
FUNDAMENTALS OF PACKAGING TECHNOLOGY

Second Edition

Walter Soroka



Herndon, Virginia

Publisher: *Richard Warrington*

Text and Cover Designer: *Gary Head*

Copyeditor: *Beverly J. DeWitt*

Proofreader: *Esther Riley*

Indexer: *Trisha Lamb-F Feuerstein*

Typesetter: *Joan Olson*

Printer: *TechniGraphix*

Copyright © 1995, 1999 by the Institute of Packaging Professionals. All rights reserved. No part of this publication may be reproduced in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from the publisher. Statements of fact or opinion are made on the responsibility of the author alone and do not imply an opinion or endorsement on the part of IoPP, its officers, or its membership. Address all inquiries to the Institute of Packaging Professionals, 481 Carlisle Drive, Herndon, Virginia 22070, U.S.A.; (703) 318-8970.

Printed in the United States of America on recycled paper

METAL CANS AND CONTAINERS

CONTENTS

Background

Early metal packaging, three-piece and two-piece constructions, advantages of two-piece and three-piece cans, common metal can shapes and applications.

Can-Making Steels

Black-plate steel, tin-plating, differential tin-plating, tin-free steel, steel-alloys, temper, Rockwell hardness, base box measure, base box conversion factors, typical tin-plating weights, typical steel application weights and thickness.

Three-Piece Steel Cans

Mechanical seaming applications, adhesive bonding applications, soldered seams, welded cans, welded-can manufacture, sidewall beading, can-end expansion rings, compound, double seaming.

Two-Piece Drawn Cans

Manufacturing methods, shallow draw, predecorated shallow draw, draw limits, draw and redraw cans, the draw-and-iron process, expanded-wall cans.

Impact Extrusion

Materials, manufacturing sequence, collapsible tubes, dimensioning collapsible tubes, tip styles, advantages and applications, coating and decorating, impact-extruded aerosol cans.

Can Dimensioning

Standard can dimensioning practice.

Protective Coatings for Cans

Purpose, resin types.

Decoration

Can lithography versus paper labeling, plastic sleeves, can lithography for flat sheets, offset letterpress for round shapes, decorating limitations.

Industrial Metal Containers

Standard industrial containers, regulated containers, open-head pails and drums, closed-head pails and drums, typical steel gauges, cover options.

Aerosols

Definition, product categories, history, propellants, propellant pressures, product formulations, actuators, mounting cups, valve operation, valve options, other pressurized dispensing systems, regulation, aerosol container specifications.

Resources

Associations related to metal cans and containers.

METAL CANS AND CONTAINERS

BACKGROUND

Steel is one of the older packaging materials and was originally used for round, square, and rectangular boxes and canisters. Tea and tobacco were two of the first products packaged in tin-plated, mechanically seamed or soldered steel containers with friction or hinged lids. Today such labor-intensive metal boxes are limited to custom and upscale applications. The old-fashioned appearance of a fabricated metal box is effectively used by package designers to create nostalgia for specialty and gift-type containers.

Of all the metal packaging forms, none has had as much impact on society as the sanitary food can. Thermal processing of food packed into hand-soldered cylindrical metal cans started in the early 1800s, and soon developed into a major industry. Metal cans have the advantage of being relatively inexpensive, thermally stable, rigid, easy to process on high-speed lines, and readily recyclable. Metal offers a total barrier to gas and light. Despite market changes brought on by freezing and plastic-based packaging, metal cans remain an important means of delivering a shelf-stable product.

Originally, all steel containers were fabricated from flat sheets that were cut to size, bent to shape, and mechanically clinched or soldered to hold the final shape. Food cans were three-piece construction, a formed sidewall and a top and bottom end. (See Figure 7.1.)

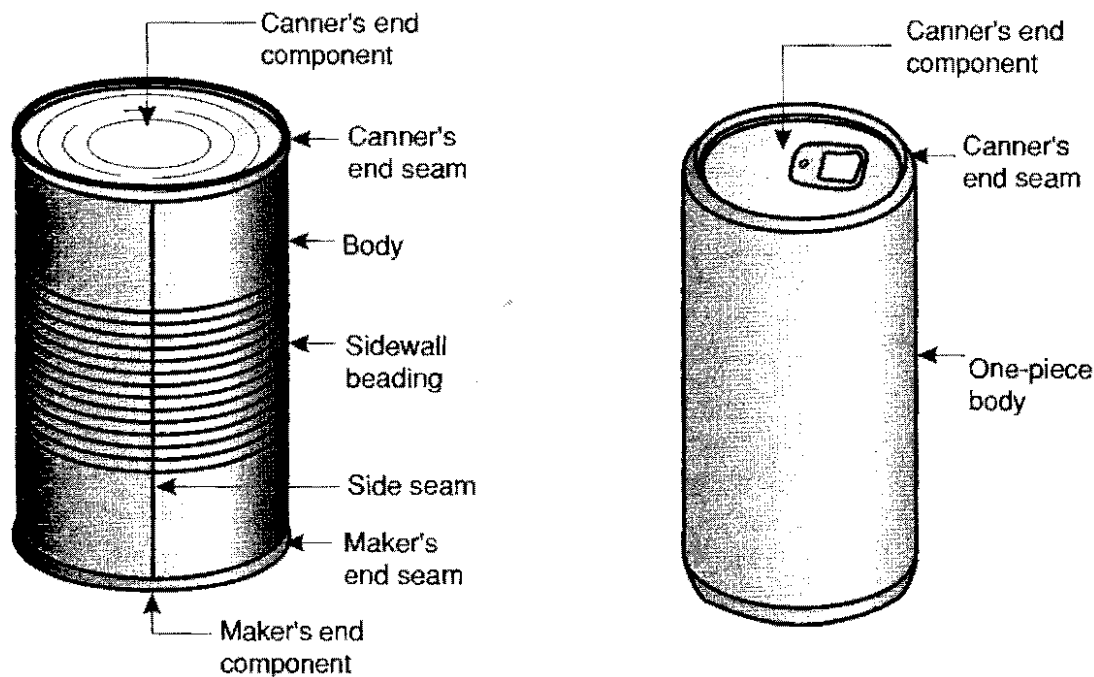


Figure 7.1
Three-piece and two-piece can construction.

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.