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KOPPERS COMPANY, INC. Tar Products Division, Pittsburgh 19, Pa.

BULLETIN

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KOPPERS

Manufacturers of hot-applied Bitumastic Enamels and cold-applied industrial coatings for protection against corrosion. Contractors for coating pipe lines, ships, lock gates, tanks and coal bunkers and other industrial, engineering and marine structures and equipment.

28 over 50

"Two are better than one" is an old saying. It not only applies to dollars in the bank but to protective coatings. Two coats give much more than twice the life of one and sometimes two different coatings, one over the other, are even more effective.

A case in point is the use of Bituplastic No. 28 over an initial coat of Bitumastic No. 50.

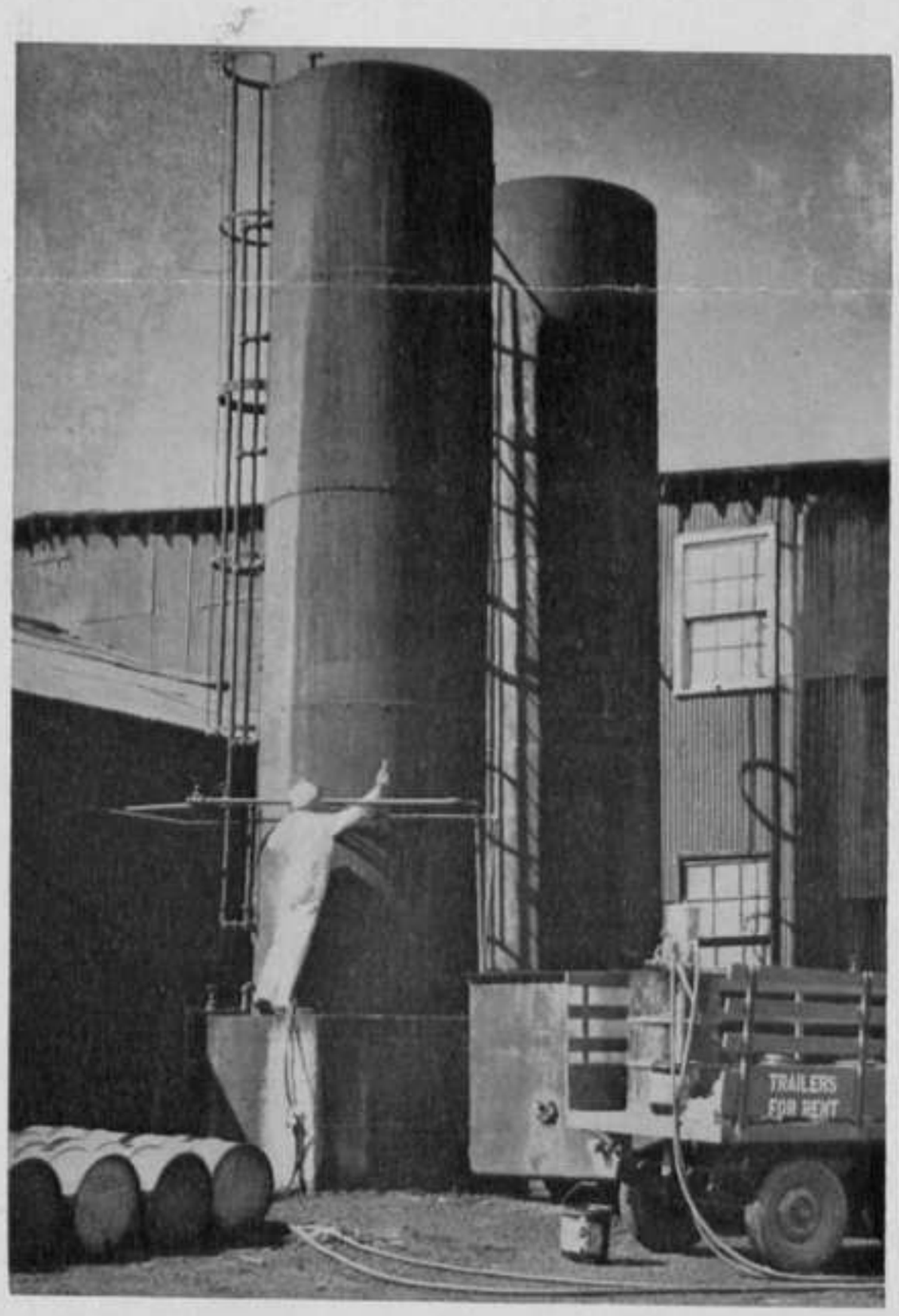
Both are cold applied heavy bodied materials, deliberately designed so that each single application produces a film thickness 5 to 8 times as thick as a single application of conventional thin paint. The reasoning is that, other things being equal, the thicker the film, the greater the protection. Experience has proven the worth of the idea and its economy.

Both are coal tar pitch base products. Coal tar offers positive protection against attack by water and is also extremely resistant to the fumes and vapors of most of the acids and alkalies occurring in industry. Both materials have therefore been recommended and extensively used for the severest cases of above ground corrosive attack.

There is much to be gained by using a combination of both materials instead of two coats of either one. One coat of Bitumastic No. 50, which does not require any primer and is applied directly to bare steel, should be followed by one coat of Bituplastic No. 28.

The top coat of Bituplastic No. 28 seals the underlying coat of Bitumastic No. 50 and keeps it much more pliable. Bituplastic No. 28 shows no tendency to alligator when exposed to sunlight, and with No. 50, excludes rain and water as well as vapors and chemical fumes from the underlying metal.

Tests have demonstrated the great advantages of this combination for protecting above ground steel structures exposed to sunlight and the most severe corrosive conditions.



Spraying Bituplastic No. 28 over Bitumastic No. 50.

The Bitumastic No. 50 should be well set up before the Bituplastic No. 28 is applied. The setting up time can vary from 24 to 48 hours, depending upon air temperature, humidity and wind velocity. As Bituplastic No. 28 is a water dispersion, it should not be allowed to freeze in the container or be applied at a time when it might be exposed to freezing temperatures before drying. After drying, freezing conditions are no problem. It should be applied at a time when it can "set" before rain occurs.

WHAT AN INSTITUTION!

The Building.

IN the year 1816 Philadelphia was the chief port and most important City in the Nation, but compared with modern standards it was a strangely unfamiliar place. Homes and shops, which were to an appreciable extent the same place, were lighted by candles or by whale oil lamps. Fireplaces, using wood as fuel, were the only means of heat. Gardens and orchards were interspersed throughout the business district. About one-half of the population lived but a few blocks away from the point at which the City had been planned a century and a quarter earlier. The only mode of travel was by foot or by horse drawn carriages or carts.

Philadelphia had been the undisputed source of strength during the Revolutionary War and also the War of 1812. It had resumed its rank as a market place of potential achievement for the financial, commercial and maritime activity upon which a new national security and expansion depended.

In 1816, Philadelphia had assumed liability for large loans incurred for recent military defenses; payments in specie were still under suspension there and elsewhere; the currency was depreciated; trade and commerce had been restricted by embargo and later paralyzed by war; public confidence was at a low ebb and banks were in popular disfavor; prolonged and intense cold had destroyed the wheat crop of 1816 and the price of flour consequently rose to distressing heights; Soup Societies were called upon to feed the poor and private charities organized to clothe and house them; disease and unemployment were widespread.

In such an atmosphere of depression, a courageous group of distinguished citizens with outstanding leadership and vision organized the first Mutual Savings Bank in America—The Philadelphia Saving Fund Society.

The first deposit on December 2, 1816 was $5.00, made by a colored domestic. With twenty additional dollars, deposited by four other persons, the first day's business was closed. As of December 31, 1950—134 years later the liabilities due 695,403 depositors amounted to almost $600,000,000 and the first place of business in the existing office of the first Secretary has since grown to a main office and seven branch offices—all in Philadelphia.

What a tribute to the sound management that this institution has enjoyed over the years!

An outstanding example of the courage and foresight of the managers was the construction of a 33-story ultra modern office building at a time when the depression following the days of wonderful nonsense in 1929 was making itself felt with increasing severity and the prostration of financial institutions was occurring in incredible numbers in Philadelphia and elsewhere. Completed in 1932, it was reputed to be the first of the modern functional type of office buildings and the first office building in America to be completely airconditioned from top to bottom.

Today—after almost 20 years—it almost looks as though it had been built yesterday. It is a tribute to the foresight of the architects—Howe and Lescaze—that the only changes in the design to keep up with the march of progress and a tremendous increase in the Society's business have been minor ones.

Its new look is due partly to the extensive use of practically ageless materials such as marble, glass, stainless steel, copper and bronze, but also to the extraordinary good maintenance the building receives. This is in charge of Mr. C. H. Rahn—Manager of the Philadelphia Saving Fund Building—and his assistants, Messrs. Bateson, Metcalf and Maher.

Bitumastic Industrial Coatings have been used to an appreciable extent for a long time on the steel work in the building that is subject to corrosion.

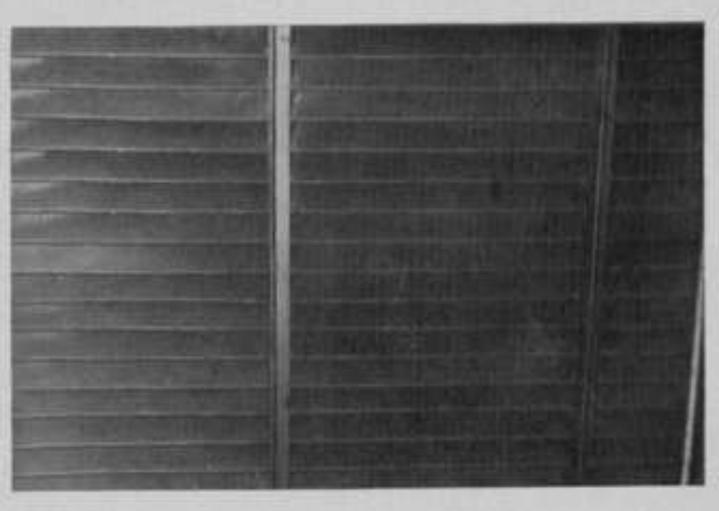
The steel of the large cooling tower on the roof is protected with heavy bodied cold applied Bitumastic No. 50. Steel house tanks and pans, located at different elevations to supply the water requirements of the floors below to the next tank, are also similarly protected. Humidifiers are coated with Bitumastic Tank Solution—as a primer—followed by heavy bodied Bituplastic No. 28, both cold applied. Eliminator plates in the air filters are coated with Bitumastic No. 50 and the walls with Bituplastic No. 28. Wash water tanks for the filters are Bitumastic protected, some with Bitumastic No. 50 and some with Bituplastic No. 28.

The coating materials are purchased from Enoch Bros., 3012 Frankford Ave., Philadelphia 34, Pennsylvania, a Bitumastic Industrial Cold Coating distributor.

The management is well satisfied with the protection afforded by these Bitumastic Coatings.

Steel Cooling Tower
Protected with Bitumastic No. 50.

Steel Eliminator Plates
Protected with Bitumastic No. 50.



STEEL SEWER PIPE LINES

STEEL pipe has been used satisfactorily for years for water transmission pipelines and is considered by many engineers as the ideal type of pipe for the purpose. But steel pipe has not been used proportionately to the same extent for sewer pipelines. This is because a water system is primarily a distribution proposition involving pressure whereas a sewage system is primarily a collection layout operating mainly by means of gravity flow. Steel pipe is generally required only where internal pressure is a factor.

However, in many sewage systems, pumping is necessary to transport the sewage from low points of the collection grids to the treatment plant and in the operation of the plant. Steel pipe is eminently suitable for these force mains for the same reason that it has found such extensive use in water mains.

Steel has the sole advantage of great tensile strength with high ductility. Consequently a much thinner wall can be used to resist the internal pressures and external loads. This, in turn, means a much lighter weight per foot. Hauling and laying costs are thereby reduced and construction time speeded up. Joints are easy to fabricate and can be depended upon to remain tight in service.

Underground pipelines are subjected not only to the external load of the backfill and weight of pipe and contents, but often to additional loads or shock from vibration of heavy street traffic, cave-ins, settlement of filled ground or insecure foundations, suddenly applied pressures from water hammer, washouts and other unusual strains. The ductility of steel assures freedom from damage from these forces which often would break pipelines of more fragile or less ductile material.

Steel pipe lengths are much longer (usually 30 to 50 feet each for straight lengths) than other types of pipe. This obviously means less joints per mile and less cost for making up the field joints. In addition, field joints can be made by welding or with Dresser Couplings that not only will be originally tight but will stay tight for years in spite of settlement or other normal strains on the pipeline. Incidentally, with Dresser Couplings slight changes in alignment are possible which eliminates the corresponding cost of special sections.

Steel needs protection against corrosion. Externally, the steel is subjected to soil corrosion. Internally, a sewer pipeline is subjected to greater corrosive attack than a water pipeline, as sewage is more corrosive than water. Nowadays most sewage also contains a variety of industrial wastes from manufacturing plants that intensifies the corrosive attack.

Without question, a very high grade protective coating material is required. Periodic inspection and maintenance is not practical. Reconditioning of such pipelines would not only be troublesome because of interruptions of service but exceedingly expensive and time consuming from the very nature of the operation.

Bitumastic Enamel—applied hot to a thickness of 1/16″ to 3/32″ over a properly dried application of cold Bitumastic Primer—has established long time records of satisfactory performance—such as 15, 20, 25, 30 and even 38 years—on many steel water pipelines. There have not been so many records established for sewer pipelines because not so many have been built, but where it has been used for sewage work, Bitumastic Enamel has proven entirely satisfactory.

A notable example is the Glasgow (Scotland) Sewage Disposal Plant. The bottom, sides and girders of steel sludge tanks were coated with the old style hot applied Bitumastic Enamel (the forerunner of the modern and improved Bitumastic 70-B Enamel) in the early 1900's. The latest report on its condition was made several years ago at which time the Enamel was still in good condition with no signs of corrosion of the underlying steel.

Another case is a steel force main for sanitary sewage, consisting of 8400 feet of 24″ O. D. steel pipe, laid in an industrial city of Ohio in 1938. The pipeline was coated by the spinning process with hot Bitumastic 70-B Enamel on both the internal and external surfaces and installed with Dresser Couplings.

The spun internal lining not only protects this surface against corrosive attack

Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

Steel sewer pipeline—protected inside and outside with hot Bitumastic 70-B Enamel.

but incidentally provides the highest flow coefficient of any pipe surface. This is particularly desirable in a force main as it keeps pumping costs at a minimum by enabling the pumps to always operate at maximum efficiency.

A recent check indicates that the internal coating is apparently in excellent condition as there has been no change in the flow coefficient characteristics. A few pits were recently discovered on the outside of the pipe near the pump house which were easily repaired by welding and then recoating. Apparently, the external coating had been damaged by workmen walking on the coated pipe during installation. At this spot the pipeline lies in cinder fill. Sharp points of the cinders had penetrated the coating. Acidic ground water from the cinders produced accelerated corrosion. Nowadays the coating is wrapped with coal tar saturated asbestos pipeline felt or glass matte or both, but this was not so well known at the time this pipeline was laid.

This Bitumastic coated steel sewer pipeline is now 13 years old and apparently good for many more years of satisfactory service. The superintendent of the local sewer and water department considers "this has been and is a very satisfactory installation".

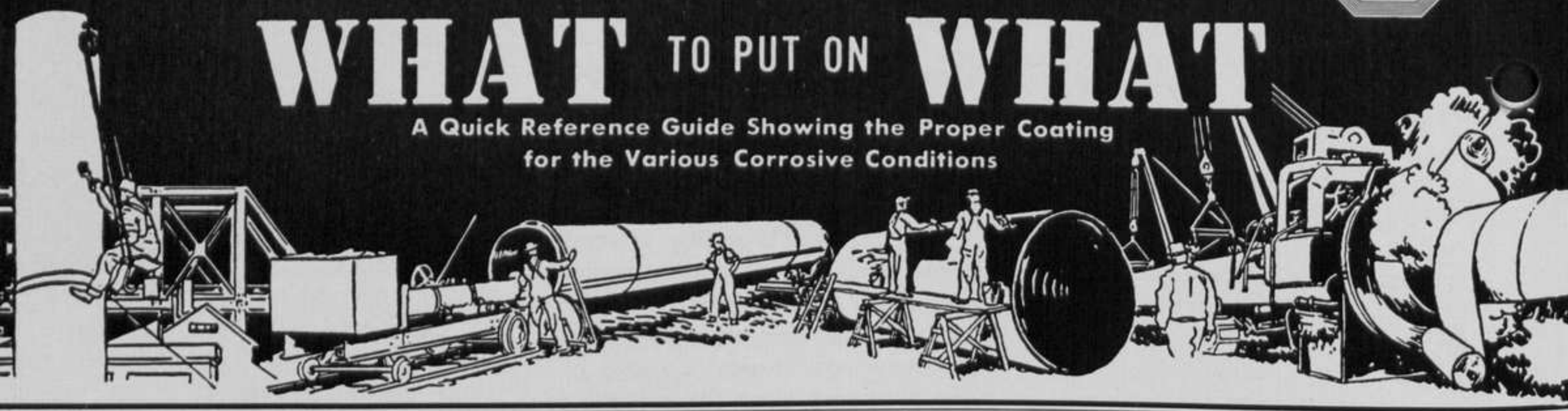
Mr. E. D. Barstow of E. D. Barstow Associates, 163 North Union St., Akron 4, Ohio, was the consulting engineer for this project. Mr. Barstow, who has had a long time experience in water supply, sewage and other municipal engineering work also states, "that steel pipelines so coated can be made to provide long life and excellent friction losses hydraulically," the latter being another of the big advantages of a spun Bitumastic 70-B lining in a sewage or water line.

Koppers Protective Coatings

KOPPERS

WHAT TO PUT ON WHAT

A Quick Reference Guide Showing the Proper Coating for the Various Corrosive Conditions



SURFACE	CORROSIVE CONDITION	RECOMMENDATION
Outside of Steel Sulphuric Acid Storage Tanks	Fumes of sulphuric acid and from mixing phosphoric acid and ammonia.	1 coat Bitumastic No. 50, applied at rate of 55 to 70 square feet per gallon. 1 coat Bituplastic No. 28, applied at rate of 50 to 60 square feet per gallon. Note: Use mild caustic to neutralize acid. Clean corroded surface by power wire brushing or preferably by sand blasting. Bitumastic No. 50 must be dry to touch before applying the Bituplastic No. 28, which should not be exposed to freezing weather in the container, during application or while drying.
Steel Hoppers of Mixing Machines in Fertilizer Plant	Atmosphere contaminated with fumes of sulphuric and phosphoric acid. Fertilizer comes out of machines at 245° F in a damp state.	3 coats Bitumastic Super-Service Black on outside surfaces at rate of 150 to 200 square feet per gallon after neutralizing surfaces with caustic and proper cleaning of rusted steel.
Outside of Cresylic Acid Storage Tanks located in the open	Industrial atmosphere, contaminated by strong acid fumes, sunlight and condensation.	1 coat Bituplastic Primer at rate of 300 to 400 square feet per gallon. 2 coats Bituplastic No. 28, each at rate of 50 to 60 square feet per gallon. Note: Clean thoroughly old corroded surfaces by scraping and power wire brushing. Do not allow exposure of Bituplastic No. 28 to freezing weather in the container, during application or while drying.
Steel Cooling Tower and Dust Collector inside of building manufacturing fertilizer	Industrial atmosphere intensified by fertilizer dust, moisture, sulphuric and phosphoric acid fumes and fumes of ammonia and potash salts.	2 coats Bitumastic Super-Service Black, each at rate of about 150 square feet per gallon after neutralizing surfaces with mild caustic solution and proper cleaning of old corroded steel.
Boiler Fronts and Furnace Doors in Boiler House	Corrosive industrial atmosphere, coal dust and temperature over 400° F.	1 coat Bitumastic Hi-Heat Gray. Note: Do not apply multiple coats but only 1 coat while surface is at atmospheric temperature.
Ash Hopper Cars at Power Plant	Water and ashes produce corrosive condition.	2 coats Bitumastic Super-Service Black, each at rate of about 150 square feet per gallon—after power wire brushing or preferably sand blasting to remove scale and clean out pits. Note: Abrasion will eventually wear off the coating on the sliding surfaces but the corners and dead areas where the severest corrosion occurs will be well protected for an appreciable time.
Forced Draft Blower and Exhaust Stacks in Industrial Plant Boiler House	Corrosive industrial atmosphere intensified by presence of coal dust.	2 coats Bitumastic Black Solution each applied at rate of approximately 350-400 square feet per gallon.

KOPPERS COMPANY, INC.

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