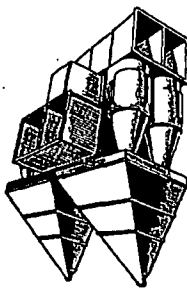


PRactical flyash PREVENTION

can be a reality

... if you logically consider the problem. Too few dollars can easily buy disappointing efficiency while it is just as possible to over-invest with the same result. That's where the Buell van Tongeren Cyclone comes in. With a patented "Shave-Off" to overcome the "double eddy" evil, it can be big enough to overcome plugging hazards. Individually engineered for each specific application Buell is in a class apart in achieving high fractional efficiencies. There's convincing data in the 1948 Buell catalog. Write to: **BUELL ENGINEERING COMPANY, 10 Cedar Street, New York 5, N. Y.**



buell

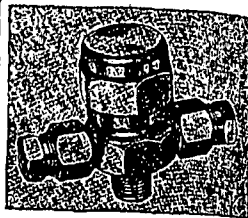
DUST COLLECTION

* See our exhibit at the
18th National Exposition of
Power and Mechanical Engineering
Grand Central Palace, New York
Nov. 29 to Dec. 4, 800TH No. 72

Engineered Efficiency in

150 (726a)

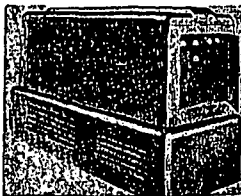
c, and e, are voltages applied to two primaries and A is single through which has been turned from position defined by electrical zero. Arma Corp, 254 86th St, Brooklyn 32, N. Y.



Lubricator Valve E475

KNOWN AS THE GRANNAN LUBRICATOR, this device dispenses all lubricants from light oils to heavy greases through the same valve without change. The through-flow valve has no pockets or crevices to retard lubrication flow. Valve is completely closed to prevent leakage and to eliminate possibility of contamination of lubricants from outside sources.

Lubricator is installed directly into bearing and does not require special gaskets to introduce lubricant into the system. Lubricator functions either with hand-operated gage or from a completely automatic actuator to operate at any desired interval. Suitable for use with road machinery, mining equipment, machine tools and other production machinery, this lubricator handles up to 500 bearings or more in less than one minute, while machine is in operation. Titeflex, Inc, 595 Freelinghyzen Ave, Newark 5, N. J.



Diesel-Electric Plants E470

Model 20SDSP 2500-watt diesel-electric plant is powered by an air-cooled single-cylinder 4-cycle engine. Automatic compression release makes possible electric starting. Plant has inherently regulated generator that provides good voltage regulation without use of rheostats or other external equipment. All engine and generator controls are conveniently located on the steel base. Available in 60-cycle or models for 115 or 230 v, single-phase; or 115/230 v, single-phase 3-wire; or 230 v, 3-phase 3-wire. Standard equipment includes two heavy-duty 6-w starting batteries in series, oil filter, oil-bath air

POWER • November 1948

COPPER ALLOY BULLETIN

MARINE AND POWER EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS.

Prepared by Bridgeport Brass Company

Bridgeport

Headquarters for BRASS, BRONZE, and COPPER

Condenser Tube Problems at Consolidated Edison

How do the large power plants solve their many condenser tube problems? Engineers of Consolidated Edison, New York, kindly consented to be interviewed by the Copper Alloy Bulletin and supplied some interesting facts.

Water Conditions Poorer

Continued increased pollution from sewage and industrial wastes has made the waters in New York harbor more and more corrosive to condenser tubes. Consolidated Edison has, for a number of years, made a practice of trying out new alloys and changing to better, more corrosion-resistant ones as they are developed by the brass industry.

About twenty-five years ago, Admiralty was the best available alloy and Consolidated Edison standardized on it.

When Aluminum Brass was developed in England about eighteen years ago, Consolidated Edison tried it out and found it to be superior to Admiralty in resisting inlet and impingement corrosion. A few years later this alloy was supplied by domestic brass mills. For most of the Consolidated Edison plants Aluminum Brass has replaced Admiralty and lasts considerably longer.

Development of Aluminum Brasses

As early as 1913 Consolidated Edison was interested in trying out Aluminum Brasses (95% Copper, 5% Aluminum). An experimental installation of about 5000 tubes was made at that time in their Sherman Creek plant then operated by United Electric Light and Power Company. These tubes were removed in 1933

— a period of 20 years, although their useful life had not been exhausted. Compare this record with Admiralty which was used in adjacent condensers of identical design and averaged six years before retubing.

Another test lot of Aluminum Brasses was installed by Consolidated Edison at Madison Ave. In 1932 and service tests proved its superiority over aluminum brasses. At the present time, Aluminum Brasses is out of the testing stage and is now a preferred alloy.

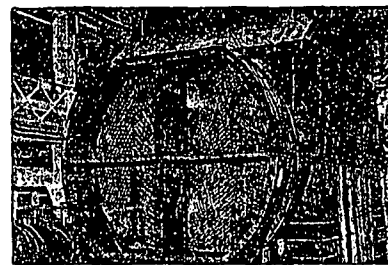
Although the merits of Aluminum Brasses had been known for many years, only experimental quantities had been produced because of the difficulties encountered in manufacture. However, through special casting techniques and the use of new and more powerful mill equipment, Bridgeport introduced Duronac IV[®] (Arsenical Aluminum Brasses) in 1938 as a standard alloy.

Advantages of Service Tests

Consolidated has learned that the most practical way of finding out whether a certain alloy is satisfactory is to install a number of tubes in certain places in the condenser which give the most trouble. Careful records are kept of their service life under actual operating conditions. Naturally it costs money to maintain such tests but they more than pay for themselves in valuable knowledge acquired. It is not necessary to make a large investment in tubing to try out a new alloy since only a limited number will suffice. Consolidated Edison has also tested other alloys. Red Brass (85% Copper, 15% Zinc) gave an unsatisfactory performance, as it stood up for only about six months. Cupro Nickel (70% Copper, 30% Nickel), which gives an outstanding performance for fast ocean-going ships, was not entirely satisfactory under existing polluted harbor water conditions.

The High Cost of Maintenance

With greatly increased labor costs, every effort is made to keep maintenance down to a minimum. Experience has shown, first of all, that it is most economical to use the best alloys available regardless of the higher initial costs, which are



101,000 square foot Worthington surface condenser Unit No. 7. Capacity 150,000 G.P.M. and 1,500,000 lbs. per hr. condensate.

BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 3, CONN.

Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal

ESTABLISHED 1888

soon absorbed through longer service life, fewer shut-downs, less frequent re-tubing, etc. However a certain amount of cleaning is absolutely necessary.

Today's units, with modern high pressure boilers and improved turbines, are much more efficient than the older designs. Consequently the tendency is to operate the newer units on a continuous basis. The older ones are used for peak loads and as standbys and generally operate for about ten hours a day, being idle the rest of the time.

Since uninterrupted service of the most modern units leads to greatest economy, every effort is made to keep them in operation. About once a day chlorine compounds are introduced in the circulating water for a short period to prevent or remove slime deposits which interfere with heat transfer. When it is necessary to shut down these units for maintenance the condenser is cleaned manually.

Consolidated Edison has found from long experience that keeping the condenser tubes as clean as possible prolongs their service life. However, they still have the problem of impingement corrosion which takes place at the inlet ends of the tubes. It is true that Aluminum Brasses withstands this attack better than the other alloys. However, protection can be obtained by painting the inlet ends of the tubes and the tube sheet with a special paint. Unfortunately, this method is time consuming since the paint has to be applied very carefully and evenly. It also has to be dried for a number of hours before using. Since shut-down time is very expensive, other methods of reducing inlet end corrosion are also being tried such as inserts which are secured in the tubes.

Conditions Vary

Experience of a successful power company such as Consolidated Edison can be helpful to other power plants interested in efficient and economical operation. Bridgeport recognizes that each power plant has its own problems as to water conditions and operation of the turbines and condensers. An alloy which proves successful in one location may be unsatisfactory in another. For this reason Bridgeport will be glad to cooperate with engineers by suggesting alloys to be tried out and by discussing the results of tests made under actual operating conditions.

Bridgeport's Corrosion Laboratory carries on a consistent program of corrosion research with the objective of understanding the properties of available alloys, improving existing alloys and developing new and better ones. Much information on the properties of available condenser tube alloys is given in Bridgeport's Condenser Tube Manual. Contact the nearest Bridgeport District for condenser tube service.

* U. S. Patent No. 2,523,256

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