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FOREIGN TECHNOLOGY DIVISION



ELECTRICAL INSULATING ENAMEL EP-91



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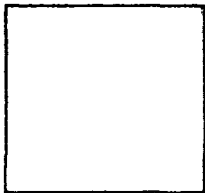
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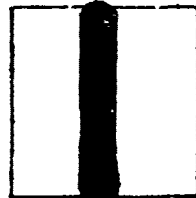
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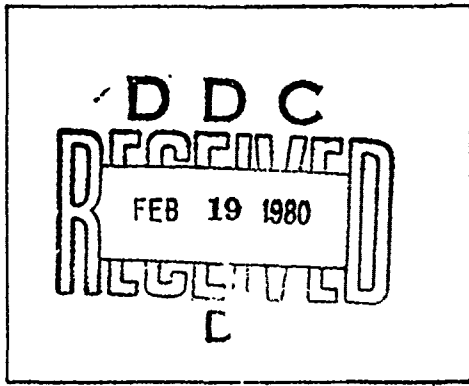
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## EDITED TRANSLATION

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U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<i>А а</i>	A, a	Р р	<i>Р р</i>	R, r
Б б	<i>Б б</i>	B, b	С с	<i>С с</i>	S, s
В в	<i>В в</i>	V, v	Т т	<i>Т т</i>	T, t
Г г	<i>Г г</i>	G, g	У у	<i>У у</i>	U, u
Д д	<i>Д д</i>	D, d	Ф ф	<i>Ф ф</i>	F, f
Е е	<i>Е е</i>	Ye, ye; E, e*	Х х	<i>Х х</i>	Kh, kh
Ж ж	<i>Ж ж</i>	Zh, zh	Ц ц	<i>Ц ц</i>	Ts, ts
З э	<i>З э</i>	Z, z	Ч ч	<i>Ч ч</i>	Ch, ch
И и	<i>И и</i>	I, i	Ш ш	<i>Ш ш</i>	Sh, sh
Й й	<i>Й й</i>	Y, y	Щ щ	<i>Щ щ</i>	Shch, shch
К к	<i>К к</i>	K, k	Ъ ъ	<i>Ъ ъ</i>	"
Л л	<i>Л л</i>	L, l	Ы ы	<i>Ы ы</i>	Y, y
М м	<i>М м</i>	M, m	Ь ь	<i>Ь ь</i>	'
Н н	<i>Н н</i>	N, n	Э э	<i>Э э</i>	E, e
О о	<i>О о</i>	O, o	Ю ю	<i>Ю ю</i>	Yu, yu
П п	<i>П п</i>	P, p	Я я	<i>Я я</i>	Ya, ya

\*ye initially, after vowels, and after ъ, ы; e elsewhere.  
When written as ё in Russian, transliterate as yë or ë.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh <sup>-1</sup>
cos	cos	ch	cosh	arc ch	cosh <sup>-1</sup>
tg	tan	th	tanh	arc th	tanh <sup>-1</sup>
ctg	cot	cth	coth	arc cth	coth <sup>-1</sup>
sec	sec	sch	sech	arc sch	sech <sup>-1</sup>
cosec	csc	csch	csch	arc csch	csch <sup>-1</sup>

Russian English

rot curl  
lg log

## ELECTRICAL INSULATING ENAMEL EP-91

GOST 15943-70

By decree of the Committee of Standards, Measures and Measuring Instruments attached to the Council of Ministers of the USSR from 7 May 1970 No. 642 the period of introduction is established from 1 January 1971.

Nonobservance of the standard is punishable by law

This standard is extended to the electrical insulating enamel EP-91, which is a suspension of the pigments in an epoxy varnish with the addition of a ureaformaldehyde resin.

Enamel EP-91 is intended for the moisture-protecting coatings of electronic parts and assemblies.

Enamel EP-91 is applied to the surface by dipping, spraying, a brush, or other method in not less than two coats. The last coat of enamel is dried at  $190 \pm 5^{\circ}\text{C}$  for 1.5 hours.

### 1. Technical Requirements

1.1. According to the physicochemical and electrical indices, the enamel EP-91 must conform to the requirements and standards indicated in the table.

[See table, next page.]

Table

Name of Indices	Standards
1. Outer form of the film	After drying the enamel must form a glossy smooth film without foreign impurities of green color, and shading is not standardized. Permitted is an insignificant stratification of pigments in the film and also the presence of small pock marks characteristic for the epoxy coatings
2. Viscosity according to viscosimeter VZ-4 at 20°C in s [seconds]	45-75
3. Content of dry residue in %, not less than	36
4. Degree of wear by the "wedge" method in arbitrary units, not more than	20
5. Covering power (in conversion to dry film) in g/m <sup>2</sup> , not more than	90
6. Bending strength of film according to the bending scale in mm, not more than	1
7. Hardness of film according to a pendulum instrument at 20±1°C, not less than	0.8
8. Adhesion in points	1
9. Specific volumetric resistance in Ω·cm, not less than: at 20±2°C	1·10 <sup>15</sup>
after the action of the relative humidity of 95-98% at 40±3°C for 48 hours	1·10 <sup>14</sup>

1.2. The formula which ensures the conformity of the quality of the enamel to requirements of this standard must be coordinated with the Ministry of the Electronics Industry of the USSR and the Ministry of Public Health of the USSR and confirmed by the Ministry of the Chemical Industry of the USSR.

1.3. Before using the enamel dilute it up to the working viscosity by ethyl Cellosolve (GOST 8313-60).

2. Methods of the Tests

2.1. For a control check of the quality of the enamel for the conformity of the indices to requirements of this standard, the rules of sampling and the methods of the tests indicated below must be used.

2.2. Taken for the batch is the quantity of enamel for one industrial process and accompanied by one quality certificate.

2.3. In the checking of the received batch of enamel, the sampling is selected according to GOST 9980-62.

2.4. Preparation of specimens for the test

Before using the enamel to be tested is stirred, diluted with ethyl Cellosolve according to a viscosity of 44-46 s by viscosimeter VZ-4 at 20°C, filtered through a sieve with a mesh of No. 0112K (GOST 3584-53), and applied to the prepared plates by pouring in one layer for determining the hardness and strength of the film with bending and in two layers for determining the outer form, adhesion and specific volumetric electrical resistance of the film.

The metal and glass plates must be carefully cleaned of the oxides and contaminants and washed in gasoline or white spirit and dried.

The strength of the film of the enamel with bending is determined on the plates of black polished sheet metal (GOST 1127-57) 20 X 150 mm in dimension and 0.25-0.32 mm in thickness. The hardness of the film and covering power of the enamel are determined on glass plates, and the remaining indices are determined on plates of a cold-cathode copper sheet with a thickness of 0.4-0.6 mm (GOST 495-70) with a dimension of 65 X 65 mm and 100 X 100 mm for the specific volumetric electrical resistance of the film.

The plates with the applied enamel are held in air at 18-22°C at an angle of 45° for 15 minutes; the excess enamel is removed from edges of the plates; and then the coating is dried by placing the plates in a horizontal position. The drying conditions of the two-layered coating are the following: the first layer - at 18-23°C for 1 hour, then the gradual raising of the temperature up to 180°C for 1.5-2 hours and 180±5°C for 1 hour: the second layer - at 18-23°C for 1 hour, then the gradual raising of the

temperature to 190°C for 1.5-2 hours and at 190±5°C for 1.5 hours. The single-layered coating is dried according to the drying conditions of the second layer.

The thickness of the single-layer coating after drying must be 18-25 μm and of the two-layer coating, 35-45 μm.

2.5. The outer form of the enamel film is determined visually with the natural scattered light.

2.6. The viscosity of the enamel is determined per GOST 8420-57.

2.7. The content of the dry residue in the enamel is determined per GOST 6989-54 at 180-190°C.

2.8. The degree of wear of the enamel is determined per GOST 6589-57.

2.9. The covering power of the enamel is determined per GOST 8784-58 according to a checkerboard. The enamel is diluted down to a viscosity of 20-25 s according to the viscosimeter VZ-4 at 20°C, applied with a sprayer in not less than two layers and dried according to item 2.4.

2.10. The bending strength of the film is determined per GOST 6806-53.

2.11. The hardness of the enamel film is determined per GOST 5233-67.

2.12. The adhesion of the enamel film is determined per GOST 15140-69. The specimen obtained according to item 2.4 is placed into a hydrostat and held at 40±3°C and a relative humidity of 95-98% for 96 hours. When there is no hydrostat, the specimen is placed into an exsiccator (GOST 6371-64) of type E with diameter D equal to 190±5 mm and suspended over distilled water (GOST 6709-53) poured with the layer at 40 mm. The exsiccator is placed into a thermostat with a volume at 3-4 times exceeding the volume of the exsiccator.

The adhesion is estimated according to GOST 15140-69 by the method of lattice incisions immediately after the removal of the specimen from the hydrostat or exsiccator.

2.13. The specific volumetric electrical resistance at 20±2°C, after the action of the relative humidity of 95-98% at

40±3°C for 48 hours, is determined per GOST 13526-68, and in this case the specimens before the test are held at 18-22°C for 1.5-2 hours and are computed as the arithmetic mean from four measurements.

Used in determining the specific volumetric electrical resistance are the measuring and protecting electrodes in the form of foil fitted to the surface of the specimen by vaseline oil (GOST 3164-52).

### 3. Packing, Marking, Transporting, and Storage

3.1. The packing, marking, transporting, and storage of the enamel are carried out per GOST 9980-62 in metal cans. The packing into a container of large capacity is allowed only on coordination with the user.

### 4. Guarantees of the Supplier

4.1. The prepared enamel must be accepted by the technical control of the supplier. The supplier must guarantee the conformity of the enamel to requirements of this standard with the observance by the user of conditions of the use and storage established by the standard.

4.2. The guaranteed storage period of the enamel from the date of production is three months. Upon expiration of the indicated period, the enamel again undergoes a test and is deemed fit when all the indices conform to the technical requirements.

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DISTRIBUTION DIRECT TO RECIPIENT

<u>ORGANIZATION</u>	<u>MICROFICHE</u>	<u>ORGANIZATION</u>	<u>MICROFICHE</u>
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A210 DMAAC	2	E017 AF/RDXTR-W	1
B344 DIA/RDS-3C	9	E403 AFSC/INA	1
C043 USAMIIA	1	E404 AEDC	1
C509 BALLISTIC RES LABS	1	E408 AFWL	1
C510 AIR MOBILITY R&D LAB/FIO	1	E410 ADTC	1
C513 PICATINNY ARSENAL	1	FTD	
C535 AVIATION SYS COMD	1	CCN	1
C591 FSTC	5	ASD/FTD/NIIS	3
C619 MIA REDSTONE	1	NIA/PHS	1
D008 NISC	1	NIIS	2
H300 USAICE (USAREUR)	1		
P005 DOE	1		
P050 CIA/CRB/ASD/SD	2		
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NASA/NST-44	1		
AFIT/LD	1		
ILL/Code L-389	1		
NSA/1213/TDL	2		