Belmont
METALS INCORPORATED
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DATA SHEET

BELMONT GRADE A TIN SHOT 8 - 20 MESH
for
ADDITION TO CAST IRON

Introduction

Practical foundry experience throughout the world has confirmed the benefits to be obtained from making tin additions to cast iron. The presence of about 0.1% of tin in a flake or nodular graphite iron will ensure a completely pearlitic structure in the casting and this pearlite is retained even at elevated temperatures. The Tin Research Institute has played an important part in fostering this development by conducting research in its laboratories, by sponsoring outside studies, and by encouraging industrial trials. As a result, the use of tin in cast iron is now widely adopted commercially. Chrysler, Simca, Fiat and a number of Japanese firms are among the automobile manufacturers who use this technique for production models. Among other cast iron casting users, more selective use for only difficult castings have been made.

Laboratory work at the Tin Research Institute has demonstrated that much higher additions of tin (i.e., 0.5 to 1.0%) to iron produces even greater stability of pearlitic structures at elevated temperatures than the normal 0.1-0.125% addition. Furthermore, combined additions of 0.3% each of tin and chromium gave an iron which showed remarkable stability at 700° C. (1292° F.).

BENEFITS

The ability of Tin to promote a fully pearlitic structure in an iron casting is attendant with important benefits, which are:

1. Higher and more uniform hardness in castings with different cross sectional areas.
2. Increased wear resistance.
3. Improved machinability resulting in increased tool life.
4. Increased strength.
5. Increased structural stability at elevated temperature.

The presence of Tin in amounts of 0.1-0.125% does not promote "hard spots" or islands of massive cementite. Full use of the effect of Tin on Cast iron microstructures can be made without undesirable side effects. The use of Tin minimizes the risk of chill at sharp corners and thin sections. Additions of Tin in place of Chromium reduces the tendancy of cementite formations.

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For further information, contact your
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(718) 342-4900 TWX 710-584-2296

Tin alloyed flake and nodular irons are markedly stable during long cooling periods in the mold. Tin prevents complete ferritization if castings cool slowly because of a stoppage on the shake out line.

Applications

The development of tin alloyed iron has gained considerable commercial importance. Among the castings being made with tin alloyed iron are:

Automotive engine blocks	Pump and valve bodies
Engine heads	Road machinery parts
Transmission carriers	Paper mill castings
Cylinder liners	Flood machinery castings
Compressors, Cylinders	Disc brakes, Brake drums
Machine tools, machine parts	Sprockets, Pully and Sheaves
Spacer collars	Traveler wheels
Fluid pressure fittings	Bearing housing and plates
Squeezer castings	Clutch plates
Refrigerator castings	Diesel engine castings
Crankshafts	Jigs and fixtures
Electric Motor cases	Crankcase castings
Rocker arms, Lever arms	Lathe beds and ways

FOUNDRY PRACTICE

Belmont Tin Shot is made from Grade "A" Tin, Specifications ASTM B339-72. The chemical requirements and typical analysis of which are:
Tin 99.80% Minimum, 99.9% Typical.

IMPURITIES:	Max. %	Typical %	IMPURITIES	Max. %	Typical %
ANTIMONY	0.04	0.015	IRON	0.015	0.007
ARSENIC	0.05	0.015	SULPHUR	0.01	0.001
LEAD	0.05	0.05	NICKEL & COBALT	0.01	---
BISMUTH	0.015	0.015	CADMIUM	0.001	---
COPPER	0.04	0.01	ZINC	0.005	---

There is no risk of elemental contamination of the iron by Belmont Tin Shot addition.

While Tin can be added in any form, Belmont Tin Shot lends itself to easier addition to Molten Cast Iron. The Tin Shot is uniformly sized thru 8 Mesh, on 20 Mesh; so it is easily measured. Tin Shot melts instantly in Molten Iron as the melting point of Tin is 450° F (232° C). Also as the boiling point of Tin is approximately 4118° F (2270° C) and it is highly soluble in iron practically all of the Tin is retained in the iron.

Pouring the iron over the Tin in the ladle, or in the mold is sufficient stirring to get complete dispersion. There is no flash. This method of adding Tin also permits selective Tin alloying without having to treat the whole heat.

PACKAGING

Standard Packaging: 500 lb. or 100 lb. Net Steel Drums with polyethylene liners and dessicant. Other packaging is available on request.