

GUIDELINES FOR
ZINCALUME® STEEL AND ZINC
COATED STEELS IN HIGH
TEMPERATURE APPLICATIONS
AND FOOD CONTACT

TECHNICAL BULLETIN TB-33

Rev 0, November 2003

This issue supersedes all previous issues

INTRODUCTION

This Technical bulletin provides general guidelines for the use of ZINCALUME® steel and Zinc Coated steels in high temperature and food contact applications.

BlueScope Steel Limited produces ZINCALUME® steel and Zinc Coated steel products with a variety of coatings and finishes to meet the needs of our customers. These products can be classified into the groups; ZINCALUME® steel, GALVALUME® steel and Zinc Coated steels for purpose of understanding effects of elevated temperature application.

ZINCALUME® STEEL

It is recommended that ZINCALUME® steel not be heated above 200°C. ZINCALUME® steel is supplied with a clear acrylic coating at a thickness of 1µm. This acrylic coating is prone to degradation above 200°C, and can generate fumes above 250°C. These fumes are associated with a heavy odour and discoloration of the metal surface.

GALVALUME® STEEL

GALVALUME® steel (Zn-Al alloy coated, resin free) should not be heated above 350°C. GALVALUME® steel is known to perform satisfactorily up to 350°C, however some embrittlement of the base steel may occur at this temperature and components should therefore not be of a load bearing nature. Above 350°C complete alloying of the zinc/aluminium coating

with the steel base occurs, resulting in a dulling of the surface. Above 375°C coating detachment and, or embrittlement of the base steel occurs.

ZINC COATED STEEL

It is recommended zinc coatings are not heated above 250°C. These coatings are suitable for continuous or intermittent service up to 250°C. Between 250°C and 300°C, Fe-Zn alloy growth occurs which appears as spots / blankets on the surface which obscure the spangle pattern. Between 300°C and 350°C, there is fracturing and detachment of the zinc coating and embrittlement of the base steel.

FOOD CONTACT APPLICATION

ZINCALUME® steel should not be used in any applications where it contacts food. Cr containing surface treatments and Zinc can be soluble in food acids and thus ZINCALUME®, GALVALUME® and Galvanised steel containers should not be used to store food and drinks.

Internal heated components could cause concern with the acrylic layer burning off during use of the component i.e. toaster components, thus GALVALUME® coated steel is preferred to ZINCALUME® steel.

The information and advice contained in this Bulletin is of a general nature only, and has not been prepared with your specific needs in mind. You should always obtain specialist advice to ensure that the materials, approach and techniques referred to in this Bulletin meet your specific requirements.

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