

## Lead Industries Association

420 LEXINGTON AVENUE

NEW YORK, N.Y.

April 21, 1931.

### TO MEMBERS MANUFACTURING LEAD PIPE:

Owing to the failure of some lead service pipe installations in the City of Washington, D. C., a movement has started in that city, to displace lead locally from this old and useful application of lead, in favor of other metals. For several months the Lead Industries Association has taken an active part in trying to defend the interests of lead pipe in Washington. Investigation so far has disclosed:

1. That the Washington failure occurred mainly in the larger sizes of lead pipe, from 1½" upward, but that failures had also occurred in the smaller sizes (apparently from fatigue stresses).
2. That Washington had raised its city water pressure in recent years from about 40 lb. to as high as 100 lb. in some parts of the City.
3. That the weights of lead pipe required by the Washington building code and generally used were "AA" or extra strong.
4. That failures in the larger sizes of pipe were chiefly caused by internal stresses bulging the pipe to the bursting point.
5. That Washington plumbers complain of the water hammer frequently found in Washington plumbing.

A further investigation discloses the fact that lead pipe sizes have little relation in respect to strength to the classification "strong", "extra strong", or "extra extra strong" (corresponding to A, AA or AAA pipe) commonly applied to them. In other words, the plumber cannot proceed on the assumption that an extra strong 2 in. lead pipe will stand the same pressure as a 1 in. extra strong pipe. In fact most of the trouble in Washington is ascribed to an incorrect selection of lead pipe for the service conditions to be met, plumbers using too light a lead pipe for the 1½ in. sizes and upwards. In this connection it is interesting to

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observe that trade literature specifying lead pipe sizes gives very little information for the guidance of plumbers, showing the bursting strength, or safe pressure, which may be carried by lead service pipe. Lead pipe sizes and grades do not appear ever to have been standardized.

With a view to improving the situation, so that "strong" or "A" lead pipe of all diameters will have equally safe working pressures, calculations have been made of the bursting strength of numerous sizes of lead pipe, and, using a factor of safety of 4 to 5, the safe working pressure has been determined. Moreover, run-of-factory samples of lead pipe have actually been tested to the bursting point in the laboratory of the National Lead Company in order to check the calculations made.

As a result of all this work there is appended herewith a carefully worked-out table showing representative sizes of lead pipe and the pressures that may be safely used with them for the weights indicated. It will be noted that in each size an "extra strong" pipe will stand the same pressure, and so on for the other grades. We have indicated in the table those pipe sizes which differ from standard weights now used. It will be noted that the changes are principally in the larger sizes of pipe.

From all the above, and in view of the highly competitive situation in service pipe, it would seem desirable for the lead pipe manufacturers represented in the Lead Industries Association, a large proportion of the total, to consider seriously the wisdom of making a few changes in the specifications commercially used today so that when plumbers and others select lead pipe they will be assured, for example, that all "extra strong" pipe, regardless of its diameter, has equal resistance to bursting pressure.

Will you, therefore, kindly give this subject your careful consideration, giving the Lead Industries Association the benefit of your views, so that if a sufficiently large enough number of manufacturing members agree, steps may be taken to establish new standards for some sizes of lead pipe.

Respectfully submitted,

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Secretary.

CALCULATED SPECIFICATIONS OF REPRESENTATIVE SIZES OF LEAD PIPE

|            | INSIDE<br>DIAMETER<br>IN. | THICKNESS<br>IN. | WEIGHT<br>PER FT.<br>LB. | SAFE<br>PRESSURE<br>LB. PER<br>SQ. IN. |
|------------|---------------------------|------------------|--------------------------|----------------------------------------|
| S or A     | 5/8                       | .198             | *2-8 oz.                 | 50                                     |
| XS or AA   |                           | .218             | *2-12                    | 75                                     |
| XXS or AAA |                           | .258             | *3-8                     | 100                                    |
| S or A     | 3/4                       | .195             | *3                       | 50                                     |
| XS or AA   |                           | .23              | *3-8                     | 75                                     |
| XXS or AAA |                           | .295             | *4-12                    | 100                                    |
| S or A     | 1                         | .21              | *4                       | 50                                     |
| XS or AA   |                           | .24              | *4-12                    | 75                                     |
| XXS or AAA |                           | .295             | *6                       | 100                                    |
| S or A     | 1 1/2                     | .21              | *4-12                    | 50                                     |
| XS or AA   |                           | .245             | *5-12                    | 75                                     |
| XXS or AAA |                           | .313 (.295)      | 7-10 (6-12)              | 100                                    |
| S or A     | 1 1/2                     | .24              | *6-8                     | 50                                     |
| XS or AA   |                           | .302 (.27)       | 7-12 (7-8)               | 75                                     |
| XXS or AAA |                           | .376 (.31)       | 11-4 (8-8)               | 100                                    |
| S or A     | 2                         | .250 (.24)       | 8-12 (8)                 | 50                                     |
| XS or AA   |                           | .374 (.255)      | 13-12 (9)                | 75                                     |
| XXS or AAA |                           | .501 (.356)      | 19-8 (11-12)             | 100                                    |

\* No change from present specification.

Note- Numbers in parentheses refer to specifications now in use for sizes indicated; where no parentheses are given no change is necessary from size now in use.

Where there is only a slight difference between the calculated and present specifications, or where present specifications give an ample factor of safety, no change has been made in the specifications.