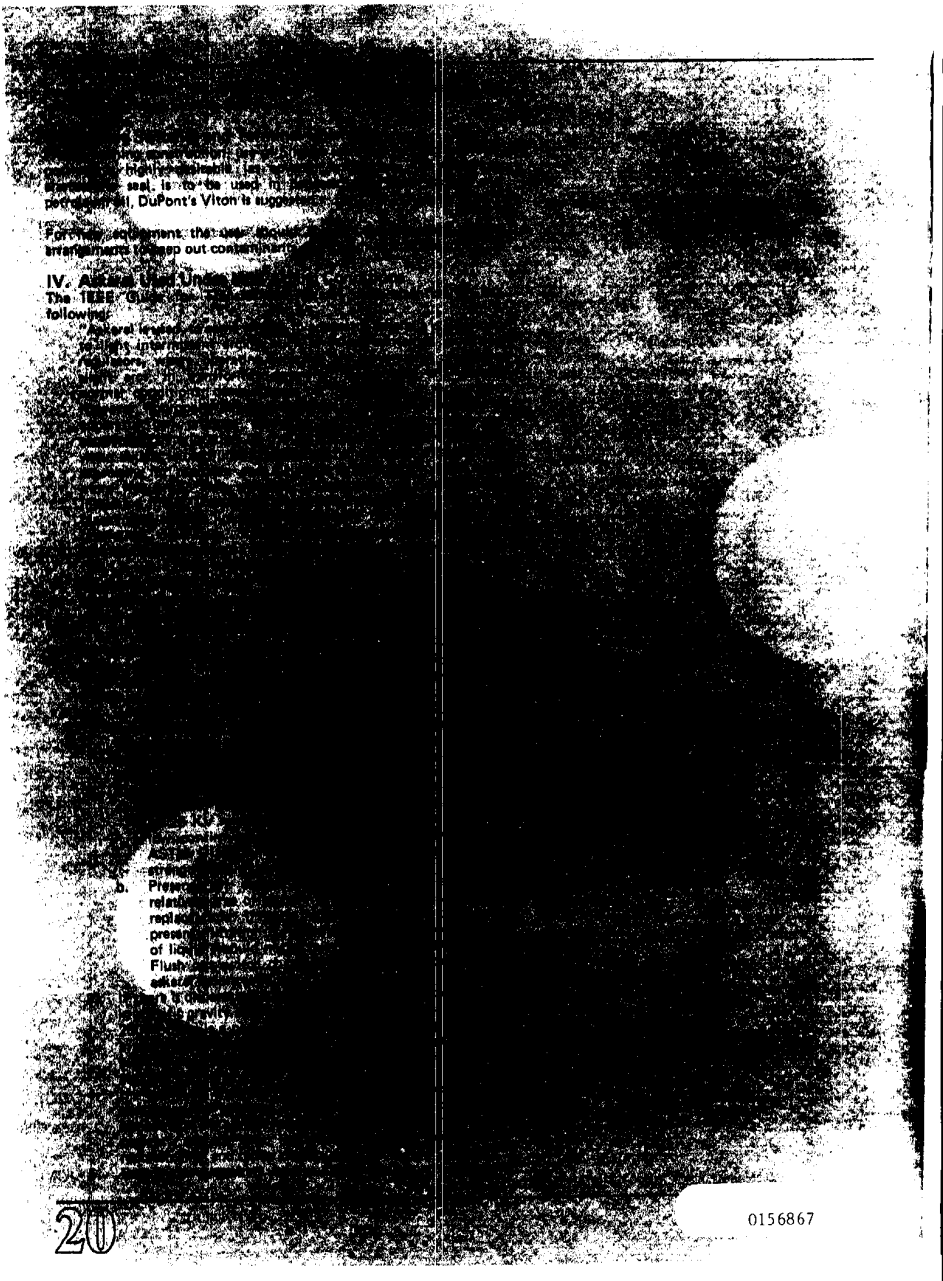

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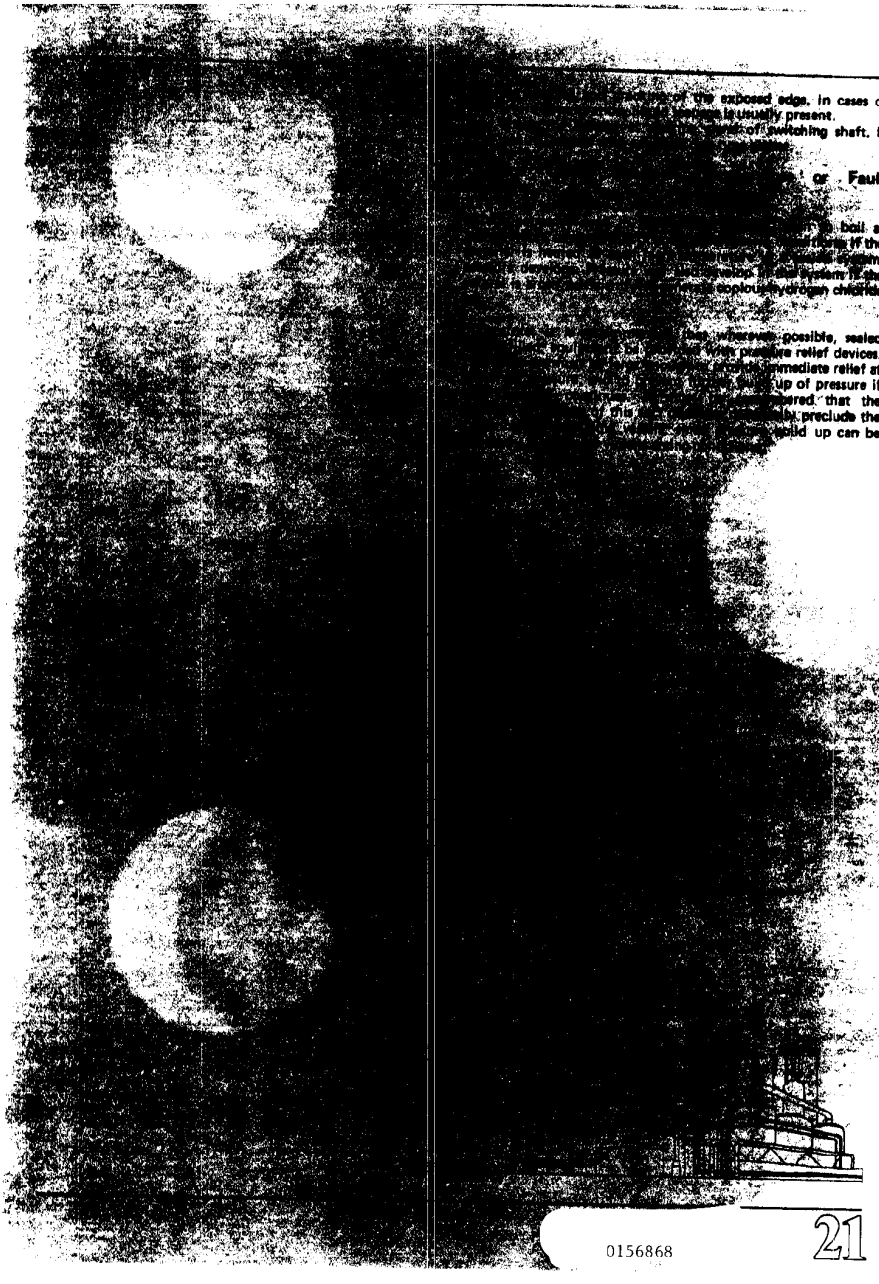

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XV. Sampling ASKAREL 17

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SECONDS

0
20
40
60
80
100

APPENDIX

10^{-6} calories
(P.) per foot.

APPENDIX

Resistance
Ascarels of
predominant



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APPENDIX J

Seals, Properties and Procurement

Dow Corning Corporation, Midland, Michigan with Districts at Atlanta, Boston, Chicago, Cleveland, Dallas, Los Angeles, New York City, Washington, D.C. and Toronto has available Bulletin 09-019, August 1962 entitled "Silastic Design Data". This lists the gasket fabricators throughout the country from whom the "Silastic 50" gasketing can be purchased in sheet, extrusions or molded shapes.

Generally, Silastic 50 sheet goods are stocked by local die cutters, hence, could be generally purchased locally. Usually small quantities of gaskets are die cut. If larger quantities are needed, tools are made of the same type used to cut other elastomers.

Where the gasket is extruded for fitting into a machined groove or between gasket stops, Dow Corning advises use of a scarved joint. This joint is then cemented using Dow Corning's Silastic 140 (clear) or their RTV 731 (white) materials, which air cure.

Dow Corning points out that the local "rubber" fabricators purchase the Silastic 50 in billet form. This is worked on a roll mill in preparation for sheeting or extrusion. Then to obtain the desired physical properties the fabricator must oven cure the Silastic 50 for 24 hours at 480°F.

SPECIFICATIONS*

	Color	White
	Specific Gravity at 77°F	1.20 ± 0.02
ASTM D676	Hardness, Shore A. Scale	45 to 60
ASTM D412	Tensile Strength, psi, min	800
ASTM D412	Elongation, percent, min	250
ASTM D395	Compression Set after 22 hrs at 300°F, percent, max	30

*All physical properties measured on 0.075 inch thick samples molded 5 minutes at 240°F, and oven cured 24 hours at 480°F.

APPENDIX K

Caution Label

The following or equivalent caution statements should be fixed on all containers of transformer askarels and the transformers themselves:

This product contains Polychlorinated Biphenyls (PCBs). Care should be taken to prevent entry into the environment through spills, leakage, use, vaporization, or disposal of liquid or containers. Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact, flush with water. In case of spillage onto clothing, the clothing should be removed as soon as practical, skin washed, and clothing laundered.

Monsanto

MONSANTO INDUSTRIAL CHEMICALS COMPANY
SPECIALTY PRODUCTS GROUP
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI 63166

The information herein regarding obtaining optimum results from askarel fluids in your transformer has been accumulated by Monsanto for over 40 years from the experience of makers and users of askarel transformers and it is believed will be helpful.

Nothing herein shall be construed as applying to other than askarel insulation. Data and maintenance suggestions herein do not apply to the other components of the transformer. All operating and maintenance suggestions recommended by the manufacturer of the transformer should also be carefully followed.

Because these maintenance directions apply only to the askarel insulation, Monsanto disclaims any liability for damage to property or injury to persons arising from transformer operation.

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CUSTOMER SERVICE CENTERS

AKRON, OHIO 44313
260 Springside Drive
Montrose Development Park
Tel. (216) 666-4111

ATLANTA, GEORGIA 30339
120 Interstate North Parkway
Suite 150
Tel. (404) 432-7111

BOSTON, MASSACHUSETTS 02149
Everett Station
Tel. (617) 387-5010

CHICAGO, ILLINOIS
3158 Des Plaines Ave.
Des Plaines, Illinois 60018
Tel. (312) 296-8888

CINCINNATI, OHIO 45236
9041 Hosbrook Road
Tel. (513) 984-1100

DETROIT, MICHIGAN
500 Northland Towers West
Southfield, Michigan 48075
Tel. (313) 357-0910

HOUSTON, TEXAS 77027
1301 Post Oak Tower
5051 Westheimer Road
Tel. (713) 621-9550

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A Unit of Monsanto Company
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