



Critical Factors in Hygienic Equipment Design

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NSF Helps People Live Safer

Our mission and focus has always been protecting and improving human health



STANDARDS

Writing standards to promote food, drinking water, indoor air, dietary supplements, consumer products and environmental safety



TESTING

Testing products to these and other standards



CERTIFICATION

Certifying products to these standards



AUDITING

Conducting safety audits for the food, water and consumer goods industries



CONSULTING

Providing strategic and technical consulting for the dietary supplement, pharmaceutical, medical device, food and beverage industries



TRAINING

Developing training and education programs

Let's Face It. Design Matters.



Design Requirements: A Historical Perspective

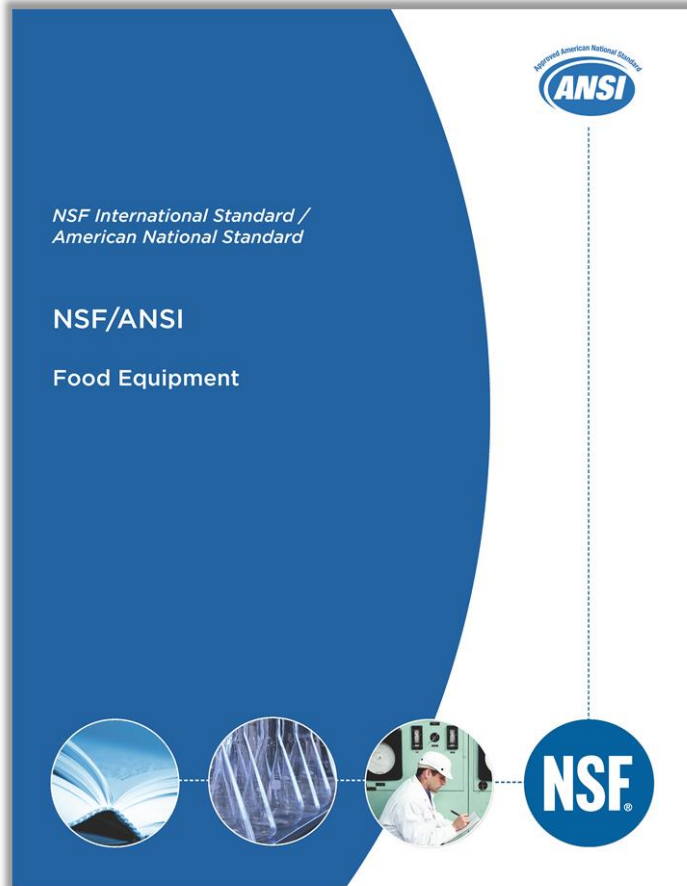
Americans began dining out in the late 1930s. State health officials monitored food service establishments for sanitation using a variety of criteria.

Inconsistent rules and regulations arose, varying from town to town, state to state. Hence...

A need for uniform national standards. NSF brings regulators, industry, consumers and public health officials together.



NSF/ANSI Food Equipment Standards



DESIGN

MATERIALS

PERFORMANCE

Purpose:

Minimum requirements for the **materials, design, fabrication, construction, and performance** of food handling and processing equipment.

Basic Principles of Hygienic Design



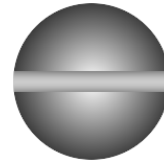
- Cleanable Design
- Inert, Safe Materials
- Easily Accessible
- Self-Draining
- Hollow Areas Sealed
- Smooth Surfaces

What to look for

Food Equipment Design: Cleanability



- Food and splash zones are accessible, and cleanable
- Using either no tools, or simple tools
- 1/8 in. smooth, continuous radii
- Chemically resistant or inert materials

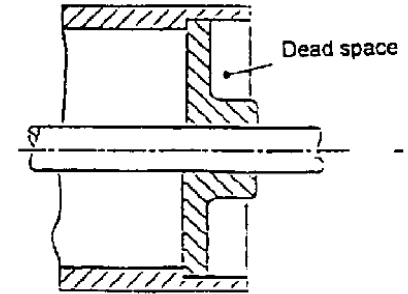


Food Equipment Design: Dead Space

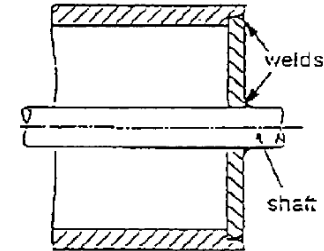


- Food and splash zones are accessible, cleanable
- Mechanical cleaning requiring minimal disassembly
- Clean in Place (CIP) or Clean Out of Place (COP)
- Installation of equipment

Hygiene risk



Acceptable



Dead Space: Space wherein product, cleaning or sanitizing agents, or soils can be trapped, retained, or not completely removed during operation or cleaning.

Hygienic Design: Avoiding Pests & Vermin

Fact:

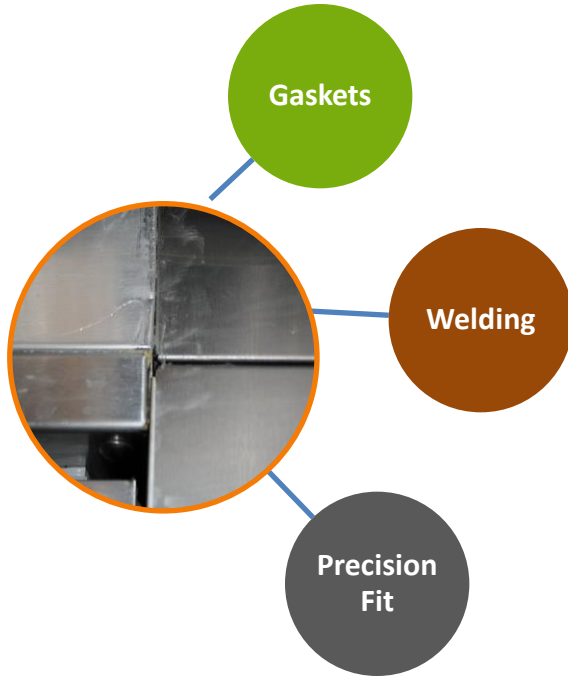
The 1/32 inch definition for 'closed' originates from the width through which a cockroach can squeeze its body

Equipment is designed to eliminate food, water, shelter for insects, rodents, and other pests & vermin:

- Food and Splash Zones
- Tubular and Hollow Spaces
- Reservoirs, Collection Areas



Hygienic Design: Seams & Sealing



When to Use Sealants:

- For structurally sound joints & seams
- For seams less than 1/8 in wide
- To fill spaces around collars, grommets, and service connections

Material Requirements

Materials are reviewed against the FDA Guidelines



21 CFR
& FCN

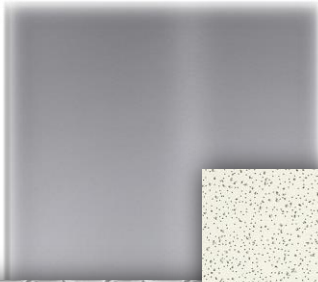
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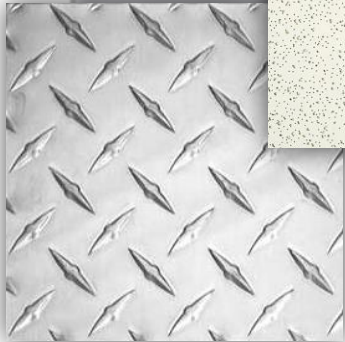


Material Requirements: Cleanability

Smooth:



Porous:



Textured:



Corroded:

Stainless Steel in the **FOOD ZONE**
must be a minimum of **16% Cr**



Look For:

Smooth, Hard,
Non-Porous, &
Corrosion-Resistant

Avoid:

Imperfections,
Pits, Pinholes,
& Wood

Performance Testing

- Refrigeration
- Hot Food Holding
- Cleaning in Place
- Temperature Accuracy
- Organic Coatings
- Heavy Metals
- Cleanability



What Does Hygienic Equipment Mean to You?



Certification
is voluntary.
Local & state
jurisdictions mandate
certified equipment to
protect the public.

- **Reduce/Control Food Safety Risk:**
Assurance that the machine can be manually cleaned
- **Encourage & Set a Food Safety Culture Efficiency:**
Faster cleaning = saved labor costs
- **Establish Uniformity in Equipment:**
If you're already specifying a design, why not incorporate hygienic standards?

You've Got Hygienic Equipment. Now What?



Installation:
Allow easy
access,
avoid
modifications.



Operation:
Clean at
prescribed
intervals,
operate as
intended.



Replacement
Equipment has
a life span.
Recognize
when the time
has come to
replace it.



Thank You.
Questions?