Australian Standard™

Double seams for steel-based cans for foods

STANDARDS AUSTRALIA

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The following are represented on Committee FT-007:

Canmakers Institute of Australia Inc.
Department of Agriculture, Fisheries and Forestry (Commonwealth)
Canned Foods Information Services—Manufacturers and users

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PREFACE

This Standard was prepared by the Standards Australia Committee FT-007, Double Seams for Tinplate Food Cans to supersede AS 2730—1984.

This revision of the Standard was required to reflect changes in double seaming as a result of the introduction of harder, thinner steel substrates and changes in manufacturing technology of some steel can bodies and ends. The revised Standard forms the basis of the minimum requirements of good double seaming practice.

In the preparation of this Standard, account was taken of the Voluntary Industry Standards of the Can Manufacturers Institute in the United States of America and the European Recommendations from the SEFEL Working Group.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

CONTENTS

FOREWORD

Cans for heat processed foods must be hermetically sealed to protect the food from contamination by microorganisms and other external agents. Therefore, to minimize the risk of the food being contaminated by post-process leakage, the double seams of the cans must be properly constructed. Cans for other foods may also need to be hermetically sealed.

A properly constructed double seam has a number of morphological and dimensional requirements which must fall within certain limits. These limits take account of the accepted variations in the raw materials and methods used in can manufacture, and the capabilities of closing machines. Therefore, the aim of the Standard is to set out the morphological and dimensional requirements of properly constructed double seams so that an hermetic seal is obtained.

It should be emphasized however, that the quality of double seams cannot be judged by measurement alone. There are certain characteristics of seam quality which are difficult to quantify and which are assessed by visual examination. In this aspect of seam evaluation, there is no substitute for training and experience. Every can manufacturer and every food processor who uses cans must have appropriately trained and experienced technical personnel, who know the characteristics required in double seams and who are competent in the techniques of measuring, inspecting and evaluating double seams. Such personnel require specialized training by experienced tutors.

As canners and can manufacturers must aim to obtain an hermetic seal with every double seam they produce, they must try to form seams with attributes well within the recommended limits. This approach minimizes the risk of non-hermetic seals being formed on the occasional can which may have unusual characteristics, and it extends the time before drifts in closing machine settings make the seams unacceptable.

Double seams which comply with the requirements of this Standard will give an hermetic seal and prevent post-processing contamination under conditions of good manufacturing practice, e.g. where the cans are cooled in chlorinated water or water of equivalent purity the cans are not subjected to mechanical stresses which disturb the seam, and the seams are not contaminated with microorganisms while they are wet.

Although the majority of cans for heat processed foods are manufactured from tinplate, the Standard is also intended to apply to cans made from steel plate which is coated with protective materials other than tin.

The Standard also provides methods by which double seams may be examined for compliance with the requirements of the Standard. Traditionally, assessment of double seams when setting up or adjusting a double seaming machine, or for quality assurance purposes during production runs, is carried out by means of visual and tactile examination and dimensional measurements with a micrometer. Certain critical attributes concerned with the compactness of the double seam, however, can be measured more reliably by optical means on cross-sections of the seam and these methods are considered to be more appropriate in an Australian Standard. This does not mean that the traditional methods should not be used for the purposes mentioned above, provided that the seams comply with the requirements of this Standard when examined by the methods given herein.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for double seams for steel-based three piece and drawn cans for foods and also for steel food cans with aluminium foil ends attached to a steel ring. Criteria for double seams of acceptable quality are set out, and methods for the examination of a double seam and assessment of its quality are provided.

This Standard does not apply to food cans with mini seams.

NOTE: If aluminium components are used the specifications need to be provided by the can makers.

1.2 APPLICATION

This Standard applies to tinplate and other steel-based cans for heat processed foods and also to other double seamed cans which require to be hermetically sealed. It applies to round cans up to a maximum diameter of 153 mm and to non-round cans up to a maximum base dimension of 156 mm.

The Standard does not apply to cans made completely or in part from aluminium with the exception of ends with attached aluminium foils to steel rings.

1.3 DEFINITIONS

For the purposes of this Standard, the following definitions apply:

1.3.1 Body hook

That portion of the double seam formed from the turned-back flange of the can body (see Figure 1).

1.3.2 Body hook butting

The distance occupied by the internal body hook length expressed as a percentage of the internal seam length (see Figure 2).

NOTES:

1 Body hook butting has a direct functional relationship with the primary seal.

2 See Appendix A for the calculation of body hook butting and free space.

1.3.3 Chuck wall, chuck wall radius

As shown in Figure 1.

1.3.4 Compactness

The term used to describe the overall interrelationship of those attributes of the assembled seam which determine whether the seal is hermetic.

NOTE: Assessment of compactness involves examination of the primary and secondary sealing areas and optical measurements of body hook butting and overlap on cross-sections of the seam; tightness of the seam is also taken into consideration.