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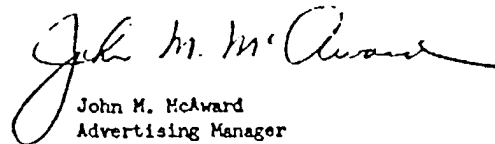
SUBJECT: WHERE TO USE
TERNE COATED STEEL

To Members of the Lead Industries Association, Inc:

Attached is a reprint entitled "Where to Use Terne Coated Steel" by David M. Borcina which appeared in a recent issue of Metal Progress magazine.

This reprint is being mailed to our list of 8,000 Design Engineers, and extra copies to the members are available upon request as long as our supply lasts.

Very truly yours,


John M. McAward
Advertising Manager

JH:mc
Enc.



Look Ahead with Lead

Where to Use *Terne Coated Steel*

By DAVID M. BORCINA

Lead Industries Association, Inc.

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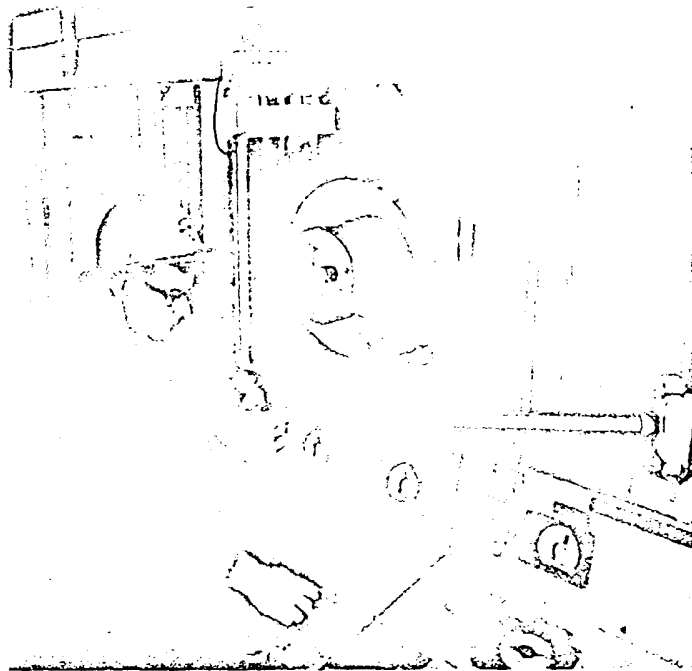
Lead Industries Association, Inc.

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Airco Steel Corp.'s newestterne steel line, rated at 10 tons per hr, delivers coils and cut lengths up to 48 in. wide.

Where to Use *Terne Coated Steel*

By DAVID M. BORCINA*

For many years a primary material for automotive components,terne coated steel is gaining wider usage. Its good forming, welding and corrosion resistant characteristics make the material useful for gaskets and auto radiator parts, radio and television chassis, gutters, downspout elbows and components of metal furniture.

Formulators of sheet products, always interested in upgrading quality while maintaining economy, are taking a closer look atterne coated steel. Used for years in automotive gas tanks, oil and gas filters, and roofing,terne steel is now being specified for an increasing number of other applications. To a great degree, these new uses, which are listed in the box on p. 102, are inspired by the unique combination of formability, weldability and corrosion resistance that such sheet offers.

Terne sheet is simply described. Coats (on low carbon sheet) consist of 80 to 55% Pb and 15 to 20% Sn. Because lead does not alloy with iron, the tin is needed for wetting and bonding to assure a smooth, continuous coat-

*Lead Industries Assn., New York.

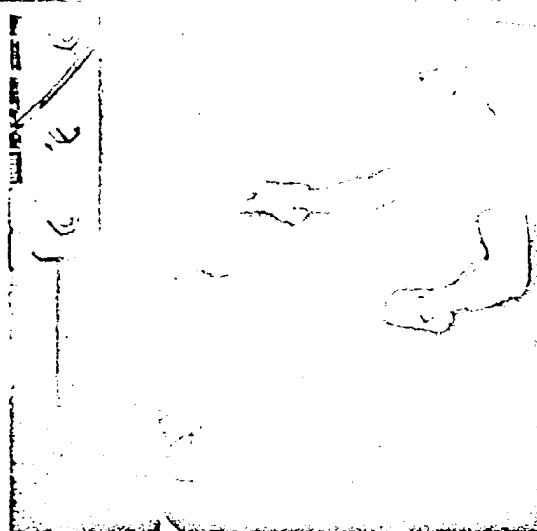


Fig. 1—Terne-coated steel has good drawing qualities, simplifying deep forming operations at Outboard Marine Corp. The lead-tin coat on the sheet also acts to lubricate the dies.



Fig. 2—Terne-coated sheet is easily welded. Here, the welder attaches a heavy step or floor plate to the top of a gas tank intended for a J.I. Case tractor.

ing of terne metal on the steel base. The coating is applied by immersing the sheet in a hot bath of the terne mixture.

Steelmakers produce sheets, designated as "long ternes", in various widths up to 144 in. long, as well as in coils. As for ternes cut in short lengths, once designated as "short ternes", they are widely applied as roofing material.

Terne Sheet in Gas Tanks

Consuming approximately 70 to 75% of total production of long terne sheet, automotive gas tanks and oil and gas filters have for many years provided the major use for the material. Because of its good corrosion resistance and high ductility of the coating (which eliminates danger of chips of the

coating or oxidized steel passing out of the tank to clog fuel lines), such sheet is well suited to these purposes. Also helping to make terne steel a favored material for gas tanks is its unusual resistance to impact. In most cars, gas tanks are particularly vulnerable to damage from flying objects or rear end collisions. Though terne steel may dent, it seldom ruptures, and seams and pipe connections remain tight.

The good drawing qualities of terne steel help to simplify stamping operations in making gas tank shells (Fig. 1); the coat also acts as a lubricant. After the shell edges are joined, crimped and seam welded, filler pipes and fuel lines are soldered to tank surfaces. Figure 2 illustrates heavy step or floor plates being welded to gas tanks intended for con-

struction equipment. Terne sheet can also be readily soldered with noncorrosive fluxes.

Varieties of New Uses

As the box reveals, applications for long-terme have risen. The growing use of small gas powered machines, such as lawn mowers, outboard motors and power saws, has created a sizeable market for small gas tanks. Deep drawing qualities, weldability and solderability of terne steel aid particularly in making small fuel tanks which require attached accessories such as lids, spouts and handles.

Other applications emerge each year, particularly because manufacturers have discovered that fabricating operations are easily set up without the need for installing heavy processing equipment. For instance, makers of gaskets, washers, spacers and other similar products can draw, cut and shear terne steel with comparative ease. The material's softness makes it an excellent metal for gaskets and also acts to reduce wear and maintenance on tools and dies employed in producing them. Terne sheet is used for plain ring gaskets, corrugated metal gaskets for valves and special asbestos filled metal gaskets for petroleum refineries and chemical processing plants.

Air Handling and Heating

Some firms specify terne steel for parts of heat exchangers, air filters, heater core assemblies, oil space heaters, engine cooling radiators and similar equipment. The conversion from oil bath to dry-type air cleaning devices, particularly for protecting internal combustion engines, has given terne coated steel an even more important role because of its rust inhibiting qualities. Once an oil bath cleaner is put into operation, the oil coating tends to resist rust, but in dry cleaners the metal is continually exposed to moisture. Terne coated steel resists corrosion, lasts indefinitely and provides a base for paint finishes required on these products.

Importance of Corrosion Resistance

The corrosion resistance of terne steel has led to many of its newer applications. For instance, fabricators of radio and television equipment make a number of parts, including chassis and case covers, from terne sheet because it need not be plated or painted. Similarly, uses developed for terne in outdoor products such as lanterns, window screen

Applications for Terne Sheet

Automotive	Building
Gas tanks	Outdoor lanterns
Air filters	Window screen housings
Distributor head tubes	Fire doors and frames
Oil filters	Lighting equipment
Instruments	Gutters and downspouts
Oil pans	
Radiator parts	Electronics
Valve rocker arm covers	Radios
Caskeys	Television sets
Car heaters	Tape recorders
Washers	
Vacuum actuators	Small fuel tanks
Air handling and heating	Leaf blowers
Oil drowes and heaters	Power saws
Furnaces	Outboard motors
Air cleaners	Tractors
Radiators	Post hole diggers
Air conditioners	
Metal furniture	Other
Ladders and cabinets	Caskeys
File drawer tracks	Railroad switch lamps

housings, gutters and downspout elbows.

Much of today's laboratory equipment and furniture is made from terne coated steel. One manufacturer, Duralab Equipment Corp., ran extensive tests to find an inexpensive material that would stand the abuse of acids, solvents and alkalis. Results showed that terne coated steel resisted corrosion better than uncoated steel, justifying its use for drawers and cabinets. Resistance to corrosion and good paint adherence have also promoted its employment in fire doors and frames — and even burial caskets.

More Production Scheduled

Rising automobile production as well as increasing numbers of other applications for terne coated steel are inspiring steel companies to increase production capacities. For example, United States Steel Corp. recently installed (at its Irvin Works) a continuous line, doubling its terne sheet capacity. Similarly, Armco Steel Corp. doubled its terne product capacity with a new line built at Middletown, Ohio, in 1963. The new line (p. 100) is rated at 10 tons per hr and produces terne sheets in coils and cut lengths in widths up to 45 in. Other steel companies are also updating facilities and preparing for future production increases.