

MR. A. B. HOLTON.  
SHERWIN-WILLIAMS COMPANY.  
CLEVELAND.

S U P P L E M E N T A R Y

TECHNICAL OPERATIONS

REPORT

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SERIES No. 54.

0007-SWP-043643

Series No. 54.

SUPPLEMENTARY TECHNICAL OPERATIONS REPORT NOV. 1946 - FEB. 1947.

INDEX

| <u>Page</u> | <u>Item No.</u> | <u>Title</u>                                                 |
|-------------|-----------------|--------------------------------------------------------------|
| 1           | C.12            | Viscosity Control                                            |
| 5           | C.13            | Cellulose Surfaces & Stoppers.                               |
| 6           | C.20            | Nitrocellulose Aircraft Finishes.                            |
| 12          | E.5             | Permanent Red 2.B.                                           |
| 13          | E.6             | Cromat                                                       |
| 14          | D.15            | Maroon Lake                                                  |
| 16          | D.17            | Effect of Stearamide on Chrome Green                         |
| 17          | E.18            | Para Reds                                                    |
| 18          | E.21            | Bansa Yellows                                                |
| 19          | E.25            | Azo Orange, C.2611.                                          |
| 24          | P.3             | Stonhard                                                     |
| 28          | P.40            | Fire Retardent Paints                                        |
| 32          | P.54            | Tinting Colours                                              |
| 33          | P.61            | Polykem                                                      |
| 36          | P.82            | Super Synthetic Pompeian                                     |
| 41          | P.86            | Finishes for Prefabricated Houses.                           |
| 43          | P.98            | White Lead Paints.                                           |
| 46          | P.103           | Railway Coach & Engine Finishes.                             |
| 47          | P.108           | Label Varnish & Waterproofers                                |
| 48          | P.117           | Komplastite                                                  |
| 51          | P.120           | "Twelve Star" Alkyd Enamel                                   |
| 53          | P.121           | Dymard Stoving Enamel                                        |
| 58          | P.122           | Coloured Stencilling Paints in Solid Form for Warehouse Use. |
| 59          | P.3.            | Wax Polish                                                   |
| 60          | P.30            | Anti Skinning Agents.                                        |
| 61          | P.31            | Rubbing Compounds                                            |
| 62          | P.32            | Para-crythritol Resins.                                      |

Acknowledgment is due to the following, under whose supervision the above-mentioned investigations have been made :-

|                      |                                 |
|----------------------|---------------------------------|
| Mr. W.H. Stitson     | Varnish and Development Section |
| Mr. R.C. Somerville  | Paint Control Section           |
| Mr. J.K. Barraclough | Dry Colour Section              |
| Mr. S.E. Francis     | Cellulose Section.              |

(Sgd) H. A. NE NUAM

MANAGER  
Technical Operations.

0007-SWP-043644

0007-SWP-000126988

(43)

Series No. 54.

WHITE LEAD PAINTS.

P38.

C. Stevens.

Further Examination of exposures after 10 months EP367 - 374.  
 Comparison of Cookson's Lonsabarc, Metal Colors grades of MI 770 with  
 Octagon High Stain and Octagon Low Stain and electrolytic process  
 White Leads. (2) The evaluation of blends of White Lead with zinc oxide  
 and Antimony Oxide.  
 All paints were Tinted Pale Blue with BY8552

| TYPE OF<br>LEAD | MEDIUM  | CHALKING | COLOUR         | GLOSS   | REMARKS.                                           |
|-----------------|---------|----------|----------------|---------|----------------------------------------------------|
| Cooksons        | V7431   | 5        | Faded<br>Badly | V. Poor | Heavy dirt retention                               |
| Cooksons        | 345/109 | 6        | "              | "       | "                                                  |
| Cooksons        | 345/110 | 6        | "              | "       | "                                                  |
| Cooksons        | V4201   | 6        | "              | "       | Slight erosion                                     |
| Lonsabarc       | V7431   | 5        | "              | "       | Heavy dirt retention<br>Very slight<br>blistering  |
| Lonsabarc       | 345/109 | 5        | "              | "       | Heavy dirt retention                               |
| Lonsabarc       | 345/110 | 5        | "              | "       | "                                                  |
| Lonsabarc       | V4201   | 5        | "              | "       | Slight blistering.<br>Moderate to heavy<br>erosion |
| Metal Colors    | V7431   | 5        | "              | "       | Heavy dirt retention.<br>Slight erosion            |
| Metal Colors    | 345/109 | 5        | "              | "       | Heavy dirt retention                               |
| Metal Colors    | 345/110 | 6        | "              | "       | "                                                  |
| Metal Colors    | V4201   | 5        | "              | "       | Fairly heavy erosion                               |

0007-SWP-043645

0007-SWP-000126989

(44)

## WHITE LEAD PAINTS

C 220.225.

| OF<br>LEAD                   | MEDIUM    | CHALKING | COLOUR         | GLOSS  | REMARKS                                    |
|------------------------------|-----------|----------|----------------|--------|--------------------------------------------|
| Octagon<br>High Stain        | V7431     | 5        | Badly<br>Faded | Poor   | Heavy dirt retention                       |
| Octagon<br>High Stain        | 345/109   | 5        | "              | "      | "                                          |
| Octagon<br>High Stain        | 345/110   | 5        | "              | "      | "                                          |
| Octagon<br>High Stain        | V4201     | 5        | "              | "      | "                                          |
| Octagon<br>Low Stain         | V7431     | 5        | "              | V.Poor | Moderate dirt retention.<br>Slight erosion |
| Octagon<br>Low Stain         | 345/109   | 5        | "              | "      | Moderate dirt retention                    |
| Octagon<br>Low Stain         | 345/110   | 5        | "              | "      | "                                          |
| Octagon<br>Low Stain         | V4201     | 5        | "              | "      | "                                          |
| Electrolytic<br>ref. 241/220 | V7431     | 4/5      | "              | Poor   | "                                          |
| Electrolytic<br>ref. 241/220 | 345/110   | 4/5      | "              | "      | "                                          |
| Octagon H.S.3<br>m6 1        | 345, 110  | 5        | "              | "      | "                                          |
| Octagon L.S.3<br>m6 1        | 345/110   | 5/5      | "              | V.Poor | Moderate dirt retention<br>Slight erosion  |
| Ionabarc<br>m6 1             | 3 345/110 | 5/5      | "              | Poor   | Moderate dirt retention                    |
| Cooksons<br>m6 1             | 3 345/110 | 5/5      | "              | V.Poor | "                                          |

0007-SWP-043646

0007-SWP-000126990

(45)

C Stevens

WHITE LEAD PAINTS

| TYPE OF LEAD |   | MEDIUM  | CHALKING | COLOUR      | GLOSS     | REMARKS                 |
|--------------|---|---------|----------|-------------|-----------|-------------------------|
| Metal Colors | 3 | 345/110 | 7/6      | Badly Faded | Very Poor | Moderate dirt retention |
| Rm 6         | 1 |         |          |             |           |                         |
| Metal Colors | 4 |         |          |             |           |                         |
| Rm 6         | 1 | 345/110 | 7/6      | "           | "         | "                       |
| Rm 618       | 1 |         |          |             |           |                         |
| Octagon H.S. | 4 |         |          |             |           |                         |
| Rm 6         | 1 | 345/110 | 6        | "           | Poor      | Isolated blistering     |
| Rm 618       | 1 |         |          |             |           |                         |
| Octagon L.S. | 4 |         |          |             |           |                         |
| Rm 6         | 1 | 345/110 | 6/5      | "           | "         | Moderate dirt retention |
| Rm 618       | 1 |         |          |             |           |                         |
| Cooksons     | 4 |         |          |             |           |                         |
| Rm 6         | 1 | 345/110 | 7/6      | "           | "         | "                       |
| Rm 618       | 1 |         |          |             |           |                         |
| Lonabarc     | 4 |         |          |             |           |                         |
| Rm 6         | 1 | 345/110 | 7/6      | "           | "         | "                       |
| Rm 618       | 1 |         |          |             |           |                         |

CONCLUSIONS:- The influence of the addition of 33% linseed stand oil or of 33% linseed wood oil. Stand oil is only slight.

Thus Stand oil is worst of the four media tried, on account of erosion.

Only small differences are apparent & it is not possible to select any one type of lead as being best.

The addition of antimony & Zinc Oxide to any of the White Leads so far shows a slight improvement, re chalking. Zinc Oxide as a sole additive has no apparent effect.

0007-SWP-043647

0007-SWP-000126991

Mr. B. Holton.  
Cleveland.

U. S. ENGINEERING A-B-C

TECHNICAL OPERATIONS

REPORT

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Presented September, 1947.

EXHIBIT NO. 15.

0007-SWP-043648

0007-SWP-000126992

Series No. 55.

SUPPLEMENTARY TECHNICAL OPERATIONS REPORT MARCH 1947 - MAY 1947.

INDEX

|  | <u>Page</u> | <u>Item No.</u> | <u>Title.</u>               |
|--|-------------|-----------------|-----------------------------|
|  | 1           | C.14            | Nitrocellulose Plasticisers |
|  | 3           | C.17            | Proxcelin                   |
|  | 6           | C.21            | Cellufin Gloss Lacquers     |
|  | 16          | C.22            | Tennis Racket Finishes      |
|  | 8           | C.23            | Wood Lacquer                |
|  | 8           | D. 4            | Pigment Green               |
|  | 11          | D. 5            | Permanent Red 5 G.          |
|  | 12          | D. 8            | Surfax                      |
|  | 16          | D.12            | Benzidene Yellow            |
|  | 18          | D.14            | Chrome Yellow               |
|  | 19          | P. 3            | Stonhard                    |
|  | 23          | P.17            | Pompeian                    |
|  | 25          | P.40            | Fire Retardent Paints       |
|  | 30          | P.43            | Maisone                     |
|  | 33          | P.43            | Matroil                     |
|  | 37          | P.81            | Bergmaster                  |
|  | 39          | P.82            | Pompeian Super Synthetic    |
|  | 42          | P.93            | Tilo                        |
|  | 43          | P.98            | White Lead Paints           |
|  | 44          | P.115           | Primer for Plaster          |
|  | 57          | P.117           | Kemplastite                 |
|  | 61          | V.16            | Linseed Stand Oils          |
|  | 66          | V.29            | Tall Oil.                   |

Acknowledgment is due to the following, under whose supervision the above-mentioned investigations have been made:-

Mr. W.H.Stitson.....Varnish and Development Section  
Mr. R.C.Somerville.....Paint Control Section  
Mr. J.K.Barracough.....Dry Colour Section  
Mr. S.E.Francis.....Cellulose Section.

(SIGNED) H. A. NEWBAM.

Manager,  
TECHNICAL OPERATIONS.

/HEM.

0007-SWP-043649

0007-SWP-000126993

File - P.95. (Contd.)

Roofing Compounds (contd.)

By adjusting this formula to raise the content of RM.578 and RM.579 up to 47.5% and altering the ratios of the liquids so as to make the mass workable, a material was obtained which was fairly close to Lastite in appearance, but the brittleness of the high silica content was very noticeable under the knife, a feature which is not apparent with Lastite. To overcome this trouble the silica was replaced by Whiting and the resultant material was a fairly close match to Lastite.

The formula eventually chosen was :- 355/247/1

|         |          |
|---------|----------|
| 50 lbs. | (348)    |
| 8 "     | (347)    |
| 40 "    | (387)    |
| 10 "    | (525)    |
| 34 "    | (RM.578) |
| 50 "    | RM. 25   |

This was tested on an upright steel panel against Lastite. Both withstood 330° F. without sagging.

Exposed on roof on a sheet of galvanised iron.

Exposure No. 1150. Exposed 23/4/47.

Chemical analysis and microscopic examination of the filler used in Lastite indicate a low grade of asbestos, having short fibres and smallish crystals.

After 3 months' exposure on the roof Lastite has developed a grey colour suggesting either surface chalking or water absorption. It has crazed badly. The match to Lastite is still in good condition at this early stage.

ARMED WEAPONS DIVISION S.O.C.  
by  
C. HASTINGS.

Further examination of exposures after 13 months on roof of Jacksons RM.770, Longbarr RM.770, Metal Colours RM.770, Octogen High Stain and Octogen Low Stain White Leads, Electrolytic White Lead, using various Mediums. Comparison made with straight leads, blend of lead and zinc oxide 3 : 1 ; blend of lead, zinc oxide and Antimony white 4:1:1.

Panel Numbers L.P. 267-274.

(Contd.)

0007-SWP-043650

White Lead Paints (Contd.)

It can be recorded that whereas straight White Lead Paints is still chalking fairly badly, with the addition of zinc oxide and Antimony chalking has practically ceased but chalking has increased.

Medium 345/103 is "BP" Medium with (45) to extent of 53% of oil content.

Medium 345/110 is "BP" Medium with V.5095 to extent of 25% of oil content.

PRIMER FOR PLASTERP.115.

by  
J.D. STEFANUTI

Some preliminary tests were carried out to determine the optimum thickness of plaster casts to be used in the measurement of moisture loss by evaporation through a primer paint film.

In these experiments Keene's Cement was mixed with sufficient water to give a mortar consistency suitable for travelling the amount being approximately of the proportion to form the dihydrate.

- {  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$  - 87% water by weight content.
- { Plaster casts prepared - 82% water by weight. content

Thin of different diameters and depth were filled with plaster mortar and weighed. The loss of weight was recorded hourly during the early stages of the experiment and twice daily afterwards, until no further loss in weight occurred. (See Table 1 and Graph.)

The plaster cast was then heated to (a)  $40^\circ \text{C}$ . and later (b)  $100^\circ \text{C}$ . to constant weight. Each operation took several days.

Other tests carried out were (i) the determination of the moisture of the original Keene's Cement and (ii) its capacity to absorb moisture from the atmosphere.

contd.

0007-SWP-043651

|                       |   |                                                         |                |            |
|-----------------------|---|---------------------------------------------------------|----------------|------------|
| Surface Area          | = | 78.5 sq. cms                                            | Weight of Tip  | 145.56     |
| Depth of Plaster      | = | 6 cms.                                                  | Plaster<br>Tip | =<br>24.40 |
| Composition of Mortar | = | 98.5 gms Keenec Cement<br>22.5 gms water equal to 22.6% |                |            |

|    |                       |   |                         |               |         |
|----|-----------------------|---|-------------------------|---------------|---------|
| B. | Surface Area          | = | 40 sq. cms              | Weight of Tin |         |
|    |                       |   |                         | + Plaster =   | 189.67  |
|    | Depth of Plaster      | = | 3 cms                   | Tin           | = 42.99 |
|    | Composition of Mortar | = | 115.6 gms Keesee Cement |               |         |
|    |                       |   | 88.7% "                 | Water (23.3%) |         |

|    |                      |               |                           |       |
|----|----------------------|---------------|---------------------------|-------|
| C. | Surface Area         | = 40 sq. yds. | Weight of Tin + Plaster = | 65.50 |
|    | Thickness of Plaster | = 3 ins.      | Tin =                     | 14.50 |

|    |                      |              |               |          |
|----|----------------------|--------------|---------------|----------|
| D. | Surface Area         | = 40 sq. cm. | Weight of Tin |          |
|    | Thickness of Plaster | = 2 cm.      | + Plaster     | = 187.45 |
|    |                      |              | Tin           | = 18.85  |

The composition of mortar of C. and D. was

158.8 gms of Kerosene Consumed.

45.19 g. water. (22.1%)

contd.

Plaster (Contd.)

TABLE I

|        | A.                       | B.                      | C.                      | D.                       |        |         |       |        |       |
|--------|--------------------------|-------------------------|-------------------------|--------------------------|--------|---------|-------|--------|-------|
|        | Wt. of Tin<br>+ Plaster. | Wt. of Tin<br>+ Plaster | Wt. of Tin<br>+ Plaster | Wt. of Tin<br>+ Plaster. |        |         |       |        |       |
| Time   | Loss                     | % Loss                  | Time<br>hrs.            | Weight<br>Loss           | Weight | % Loss. |       |        |       |
| 3 hrs. | 143.80                   | 2.78%                   | 133.15                  | 1.58%                    | 1      | 35.53   | 1.75% | 207.36 | 0.57% |
| 4 "    | 141.97                   | 5.82                    | 135.8                   | 3.32                     | 2      | 35.50   | 2.43  | 137.17 | .85%  |
| 5 "    | 141.57                   | 8.08                    | 135.21                  | 4.44                     | 3      | 35.12   | 3.83  | 136.83 | 1.72  |
| 6 "    | 140.71                   | 10.44                   | 134.76                  | 5.84                     | 4      | 34.93   | 5.62  | 136.47 | 2.21  |
| 7 "    | 140.03                   | 13.01                   | 134.28                  | 7.21                     | 5      | 34.75   | 7.27  | 136.23 | 3.26  |
| 23 "   | 135.32                   | 30.12                   | 129.93                  | 17.54                    | 6      | 34.54   | 9.12  | 136.09 | 4.12  |
| 27 "   | 135.00                   | 31.55                   | 130.62                  | 18.5                     | 7      | 34.30   | 11.13 | 135.75 | 5.15  |
| 31 "   | 134.82                   | 32.0                    | 130.33                  | 19.25                    | 23     | 31.25   | 32.4  | 132.9  | 14.57 |
| 47 "   | 134.53                   | 32.32                   | 129.76                  | 21.13                    | 26     | 31.83   | 32.8  | 132.22 | 15.63 |
| 55 "   | 134.57                   | 32.33                   | 129.25                  | 22.7                     | 30     | 31.77   | 33.2  | 131.57 | 16.8  |
| 57 "   | 134.57                   | 32.55                   | 129.13                  | 22.95                    | 47     | 31.63   | 34.33 | 130.85 | 20.3  |
| 120'   | 134.53                   | 23.6                    | 129.15                  | 23.9                     | 54     | 31.63   | 34.33 | 130.65 | 20.6  |
|        |                          |                         |                         |                          | 65     |         |       | 129.34 | 21.33 |
|        |                          |                         |                         |                          | 120    |         |       | 130.22 | 22.02 |
|        |                          |                         |                         |                          | 144    |         |       | 130.15 | 22.4  |
|        |                          |                         |                         |                          | 168    |         |       | 130.03 |       |

After several  
at 100° C.

117.1 gm.

Kept 40° C.  
for several  
days

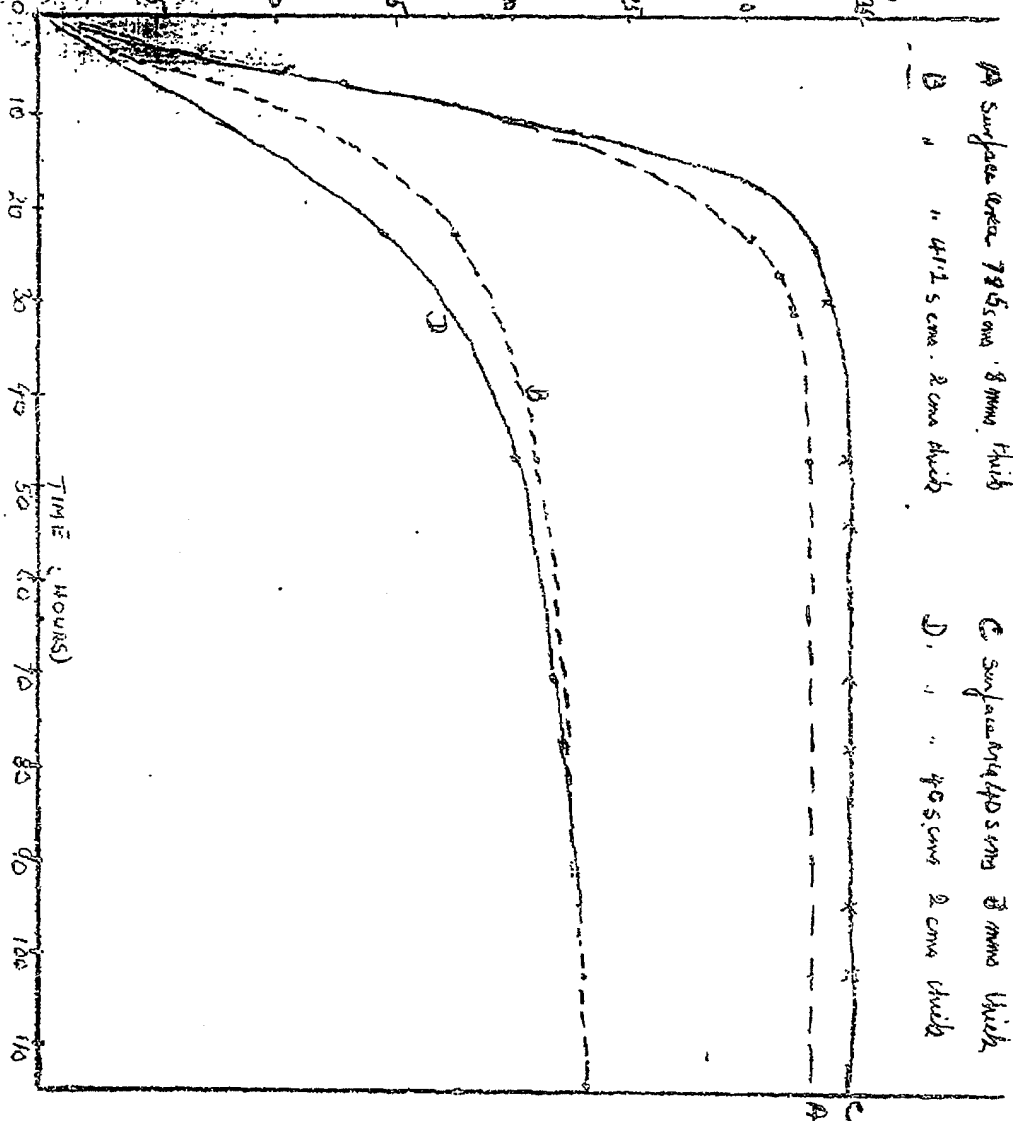
= 61.43 gm.

contd.

0007-SWP-043653

PERCENTAGE LOSS OF WATER (EVAPORATION)

KEENES COEFFICIENT



0007-SWP-043654

Primer for Plaster (Contd.)

- (i) Moisture content of original Keenes Cement was 0.5%
- (ii) Absorption of Moisture under normal atmospheric conditions was only 0.005 grams after several days' exposure.

Conclusions

1. From (ii) Keenes Cement is not hygroscopic.
- " (i) Keenes Cement as supplied by manufacturer has a very low moisture content (0.5%).
2. From the final figures in column A of Table it is calculated that the hydrate of Calcium Sulphate reverts to the anhydrous state at 100° C.  
From the final figure in column C of Table it may be assumed that the product of hydration is a mixture of the mono - di hydrate of Calcium Sulphate.
3. From curves A & C it will be seen that the rate of loss by evaporation is not dependent on surface area.
4. Curves A, B, C and D. show that the rate of loss of evaporation decreases with increase in thickness of plaster cast.
5. Curves A and C show that for thin layers of plaster drying is almost complete within 24 hours, whereas B and D show that thicker layers take a longer period of time (72 hours).
6. It may therefore be concluded that for the purpose of making comparisons of the permeability of different primer paints, thin plaster casts of less than 1 cm. thick should be used, as any change in the rate of loss of evaporation would be more marked in the case of plaster casts of this thickness.

contd.

0007-SWP-043655

Plaster for Plaster (contd.)

Determination of percentage loss of moisture of various plasters by evaporation through a primer paint film.

For the purpose of this work plaster casts of a maximum thickness of 8 mm. were used - See previous report on optimum thickness of plaster.

These casts were prepared by mixing a pre-determined quantity of plaster and sufficient water to form a paste of mortar consistency suitable for trowelling. The paste was then poured into a rectangular area - 80 of cms - 8 mm. deep.) and the total weight recorded. When the plaster was sufficiently set - after about 3 hours - a coat of primer paint was applied. Loss in weight of the casts was recorded daily until constant weight was reached.

On these experiments three types of plaster were used.

- (a) Pioneer (anhydrite) in which the ratio of plaster to water for the paste was 100 : 30.
- (b) Keenes' Cement (anhydrous) - ratio 100 : 50.
- (c) Whistle (hemihydrate) - ratio 100 : 40.

The primer paints used in this work were (1) Maisono (2) Mastrol, (3) Dusseal and (4) Sharp White Lead.

In order to obtain the true loss of moisture of evaporation a correction for the weight of primer film must be made.

A quantity of primer paint sufficient to form a thin film was poured into an empty tin and allowed to dry out at atmospheric conditions to constant weight, and the percentage solids calculated.

Thus the weight of dry primer film was determined and deducted from that of the coated plaster cast and the resultant weight gave the true reading of loss of moisture by evaporation.

|                                   |                                                          |
|-----------------------------------|----------------------------------------------------------|
| In the case of (a) <u>Maisono</u> | a deduction of 56.05% of the weight of wet film is made. |
| (b) <u>Mastrol</u>                | " 61.5% - do -                                           |
| (c) <u>Dusseal</u>                | " 75.47% - do -                                          |
| (d) <u>Sharp white Lead</u>       | " 37.77% - do -                                          |

The experiments were carried out in duplicate to observe the effect of over trowelling. Control tests were also made for comparison.

contd.

0007-SWP-043656

Primers for Plaster (contd.)TABLE OF RESULTS.1. Pioneer Plaster.

Percentage Moisture Loss from original total water.

| Time<br>in<br>Days | CONTREX            |       | MAISONNE              |       | MASTOYL |   | DUSSEAL               |       | SHARP WHITE LEAD |       |
|--------------------|--------------------|-------|-----------------------|-------|---------|---|-----------------------|-------|------------------|-------|
|                    | over<br>trowelling |       | o.<br>trow-<br>elling |       |         |   | o.<br>trow-<br>elling |       | o.<br>trowel.    |       |
| 6 hours            | 18.5%              | 12.8  |                       |       |         |   |                       |       |                  |       |
| 1 day              | 25.8               | 35.8  | 32.0                  | 33.9  | 39.43   | - | 12.6                  | 13.9  | 11.42            | 11.28 |
| 2 days             | 57.18              | 51.76 | 57.14                 | 55.6  | 61.05   | - | 16.9                  | 19.85 | 12.62            | 13.0  |
| 3 "                | 59.84              | 55.2  | 60.8                  | 58.8  | 61.55   | - | 20.04                 | 22.3  | 13.5             | 14.15 |
| 5 "                | 60.4               | 56.95 | 61.1                  | 59.25 | 61.05   | - | 24.44                 | 27.13 | 14.8             | 15.1  |
| 6 "                | 60.5               | 57.1  | 61.1                  | 59.26 | 61.55   | - | 26.32                 | 29.45 | 15.45            | 16.23 |
| 7 "                | 60.5               | 57.6  | 62.2                  | 59.22 | 61.55   | - | 28.2                  | 31.8  | 16.05            | 17.05 |
| 9 "                |                    |       |                       |       |         |   | 29.7                  | 34.05 | 16.85            | 17.75 |
| 10 "               |                    |       |                       |       |         |   | 31.4                  | 36.0  | 17.03            | 19.0  |
| 13 "               |                    |       |                       |       |         |   | 36.5                  | 39.8  | 19.35            | 21.2  |
| 20 "               |                    |       |                       |       |         |   | 36.1                  | 40.9  | 20.15            | 22.65 |
| 21 "               |                    |       |                       |       |         |   | 36.95                 | 41.5  | 20.72            | 23.4  |
| 23 "               |                    |       |                       |       |         |   | 38.51                 | 42.6  | 20.92            | 24.3  |
| 25 "               |                    |       |                       |       |         |   | 40.6                  | 45.4  | 22.25            | 25.9  |
| 26 "               |                    |       |                       |       |         |   | 42.1                  | 45.7  | 24.4             | 28.5  |
| 28 "               |                    |       |                       |       |         |   | 46.2                  | 44.6  | 51.3             | 35.0  |

Example

Pioneer (Dusseal).

Weight of tin = 22.02 gms } weight of Plaster  
 + plaster mix 144.83 gms } mix = 122.83 gms.  
 " after set 142.40 gms } weight of  
 + Dusseal = 145.93 gms } wet films = 1.53 gms.

By calculation - total water content of plaster - 28.34 gms.  
 - weight of dry film - 1.15 gms.

contd

0007-SWP-043657

Plaster for Plaster (Contd.)

Example (contd.)

Weight of plaster + film and tin after 2 days = 141.81 gms.

Therefore.  $144.85 - \frac{(141.81 - 1.15) \times 100}{28.84} = 18.9\%$

% Moisture after 2 days = 18.9%

2. Keeone Cement

| Time<br>in<br>days | CONTROL |                | MAISONNE |                | MATROIL |            | DUSSEAL |                | SHARP F. LEAD |                |
|--------------------|---------|----------------|----------|----------------|---------|------------|---------|----------------|---------------|----------------|
|                    | Normal  | Over<br>Trowel | Normal   | Over<br>Trowel | Normal  | Over<br>T. | Normal  | Over<br>Trowel | Normal        | Over<br>Trowel |
| 6 hrs.             | 38.8%   | 11.25          |          |                |         |            |         |                |               |                |
| 1 day              | 38.8    | 31.5           | 30.6     | 27.4           | 23.07   | -          | 8.09    | 8.8            | 11.34         | 13.2           |
| 2 days             | 38.85   | 32.25          | 35.33    | 31.7           | 30.1    | -          | 9.81    | 9.86           | 12.4          | 14.28          |
| 3 "                | 36.4    | 33.3           | 36.2     | 32.0           | 36.2    | -          | 9.87    | 10.00          | 13.0          | 15.06          |
| 5 "                | 30.5    | 33.4           | 36.1     | 32.28          | 36.2    | -          | 10.3    | 10.84          | 13.6          | 16.22          |
| 6 "                | 36.5    | 33.5           | 33.18    | 28.8           | 36.3    | -          | 10.5    | 11.69          | 14.13         | 16.2           |
| 7 "                | 36.5    | 33.6           | 36.2     | 32.5           | 36.3    | -          | 11.32   | 11.88          | 14.56         | 17.4           |
| 8 "                |         | 33.6           | 36.2     |                |         |            | 11.93   | 12.75          | 15.2          | 18.2           |
| 9 "                |         |                |          |                |         |            | 12.56   | 14.35          | 15.42         | 18.9           |
| 12 "               |         |                |          |                |         |            | 14.46   | 15.6           | 17.3          | 20.5           |
| 15 "               |         |                |          |                |         |            | 15.03   | 15.75          | 17.3          | 20.9           |
| 16 "               |         |                |          |                |         |            | 15.58   | 16.2           | 18.1          | 21.15          |
| 18 "               |         |                |          |                |         |            | 16.93   | 17.1           | 18.95         | 21.6           |
| 19 "               |         |                |          |                |         |            | 18.05   | 18.11          | 19.9          | 21.7           |
| 23                 |         |                |          |                |         |            | 19.5    | 19.0           | 20.8          | 21.9           |
| 26                 |         |                |          |                |         |            | 20.5    | 21.0           | 22.8          | 22.0           |

contd.

0007-SWP-043658

Plasters for Plaster. (Contd.)3. Thistle Plaster

| Time<br>in<br>Days. | CONTROL |                | MAISONNE |                | MATROIL |            | DUSSEAL |                | SHARP W. LEAD. |                |
|---------------------|---------|----------------|----------|----------------|---------|------------|---------|----------------|----------------|----------------|
|                     | Normal  | Over<br>Trowel | Normal   | Over<br>Trowel | Normal  | Over<br>T. | Normal  | Over<br>Trowel | Normal         | Over<br>Trowel |
| 6 hrs.              | 10.17   | 10.2           |          |                |         |            |         |                |                |                |
| 1 day               | 31.5    | 32.45          | 27.4     | 27.07          | 26.5    | -          | 10.84   | 12.3           | 12.44          | 13.52          |
| 2 days              | 57.13   | 57.64          | 52.75    | 53.6           | 51.8    | -          | 15.8    | 18.69          | 18.27          | 17.45          |
| 3 "                 | 62.35   | 62.3           | 56.55    | 58.3           | 53.2    | -          | 18.23   | 22.5           | 20.09          | 21.2           |
| 5 "                 | 65.0    | 62.9           | 61.55    | 59.55          | 63.5    | -          | 20.0    | 20.8           | 24.6           | 23.14          |
| 6 "                 | 65.0    | 63.0           | 61.9     | 59.8           | 63.5    | -          | 22.23   | 31.7           | 29.95          | 29.24          |
| 7 "                 |         | 63.0           | 61.9     | 59.8           | 63.5    | -          | 24.75   | 36.0           | 33.55          | 32.35          |
| 8 "                 |         |                |          |                |         |            | 25.03   | 43.13          | 36.9           | 37.64          |
| 9 "                 |         |                |          |                |         |            | 32.07   | 48.4           | 40.35          | 41.55          |
| 12 "                |         |                |          |                |         |            | 43.5    | 56.5           | 47.2           | 48.84          |
| 13 "                |         |                |          |                |         |            | 43.5    |                | 48.6           | 49.26          |
| 14 "                |         |                |          |                |         |            | 49.0    | 59.3           | 49.3           | 51.0           |
| 16 "                |         |                |          |                |         |            | 52.9    | 60.0           | 51.2           | 52.1           |
| 19 "                |         |                |          |                |         |            | 55.9    | 69.55          | 54.5           | 55.4           |
| 25 "                |         |                |          |                |         |            | 58.0    | 62.0           | 56.0           | 56.9           |
| 26 "                |         |                |          |                |         |            | 62.0    | 63.0           | 61.8           | 59.9           |

Observations on film hardness and adhesion.

- (1) Adhesion of paint films was good in all instances.
- (2) Order of toughness. Dusseal tougher than Matroil - Maisonne tougher than Sharp White Lead.
- (3) There was some evidence of efflorescence on the Sharp White Lead film of the Thistle Plaster Cast.

contd.

0007-SWP-043659

Plaster (Contd.)

General Observations:

The curves of the graphs (Time - moisture loss) show that

- (a) Metrolite and Mazonite have a high water permeability, permitting the excess water in the plaster to evaporate away freely and rapidly, compare control test in which the plaster cast was not primed. Constant weight was in all three instances reached within three days.
- (b) Dusseal and Sharp White Lead primers have a low water permeability. Even after 58 days of priming the plaster casts still retained as much as 25% to 50% of the free moisture in the plaster. Except in the earlier stages of the experiments, the rate of moisture loss can be said to be fairly constant.
- (c) The variation in the results obtained in over crowding to normal trowelling of a plaster surface is insufficient to state that the former process might appreciably affect the drying out of a plaster.

Conclusions:

From the data obtained in the experiments the moisture loss was calculated to be:

- (a) Pioneer - Monohydrate
- (b) Keene's Cement - Mixture of Mono - and dihydrate.
- (c) Emulic - Dihydrate.

In practice, primer paints such as Dusseal and Sharp White Lead are applied, in the 'follow the trowel' process to Keene's Cement Plaster surfaces to prevent a too rapid dry-out. A rapid 'dry-out' would affect and retard the setting and hardening process of the cement.

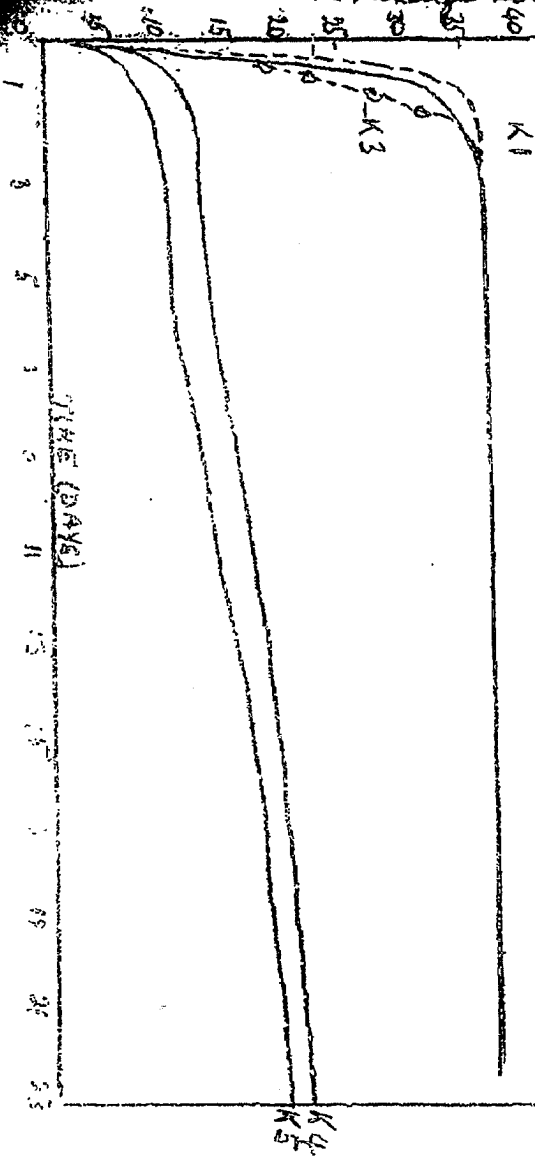
The results of the above experiments show that on the application of Dusseal or Sharp White Lead moisture is retained in the plaster even after 58 days of drying. This prolonged retention of moisture may, however, in time give rise to defects in the finished paint-work, and the extent to which these defects may arise can only be determined by carrying out plaster wall tests.

The Building Research Station may be able to give information on the period of setting and hardening of Keene's Cement, and indicate the correlation between laboratory tests and building practice.

contd.

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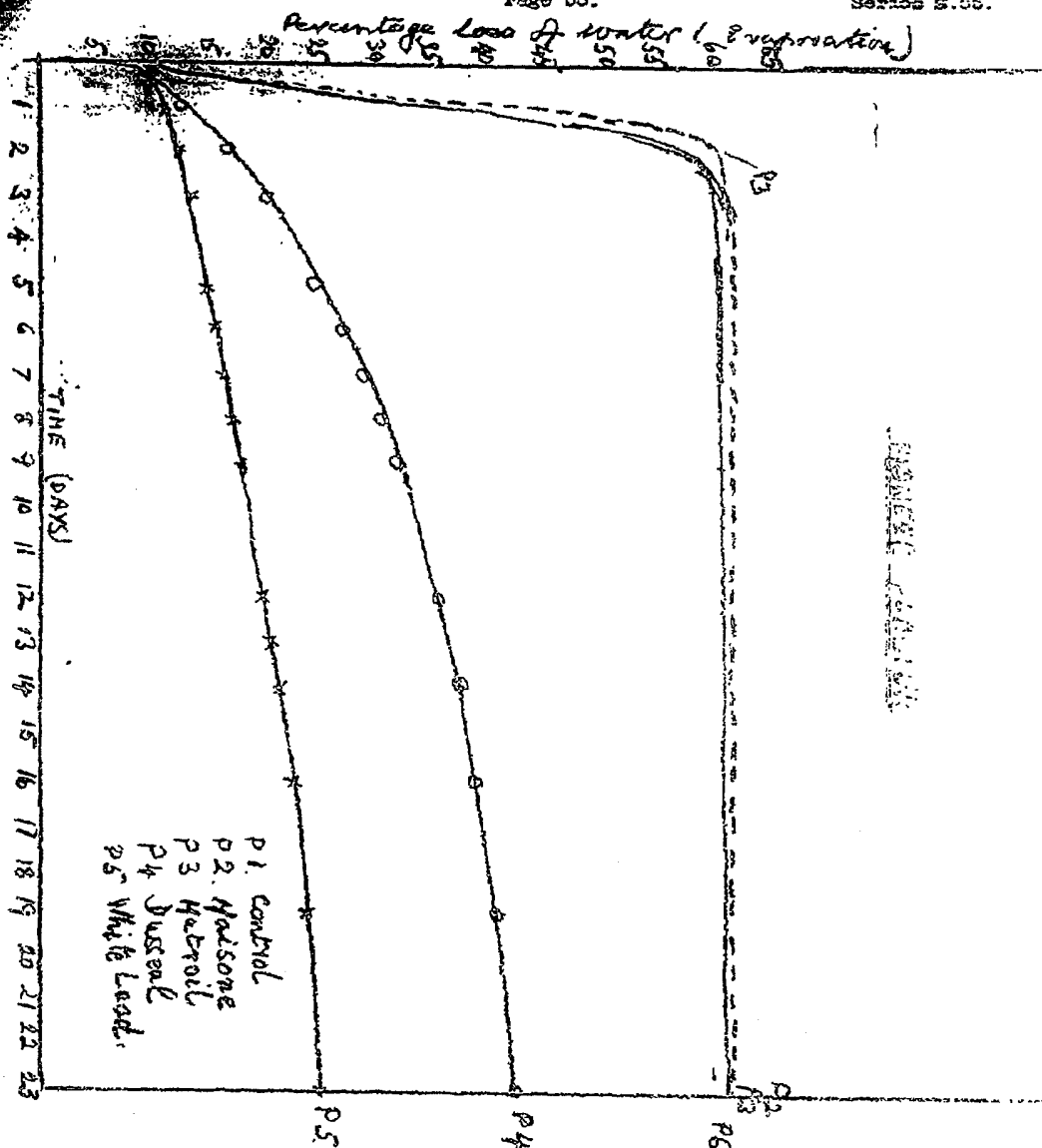
Percentage loss of water.



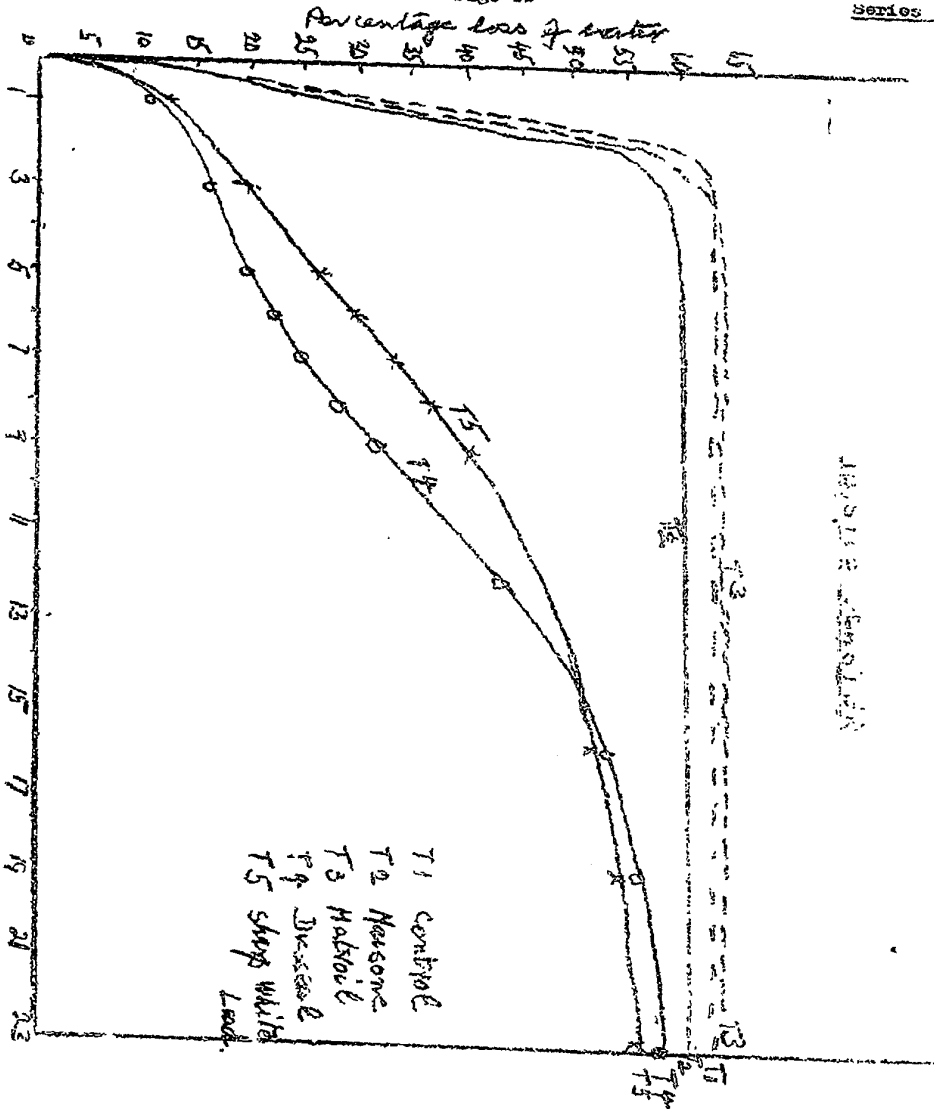
KEENES CEMENT

K1 control  
K2 Hasone  
K3 Habyoil  
K4 Dussac  
K5 sharp white lead

0007-SWP-043661



0007-SWP-043662



0007-SWP-043663

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