G-E INSULATING MATERIALS

THE RESULT OF RESEARCH

MERCHANDISE DEPARTMENT
GENERAL ELECTRIC COMPANY
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INTRODUCTION

THE best is the only standard recognized when materials are selected for General Electric apparatus. The insulating materials placed on the market by the General Electric Company are identical with those made by the Company for its own use.

A purchaser of G-E insulating materials obtains not merely insulation but a service originating in our Research Laboratory, and backed by the resources of the largest manufacturer of electrical goods. He is thus assured that the G-E insulating materials he buys or uses have been selected for the service for which they are recommended, and only after having been subjected to exhaustive tests.

In addition to the material herein described, this Company has developed various insulating materials for many special applications. Complete information on these may be obtained upon application.

The prices in this publication are, in the majority of cases, subject to discounts dependent on quantity of material purchased. We will gladly quote discounts upon application to our nearest sales office.

Prices and data are subject to change without notice.

G-E INSULATING MATERIALS

The Result of Research

G-E INSULATING VARNISHES, FINISHING VARNISHES AND OILS

1-Pt., 1-Qt., 1-Gal., 2-Gal., and 5-Gal. Containers Showing Standard Labels Used with G-E Insulating Varnishes

G-E varnishes are made in the General Electric Company's factory by skilled varnish makers, from carefully selected and regularly inspected high grade raw materials; for the sake of low costs cheap ingredients are never considered. Quality is demanded and obtained. High grade varnishes necessarily cost more than inferior grades, but they more than repay the additional cost in the results obtained through their use.

Insulating varnishes are used for brushing on coils which have been wound with untreated fibrous materials, such as cotton yarns or tapes. Coils so wound are also dipped in vats of the varnish, and the surplus is drained or brushed off.

The term "japan" has long been associated with materials prepared from natural asphaltum and drying oils by cooking with liberal amounts of chemicals, called driers, which aid in the formation of films when the resulting product is baked or air-dried on metallic or analogous surfaces. These films or coatings have such comparatively short life, particularly those of air-drying japans where larger amounts of driers and less oil are used, that this class of products has gained ill repute in the electrical industry, especially since the films have only medium insulating value and are prized chiefly for their fine, glossy black finish.

In the development of the standard black insulating varnishes, products have been obtained which are equal to the old type of japans in finish and are superior in aging qualities and dielectric properties. These new products are now classified as FINISHING VARNISHES and have in large measure replaced the old japans. It is, therefore, proposed to discard the older terminology in this catalogue and in future, products of this class will be listed as "Finishing varnishes."

Finishing varnishes may be had in a range of lusters, such as "flat," "egg-shell," gloss and high gloss, for application to metal parts, and as a final coating on coils and assembled armatures.

Finishing varnishes are used to give a pleasing appearance to finished coils, metal castings and completed apparatus. They do not have as high dielectric strength as insulating varnishes.

Varnishes are of two general classes: usually these are known as black varnishes and yellow, or clear varnishes. Black varnishes are produced by compounding drying oils and asphaltic materials, and in this way a varnish of maximum insulation value, flexibility, and moisture resistance is secured. Such a varnish, however, has a softer film than the yellow, or clear varnishes which are made from drying oils and which, by oxidation, produce hard films resistant to abrasion but of appreciably lower values in other properties. The only requirement necessitating yellow or clear varnish is that of hardness of surface in order to resist wear and abrasion to a

G-E INSULATING VARNISHES, FINISHING VARNISHES AND OILS

greater degree than the softer black varnish films.

Varnishes are also known according to the method of drying, as air-drying and baking varnishes. The air-drying varnishes are not ordinarily so flexible or durable as the baking varnishes because of the large percentage of drying ingredients contained in them. Naturally, the selection of air-drying or baking varnishes will depend greatly upon the facilities for properly applying the finish. The air-drying varnishes may be brushed on or applied by dipping, and are inferior to baking varnishes only in the degree of flexibility and aging qualities.

In manufacturing, G-E varnishes are brought to a consistency which has been found best for the general line of work for which they are applicable. In the use of these varnishes the best results will be obtained only by using them at approximately room temperature. If a varnish is allowed to become very cold, it will naturally thicken, and cannot be applied as readily as at normal temperatures. On the other hand, if the varnishes are kept at an elevated temperature there is, at first, difficulty because of the material being thin, and afterwards rapid loss of solvent will cause a thickening, so that uniform results cannot be obtained. It is, therefore, recommended that varnishes and similar materials be used at the consistency at which they are furnished, to do which necessitates keeping the materials as nearly as possible at average room temperature (70 deg. F. or 21 deg. C.).

Tanks or vats in which varnish is stored should be kept covered, while not in use, both to prevent loss of solvent and the entrance of dirt or foreign matter. It will be found advisable periodically to filter or strain varnishes used in large containers for daily brushing or dipping, since more or less dirt is certain to find its way into the material. As varnish in tanks will gradually become thicker by loss of solvent, the proper consistency must be restored at intervals by the addition of the proper thinner. In adding this thinner, care should be taken to do so only until the material is brought to the proper specific gravity, as measured at standard temperature, and to use only the particular thinner or solvent recommended. The thinner should be added slowly, with constant stirring, and should be at practically the same temperature as the compound which is being reduced. The addition of large quantities of cold thinner often produces coagulation of the varnish and renders it unfit for use. An ideal method of reducing varnish is to add the thinner while the varnish is being pumped through a filter press to clean it and remove the moisture.

To secure best results with varnishes all surfaces to be coated should be clean and dry, and free from grease and dirt. Metal parts should be carefully pickled; if the presence of insulation prevents such treatment, they should be thoroughly washed with gasoline. Where a smooth finish is desired, the nap should be removed from tapes or threads by singeing. Any small particles on the work, at the start, will increase in size and become more unsightly after each succeeding baking operation.

Baking ovens are of varied designs and may be heated by electricity, gas, steam, or by the circulation of heated oil. Care should be taken that proper ventilation (a fresh supply of oxygen) is at all times secured; but, in cases where an open flame or glowing metal may come in direct contact with the fumes of volatile solvents, forced draught should be provided to keep the inflammable gases at a low concentration.

Oven temperatures found in practice are from 90 to 150 deg. C., or, in some cases, higher. The baking period is dependent upon the temperature used, more time being required to bake at a low temperature than at a higher temperature.

In the past, the common method of operating baking ovens has been to employ a varying and relatively low temperature, with consequent long baking period, for all classes of work. As a result of careful investigation and extended experience, however, methods re-

G-E INSULATING VARNISHES, FINISHING VARNISHES AND OILS

quiring rapid baking at higher temperatures than were formerly used, are being adopted with satisfactory results. This work is divided into two classes: (a) where organic or fibrous materials are involved, and (b) where inorganic substances such as metals, brass, marble, slate, asbestos, composition sheet materials, etc., are to be treated.

In handling class (a) work, steam-heated or electrically-heated ovens are to be preferred, and the best temperatures are 120 to 130 deg. C. (248 to 266 deg. F.). Insulating materials prepared from cellulose and other fibrous matter in the form of cloths, tapes, twines, etc., may be safely subjected to this method of treatment. Class (b) work is best handled at 200 to 260 deg. C. (392 to 500 deg. F.). The most satisfactory results are obtained in electric ovens.

Electrically-heated baking ovens possess many advantages over other types for high-temperature service. They are, in the first place, more economically installed and operated than other types. They reduce the fire risk by eliminating open flames or glowing red surfaces which ignite fumes from the varnishes and japans used, producing explosions and fires. The finish upon the apparatus treated in electric ovens is more brilliant and glossy, owing to the absence of products of combustion (such as water, vapor, reducing gases, etc.) in this type of oven.

Although it is preferred that the compounds be used at the consistency at which they are supplied by this Company, it sometimes becomes necessary to reduce the consistency of the compound because of the material becoming too thick on standing in tanks.

When difficulty arises in securing the proper drying, through slow evaporation of solvent, the following considerations should be borne in mind. Benzol is the most volatile solvent commonly used. G-E No. 811 thinner is nearly as volatile as benzol, and provides a different type of solvent. It is, however, more expensive than benzol or 55 deg. naphtha. Next in order of volatility is 55 deg. naphtha which may be satisfactorily employed for air-drying materials, where medium or slow drying rates are permissible; 55 deg. naphtha is perhaps better known as varnish makers' and painters' naphtha. Turpentine substitute is slow drying, and should be used for thinning only those varnishes subjected to baking. Turpentine is used in baking varnishes and in slow air-drying varnishes, where the characteristic properties of this solvent are required. It is ordinarily more expensive than any of the other solvents just mentioned.

Insulating varnishes are used for brushing on coils which have been wound with untreated fibrous materials, such as cotton yarns or tapes. Coils so wound are also dipped in vats of the varnish, and the surplus is drained or brushed off. For this work varnishes do not require so high a degree of flexibility, nor so good aging qualities at high temperatures, as do those used in the manufacture of varnished cloth, but the varnish film is usually tougher and glossier.

G-E VARNISHES

No. 150 Black Baking Varnish

This varnish imparts a very high gloss and is used extensively for finish. It is particularly resistant to oils, even when immersed. This varnish is recommended for use on armatures to which a baked finish is given. It may be used over other insulating varnishes as a finish, and is applied by brushing or dipping and fixed by baking for a period of from six to ten hours at temperatures from 85 to 135 deg. C. The thinner recommended for use with this is 55 deg. naphtha.

No. 460 Black Baking Varnish

A black, plastic varnish suitable for general use wherever a black baking varnish is required. When properly baked, it produces a firm, hard film which is not easily injured in the assembly of apparatus, and which possesses high dielectric strength and endurance. It is recommended for treating absorbent materials used in wrapping various types of electrical apparatus: to exclude air and mois-

G-E INSULATING VARNISHES, FINISHING VARNISHES AND OILS

ture and produce a firm uniform mass; to fill the tapes wound upon coils; to form insulating films of any required thickness over the tape layers; and to produce a moistureproof surface finish which is resistant to acids, alkalies, weathering, aging under heat, electrical and mechanical stresses.

Films of any degree of toughness may be produced by suitable regulation of the baking period. A short baking produces a tough, rubbery coat, not affected by bending, which softens slightly under heat to accomplish bonding effects. Baking for a longer period gives a film which is hard and tough, and is not affected by mineral oils. This varnish may be used on all armature and field coils which are given a baked finish. It is applied by brushing or dipping and fixed by baking, from two to eight hours, at temperatures from 100 to 150 deg. C. Thinner used is 55 deg. naphtha.

No. 458 Black Air-Drying Varnish

A black, plastic varnish of high insulation value which dries in air, producing an extra black, glossy surface, resistant to weather, moisture, acids and alkalies. This varnish is suitable for finishing armature coils, compensators and motors which cannot be subjected to baking, pole leads, connection rings and various other types of connections, as well as for a finish and rust preventive coating on metal parts.

It is suitable for bonding the slot portions of armature coils by first applying it to pressboard and papers, as in the case of shellac. This varnish has a higher cementing value than shellac, particularly at temperatures above 75 deg. C., and should be preferred on account of its higher heat resistance and higher insulation value as well as its lower cost. This varnish may be applied by brushing, dipping or spraying, and will dry in air in approximately three hours. Thinner used is 55 deg. naphtha.

No. 450 Clear Baking Varnish

A heavy, clear, insulating varnish suitable for general use where a baking varnish is required. It possesses high insulating qualities which it retains, together with flexibility, under severe assembly and service conditions. It has a heavy body and has been found of especial value in the insulation of transformer, regulator and meter coils, for the coating of pressboard, and for the preparation of tacky varnished cloth. This varnish is oilproof, moistureproof and weather-resisting, and is especially suitable for work where high temperatures prevail. It may be applied either by dipping and brushing, or by an impregnation process, and should be baked for a period of from eight to ten hours at 100 to 120 deg. C.

No. 152 Clear Air-Drying Varnish

A hard, clear varnish which dries in air, producing a bright glossy finish. It is suitable for use on commutator rings, transformer coils, and for general insulating finish work where clear, air-drying varnish is desired. It may also be used for repairing coils, when the use of a baking varnish is impracticable. This varnish is oilproof, weatherproof and moisture-resistant. It dries in from three to eight hours. A special thinner known as G-E No. 811 Thinner is used with this varnish.

G-E FINISHING VARNISHES

No. 165 Black Baking Varnish

A finishing varnish which bakes to a high gloss surface possessing exceptionally good aging properties when exposed to service or weathering conditions. May be applied by dipping or spraying and should be baked at a temperature of 150 deg. C. (300 deg. F.) for two hours, or at 225 deg. C. (435 deg. F.) for 45 minutes. Suitable for use upon any clean iron or steel surface either plain or galvanized, upon which not only a pleasing finish but a high grade insulating coating will be produced.

No. 183 Black Air-Drying Varnish

An excellent quick air-drying black varnish, which is weather resistant and of high insulating value. It is used principally for treating

G-E INSULATING VARNISHES, FINISHING VARNISHES AND OILS

field coils. The film produced is not so tough as that resulting from the use of No. 458 Varnish, but it dries more quickly.

No. 188 Air-Drying Varnish

A finishing varnish which air dries to a glossy black surface resistant to weather, moisture, acids and alkalies. May be applied by brushing, dipping or spraying, to metal parts on which a pleasing glossy black finish of great permanency is desired. May also be used for spraying on finished fields and armatures where in addition to finished appearance it imparts an insulating coating.

G-E OILS

No. 247 Double-Boiled Linseed Oil

A double-boiled linseed oil with drier. Used for treating coils, for oiling sheet insulations such as red rope paper, horn fiber, asbestos, hemp rope, wedges, and for general purposes which require a good grade of double-boiled oil.

G-E THINNER

No. 811 Thinner

A blended solvent for use with certain G-E compounds.

No.	Color	Class	NET RETAIL PRICE PER GALLON						Approx. Wt. per Gal. in Lb.	Specific Gravity	Drying Time in Hours	Thinners to be Used
			55-Gal. D'm	5 Gal.	2 Gal.	1 Gal.	Qt.	Pt.				
G-E INSULATING VARNISHES												
150	Black	Baking	$1.60	$1.95	$2.05	$2.25	$2.75	$3.40	7.313	0.875	6	V.M.& P. Naphtha
152	Clear	Air-drying	1.90	2.25	2.35	2.55	3.05	3.70	7.063	0.850	4	No. 811 Thinner
450	Clear	Baking	2.00	2.35	2.45	2.65	3.15	3.80	7.438	0.890	8	V.M.& P. Naphtha
458	Black	Air-drying	1.15	1.50	1.60	1.80	2.30	2.95	7.125	0.855	3	V.M.& P. Naphtha
460	Black	Baking	1.70	2.05	2.15	2.35	2.85	3.50	7.063	0.845	7	V.M.& P. Naphtha
G-E FINISHING VARNISHES												
165	Black	Baking	$1.60	$1.95	$2.05	$2.25	$2.75	$3.40	7.250	0.865	2	V.M.& P. Naphtha
183	Black	Air-drying	1.55	1.90	2.00	2.20	2.70	3.35	7.625	0.915	¼	Benzol
188	Black	Air-drying	1.10	1.45	1.55	1.75	2.25	2.90	6.938	0.835	8	V.M.& P. Naphtha
G-E DOUBLE-BOILED LINSEED OIL												
247	Clear	Air-drying or Baking	$2.70	$3.05	$3.15	$3.35	$3.85	$4.50	7.875	0.940	6	.....

G-E SPECIAL THINNER

No.	Name	NET RETAIL PRICE PER GALLON						Weight per Gal. in Lb.	Specific Gravity
		55-Gal. Drum	5-Gal.	2-Gal.	1-Gal.	1 Qt.	1 Pt.		
811	Thinner	$0.55	$0.90	$1.00	$1.20	$1.70	$2.35	5.955	0.715

A charge of **$10.00** is made for 55-gal. iron drums, but full credit will be allowed upon their return in good condition to Schenectady, freight prepaid. No charge is made for cans.

G-E STICKERS AND SHELLACS

Stickers may be classed as auxiliary insulating materials, since their chief function is not so much to produce an insulating layer, as to hold other insulating substances in place.

These stickers are not expected to remain permanently sticky, the material held being supported in some other manner within a short period after the sticker is applied. An example of this kind of work is the wrapping of varnished cloth on armature coils, where subsequent wrappings or compression within the slot hold the strips or tapes in place.

Aside from the cementing in place of varnished cloth, varnished tape and mica tape, other uses for this class of compounds are pasting asbestos paper to iron or wood, felt gaskets to iron, etc.

The uses of shellac are well known and need no general description. The special purpose for which each standard shellac is designed will be found under the proper numerical designation.

Owing to the limitations of shellac as a bonding material, and its relatively high cost, black bonding varnishes are being used more generally. This material is a better insulator and a more permanent sticker, but requires a somewhat higher temperature.

NO. 211 STICKER

A sticker for cementing varnished cloth, varnished tape, paper and mica tape to armature coils. Also useful for sticking asbestos paper to controller covers. Thinner: benzol.

No. 213 STICKER

A sticker for use with asbestos as in pasting asbestos tape to copper. Thinner: benzol.

NO. 263 SHELLAC

This is an orange shellac solution of low specific gravity adapted for general use. Thinner: denatured alcohol.

NO. 265 SHELLAC

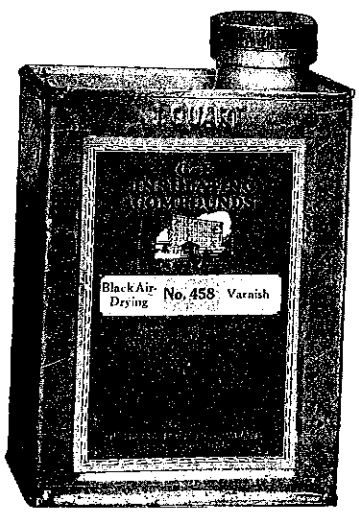
This is a black shellac of high insulating qualities. Suggested uses are for finishing switch handles, black paint cables, backs of commutators, and as an oilproof protective finish coating. On coils exposed to the penetrating action of fine dust, as in carbon factories, short-circuiting of the coils has been eliminated by the use of a protective coating of this shellac. Thinner: denatured alcohol.

NO. 266 SHELLAC

A clear, light-bodied shellac for coating asbestos and other papers to produce bonding materials required in coil manufacture. Thinner: denatured alcohol.

NO. 462 BLACK BONDING VARNISH

A quick-drying, black bonding varnish developed to replace shellac for general bonding purposes. It is appreciably cheaper than shellac, is a better insulator because of its non-conducting solvent, and is a more permanent sticker. Thinner: benzol.



G-E STICKERS AND SHELLACS

No.	Name	NET RETAIL PRICE PER GALLON						Approx. Weight per Gal. in Lb.	Specific Gravity	Thinner
		55-Gal. Drum	5 Gal.	2 Gal.	1 Gal.	Qt.	Pt.			
G-E STICKERS										
211	Sticker	$2.00	$2.35	$2.40	$2.65	$3.15	$3.80	7.313	0.880	Benzol
213	Sticker	3.80	4.15	4.25	4.45	4.95	5.60	8.313	1.000	Benzol
462	Varnish	1.75	2.10	2.20	2.40	2.90	3.55	7.750	0.930	Benzol
G-E SHELLACS										
		52 Gal. Wdn. Bbl.								
263	Shellac	$4.15	$4.40	$4.50	$4.70	$5.20	$5.85	7.438	0.890	Denatured Alcohol
265	Shellac	7.10	7.35	7.45	7.65	8.15	8.80	7.875	0.945	Denatured Alcohol
266	Shellac	9.10	9.35	9.45	9.65	10.15	10.80	8.125	0.97	Denatured Alcohol

A charge of $10.00 will be made for 55-gal. iron drums, but full credit will be allowed upon their return in good condition to Schenectady, freight prepaid.

No charge is made for cans or wooden barrels.

G-E SEALING AND FILLING COMPOUNDS

Solid, fusible compounds find an extensive use in various insulating operations. Of first importance is the treatment of coils to produce a solidified mass from which moisture and air are excluded. By the use of asphaltic compounds, coils treated by the vacuum process are rendered permanently moistureproof; while, by the use of specially designed compounds, coils may be protected from the penetration both of moisture and mineral oils. Compound-treated coils are of rigid type and do not possess any considerable degree of flexibility when finished.

The compounds used in this work, however, should preferably be sufficiently tough to withstand rough handling. Other desirable properties of these compounds are uniform flow-point maintained under continued heat, a high degree of fluidity and high penetration at the treating temperature.

A second class of solid compounds is required for filling cavities to exclude moisture, dust and dirt. There are two general divisions of this group, one including those solid compounds which are melted, poured in place and solidified by cooling. Large quantities of these compounds are required for filling the spaces between porcelain tubes, bases and caps in lightning arresters, to produce a rigid apparatus, and to exclude moisture; for filling between the leads and porcelain bushings in transformers, to produce an oil-tight joint;

G-E SEALING AND FILLING COMPOUNDS

for filling over screw-heads in receptacles, sockets, switches and other wiring supplies; and for filling cable end-bells and joints.

The other division includes those plastic or putty-like compounds which are used in the manufacture of armature and field coils, to fill in spaces between the wires, excluding air and producing a rigid, moistureproof construction. These compounds gradually set to a firm condition, either with or without the application of heat according to the design of the compound.

In heating compounds used for filling, cementing and treating, to render them fluid for pouring, great care should be taken to avoid overheating, since excessive temperatures impair the strength and elasticity of the compound, and ruin the organic insulating materials with which the compound comes in contact.

Where the mass of porcelain or metal to be filled with compound is relatively large as compared with the amount of compound required, the porcelain or metal should be handled at a temperature as near that of the flow point of the compound as is convenient, so as to avoid the chilling of the compound at the surface of contact, a result which tends to develop cracks in the compound and causes it to adhere very poorly. In no case should compound be poured on a surface which is colder than 21 deg. C. (70 deg. F.), the temperature of the average room.

It is understood, of course, that surfaces with which the compound comes in contact should always be freed from oil, grease, dirt, grit, and similar substances which tend to impair the adhesive qualities.

NO. 8 COIL-FILLING COMPOUND

This compound—applied in the form of putty as the coils are wound, and hardened by subsequent heating—forms a dense, hard, stone-like insulation which is oilproof and waterproof, and is absolutely unaffected by temperature up to 250 deg. C. It has excellent binding properties (cementing together the turns and layers of the conductor solidly and firmly), conducts heat well, and is valuable when desirable to carry heat away rapidly from the interior of the coils.

The liquid and dry portions of No. 8 Coil Filling Compound are shipped in separate containers as follows:

For every one gallon of No. 8 Compound one-half gallon of No. 428 Clear Cementing Compound and 10 lb. of No. 8 Dry Filler will be supplied in separate containers. Full directions for mixing the two portions are printed on the label of the can containing the No. 8 Dry Filler.

NO. 12-G ARC-CHUTE CEMENT

An arc-chute cement which may be used in controllers. The cement is supplied at the consistency of putty, and should be preserved in tight cans, as it sets rapidly when exposed to the air. In use it is pressed into place and sets to a tough, solid, white mass, highly resistant to the electric arc.

NO. 224 POTHEAD COMPOUND

This is a flexible, black, asphaltic compound having a flow point of 105 to 110 deg. C. It may be used in filling the lower orifices of porcelain insulators in arc-lamp cutouts, filling the porcelain parts of lightning arresters, etc.

NO. 225 TREATING COMPOUND

A black, asphaltic compound recommended for treating transformer and field coils by the vacuum process. It possesses high insulation value and is absolutely waterproof.

NO. 226 FILLING COMPOUND

A black, elastic, sealing compound with a flow point of 85 to 95 deg. C. Recommended for use filling in cavities over metal parts, such as over bolt heads in railway contact plows, etc.

NO. 227 JOINT COMPOUND

A black, waxlike sealing compound which may be used for filling cable joints, Edison tube joints, and coupler sockets, when it is

G-E SEALING AND FILLING COMPOUNDS

desired to melt the compound out of place without injuring the moulded insulation; and for telephone and series lightning transformers when high fluidity at comparatively low temperatures is required, on account of the small pouring orifice. It also may be used as a treating compound during the winding of coils, and in the spraying of asbestos for moulded compound insulations. Recommended for use as a protective compound for iron pipes which are to be placed under ground. Flow point, 65 deg. C. Fluid for filling at 130 deg. C. Shrinkage from 100 to 20 deg. C. is 5 per cent. Puncturing voltage for ¼-in. thickness, 75,000 volts, 60 cycles, alternating current at 65 deg. C. It is strongly adhesive, does not corrode metal, or crack in cooling. Low dielectric loss under high electromotive force.

NO. 229 FILLING COMPOUND

This compound is similar to No. 227 Compound, but with higher flow and melting points. It is principally used as a filling compound for cable end-bells. Flow point, 120 deg. C. Fluid for filling at 180 deg. C.

NO. 231 SEALING COMPOUND

This is a brown sealing compound which may be used for transformer terminal bushings, etc. Flow point, 112 to 115 deg. C.

NO. 234 SEALING COMPOUND

This compound may be used for the same general purposes as No. 837 Compound, and possesses the same general properties. Color, black.

NO. 236 SEALING COMPOUND

This compound is resistant to mineral oils and adheres well to iron, porcelain and cable insulations. It may be used for sealing in bushings for transformer leads and for general use. Flow point, 130 to 135 deg. C. Color black.

NO. 424 FILLING COMPOUND

A synthetic pitch of smooth, firm consistency, of use where a flexible filling compound of high flow point is required.

No. 424 Compound possesses high dielectric properties and permanent resistance to heat-

No.	Name	NET RETAIL PRICE PER LB.					Approx. Weight Per Gal. in Lb.	Flow Point in Deg. C.
		50-Gal. Bbl.	10-Gal. Tub	5 Gal.	2 Gal.	1 Gal.		
8	Coil Filling Compound	$0.37	$0.39	$0.41	....	$0.44	16.00	...
12-G	Arc-Chute Cement	.14	.16	.18	....	.21	15.00	...
224	Pothead Compound	.17	.19	.21	....	.24	7.00	110
225	Treating Compound	.18	.20	.22	....	.25	8.00	100
226	Filling Compound	.20	.22	.24	....	.27	8.00	95
227	Joint Compound	.15	....	.19	$0.21	.22	8.00	65
229	Filling Compound	.27	....	.31	.33	.34	8.00	120
231	Sealing Compound	.38	.40	.42	....	.45	13.75	115
234	Sealing Compound	.14	.16	.18	....	.21	8.00	100
236	Sealing Compound	.09	.11	.13	....	.16	16.75	135
424	Filling Compound	.19	.21	.23	....	.26	8.00	150
831	Filling Compound	....	....	.26	.28	.29	11.75	...
837	Filling Compound	.10	.12	.14	....	.17	14.00	100

No charge is made for containers and no credit will be allowed for their return.

G-E SEALING AND FILLING COMPOUNDS

ing, or to weathering when exposed to the atmosphere. Color, black. Flow point, approximately, 150 deg. C.

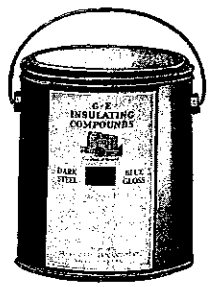
NO. 831 FILLING COMPOUND

This is a putty-like compound for filling between the windings, coil interstices, or stator ends in motors. This compound is especially satisfactory where dust, moisture, acid, or alkali are present.

NO. 837 FILLING COMPOUND

A filling compound recommended for use in filling in over screw heads in porcelain parts, slate bases, etc., where the cement is not exposed to view, and in the assembly of lightning arresters, wooden handles on moisture-proof rope, etc. Possesses good insulating properties, low coefficient of expansion and is absolutely waterproof. Flow point, 95 to 100 deg. C. Color, light brown.

G-E PAINTS



1-Gal. Paint Pail with G-E Standard Label

In manufacturing electrical apparatus, paint is used:

(a) To afford a protective coating, and to give a finished appearance to electrical machines.

(b) For filling the braiding of cables, to render them fireproof.

(c) To afford a protective coating, on certain parts of apparatus, against the dissolving action of certain oils.

In specifying paints, care should be taken to select one suitable for the service required since there is a necessary difference in the composition of paints for indoor and outdoor use. Most paints are suitable for indoor service, or for apparatus not exposed to weather; but, for outdoor service, a more careful selection of ingredients is required, to enable the paint to withstand the effect of the elements.

Brushing is the usual method of applying paint but, where economy of time is important, spraying and dipping are also used. The two latter methods require the paint to be of a thinner consistency than for brushing. Spraying has the advantage of producing a very uniform coat. Brushing should be used unless spraying or dipping is recommended in the paragraph describing the paint.

The characteristic properties of each paint is given in the following pages.

NO. 162 BLACK OILPROOF ENAMEL

An air-drying, oilproof paint for coating the interior of transformer tanks. It is insoluble in transformer oil and adheres tenaciously to surfaces to which it is applied.

NO. 251 BLACK CABLE PAINT

A black, flame-resisting paint used on wire and cables, switchboards, etc., to impart an insulating finish and protect them from moisture and weathering.

NO. 284 LIGHT BLUE PAINT

This is a high-gloss, oilproof and waterproof paint which is also heat resisting. It may be

G-E PAINTS

used for painting the inside of gas-engine cases, bearing housings and other apparatus where resistance to heat and oil are essential qualities. It is useful for filling porous castings to prevent oil from leaking through.

NO. 285 DARK STEEL-BLUE ENAMEL

A dark, steel-blue enamel paint used for a finish on motors, generators, railway motor frames, gear cases and similar apparatus. The paint is applied by brushing over rough filled or unfilled surfaces, and will dry in from five to six hours, to produce a more or less glossy finish, depending upon the surface over which it is applied.

NO. 286 DARK STEEL-BLUE GLOSS

A steel-blue egg-shell finishing paint of high grade. It may be applied by spraying or brushing. Suitable for use on motor and generator frames, the surfaces of which are usually filled. This gloss, although essentially an indoor paint, is also weather-resistant, does not fade and will not turn white when exposed to the elements. Same as No. 285, but of a thinner consistency for spraying.

NO. 287 BRIGHT RED PAINT

A bright red paint for general use. It is oil-proof, and may be used on apparatus requiring a bright red finishing coating such as gas engines, oil switch parts, etc. The most satisfactory method of application is by brushing.

NO. 466 MATT BLACK LACQUER

This is a quick-drying, matt black lacquer suitable for spraying metal and moulded compound parts, to produce the pleasing surface commonly known as "marine finish." This lacquer was developed to eliminate surface leakage common in lacquers of this type. No. 466 produces an insulating coating, while the common black cellulose lacquers producing the same finish are conducting, and are very much higher in cost.

NO. 475 RED PRIMING PAINT

A red-lead, linseed-oil priming paint manufactured to formula specified for use on United States Government apparatus, and for general use as a first coat on ironwork. It should always be covered with a coat of finishing paint. This priming paint adheres well to the metal below, and also to the finishing coat above, thereby bonding the paints firmly to the metal.

NO. 478 GRAY PRIMING PAINT

This paint possesses remarkable durability and is especially suitable for galvanized iron surfaces, to which the ordinary priming paint will not adhere successfully. It may also be used on cast or sheet iron surfaces. This primer should always be covered by a finishing paint.

NO. 480 SLATE-GRAY CABLE PAINT

A slate-colored, flame-resisting finishing paint for cables. Same uses as No. 251.

NO. 481 WHITE CABLE PAINT

A white, flame-resisting finishing paint for cables. It is not suitable for finishing work on wood or iron surfaces.

NO. 482 FRENCH GRAY PAINT

A gray paint possessing exceptionally good wearing qualities, developed especially for application to weather-exposed apparatus. It has excellent covering power and produces an elastic coating that adheres tenaciously to the surfaces to which it is applied. The use of a primer is recommended.

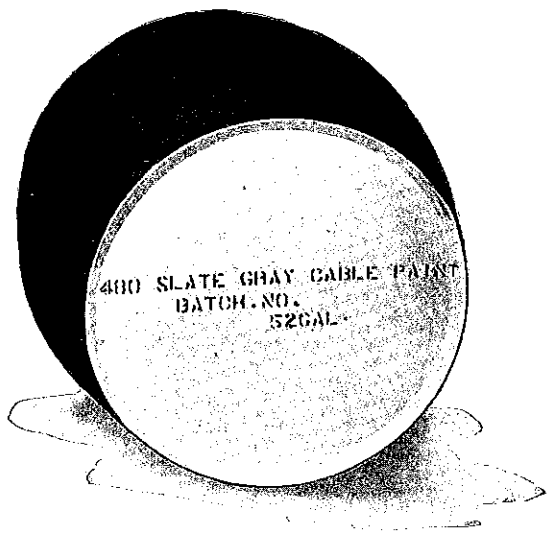
NO. 489 BLACK FINISHING PAINT

A superior high-gloss, black paint designed for use on metallic surfaces only. It adheres firmly to iron, forming a tough, weather-resistant film which will not fade or lose its gloss, and which affords an effective protection against rust. The paint may be used alone on black iron, but for galvanized work should be used over a priming coat of No. 478 Gray Priming Paint. Especially serviceable for outdoor work. It is recommended for use in painting transformer cases and galvanized iron tanks for lightning arrester apparatus.

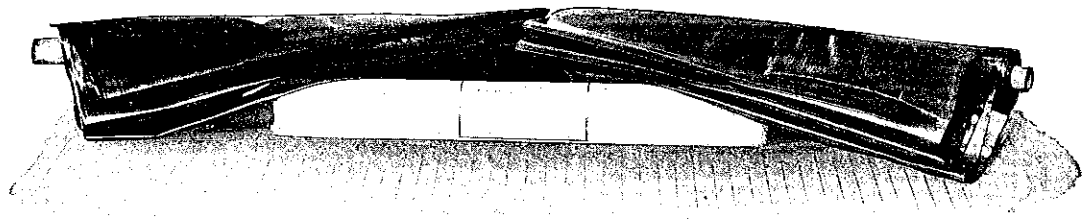
G-E PAINTS

No.	Color	Class	NET RETAIL PRICE PER GAL.		Approx. Weight per Gal. in Lb.	Time of Drying in Air in Hr.	Thinners
			52-Gal. Bbl.	1-Gal. Pail			
162	Black	Oilproof	$1.20	$1.70	13	3	55° Naphtha or Turpentine
251	Black	Cable Finish	3.25	3.70	12	2	55° Naphtha or Turpentine
284	Light Blue	Heatproof and Oilproof	*	4.50	11	2	55° Naphtha or Turpentine
285	Steel Blue	Finishing	5.85	6.35	12	5	55° Naphtha or Turpentine
286	Steel Blue	Finishing	*	5.15	12	2	811 Thinner or 55° Naphtha
287	Bright Red	Finishing	*	4.70	9.5	5	55° Naphtha or Turpentine
466	Matt Black	Finishing	5.20	5.70	7.5	½	Methyl Acetone
475	Red	Priming	*	9.00	24	8	Turpentine
478	Gray	Priming	*	4.00	9	24	55° Naphtha or Turpentine
480	Slate	Cable Finish	3.15	3.60	13	12	55° Naphtha or Turpentine
481	White	Cable Finish	3.70	4.20	13	12	55° Naphtha or Turpentine
482	French Gray	Finishing	*	7.00	16.5	24	55° Naphtha or Turpentine
489	Black	Finishing	6.00	6.60	8	24	55° Naphtha or Turpentine

* Put up in 1-gal. pails only.
No charge is made for containers.



G-E VARNISH-TREATED CLOTHS



The varnish-treated cloths and varnish-treated cloth tapes, as well as all other insulating materials placed on the market by the General Electric Company, are identical with those made by the Company for its own use. No higher commendation, no safer assurance of excellence, could be offered.

THE BASE CLOTH

G-E base cloth is selected to have high mechanical strength, to be free from acids which would attack and weaken fibers during treatment or storage, and from starch or other substances preventing thorough penetration by the treating varnishes and producing a laminated rather than a homogeneous material.

G-E base cloth is subjected to rigid inspection to maintain its quality at the established high standard.

VARNISH TREATMENT

G-E base cloth is treated with insulating varnishes made in the General Electric factory by skilled varnish makers, from carefully selected and regularly inspected high grade raw materials. These varnishes are applied so as thoroughly to treat the fabric and produce a homogeneous material.

G-E cloth insulating varnishes are chemically inert as regards the cloth to which they are applied, and show a minimum of chemical action in the presence of metallic conductors.

PUNCTURE VOLTAGE

Most results of resistance to puncture are expressed in volts per mil on instantaneous breakdown. This is not an index of true value under service conditions. Starched or other filled base cloths will give initially high instantaneous puncture voltages, but fail to show as high continued dielectric strength in actual service as G-E varnish-treated cloth.

HEAT DISSIPATION

G-E varnish-treated cloth, because of its homogeneous nature, develops less heat under electrical stress, and more readily dissipates the heat of operation of electrical apparatus than cloths not of homogeneous structure.

FLEXIBILITY

Because of the homogeneous nature of G-E varnish-treated cloth, its flexibility is maintained even after long exposure to severe conditions of heat and stress.

RESISTANCE TO HEAT, OIL AND WATER

Resistance to heat, oil and water is dependent upon the composition of the treating varnishes and proper conditions of processing. In G-E varnish-treated cloths these properties are of highest order, because of the high grade varnishes used and expert methods of handling during applications to the cloth.

BLACK VARNISH-TREATED CLOTH

Black varnished cloths possess extreme flexibility and are more permanent than yellow cloths when subjected to high temperatures. Their oily surface renders them particularly moisture-repellent. Because of their superior insulating qualities, they are to be preferred for all work where a hard surface film is not required.

G-E VARNISH-TREATED CLOTHS

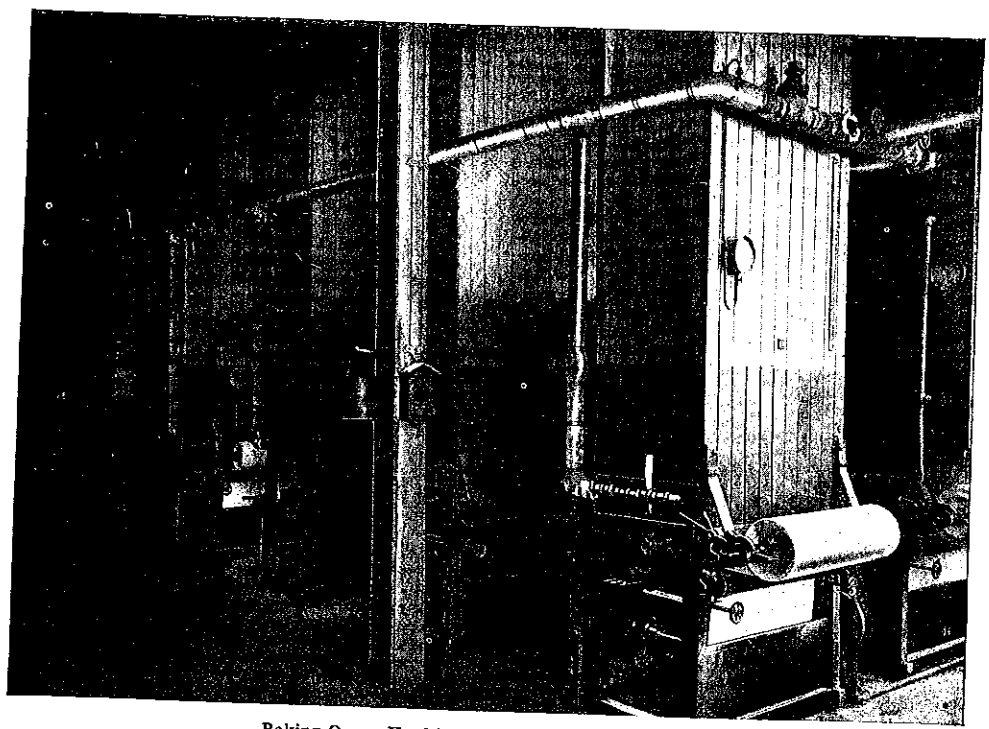
YELLOW VARNISH-TREATED CLOTH

Yellow varnished cloths are very flexible, have high dielectric strength, are oilproof and moisture- and age-resistant. The film imparted by yellow varnish is much harder than that obtained by using black varnish, and consequently resists abrasion better.

Thickness in In.	No.	Name	Width of Roll in In.	Net Retail Price per Yd.	Thickness in In.	No.	Name	Width of Roll in In.	Net Retail Price per Yd.
		BLACK					YELLOW		
0.005	508	Varnished Silk	36	*	0.005	509	Varnished Silk	36	*
0.007	506	Varnished Cloth	36	$0.495	0.007	514	Varnished Cloth	36	$0.505
0.010	505	Varnished Cloth	36	.53	0.010	510	Varnished Cloth	36	.54
0.012	505	Varnished Cloth	36	.60	0.012	510	Varnished Cloth	36	.62
0.020	513	Varnished Drill	30	.85	0.020	516	Varnished Drill	30	.85
0.025	504	Varnished Duck	36	1.05	0.025	517	Varnished Duck	36	1.05
0.040	519	Varnished Duck	34	1.70	0.040	515	Varnished Duck	36	1.70

* Price on application.

Treated cloths are supplied in 25-, 50- and 100-yd. lengths. Specify desired length of roll.



Baking Ovens Used in Producing Varnished Fabrics

From the roll plainly visible in the foreground, the fabric passes downward into the tank where it receives a coat of varnish which dries as the fabric passes upward through the warm-air tower or shaft and again downward in the next shaft to receive a succeeding coating. Each coating is properly dried before the next is applied, and the production of varnished fabric is an operation which is continuous from the introduction of the untreated material to the delivery of the fabric ready for shipment.

G-E FIBERS AND PAPERS

All fibers and papers used by the General Electric Company are especially selected for their high insulating properties, uniform thickness and high tensile strength. They are subjected to rigid inspection and exhaustive tests to determine invisible weaknesses and to insure their freedom from deleterious chemicals, foreign substances, and holes or cracks.

G-E treated fibers and papers are impregnated with varnishes, oils and japans which have been developed in the Research Laboratories of the General Electric Company for this particular purpose. These treatments render the fibers and papers more flexible and increase their dielectric strength and ability to withstand oil, water and high temperatures.

NO. 520 UNTREATED PRESSBOARD

A specially prepared paper which is dense, flexible and easily worked. It readily absorbs oils and varnishes which render it more moistureproof than in its untreated condition. It is used extensively for layer insulation and spacers in various types of generator, motor, transformer and regulator coils, and for collars and shields on high-voltage transformers. Pressboard has good dielectric strength, and is useful where an insulation value must be combined with mechanical rigidity. When immersed in insulating oil, its dielectric strength is more than doubled. This property renders it especially valuable for service where it will be continually immersed in oil.

NO. 522 OILED PRESSBOARD

Pressboard treated with oil to render it more flexible and impervious to moisture. Used extensively as separators and fillers in armature and field coils.

NO. 525 UNTREATED HORN FIBER

A tough, flexible insulating material of high mechanical and dielectric strength, easily impregnated with oils, varnishes, and other insulating compounds. It is used for separators, slot channels, angles and joint insulation and wherever a high degree of flexibility is required. Horn fiber is used to replace pressboard where a thinner, tougher, more flexible insulation is required.

NO. 527 OILED HORN FIBER

Horn fiber treated with a high-grade oil and oven-cured produces an insulating material of superior dielectric strength, and also renders the material more flexible than in its untreated state. May be used for general insulating work.

NO. 530 UNTREATED RAWHIDE FIBER

This is a harder pressed material than horn fiber, and consequently lacks some of the flexibility of the latter, but is mechanically stronger and has a smoother finish. This fiber can readily be rendered more flexible by treating with japan, oil, or varnish. Untreated, it is used for general insulating purposes where a high degree of flexibility is not required. No. 530 Rawhide Fiber is highly resistant to mechanical injury and heat. It is adapted for use where a tough material affording mechanical protection and insulation value is required.

NO. 532 OILED RAWHIDE FIBER

Rawhide fiber treated with an insulating oil and oven-cured to produce a firm surface. This process renders the material more flexible, gives it higher dielectric strength, and greater resistance to moisture. It is used for the same general purposes as No. 568 Varnished Rawhide Fiber.

NOTE.—Rawhide Fiber is also known to the trade as Fish Paper.

NO. 540 UNTREATED EXPRESS PAPER

A strong, high grade, wood fiber paper, carefully selected to insure freedom from pin holes and metallic particles. Suitable for great variety of uses such as layer insulations, preparation of insulating pads and where a thin material of moderate mechanical strength is required.

G-E FIBERS AND PAPERS

NO. 542 VARNISHED EXPRESS PAPER

Express paper treated with varnish and oven-cured to produce a firm, glossy surface. This treatment renders the paper more moisture-proof, and gives it higher dielectric strength.

NO. 545 UNTREATED CABLE PAPER

A tough, pliable paper made from Manila rope stock. It is used for wrapping on wires and cables, and in the manufacture of pad and layer insulations for transformers.

NO. 546 VARNISHED CABLE PAPER

Cable paper treated with a black insulating varnish to form a sheet material for use as slot insulation. This treatment provides a cheaper product which for many requirements can be used in place of No. 566 Varnished Horn Fiber.

NO. 555 UNTREATED RED ROPE PAPER

A good grade of hemp rope stock, tough and strong, selected to insure freedom from pin holes and foreign substances. It is used for general insulating purposes.

NO. 556 OILED RED ROPE PAPER

Red rope paper treated with hot insulating oil. This treatment renders the material more flexible and moistureproof, and gives it higher dielectric strength.

NO. 566 VARNISHED HORN FIBER

Horn fiber treated with black insulating varnish to produce a flexible sheet material of high dielectric strength, moisture-resistant and more heat-resistant than the untreated fibrous material.

NO. 567 VARNISHED PRESSBOARD

Pressboard treated with black insulating varnish is flexible and moisture-resisting and possesses higher insulating values than in its untreated state. It is recommended for use as a bonding material.

NO. 568 VARNISHED RAWHIDE FIBER

A sheet insulation produced by treating rawhide fiber with a black insulating varnish. It is more flexible than the untreated fiber and gives better resistance to temperature and moisture. Used to replace varnished horn fiber where a stiffer insulation is permissible.

NO. 590 UNTREATED ASBESTOS PAPER

Prepared from carefully selected asbestos fiber free from conducting particles of iron. This paper is used for wrapping on cables, as lining for controller covers, boxes of enclosed motors, and as separators between turns of field coils.

NO. 592 OILED ASBESTOS PAPER

Asbestos paper treated with hot insulating oil and oven-cured. It is used as a moisture-proof, heat-resisting insulation in field and armature coils.

NO. 593 VARNISHED ASBESTOS PAPER

Asbestos paper treated with black plastic insulating varnish and over-cured. It is used as a heat-resisting, moistureproof insulation in field and armature coils and in the preparation of cores or spools for the winding of magnet coils.

G-E FIBERS AND PAPERS

*HORN FIBER

(All rolls are supplied in 25-, 50- and 100-yard lengths)

Thickness in In.	Width of Roll in In.	Size of Sheet in In.	UNTREATED No.	UNTREATED Net Retail Price per Lb.	VARNISHED No.	VARNISHED Net Retail Price per Lb.	OILED No.	OILED Net Retail Price per Lb.	Weight per Sq. Ft. in Lb.
0.007	24	. . . . .	525	$0.65	566	$0.80	527	$0.80	0.035
0.010	24	. . . . .	525	.65	566	.80	527	.80	0.047
0.015	24	. . . . .	525	.65	566	.80	527	.80	0.070
0.020	24	. . . . .	525	.65	566	.80	527	.80	0.094
0.025	24	. . . . .	525	.65	566	.80	527	.80	0.117
0.030	24	. . . . .	525	.65	566	.80	527	.80	0.141
0.060	. .	30 by 40	525	.65	566	.80	527	.80	0.281
0.125	. .	30 by 40	525	.65	566	.80	527	.80	0.563

†RAWHIDE FIBER

0.005	. .	32 by 46	530	$0.65	568	$0.80	532	$0.80	0.031
0.010	. .	32 by 46	530	.65	568	.80	532	.80	0.063
0.015	. .	32 by 46	530	.65	568	.80	532	.80	0.094
0.020	. .	32 by 46	530	.65	568	.80	532	.80	0.125

* No. 525 Untreated Horn Fiber can also be supplied in rolls 46 in. wide.
† No. 530 Untreated Rawhide Fiber can also be supplied in rolls 46 in. wide.

PRESSBOARD

Thickness in In.	Size of Sheet in In.	UNTREATED No.	UNTREATED Net Retail Price per Lb.	VARNISHED No.	VARNISHED Net Retail Price per Lb.	OILED No.	OILED Net Retail Price per Lb.	Weight Per Sq. Ft. in Lb.
0.009	30 by 40	520	$0.30	567	$0.50	522	$0.50	0.078
0.020	33 by 64	520	.30	567	.50	522	.50	0.160
0.030	34 by 40	520	.30	567	.50	522	.50	0.230
0.060	34 by 40	520	.30	567	.50	522	.50	0.470
0.094	24 by 60	520	.30	567	.50	522	.50	0.700
0.125	40 by 60	520	.30	567	.50	522	.50	0.930

EXPRESS PAPER

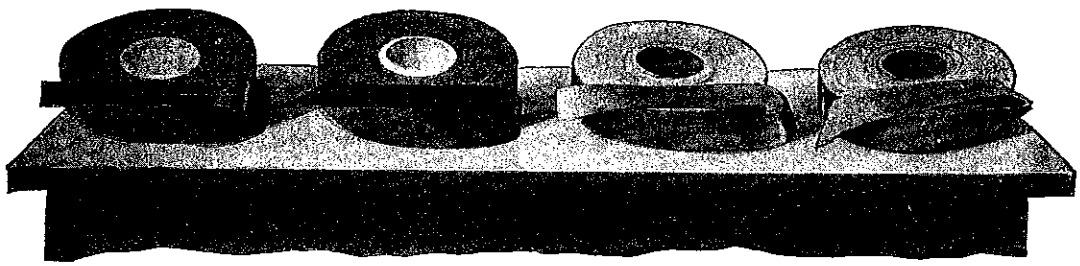
(Supplied in rolls 50, 100 and 200 yards in length)

Thickness in In.	Width of Roll in In.	UNTREATED No.	UNTREATED Net Retail Price per Lb.	VARNISHED No.	VARNISHED Net Retail Price per Lb.	OILED No.	OILED Net Retail Price per Lb.	Weight per Sq. Ft. in Lb.
0.003	32	540	$0.20	542	$0.60	. . .	. . .	0.017
0.005	32	540	.20	542	.60	. . .	. . .	0.027
0.009	32	540	.20	542	.60	. . .	. . .	0.040

G-E FIBERS AND PAPERS

Thickness in In.	Width of Roll in In.	UNTREATED No.	UNTREATED Net Retail Price per Lb.	VARNISHED No.	VARNISHED Net Retail Price per Lb.	OILED No.	OILED Net Retail Price per Lb.	Weight per Sq. Ft. in Lb.
CABLE PAPER (Supplied in rolls 50, 100 and 200 yards in length)								
0.003	36	545	$0.45	546	$0.65	...	.....	0.011
0.005	36	545	.45	546	.65	...	.....	0.019
0.008	36	545	.45	546	.65	...	.....	0.029
RED ROPE PAPER (Supplied in rolls 50, 100 and 200 yards in length)								
0.005	32	555	$0.35	...	.....	556	$0.45	0.031
0.009	32	555	.35	...	.....	556	.45	0.062
ASBESTOS PAPER (Supplied in rolls 25, 50 and 100 yards in length)								
0.006	36	590	$0.60	593	$1.40	592	$1.05	0.025
0.010	36	590	.42	593	.90	592	.65	0.042
0.015	36	590	.42	593	.90	592	.65	0.070

G-E VARNISHED CLOTH TAPES



G-E varnish-treated cloth tapes are cut from G-E varnish-treated cloths, and therefore possess the same characteristics and high quality as the cloth itself.

Tapes cut from treated fabrics may be obtained in continuous lengths any desired width from ½ in. to the full width of the rolls, 36 in., when cut parallel to the warp threads.

These are known as straight cut tapes. To obtain tapes of greater elasticity or "stretch" than when cut straight, treated fabrics are cut in a direction diagonal to the weave, and the resulting strips are known as bias-cut tapes. These may be supplied in widths from ½ to 2 in.

Both straight and bias-cut tapes are carried in stock in ½ to 2-in. widths in 36-yd. rolls.

G-E VARNISHED CLOTH TAPES

Thickness in In.	Width in In.	* Length per Roll in Yd.	STRAIGHT CUT		BIAS CUT	
			Net Retail Price per Roll	Approx. Weight per Roll in Oz.	Net Retail Price per Roll	Approx. Weight per Roll in Oz.
NO. 506 BLACK VARNISHED CLOTH TAPE						
0.007	½	36	$0.29	3¼	$0.30	3½
0.007	¾	36	.44	4¾	.45	5¼
0.007	1	36	.58	6¾	.59	7
0.007	1½	36	.90	10½	.91	11
0.007	2	36	1.17	13¾	1.18	15
NO. 514 YELLOW VARNISHED CLOTH TAPE						
0.007	½	36	$0.30	3¼	$0.31	3½
0.007	¾	36	.45	4¾	.46	5¼
0.007	1	36	.59	6¾	.60	7
0.007	1½	36	.91	10½	.92	11
0.007	2	36	1.18	13¾	1.19	15
NO. 505 BLACK VARNISHED CLOTH TAPE						
0.010	½	36	$0.31	4¼	$0.32	4¾
0.010	¾	36	.46	6½	.47	6¾
0.010	1	36	.60	9¼	.61	9½
0.010	1½	36	.92	13¼	.93	13½
0.010	2	36	1.19	18	1.20	19½
NO. 510 YELLOW VARNISHED CLOTH TAPE						
0.010	½	36	$0.32	4¼	$0.33	4¾
0.010	¾	36	.47	6½	.48	6¾
0.010	1	36	.61	9¼	.62	9½
0.010	1½	36	.93	13¼	.94	13½
0.010	2	36	1.20	18	1.21	19½
NO. 505 BLACK VARNISHED CLOTH TAPE						
0.012	½	36	$0.33	5	$0.34	5¼
0.012	¾	36	.50	7¾	.51	8½
0.012	1	36	.64	10¾	.65	11
0.012	1½	36	.96	16	.97	16½
0.012	2	36	1.25	20¾	1.26	22
NO. 510 YELLOW VARNISHED CLOTH TAPE						
0.012	½	36	$0.34	5	$0.35	5¼
0.012	¾	36	.51	7¾	.52	8½
0.012	1	36	.65	10¾	.66	11
0.012	1½	36	.97	16	.98	16½
0.012	2	36	1.26	20¾	1.27	22

* Bias cut tapes are furnished in short lengths of about 5 ft. per length, totaling 36 yards per roll.

G-E FRICTION AND SPLICING TAPES

NO. 363 SPLICING GUM

This is an all-rubber compound containing no cloth, and made from fine para rubber. It will not oxidize copper. At ordinary temperatures, the heat of the hand is sufficient to cause the layers of this tape, after it has been wound on the joint, to unite into a solid mass, making a watertight joint. At temperatures below freezing, the warmth from a blow lamp, or even a match, will accomplish the same result. The tape is tough, pliable, elastic and adhesive. The color is drab.

NO. 374 PURE GUM-FACED TAPE

Pure gum-faced tape consists of a layer of 98 per cent pure para rubber on a backing of unvulcanized high grade rubber compound containing only fine para. This tape can be used to advantage in making joints where extremely high insulation resistance is desired, such as on underground rubber-insulated cables where the joint is to be waterproof. It affords a satisfactory substitute for cut-sheet rubber which is not only very difficult to handle, but very expensive. Joints made with gum-faced tape may be vulcanized if desired. The rubber compound contains sufficient sulphur for this purpose, and the completed joint will be fully as strong as any unbroken portion of the cable insulation.

NO. 631 PARAGON TAPE

An unbleached cotton cloth coated and filled with a black asphalt compound and slit to the proper width. It is used for temporary binding purposes and as a waterproof covering for street car cables. This tape does not obstruct the passage of varnishes and treating compounds, and as a binding tape is therefore superior in this respect to rubber-filled friction tapes which are impervious to varnishes.

NO. 667 SPECIAL ACME FRICTION TAPE

This is an adhesive tape of superior quality prepared from cotton cloth filled with a very high grade of black rubber compound which is slightly sticky at room temperature. Recommended for use when a tape of the highest quality is required.

NO. 668 STANDARD BLACK ACME FRICTION TAPE

A closely woven cotton cloth, filled with a rubber compound and cut into strips of the desired width. It is light in weight, uniform in its adhesion, and not subject to rapid deterioration. The compound used is of high insulating qualities and as it contains no sulphur, it will not corrode copper. This tape is used in the construction or repair of electrical apparatus and is somewhat cheaper than No. 667.

G-E FRICTION AND SPLICING TAPES

NO. 669 RED LABEL FRICTION TAPE

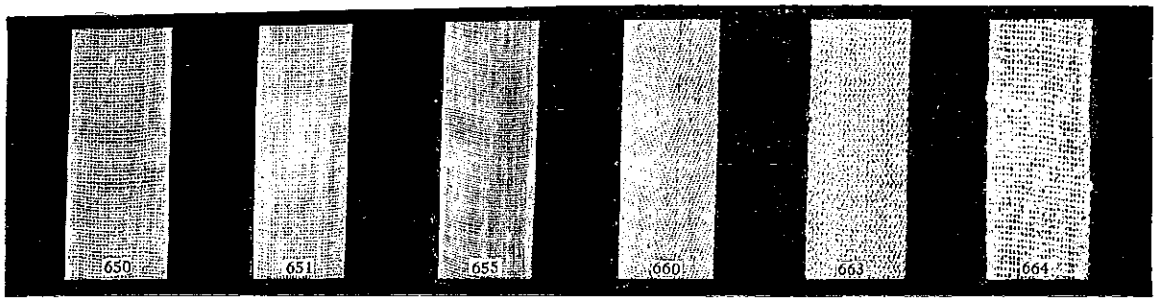
This is a good quality tape, and is used where conditions are not so severe as to warrant the use of No. 667 or No. 668.

No.	Name	Width in In.	Net Retail Price per Lb.	Approx. Net Weight per Roll in Oz.	Approx. Diameter of Roll in In.	Approx. Yards per Roll
363	Splicing Gum	¾	$0.95	8	4	9
		1	.95	16	4¼	13
		1½	.95	16	3¼	9
		2	.95	16	3½	7
374	Gum Faced	¾	1.15	6	4	6
		1	1.15	8	4	6
		1½	1.15	12	4	6
		2	1.15	16	4	6
631	Paragon	¾	.65	6	4¼	22
		1	.65	8	4¼	22
		1½	.65	12	4¼	22
		2	.65	17	4¼	22
667	Special Acme	¾	.82	8	4¼	25
		1	.82	16	4¼	40
668	Standard Black Acme	½	.72	6	4¼	30
		¾	.72	8	4¼	25
		1	.72	16	4¼	40
669	Red Label	½	.62	6	4¼	23
		¾	.62	8	4¼	23
		1	.62	16	4¼	30

All friction and splicing tapes are regularly packed in paper boxes, except the 1½- and 2-in. Paragon, Gum Faced and Splicing Gum, which are wrapped in foil. These tapes are sold NET WEIGHT.

Large Capacity Kettles for Compounds

G-E COTTON, PREPARED PAPER AND ASBESTOS TAPES



Tapes, in various forms, have long been used as insulation because of their ease of application to irregular shapes and forms of coils, cores, etc., upon which it would be difficult to place the necessary insulation in sheet form.

Insulating tapes may be woven from fibrous materials in which case they have a "selvage" edge which adds to the mechanical strength of the tapes. These are known as "tapes," "stay bindings," or "webbings." When cut from fabrics already woven to form they are known as "slit" tapes.

Both straight and bias-cut tapes are carried in stock in ½- to 2-in. widths in 36-yd. rolls.

NO. 650 WHITE COTTON TAPE

This is a white cotton tape woven with selvages. It has an open structure, possesses full strength for this class of tape, and is finished to a smooth, glossy, linen surface. It is used on transformer and motor coils, low-voltage armature coils, and as an armor or binding for high-voltage coils.

NO. 651 WHITE COTTON TAPE

This tape is similar to No. 650 but is more closely woven and possesses greater strength. It is used in taping armature and field coils as a base for a film of insulating varnish.

NO. 655 WHITE COTTON TAPE

A tape similar to No. 650 and No. 651 in general characteristics. It possesses a more closely woven structure, and therefore somewhat greater strength than the former but is of more open weave and not quite so strong as the latter.

NO. 660 STAY BINDING

This is a medium-weave, white cotton stay binding. It is used on large armature coils, direct-current field coils and large transformer coils where greater mechanical strength than is given by No. 650 and No. 651 Tapes is required.

NO. 663 NON-ELASTIC WEBBING

A non-elastic white cotton webbing used as an outer covering on field coils, as an insulating buffer between armature coils and for binding phase insulation on shell type transformers where great mechanical strength is desired.

NO. 664 ASBESTOS TAPE

An asbestos tape containing a small percentage of cotton to facilitate the spinning of the yarn. It is used on windings where a heat enduring insulation is required and is usually placed on the outside to act as a binder, to which purpose it lends itself better than cotton.

NO. 632 PREPARED PAPER TAPE

This tape consists of pure Manila paper which has been dried in a vacuum and impregnated with special cable compound. It is packed in pails and tin boxes which are sealed so that there is no danger of the tape absorbing moisture in any climate. When the tape is wanted for use, the container itself can be heated with a blow lamp, which immediately melts the compound in which the paper tape is packed and at the same time warms the tape. This makes it ready for the

G-E COTTON, PREPARED PAPER AND ASBESTOS TAPES

jointer to use under the best conditions, as it will be perfectly free from moisture, and will be warm, soft and pliable. This tape has been used in jointing paper cables of all tensions from 100 to 25,000 volts and has given perfect satisfaction.

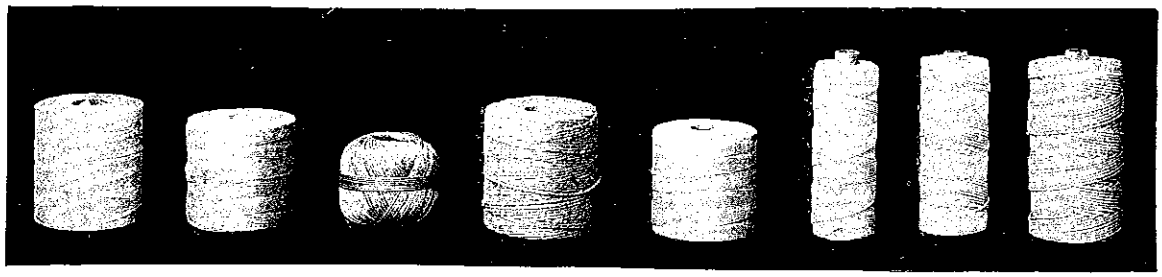
No.	Name	Width in In.	Thickness in In.	Retail Price per Roll	Approx. Wt. per Roll in Oz.	Approx. L'th. per Roll in Yd.
650	White Cotton Tape	¾	0.007	$0.95	4½	72
		1	0.007	1.15	7	72
		1½	0.007	1.75	10	72
651	White Cotton Tape	⅜	0.005	.45	1	36
		½	0.005	.50	1½	36
		¾	0.007	1.10	3½	72
655	White Cotton Tape	¾	0.005	1.15	6	72
		1	0.005	1.35	7	72
660	Stay Binding	1	0.015	.80	4½	36
		1½	0.015	1.40	6½	36
663	Non-Elastic Webbing	½	0.025	.90	5	36
		1	0.025	1.50	8	36
		1½	0.025	1.85	14	36
		2	0.025	6.20	39	72
				Per Lb.		
664	Asbestos Tape	¾	0.015	6.35	5	30
		1	0.015	5.95	7	30
		1	0.020	5.20	17	50
		1¼	0.020	5.00	15	35
		1¼	0.030	4.25	20	30

NO. 632 PREPARED PAPER TAPE

Thickness in In.	Width in In.	† Diameter of Roll in In.	Yards per Roll	Rolls per Container	* Net Retail Price per Lb.	Net Wt. of Paper per Container in Lb. (Approx.)
0.005	½	1	3⅓	336	$1.65	3.72
0.005	½	1¼	6	252	1.15	4.85
0.005	½	1½	9	168	1.00	5.21
0.005	½	1¾	12⅓	120	.95	5.00
0.005	½	2	16⅔	96	.90	5.67
0.005	½	2¼	21	84	.85	5.97
0.005	½	2½	27	60	.85	5.29
0.005	¾	1	3⅓	224	1.55	3.72
0.005	¾	1¼	6	168	1.10	4.85
0.005	¾	1½	9	112	.95	5.21
0.005	¾	1¾	12⅓	80	.90	5.00
0.005	¾	2	16⅔	64	.85	5.67
0.005	¾	2¼	21	56	.80	5.97
0.005	¾	2½	27	40	.80	5.29
0.005	1	1	3⅓	168	1.45	3.72
0.005	1	1¼	6	126	1.05	4.85
0.005	1	1½	9	84	.90	5.21
0.005	1	1¾	12⅓	60	.85	5.00
0.005	1	2	16⅔	48	.80	5.67
0.005	1	2¼	21	42	.75	5.97
0.005	1	2½	27	30	.75	5.29
0.008	¾	5	60	1	.95	0.55
0.008	1	5	60	1	.90	0.73

*Includes boxes and pails.
† The 1 in. to 2½ in. inclusive rolls of paper tape are packed in 1-gal. pails and sealed in mineral compound. The 5-in. rolls of paper tape are packed in tin boxes and sealed in paraffin.

G-E CORDS AND TWINES



Boot threads, cords and twines find a considerable use in insulation processes as space fillers in armature cores, protective braiding on wires and cables, temporary binding in the winding of coils, insulation for the front end of commutators, etc. For all insulating requirements, the various twines and cords, which are naturally of an open, porous nature and would readily absorb moisture, should be sealed or filled with some suitable moisture-proofing compound of high dielectric properties.

NO. 680 CORD

A brown linen cord known as "3-Cord Boot Thread."

NO. 681 CORD

A brown linen cord of larger size than No. 680, known as "7-Cord Boot Thread" used after treatment to fill in the small space between the commutator cap and commutator and armature head on railway motors.

NO. 682 CORD

A brown linen cord of larger size than No. 681. Used after treatment for the same purpose as No. 681 where the space is larger, and for the insulation of the front end of all G-E railway motor commutators.

NO. 684 TWINE

A white twine known as "No. 6 Cable Laid Twine."

NO. 685 TWINE

A white, cable laid twine known as "No. 12 M. P."

NO. 687 TWINE

A white, cable laid twine known as "No. 18 M. P."

NO. 688 TWINE

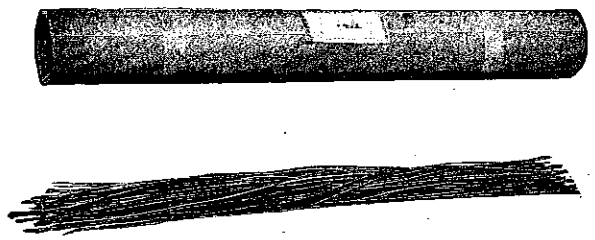
A white, cable laid twine known as "No. 24 M. P."

NO. 698 TWINE

A white, cable laid twine known as "No. 36 M. P."

No.	Approx. Diameter in In.	Standard Size Spool in Lb.	Net Retail Price per Lb.
	CORDS		
680	0.030	1	**$3.20**
681	0.040	1	**3.45**
682	0.085	1	**4.00**
	TWINES		
684	0.035	1	**$1.50**
685	0.055	½	**1.30**
687	0.065	½	**1.30**
688	0.080	½	**1.30**
698	0.105	1	**1.30**

G-E FLEXIBLE VARNISHED TUBING



G-E Flexible Varnished Tubing is used for insulating bare wires or for increasing dielectric strength of insulated wires when used as leads, connecting wires or cross-over wires, such as are found on motors, transformers, arc lamps or meter coils.

The smaller sizes are now widely used in connection with radio work and are commonly called "Radio Spaghetti."

Sizes not listed, price on application. Furnished in colors: black, green, red and yellow in 24-in. lengths only.

Inside Diameter in In.	Covers B.& S. Gauge (Bare) Wire	Net Retail Price per 1000 Ft. (Packed 100 Ft. Minimum)	Inside Diameter in In.	Covers B.& S. Gauge (Bare) Wire	Net Retail Price per 1000 Ft. (Packed 100 Ft. Minimum)
1/32	40 to 21 inc.	**$38.00**	5/32	8 and 7	**$71.00**
1/16	20 to 15 inc.	**42.00**	3/16	6 and 5	**88.00**
3/32	14 to 11 inc.	**42.00**	7/32	4	**92.00**
1/8	10 and 9	**71.00**	1/4	3	**97.00**

G-E NO. 293 SOLDERING PASTE

G-E No. 293 Soldering Paste is characterized by the skillful blending of ingredients by modern laboratory apparatus and methods to produce a finished product that is unexcelled.

G-E No. 293 Soldering Paste is non-corrosive, dependable, economical, efficient, **BEST.** It is guaranteed to solder all metals except aluminum.

Size of Container	Net Retail Price	Size of Container	Net Retail Price
2 oz. can	**$0.15** per can	10 lb. pail	**$0.50** per lb.
8 oz. can	**1.00** per lb.	25 lb. pail	**.45** per lb.
1 lb. can	**.90** per lb.		

GENERAL ELECTRIC COMPANY

GENERAL OFFICE: SCHENECTADY, N. Y.

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Atlanta, Ga.	123 Spring Street
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Bluefield, W. Va.	104 Federal Street
Boston, Mass.	84 State Street
Buffalo, N. Y.	39 East Genesee Street
Butte, Mont.	40 East Broadway
Canton, Ohio	700 Tuscarawas Street
Charleston, W. Va.	201 Capitol Street
Charlotte, N. C.	200 South Tryon Street
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Cincinnati, Ohio	632 Vine Street
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Columbus, Ohio	81 East State Street
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Erie, Pa.	10 East Twelfth Street
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Hartford, Conn.	18 Asylum Street
Houston, Tex.	5 North Milam Street
Indianapolis, Ind.	106 North Illinois Street
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Jacksonville, Fla.	108 West Forsyth Street
Kansas City, Mo.	1004 Baltimore Avenue
Knoxville, Tenn.	602 South Gay Street
Little Rock, Ark.	223 West Second Street
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Louisville, Ky.	455 South Fourth Street
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Minneapolis, Minn.	410 Third Avenue, North
Nashville, Tenn.	234 Third Avenue, North
Newark, N. J.	671 Broad Street
New Haven, Conn.	129 Church Street
New Orleans, La.	921 Canal Street
New York, N. Y.	120 Broadway
Niagara Falls, N. Y.	201 Falls Street
Oklahoma City, Okla.	1 West Grande Avenue
Omaha, Neb.	401 South 16th Street
Philadelphia, Pa.	1321 Walnut Street
Pittsburgh, Pa.	529 Smithfield Street
Portland, Ore.	329 Adler Street
Providence, R. I.	76 Westminster Street
Richmond, Va.	700 East Franklin Street
Rochester, N. Y.	130 Main Street East
St. Louis, Mo.	112 North 4th Street
Salt Lake City, Utah	10 Exchange Place
San Antonio, Tex.	City National Bank Building
San Francisco, Cal.	116 New Montgomery Street
Seattle, Wash.	811 First Avenue
Spokane, Wash.	425 Riverside Avenue
Springfield, Mass.	387 Main Street
Syracuse, N. Y.	113 South Salina Street
Tacoma, Wash.	950 Pacific Avenue
Terre Haute, Ind.	701 Wabash Avenue
Toledo, Ohio	520 Madison Avenue
Trenton, N. J.	45 East State Street
Tulsa, Okla.	403 Cosden Building
Utica, N. Y.	239 Genesee Street
Washington, D. C.	1405 G Street N.W.
Waterbury, Conn.	195 Grand Street
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Minneapolis	410 Third Avenue, N.
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Oakland	5441 E 14th Street
Philadelphia	1223 Washington Avenue
Schenectady, N. Y.	1 River Road
Seattle	1508 Fourth Ave. S.
St. Louis	1007-1009 Spruce Street

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INTERNATIONAL GENERAL ELECTRIC COMPANY, INC.

New York City	General Sales Offices	London
120 Broadway	Schenectady, N. Y.	Crown House, Aldwych, W.C. 2

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