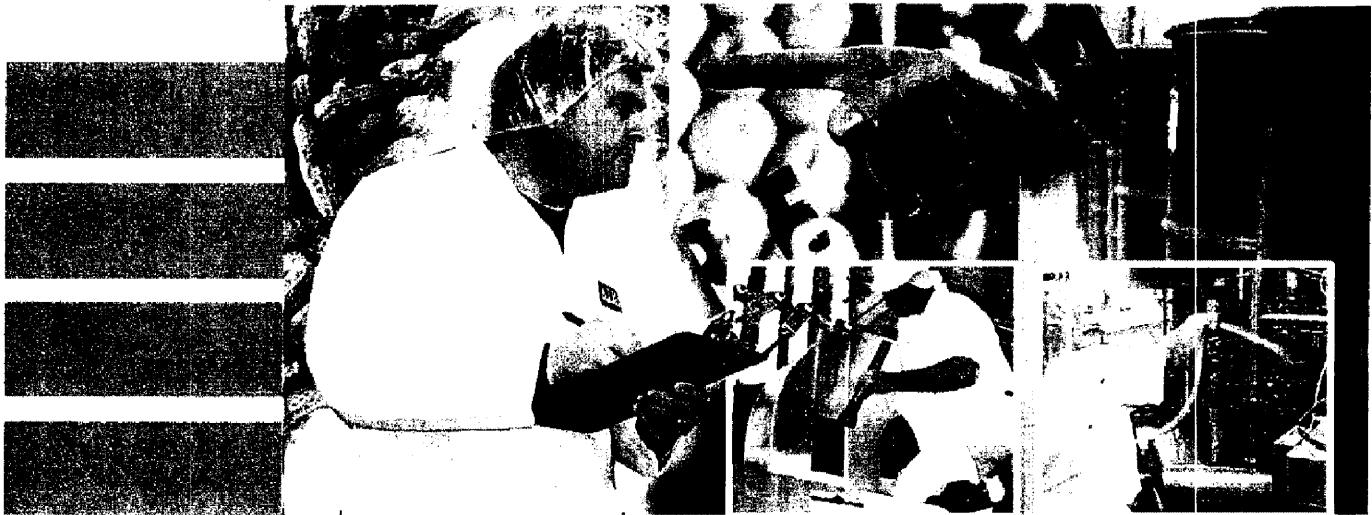


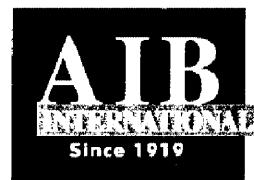


Food Safety

Food safety is a critical concern for the food industry. It involves the prevention of contamination at every stage of food production, processing, storage, and distribution. Proper sanitation is essential to ensure that food is safe for consumption. This document provides guidance on developing and implementing an effective sanitation program.



## Sanitation Program



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Dear Participant:

Thank you for attending this AIB International seminar. We hope you found the seminar useful and interesting. We will use the feedback you provided on your Course Critiques for improvement. If you have additional suggestions or comments about the course, we welcome these at any time as AIB International is continually adapting to better satisfy our customers.

As part of our ongoing efforts to assist the food industry, we wanted to reiterate a point that may be of particular use to you within your organization. AIB International has been performing cost-effective in-plant training for over twenty years and has a range of valuable options, which can have a very positive impact on your operations. If you have not recognized this as an option, we think that it might be to your benefit to read on.

In-house training is incredibly effective for many reasons, first of which is the impact that a trained professional can have within your company. Our trainers bring a level of recognition to training that company employees cannot. They bring with them a vast amount of knowledge and skills, as well as years of industry experience. If you decide to use this effective option, we will work with you to provide a customized training solution that satisfies all your needs. Having in-plant training is unique because the training occurs in the very area that you are expected to manage, showing you exactly where you need to focus for continuous improvement. Imagine the impact that an AIB International trainer would have if they were talking to your employees in your own facility!

Over the years, we have done training in many areas and in hundreds of different formats; we can even train in Spanish or French. Listed below are the types of training that we have performed with clients. We are not limited to these, and we can put together any combination of training that you need – be as innovative as you like.

- GMP/Food Safety
- Hazard Analysis Critical Control Point (HACCP)
- Allergen Training
- Food Defense Training
- Pest Control
- Employee Safety and OSHA Compliance
- Gap Analysis

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www.aibonline.org E-mail: info@aibonline.org  
Phone: 785-537-4750 Fax: 785-537-1493  
**Serving the Food Industry Since 1919**

This training can be done at a fraction of the cost of sending an employee off-site for a few days, and it can be a great resource for the typically overburdened management and quality department. Much of the training that we perform is at the cutting edge of food safety, like HACCP, food defense, and allergens. Many of these issues have only become a major concern to the food industry in the last ten years; we can help you get up to speed on these topics very quickly.

For those of you that are more interested in maintaining a regimen of attending the traditional off-site courses, the following is a partial list of the courses that AIB International will be presenting:

Advanced HACCP Workshop	GMP Workshop for Packaging Suppliers
Building Your HACCP Program	HACCP Workshop
Certified Equipment Design	HACCP Workshop for Packaging Suppliers
Developing and Implementing Food Safety Programs	Integrated Quality System (IQS)
Engineering for Food Safety	Internal Auditor
Food Defense Coordinator Certification Training	Organic Certification with a Foundation in Food Safety
Food Industry Pest Management- Recertification Seminar	Pest Management for Food Plants
Food Plant GMP/Sanitation Workshop	Principles of Inspecting and Auditing Food Plants
Food Safety and Quality Update	Principles of Warehouse Sanitation
Food Safety and Sanitation for Food Plants	Safety & Health Management Systems

If you would like more information regarding these highly effective programs, take a look at our web-site [www.aibonline.org](http://www.aibonline.org) or contact Doreen Towne or myself at 1-800-633-5137. Again, thank you for choosing AIB International to meet your training needs. We look forward to seeing you again in the near future.

Sincerely,



Rosalie R. Wagner  
Training Coordinator

# **DEVELOPING & IMPLEMENTING A SANITATION PROGRAM**

## **TABLE OF CONTENTS**

- SECTION 1 Cleaning and Quality for Food Safety**
- SECTION 2 Principles of Cleaning and Sanitation**
- SECTION 3 Developing & Implementing a Sanitation Program**
- SECTION 4 Workshop**
- SECTION 5 Appendices**

## Section 1

# Cleaning and Quality for Food Safety

Intro: 26 prerequisite programs.

## Sanitation and Quality/Food Safety

Presented by:

AIB



### Sanitation Program

#### ♦ Why must a Food Plant have a Sanitation Program?

- Essential to the production of safe wholesome food
- Pre-requisite to effective HACCP
- Regulatory requirements → 19 dead
- Customer expectations
- Employee safety



### Why do we clean?

#### ♦ To reduce the risk of contamination issues from microbiological, physical or chemical sources by controlling the factors that contribute to the potential for contamination from these sources.

- allergens
- FM



Involved in a recall? dual blade  
Canada co.  
Listeria

HACCP only works if have good Sanitation Program (SP)

Sanitation crews must have support of production to ensure equipment is kept clean/operating properly.

• Took about 3 yrs. to train and put Sanitation pgm in place.

Regulatory people not going to give you much static, too few, are looking at minimum standard, Customer Inspections (GMA, SQF) are mostly

Sanitation eyes & ears on inspection of maintenance.

## Why do we clean?

### ♦GMPs Part 110.35 Sanitary Operations

- Buildings, fixtures and other physical facilities shall be maintained in a sanitary manner ..... to prevent food from becoming contaminated.
- Cleaning and sanitizing of utensils and equipment shall be conducted in a manner that protects against contamination of food, food-contact surfaces, or food packaging.



## Why do we clean?

### ♦GMPs Part 110.35 Sanitary Operations

- Sanitation of Food Contact Surfaces
  - Dry surfaces ) start here
  - Wet processing
  - Non-food contact surfaces of processing equipment
  - Single service articles
  - Sanitizing agents - appropriate to be effective  
*(Listeria becoming more common)*



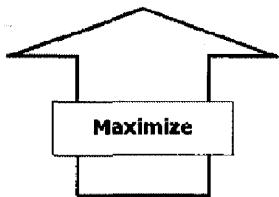
Sanitation is the law.

delegated to competent supervisory help, self protection & proper policies & written procedures

don't ignore non-food contact surfaces

- pkg defined as a fcs.

### Sanitation Programs



- Shelf life of products ↑
- Consistency of product quality & attributes in mkt. / customer's view, stay true to formula
- Customer satisfaction - help customer confidence



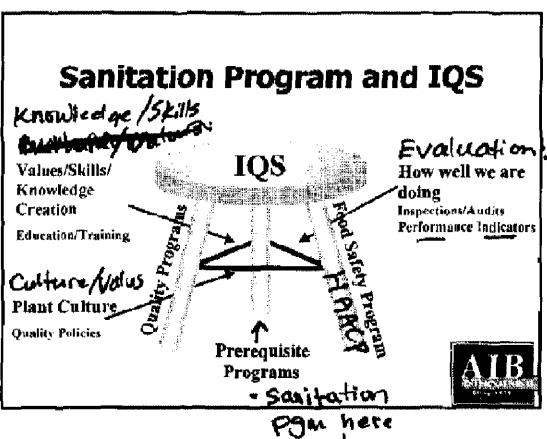
## Sanitation and IQS

### Integrated Quality System (IQS)

A system that addresses food industry concerns, namely prerequisite programs, food safety, and quality in an integrated manner.



## Integrated Quality Protection



## Elements of a Sanitation Program

- ◆ Management support - sets tolerance level
- ◆ Cleaning Schedules
- ◆ Documented cleaning procedures
- ◆ Training - taking short cuts can be <sup>'that's ok' if task go undone</sup>
- ◆ Supervision - come very dangerous <sup>go out to verify what's going on out there</sup>



Culture/Values : you need to define this in SP and should include worker input.  
Educate people as to WHY its important to do something, don't just educate them. Do my people really understand why I'm asking them to do things this way? There are different levels of performance in Sanitation pgm. Some people who are brighter enough will get paid more. A progression to aspire to the higher level performance / jobs.  
Select appropriate people in Sanitation dept. to get the job done.

Be out in field checking on what is being done, Don't just review documents. (Daily Sanitation Schedule log sheets)

Have plant mng. on floor during inspection. Do it at night when equipment is open in full view.  
Biggest weakness is having cleaning procedures for people to use.  
(use pictures, videos, audios.)

## **Elements of a Sanitation Program**

- ◆ Designated person in charge - Sanitarian
- ◆ Monitoring program

Training  
1/2 month  
training  
6 Wk's, 16 days)



Sanitarians are gone in  
places today. But someone  
is forust be responsible for  
sanitation. Someone needs to  
control what is going to happen  
out there.

## **Elements of a Sanitation Program**

- ◆ Verification Program - everyday, verified next day & pre-op visual
- ◆ Validation Program - bring out ATP, protein test, validates clean procedure
- ◆ Annual review of Program  
or biannual

involvement  
Engineering up front can help  
resolve sanitation  
issues upfront.



Its most. responsibility to  
provide education & training  
to do job right not just  
pencil whip it.

review customer complaints  
" engineering / production AS

(i.e. remove ledges, catch pts. in  
process that could cause  
micro count to increase over  
shift to unacceptable levels)

Extremely  
important  
to SP

Check AIB website

#### PREREQUISITE PROGRAMS

Program	Goal
Sanitation	Maintain a sanitary environment, necessary for the production of safe and legal products.
Personnel	Achieve and maintain hygienic practices and procedures by all personnel in the process facility.
Body Fluids	Manage the potential incidence of body fluid contamination.
Water Quality	Assure potable water, including ice, to and within the process facility.
Pest Management	Manage pest population to minimize its potential for product adulteration and/or contamination.
Chemical Control	Protect the process environment from possible chemical contamination.
Allergen Control	Control the possibility of product cross contamination with allergenic materials.
Customer Complaints	Identification and resolution of complaints.
Traceability	The ability to find any ingredient or finished product in the event of a recall.
Recall	Ability to remove suspect product from the market in a timely and effective manner.
Buildings and Grounds	Organize, maintain and operate a sanitary process environment
Microbiological Control	Manage the potential presence of microorganisms that may represent a safety or quality hazard from facility wide to area specific.
Plant Maintenance	Maintain the process environment to optimize production and minimize food safety risks.
Glass and Brittle Plastic Control	Manage essential glass and plastic in the process environment to minimize the risk of contamination.
Metal-to-Metal	Identify and prevent metal-to-metal or metal-to-plastic contact in equipment.
Foreign Material Control	Minimize the opportunity for foreign material contamination.
Package Material / Labeling	Assure proper package label for all food products.
Employee Safety	Assure a safe working environment for all employees.
MSDS / Right to Know	Provide information and knowledge about chemicals used in the work environment.
Plant Security	Provide security in order to minimize the potential for intentional product contamination.
Regulatory Inspections	Effectively prepare for and handle regulatory inspections.
Technical Assistance	Provide consulting services to clients to enhance product utilization.

## Section 2

# Principles of Cleaning and Sanitation

## PRINCIPLES OF CLEANING AND SANITATION

Presented  
by



### Methods of Cleaning

- Wet cleaning requiring the use of the appropriate cleaning compound delivered in the correct manner.
- Dry cleaning is used as an initial cleaning process before wet cleaning or as the sole method in dry processing environments.



### Understanding the Chemistry of Detergents and Cleaning Compounds



If get a good chemical co. tech rep.  
stick with it. Chlorox eats  
up cast iron pipes!

alkaline based - oils,  
acid based - protein, maybe  
once /wk to get biofilm  
Pressure washer metering device  
not a very efficient way to clean  
Cost factors in to BOD in sewer  
charges, reduce water costs, etc.  
1) gross rinse  
2) wash/cleaning )  
3) sanitizing )  
Can reduce water usage.

If you have gross soil, wash it  
with sanitizers (Listeria,  
Salmonella, etc.)  
temp. - oils > 140°F  
action - me, mechanical brush  
bubbles on foam for non-  
Stubborn soils

## Why do we clean?



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## Why do we clean?

- To minimize physical adulteration

AIB

surprise in every box?

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## Why do we clean?

- To minimize physical adulteration
- To minimize microbial adulteration

AIB

Spoilage is gone now  
so pathogens don't  
have to compete for  
the H<sub>2</sub>O & food and are  
becoming more of a  
problem

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## Microbiology

The science which deals with the ~~study of~~  
~~bacteria, yeast, molds, and other~~  
~~microscopic forms of life and their effects on~~  
~~other forms of life.~~



## Factors Influencing Microbial Growth

- moisture



## Factors Influencing Microbial Growth

- moisture
- oxygen



where is ~~wall~~ <sup>floor scrubber</sup> going.  
It could be the micro  
transport system When is  
the last time you sanitized  
the unit, filters, hard to  
clean areas?

aerobic

anaerobic

O<sub>2</sub> is hard to control  
in trying to influence micro

## Factors Influencing Microbial Growth

- moisture
- oxygen
- ~~temperature~~

AIB  
FOOD SAFETY

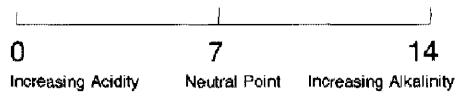
## Factors Influencing Microbial Growth

- moisture
- oxygen
- temperature

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FOOD SAFETY

## pH

Is a measure of the acidity or alkalinity of a solution.



AIB  
FOOD SAFETY

40°F - 140°F used to

be able to control

most micro. Now

Listeria & E-coli can

survive these temp.

May need to go to 160°F min.

Some  
Micros are able to  
resist pH control

Should be designed  
into the product  
specification

### **Factors Influencing Microbial Growth**

- moisture
- oxygen
- temperature
- pH

AIB

How many minutes hrs.  
Do we need? to kill

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### **Factors Influencing Microbial Growth**

- moisture
- oxygen
- temperature
- pH
- time

AIB

What is the pop. level.

~~Pop.~~ Pop. can go up so  
high it kills itself off  
to poison. Sanitation  
is key in control pop.

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### **Factors Influencing Microbial Growth**

- moisture
- oxygen
- temperature
- pH
- time
- population

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SP takes away the food

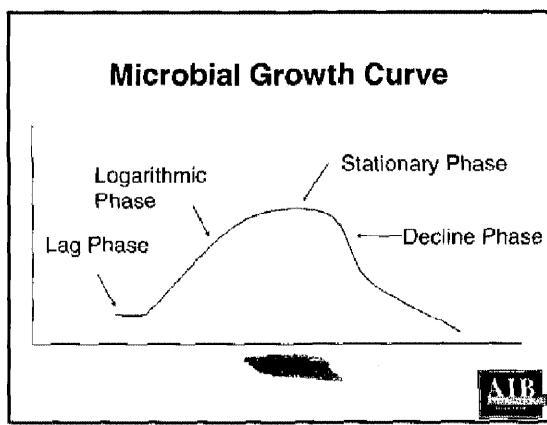
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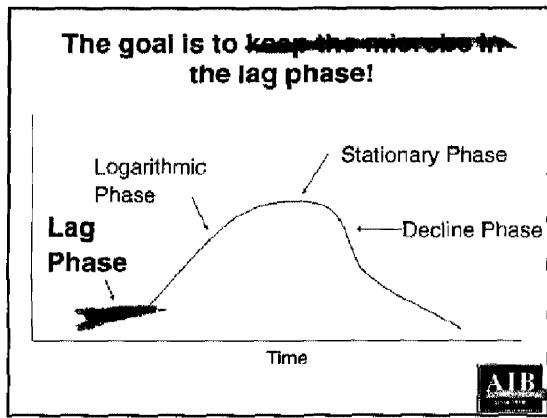
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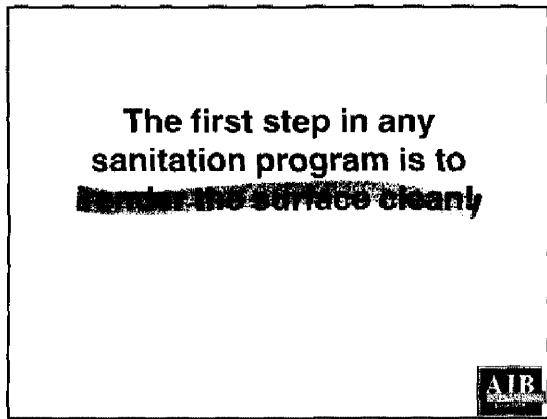
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micro life a  
couple of days  
life span



may kill off micro  
but toxin still in  
there. Staph, etc.



### ~~Cleaning~~

- Reduces the number of microorganisms present
- Reduces the essential ingredient for life - ~~Food~~
- Reduces the potential for physical adulteration

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Wet process - ↑ potential  
for micro.

Sugars bind up available  
H<sub>2</sub>O so reduce micro

### Water



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- Other water concerns:  
mineral content - hardness
- iron bonds & chlorine which  
will sweeten water but will  
not salinize.
- surfactant softens minerals  
in water to help it work  
efficiently

- The common denominator to most cleaning

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~~Water~~

- The common denominator to most chemical cleaning
- The ~~universal solvent~~

AIB  
Control

*potable*  
**The water used  
should be...**

- ~~free from disease producing organisms~~

AIB  
Control

**The water used  
should be...**

- free from disease producing organisms
- ~~free from metal ions~~

AIB  
Control

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**The water used  
should be...**

- free from disease producing organisms
- free from metal ions
- free from objectionable tastes and odors

AIB  
American Industrial Bakers

Midwest has a lot of  
nitrates.

**The water used ...  
should be as "soft" as possible.**

- Water hardness is a measure of minerals dissolved in the water.
- ~~Water hardness is measured in parts per million (PPM) and, approximately, 17.1 PPM equals one grain of calcium carbonate.~~

~~or measured as grains  
of calcium carbonate~~

17 ppm = 1 grain

AIB  
American Industrial Bakers

**Water Hardness**

Level	Parts per Million
Soft	0-60 PPM
Moderately Hard	60-120 PPM
Hard	120-180 PPM
Very Hard	180 PPM and up

Hardness is also reported as grains per gallon, ~~17.1 PPM equals one grain~~

AIB  
American Industrial Bakers

WS-

2007 Forsyth Co. Water Quality Report  
~~annual values~~  
Calcium 2.58 - 7.86 ppm; 4.27 ppm avg.

Hardness 21 ppm

~~begin treatment to soften H<sub>2</sub>O~~

pH 7.48 6.76 - 8.03

## THIS IS WET CLEANING

### The Fundamental Cleaning Phenomenon

- Penetrate soil - break surface tension
- Dislodge soil - mechanical action
- Disperse soil
- Prevent re-deposition

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Detergents and cleaners are used to make water work better!

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### Cleaners and Detergents Help Water...

- Penetrate
- Dislodge
- Disperse
- Prevent re-deposition

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hard water, float

needle, eye dropper  
of dish soap add  
drop needle

give them the right  
detergent & surfactant  
to soften water to  
do the right job.

See

## **Components of Any Cleaning Operation**

### **Time**

- Action
- Concentration
- Temperature
- Water
- Individual
- Nature
- Surface

**"TACT WINS"**



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**Time**  
Represents the time the chemical is in contact with the soil and surface to be cleaned.

It is also the time required for the complete cleaning job to be performed.



**"TACT WINS"**



Put a \$ tag on this  
for management  
Duy-in.

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**Action**  
Represents the physical or chemical force applied to the soil and the surface to be cleaned.

**"TACT WINS"**



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[REDACTED]  
Represents the ~~type~~ and ~~amount~~ of chemical applied to the soil and surface to be cleaned.

"TACT WINS"



[REDACTED]  
Represents the amount of ~~heat energy~~ applied to the cleaning solution, the soil, and surface to be cleaned.

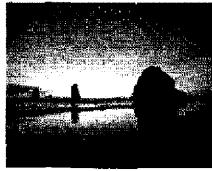
Temperature is ~~related~~ to virtually every chemical reaction.

"TACT WINS"



### Water

Represents the ~~method~~ used to apply the cleaners and rinse the chemical and soil from the surface to be cleaned.



"TACT WINS"



detergents helps us  
lower the temp.

We are trying to  
control the volume  
of water used in the  
plant. Using right  
chemicals and  
water handlers  
temperature to do  
job right.

### Individual

Represents the worker or workers involved in the cleaning operation.

**"TACT WINS"**



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~~██████████~~

Represents the type or composition of soil and the ~~volume~~ of soil on the surface.

**"TACT WINS"**



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### Surface

Represents the type of material being cleaned.

~~██████████~~, galvanized metal, aluminum, painted surfaces, etc.

**"TACT WINS"**



don't mix ss, galvanized,  
Al & cast iron.

How are you going to  
clean a machine made  
with all of these  
included?

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### Components of Any Cleaning Operation

- Time
- Action
- Concentration
- Temperature
- Water
- Individual
- Nature
- Surface

### Cleaners and Detergents Help Water...

- Penetrate
- Dislodge
- Disperse
- Prevent re-deposition

AIB  
International

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### Common Classes of Chemical Compounds

- Basic Alkalis →
- Complex Phosphates
- Surfactants
- Chelating
- Acids
- Oxidizing Agents

AIB  
International

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### Basic Alkalis

#### Major functions

- ~~saponification~~
- emulsifying
- saponifying → fats to soap, don't add  $\text{NaOH}$  → soap
- peptizing → protein breakdown

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition

AIB  
International

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## Complex Phosphates

### Major functions

- dispersion of soil
- water softening *agents*
- peptizing
- soil displacement/ emulsifying
- prevention of soil *depositions*

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition

AIB

Saturate the soln. will  
overkill the cleaning  
process

## Surfactants

### Major functions

- dispersion of soil
- wetting
- soil penetration
- prevention of soil depositions

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition

AIB

## Chelating agents

### Major functions

- water softening
- peptizing
- mineral deposit control
- prevention of soil depositions

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition

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## Acids

### Major functions

- neutralize alkalinity
- ~~destaining~~
- ~~improves peptizing~~

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition



acid rinse

PPE needed

## Oxidizing Agents

### Major functions

- ~~destaining~~
- improves ~~peptizing~~

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition



chlorinated  
cleaness

remove mold

brightens surfaces

## BASIC STEPS

### Cleaning Steps

#### ~~pre-clean-~~

- pre-rinse ~~wash process~~ - wash off
- ~~application~~ of cleaning compounds

-~~rinse~~ ~~force~~



## ~~Methods of Applying Cleaning Compounds~~

- Manual - ~~me~~ on a brush

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition

"TACT WINS"



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- ~~Most common~~ Method of Wet Cleaning
- Hardest Method to Control / Monitor
- Complete Disassembly of Equipment Required



diff. to control cause  
cleaning = individuals  
think robotics cause  
don't need to work = people  
Don't reassemble post  
sanitize can cause issues  
if tools used not sanitized.  
weigh the pros & cons on  
the reassembly. This is a  
common error AIB sees.

## ~~Methods of Applying Cleaning Compounds~~

- Manual
- ~~Soaking~~

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition

"TACT WINS"



have two units one to  
clear one being used

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## Methods of Applying Cleaning Compounds

- Manual
- Soaking
- Spraying

Penetrate  
Dislodge  
Disperse  
Prevent re-deposition

"TACT WINS"



## Methods of Applying Cleaning Compounds

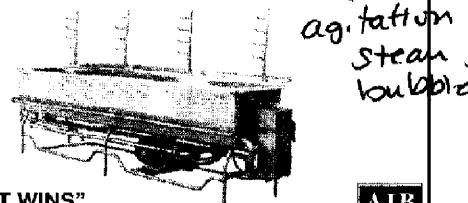
- CIP



"TACT WINS"

## Methods of Applying Cleaning Compounds

- Steam



"TACT WINS"



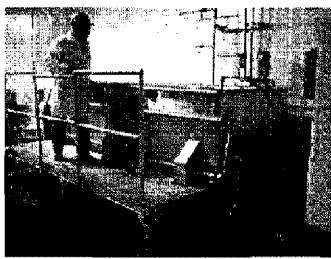
Can CIP conveyer  
systems today!

Where can I take that  
person & used them better  
CIP for pumps, valves, etc.

need to understand  
well what you are  
doing in CIP System

### COP Tank Types

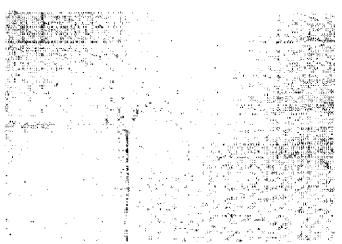
- Side Jet
- Push – Pull
- Combination



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### Methods of Applying Cleaning Compounds

- Foam



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### Types of Foam Equipment

- Portable
- Wall Mounted
- Central Systems
- Automated



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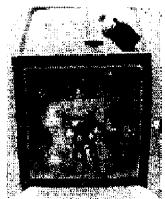
can destroy mild  
metals ie. Aluminum

People love this method

- energy efficient
- alone will not always work
- brush, scrub
- good dispersal pattern
- may only need to rinse was off
- portable or central sys.  
(adv. is can control foam concentration as compared to nine diff. portable units L's.)

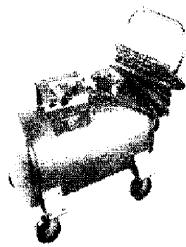
### **Portable Foamers**

- Available in various sizes
- Non-Pressurized
- Versatile



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### **Portable Tank Foamers**

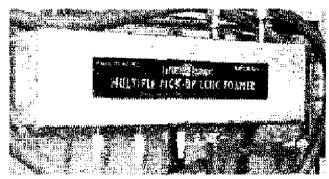


- Pressurized → 90 psi
- 304 & 316 SS Steel

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W

Fast -- No Need to Bring Out Equipment  
Require Utilities  
Hose Length Limited to about 60 ft.



AIB

can house system

handle 90 psi -

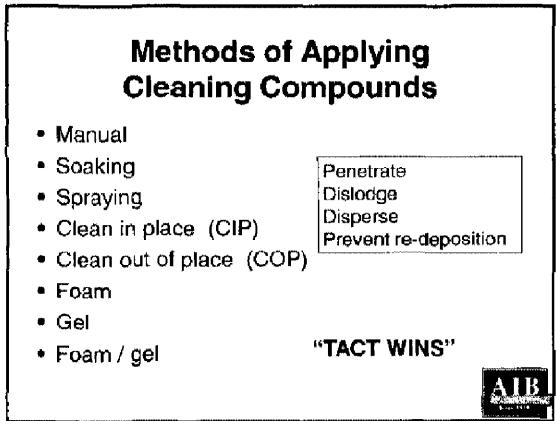
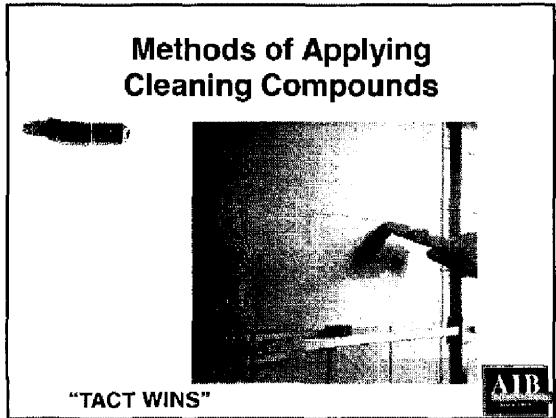
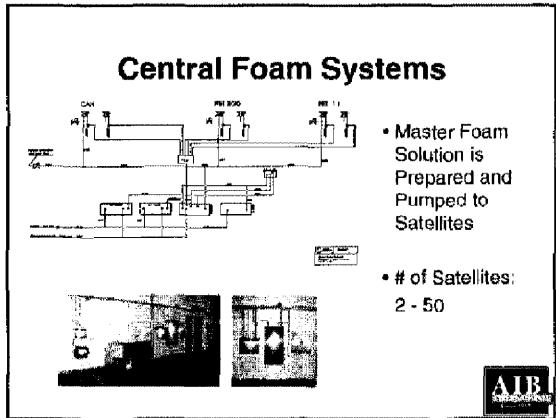
Do we have internal

sys to handle this?

consistency

must maintain

can grow micro if  
not used




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oils, fryers  
stays put  
delivery sys for caustic  
will STRIP PAINT!

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looks out soil

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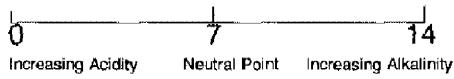
## Choosing the Chemical

- Soil type and amount
- Foam level / method of application
- Liquid or powder *? your budget*
- pH *no [ ] mistakes*

AIB

## pH & Cleaning Strength

Is a measure of the acidity or alkalinity of a solution.



pH is a logarithmic scale, each measure of 1 unit is 10 times stronger or weaker than the previous number

AIB

## Cleaning Steps

- Pre-clean
- Pre-rinse
- Application of cleaning compounds
- Rinse
- Inspect and re-clean as necessary
- (if necessary use alternate pH cleaner)
- Rinse

AIB

*bio film*

*break down*

## The next step?

AIB  
SINCE 1919

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## The next step...

AIB  
SINCE 1919

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## The claims...

- Sterilize - kills everything even spores
- Disinfectant - most bacteria but only ~~plus~~ phenols kill spores (Pesticide registered)
- Sanitize -
- Bacteriostat - inhibit growth, leaves inhibitor behind, QUATs for molds

AIB  
SINCE 1919

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## Sanitizing Methods

Heat

- Chemical

AIB

Heat

Temp./Time (min.)

170°F / 15

200°F / 5

180°F / 1

170°F / 5

180°F / 20

rare use  
drapped

AIB

Water

## Sanitizing Methods

- Chlorine bearing compounds
- Iodine complexes - rare, fishery industry
- Quaternary ammonium compounds - metals
- Acid-anionic
- Peroxyacetic Acid - Good for Listeria  
but need to be aware of other physical factors
- Dual Halogen
- Chlorine dioxide

Latin American  
Very toxic  
CTP systems

Hydrogen Peroxide - using oxygen capabilities

safe, low odor, easy on hands  
can generate bromine, heat and etc. offgas

ONE DOES NOT FIT ALL

Will have to use 2-3

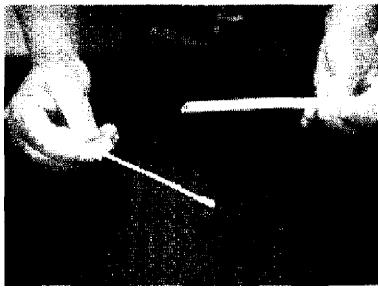
Sanitizers in plant  
to take care of  
various micros.

## ~~Validating~~ Cleaning and Sanitizing Methods and Procedures

- If it is important enough to do it, it's important enough ~~to do it right~~
- How do I know it is the best method?  
~~most effective~~ > will need to be a ~~balance~~  
~~most effective~~
- Achieve uniformity in their application
- Train personnel
- ~~improve as needed - make the effort management open mindedness~~

AIB

## Validation through Culture

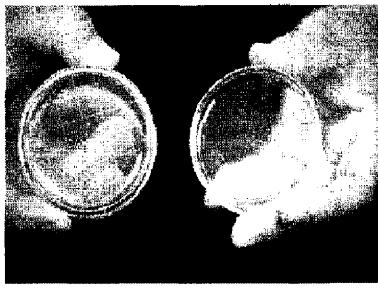


AIB

not the cheapest but effective

Confirm this is working

## Culture Plate



AIB

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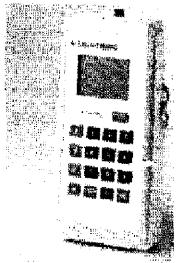
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**ATP Swabs**

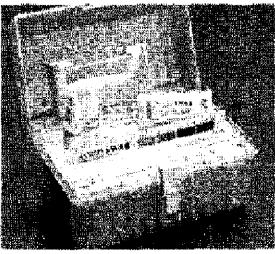
- Immediate
- Food Residue
- Microbes
- Bioluminescence



AIB

~~rapid read on~~  
Sanitation on that  
Equip on that day  
not species specific

**Protein Residual Validation Kit**



- Quick
- Microorganisms
- Product Residual
- Visual Reading

AIB

Allergens  
don't go & 10 ppm

Rapid read systems help  
us go by corrective  
actions

When it comes to ~~sanitation~~.

Always

Think ~~sanitary~~

AIB

\_\_\_\_\_

\_\_\_\_\_

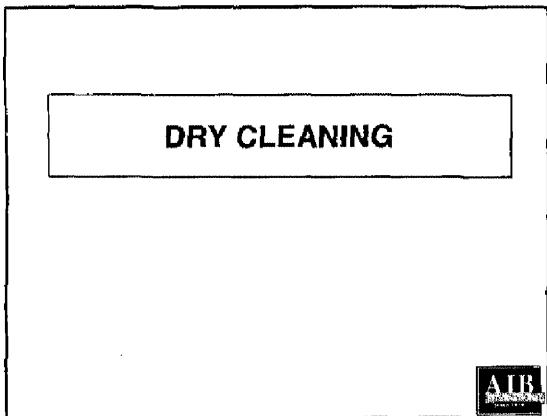
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**Dry Cleaning**

- Essentially is the process of cleaning without ~~water~~

- Vacuum cleaning
- Scraping
- Brushing
- Sweeping
- Blowing - reduce to 30 psi.



HIRE OUT

Don't use H2O, a micro

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**Dry Cleaning**

- Dry cleaning methods are normally associated ~~with~~

- Structural cleaning
  - Overheads
  - Walls
- Outside areas - *Compactors*
  - Bulk receiving for dry goods
  - Compactor area
- Grain handling equipment
- Dry processing equipment



asphalt, cracks, water,  
Dreading for flys,

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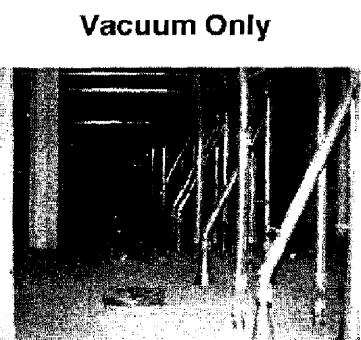
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### Steps for Effective Dry Cleaning

- Removal of the gross soil deposits from equipment by brushing or vacuuming
- Scraping dried residue materials
- Blowing difficult-to-reach soils with compressed air (30 psi) to a more accessible area
- Vacuuming dried materials  
Central Sys.  
needs maintenance  
wet matl. cause micro

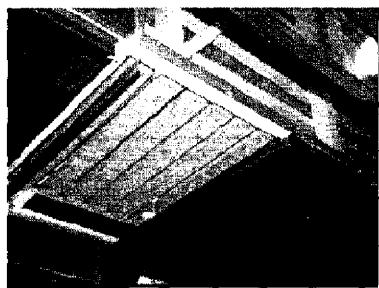
AIB  
AIB



Vacuum Only

AIB  
AIB

### Dry Process Equipment



AIB  
AIB

Vacuum Sys.  
need to be on

inspection pgm.

hamburger buns

### Dry Clean Application



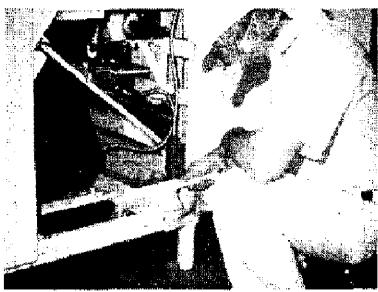
AIB

### Static Charge Potential?



AIB

### Using the Right Utensil

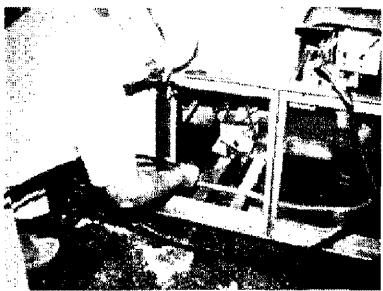


AIB

touch ladder could  
pose static etc.  
discharge  
must be grounded

color code brush to  
be used on right  
application

### **Use Air Where Appropriate**



AIB  
American Institute of Baking

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### **Dry Cleaning**

- Dry cleaning is an important element of the effort to control stored product pests in cereal processing facilities.
- If conducted properly prior to a wet cleanup, it can reduce the cost of sewage treatment substantially.
- Make sure all appropriate safety procedures are being followed since overhead work will likely occur.

AIB  
American Institute of Baking

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## Section 3

# Developing and Implementing a Sanitation Program

Section 3: Developing and Implementing a Sanitation Program

**Developing and  
Implementing a  
Sanitation Program**

Presented by:



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**PROGRAM  
DEVELOPMENT CYCLE**

- Assess facility needs - do in field, dynamic process season to season
- Review assets - def. people, capabilities, creativity, right people in job
- Develop plan - how to roll up prod., maintenance on board
- Implement a program - ~~once~~ up constantly
- Review and improve - constantly



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go to mgt. and say how much do you want to spend? Then in the plant how do you want to spend it.

**ELEMENTS OF  
CLEANING TASKS**

- Decide what tasks are required
  - Daily - keep it going
  - Periodic notification needed, schedule
- Develop clear procedures
- Determine who gets to do it
- Train personnel to do the task
- Verify completion to a satisfactory level



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Sanitation occurs @ night  
mgt. at home, we wonder  
Why do we have failures

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Then expectations are diff. then wins

## ELEMENTS OF CLEANING TASKS

- Periodic cleaning tasks require:
  - A Master Cleaning Schedule to enable tracking the status of the cleaning tasks done on an other than daily basis
  - Frequency of task completion can vary with seasons or other factors



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## DAILY CLEANING SCHEDULES

- Are normally daily housekeeping tasks conducted throughout production?
- Normally included in the job description for the position



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Put it in the job description  
can resolve the conflict  
in these situations

Tell employee why this is an issue.

## JOB DESCRIPTION

- Job description from Food Safety Companion (Quality Manual Section B; See Annex)



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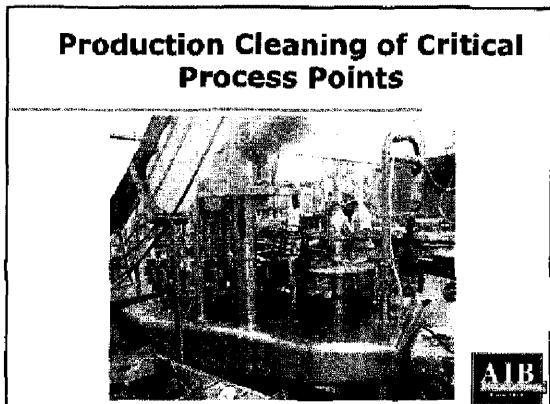
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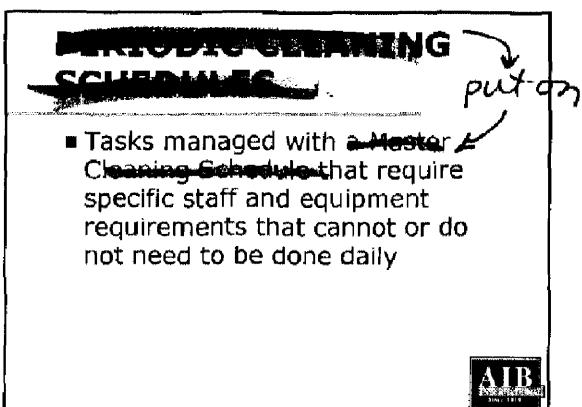
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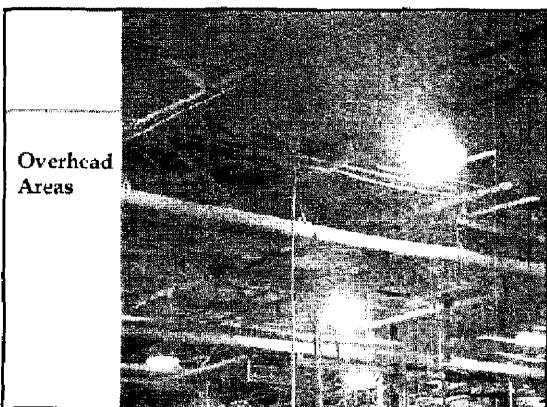
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fluid milk plant - filler  
 Soals need to sanitay  
 Soals, op. needs to call  
 sanitation maint. or do we need to  
~~add~~ add to his resp. &  
 put in container for sanitation  
 to clean and return.



infestation / insulation exposed  
 remove unused equip.  
 \$240K cleaning annual  
 take diff. perspective -  
 what is causing / or is  
 point source of the flour dust?  
 Do we need dust collection  
 sys.? Stop blowing  
 Are there areas where accumulator  
 is worse?



PUT IT IN #3 Cent  
 do eval. & get good #  
 first. Go to MBA  
 and ask for help

## DEVELOPING A MASTER CLEANING SCHEDULE

### ■ Factors to consider:

- Type of products — influences freq. of clean.
- Type of equipment — conveyor, cloth
- Availability of equipment for cleaning — downtime / hrs per day or week, 5,220r jack
- Number of personnel — make up of prod. crew, working/day & some small amt.



## DEVELOPING A MASTER CLEANING SCHEDULE

### ■ Factors to consider:

- ~~Frequency~~ of Cleaning is based on the demand:
  - Public health-Critical
  - Production needs
  - Insect life cycles — seasonal ds, temp.
  - Access to systems — prod & main. must give ~~up~~ time to do sanitation
  - Historical data



What needs to be done?



Is lack of sanitation increasing downtime?

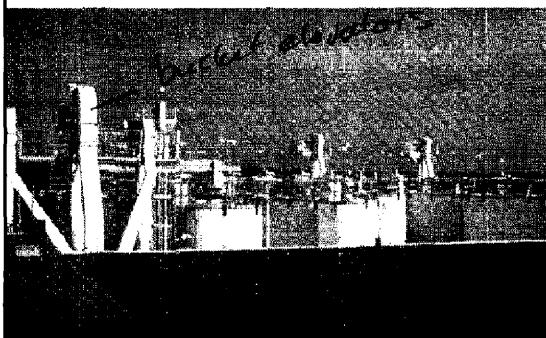
Make a list of all equipment. Create cleaning schedules on each and est. freq., what's the liability of each sanitation challenge?  
devel. plan be involving other departments. Buy the coffee! Then abuse the late

## BULK SILEO

- Contains flour or cereal products
- Hazards: pests and ~~hold~~
- ~~days~~ worst case
- Disrupts insect reproduction



### Bulk Storage/Silos



designed for whole grain used for  
(28 silos) flour  
outside, not designed for  
external weather exposure

## FLOOR DRAINS IN PROCESSING

- Contains product residues
- Hazard: potential for micro and insects
- Cycle: scrub and sanitize weekly
- Prevents breeding site for flies

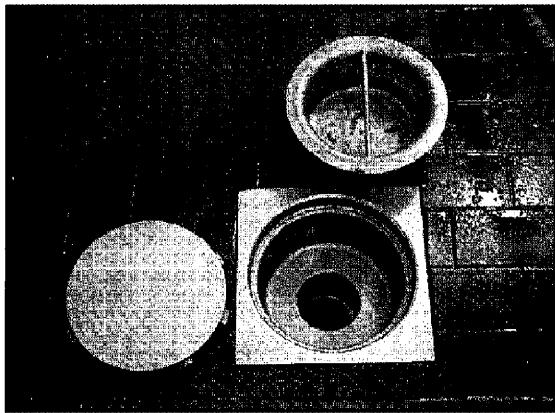


warehouse floor drains

dry clean

processing areas must

clean & sanitize



## VENTS OVER PRODUCT A-1 through A-4

- Contains product residue
- Hazard: mold, insects, foreign material
- Cycle: monthly
- Timely removal of product residue to prevent insect development, mold growth and potential for debris falling onto process

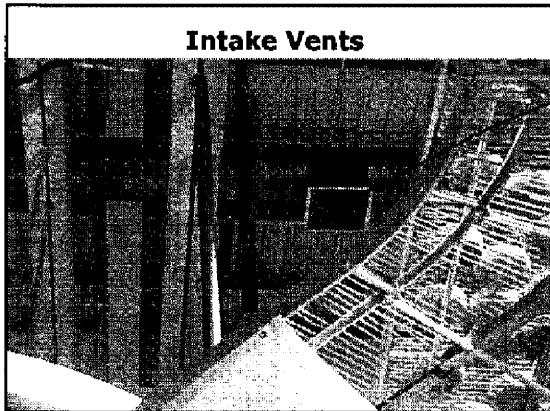
AIB  
INSPECTORATE

1d. physically on  
cleaning schedule

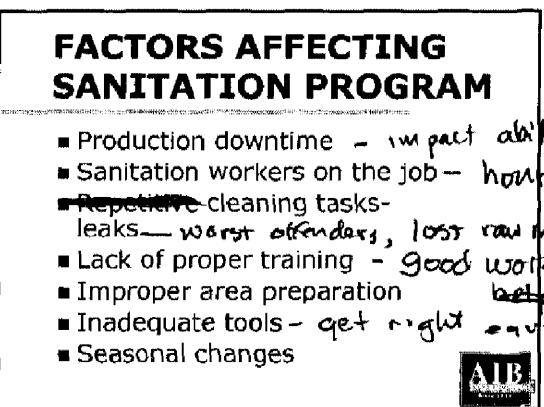
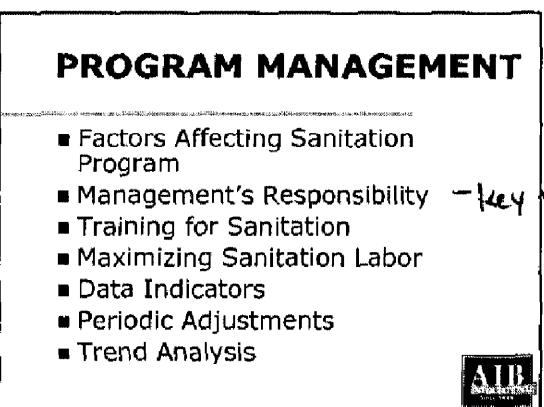
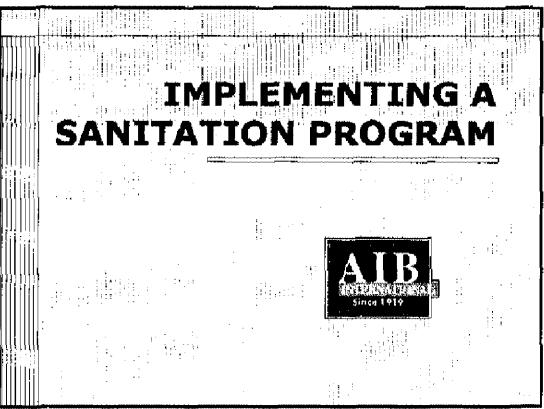
alt drains on schematic  
and use if person  
doing cleaning  
control, organizer take care  
of it.

monitor duct

blowing out creates some  
vacuum so it accumulates  
on surfaces until it  
falls out on product



salmonella source!  
65 ft up, not cleaned



realign priorities to get mgf. to  
get peaks fixed by ~~convince them~~ convince them  
on how much it costing the company.  
on how much it costing the company.  
get cleaning, preventive  
training helps get employee proficient

## **MANAGEMENT'S RESPONSIBILITY**

- Evaluate labor requirements
- Evaluate results
- Implement change when needed - especially, if you wrote the program
- Establish "Best Method" - listen to your employees.



## **MANAGEMENT'S RESPONSIBILITY**

- Assigned schedules are followed
- Procedures are followed
- Production prepares areas for Sanitation Personnel
- Maintenance participates in preparations by disassembling equipment



## **TRAINING FOR SANITATION**

- Provided in [redacted] language
- Follows written procedures
- Conducted [redacted] worker begins working
- Follow up evaluations are [redacted] Not to be neg. but positive.
- Objectives are consistently [redacted] and properly enforced



get chair, watch people, time them on tasks, are results acceptable.

They did. There are better ways of doing things this way. If it's getting done and is acceptable then give them ownership. Can find acceptance when it comes from them. Not always my way. Are procedures relevant when they change? Annual review of sanitation procedures needed!

Wherever you can marry S schedule to Maint. Schedule do it.

Language - How many in your plant(s)? Be careful about using local slang.

Spanish - PR, Venezuela, Mexico, etc.

reinforced

## MAXIMIZING SANITATION LABOR

- Start employees at ~~proper times~~
- Provide ~~proper equipment~~
- Provide effective supervision
- Equipment and assignments are prearranged
- ~~Put-away time~~ is controlled
- Areas are ~~properly prepared~~
- Personnel are ~~properly trained~~



Staggered shifts (prepping, sanitation) means extended hours on Sanitation. Start one hour ahead

## DATA INDICATORS

- ~~Poor~~ sanitation leads to:
  - Increase in production ~~time~~
  - Increase in maintenance ~~time~~
  - Decrease in sanitation time, and
  - Increase in overall ~~costs~~
- Production performance can easily be measured by ~~sanitary conditions~~. They both reflect the culture and tolerances of an organization.



out of control, not discipline, mgt. ~~not~~ is incompetent (rule by intimidation)

## PERIODIC ADJUSTMENTS

- The sanitation cleaning program is a ~~dynamic~~ program that responds to the needs of the environment. Changes in the environment will result in changes required in the program.



## TREND ANALYSIS

- Data collected will dictate changes required
  - Verification of procedure failures
  - Self-inspection program results
  - Customer complaints - helps see problem
  - Product safety issues - 16+ times/month
  - Repeated issues



root cause analysis I.C.E.

I - identify root cause, consensus  
C - control / immediate corrective action  
E - eliminate root cause

## SCHEDULING INFLUENCES

- Seasonal changes can [redacted] or [redacted] cleaning cycles
- Addition of or change in an ingredient can dramatically affect the schedule
- Changes in production schedule for seasonal production runs

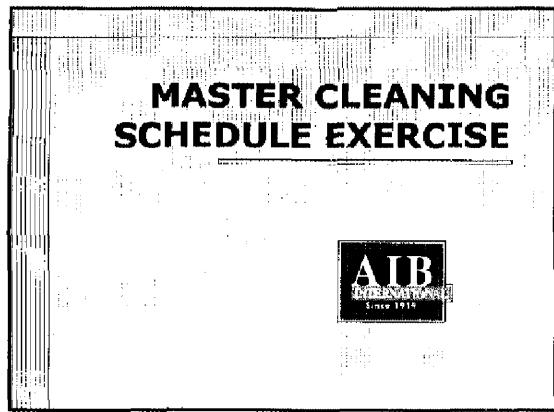


## DDT [redacted]

- When resources are limited, how do you choose what to do:
  - [redacted] - don't
  - Production priority
  - Access due to [redacted] maintenance procedures



kill or hurt anyone, assumed



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A presentation slide titled "MASTER CLEANING SCHEDULE". It contains a bulleted list:

- Formats for Master Cleaning Schedules
  - Computer systems
  - Sheet given

A small AIB International logo is in the bottom right corner.

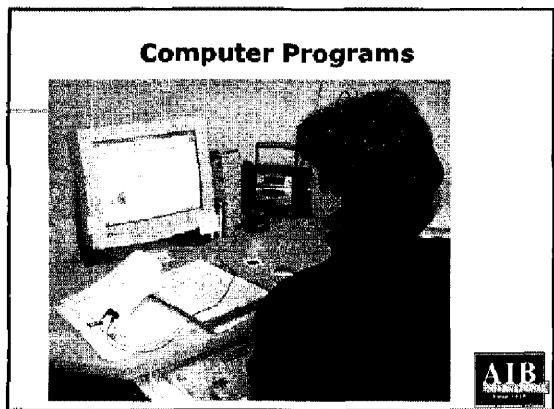
~~tie into maintenance schedule~~

put on .xls spreadsheet  
Camp & Kleen program

Robert Burg -- too intense  
over redundant

- 4 levels of programs
- go for Cleaning for dummies

www.Nexcor.com



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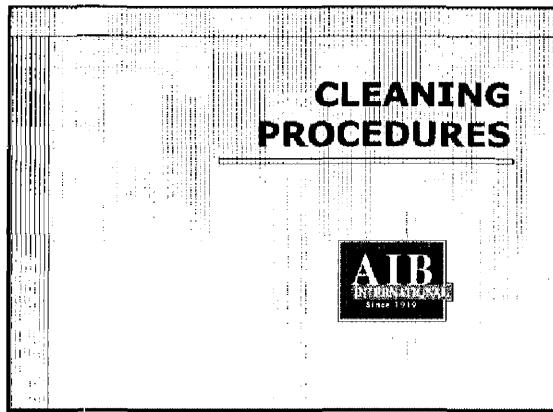
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MASTER CLEANING SCHEDULE  
(TAKES OTHER THAN DAILY)

ITEM	DESCRIPTION	FREQUENCY	ASSIGNMENT
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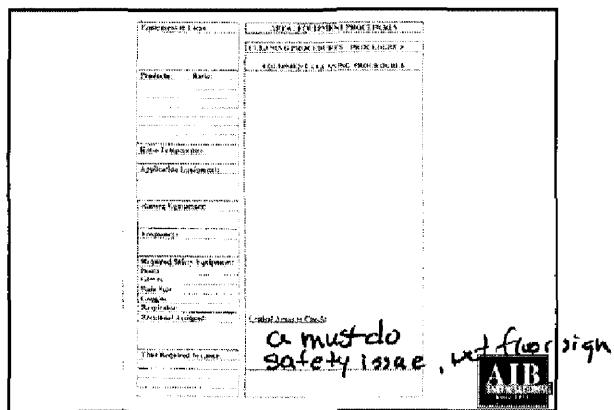
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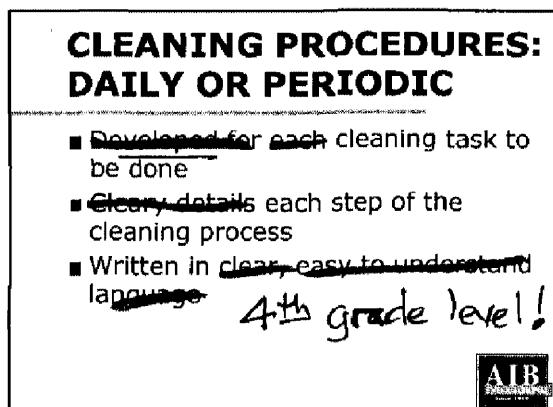
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handout  
two diff. formats  
use digital photos  
for disassembly, end  
result  
periodic and daily cleaning



write procedure related  
to something they are  
already familiar with  
get not the smartest  
person on team to write  
it at their ability and  
level of education  
Get a lot of people  
working on it not  
you alone

## FREQUENCY

- Weekly
- Bi-weekly
- Monthly
- Quarterly
- Semi-annually
- Yearly



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## SAFETY EQUIPMENT REQUIRED

- List all of the personal safety equipment the person will require to do the job:
  - Gloves
  - Boots
  - Apron
  - Goggles
  - Rain suit
  - Etc.



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## PERSONNEL ASSIGNED

- This section identifies ~~who is~~ responsible for the cleaning tasks by ~~position or department~~, rather than by ~~the individual's name~~
  - Maintenance
  - Sanitation
  - Packaging Room Technician



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## TIME REQUIRED

- Initially, a ~~plan~~ will need to be done. This information becomes important when ~~training levels~~ are established or budgets need to be justified.



Mgt. will cut your plan  
20% any way

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## PROCEDURE NUMBER

- ~~Number the procedures~~ for accountability in the program. The numbering can be assigned based on the ~~tracking code~~ for the Master Sanitation Schedule or other ~~method~~ for accounting.



## HOW DO I DO THE JOB!

- List a ~~step by step~~, detailed accounting of what you require to be done
- ~~Safety~~ requirements should be discussed ~~first~~
- Include for reference any ~~"Critical Areas"~~ to be checked or monitored



## **VITAL FEW: NON-NEGOTIABLE**

- When pressed for time, not every item on a cleaning procedure can be completed
  - Each procedure on a system should clearly indicate those elements of a system that are non-negotiable for completion during any cleaning cycle



Clean Stairway to  
pkg mezzanine

Description of Job: Name of Packaging Material:		AIA/EQUIPMENT PROCEDURE CLEANING PROCEDURE - PROCEDURE # 1076	
Product:	Date:	EQUIPMENT CLEANING PROFILE#1076	
Alum. Channel	10/01/01	<p><b>CLEANING CYCLE:</b></p> <p>1. Pre-clean with water and detergent.</p> <p>2. Rinse with water.</p> <p>3. Dry with compressed air.</p> <p>4. Inspect.</p> <p>5. Re-inspect.</p> <p>6. Clean with water.</p> <p>7. Rinse with water.</p> <p>8. Dry with compressed air.</p> <p>9. Inspect.</p> <p>10. Re-inspect.</p> <p>11. Clean with water.</p> <p>12. Rinse with water.</p> <p>13. Dry with compressed air.</p> <p>14. Inspect.</p> <p>15. Re-inspect.</p> <p>16. Clean with water.</p> <p>17. Rinse with water.</p> <p>18. Dry with compressed air.</p> <p>19. Inspect.</p> <p>20. Re-inspect.</p> <p>21. Clean with water.</p> <p>22. Rinse with water.</p> <p>23. Dry with compressed air.</p> <p>24. Inspect.</p> <p>25. Re-inspect.</p>	
Initial Temperature:			
Final Temperature:			
Application Parameters:			
Revised Scale: Average, Avg. Sample, Min. and Max. Sample, Sample Size:			
Washing Equipment:			
Rinsing Equipment:			
Drying Equipment:			
Post-cleaning:			
Required Safety Equipment:			
Comments:			

do steps in conjunction  
with people who actually  
do the job.

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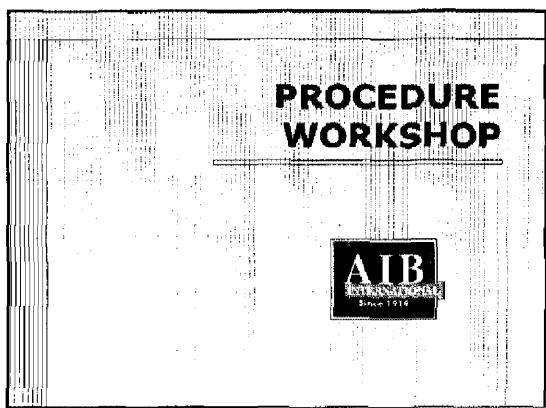
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Ingredient Storage

Flour bin - clean in-between lots, may want to clean in between fillings.

Get people in the plant involved  
to help write cleaning protocol.  
i.e. - vacuum cleaner

Give them an outline. Get their feedback. You are the editor. Push back. They are on the team.



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## **WAREHOUSE MANAGER:**

### **OBJECTIVE OF THE POSITION:**

Buy all the supplies and control inventory in the warehouse.

<b>Customer</b>	<b>Product/Service</b>
Anyone in the company	Product or material requested

<b>Supplier</b>	<b>Product/Service</b>
External Suppliers	Product, material or service requested

### **TASKS AND RESPONSIBILITIES:**

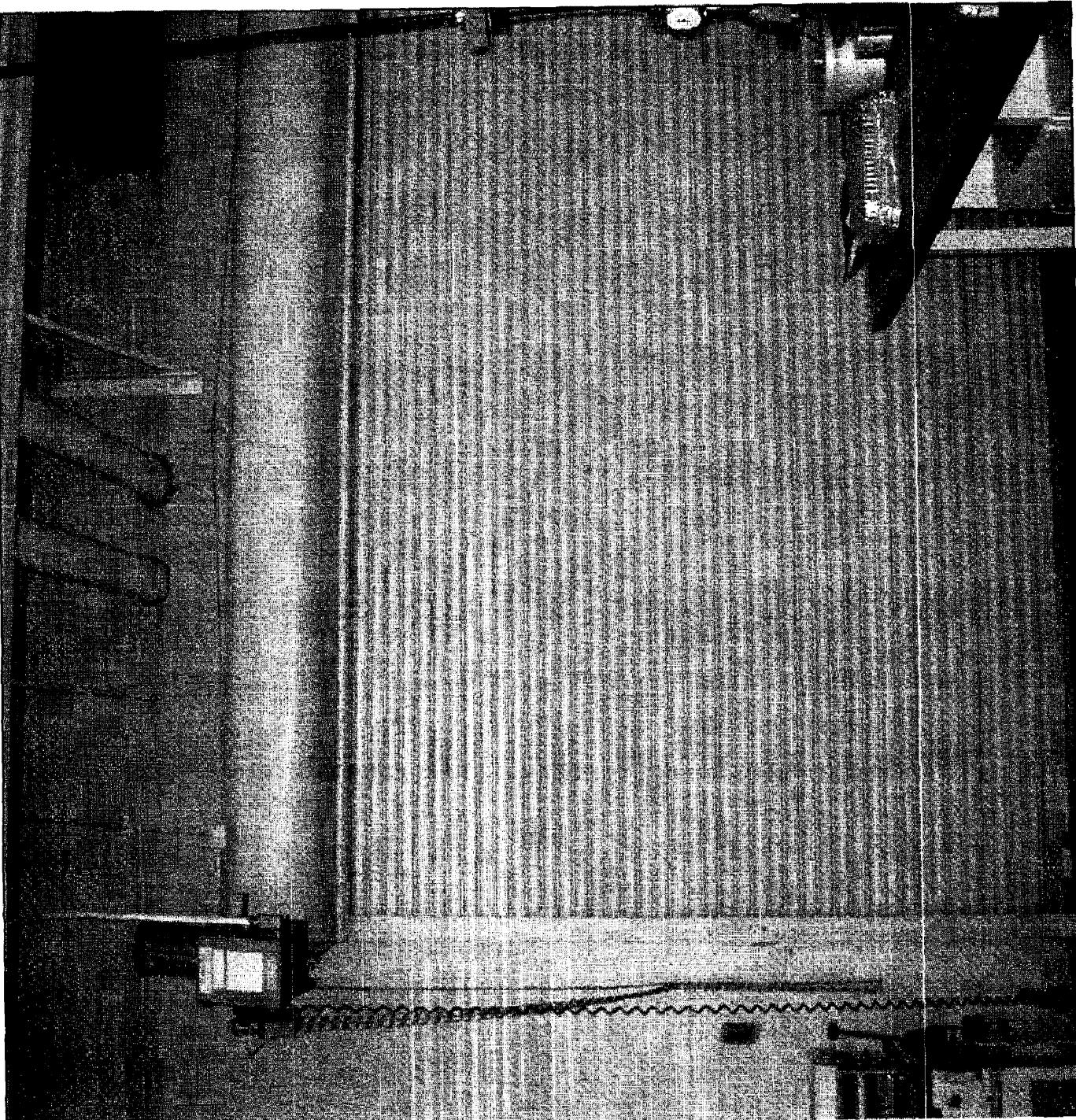
- Fill out Purchase Orders for the products or materials requested.
- Buy the products or materials from authorized suppliers.
- Receive and store products or materials (paint, adhesives, etc.)
- Obtain Material Safety Data Sheets (MSDS) for all chemicals received
- Inspect the material received.
- Control and rotate the inventory in the warehouse.
- Assign tasks and responsibilities to the Warehouse Manager Assistant, training him/her in relevant tasks.
- Maintain training records for subordinate employees
- Supervise the implementation of tasks assigned to the Assistant.
- Counsel subordinates as required
- Ensure that all activities mentioned in the Quality Assurance System, that are related to the Warehouse, are being followed.
- Initiate preventive actions to assure that no non-conformities will occur with the product, process, or quality systems.
- Identify and record any problem related to the product, process, or quality systems.
- Initiate, recommend, and/or provide solutions to problems.
- Develop written procedures as assigned.
- Avoid that a product out-of-specification be used until the problem or unsatisfactory condition is solved.
- Hold or dispose any out-of-specification product or material.
- Maintain the warehouse in a clean and organized manner.

### **ORGANIZATION:**

Immediate Supervisor	General Manager
Substitute	Warehouse Manager Assistant
Subordinate	Warehouse Manager Assistant

## **Section 4**

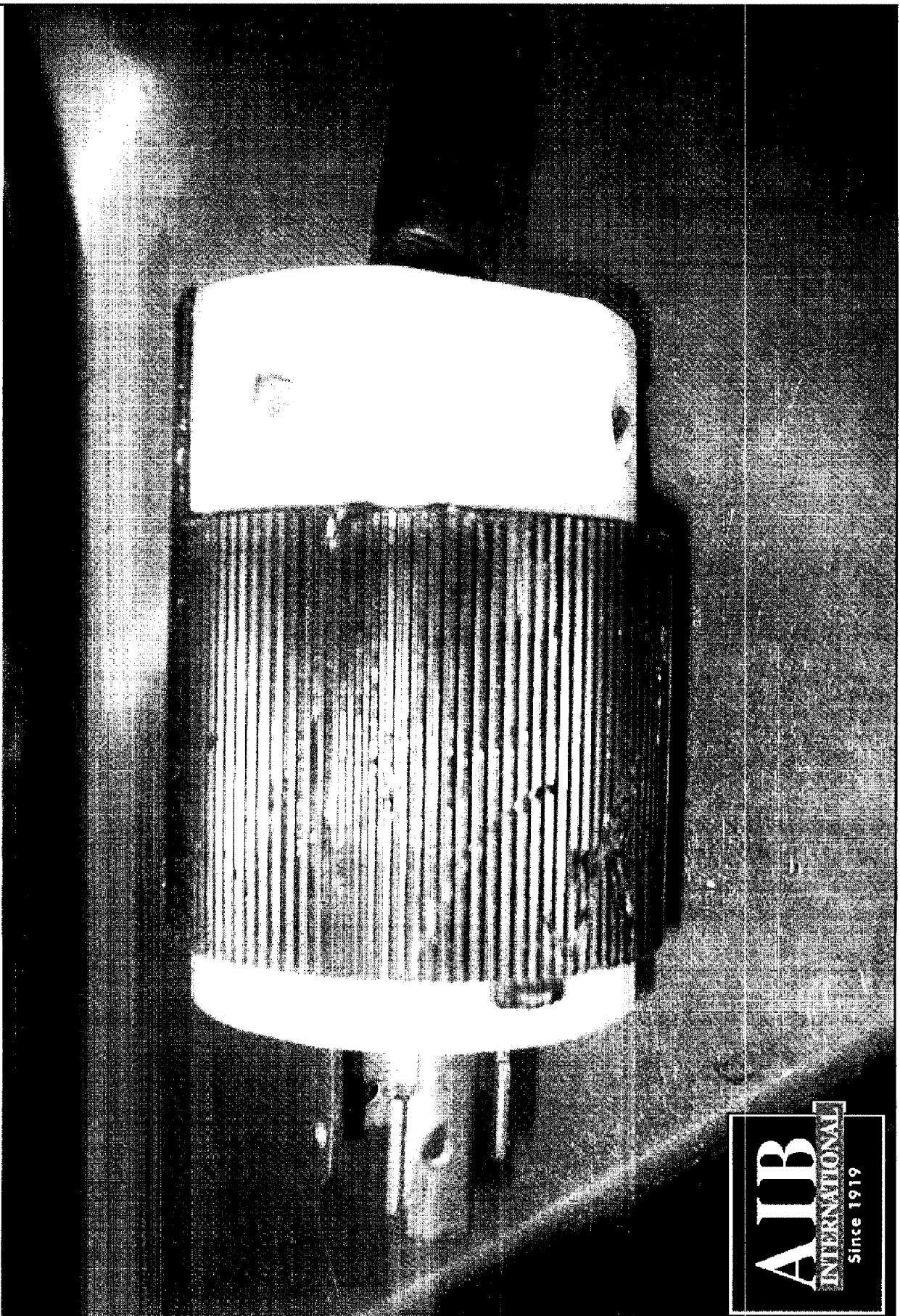
# **Workshop**



Roll-up Door

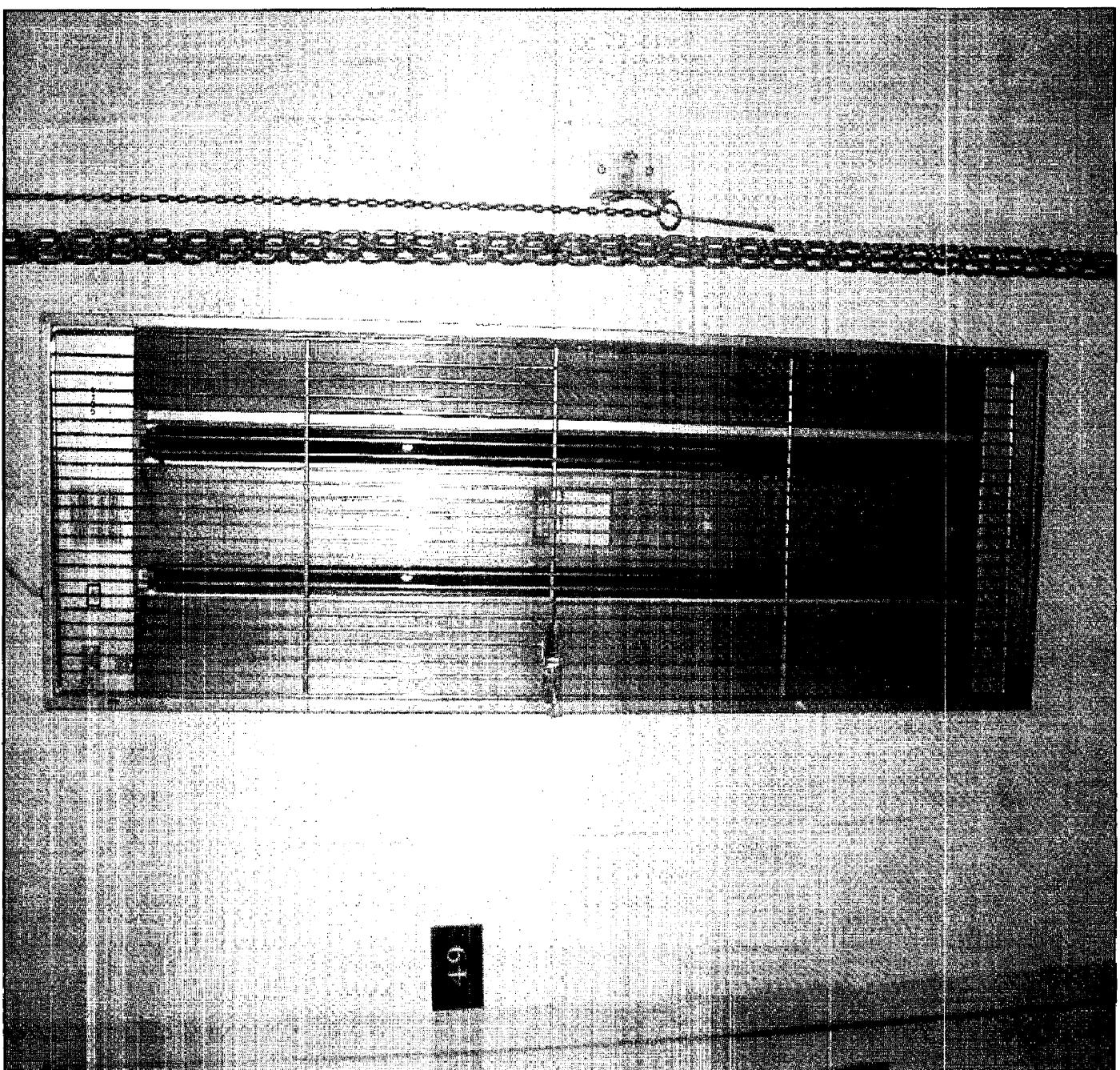


## Electrical Plug

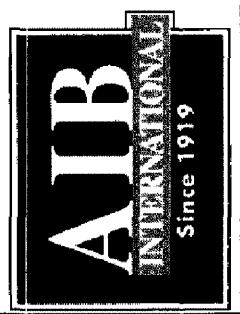


## Electrical Junction Boxes

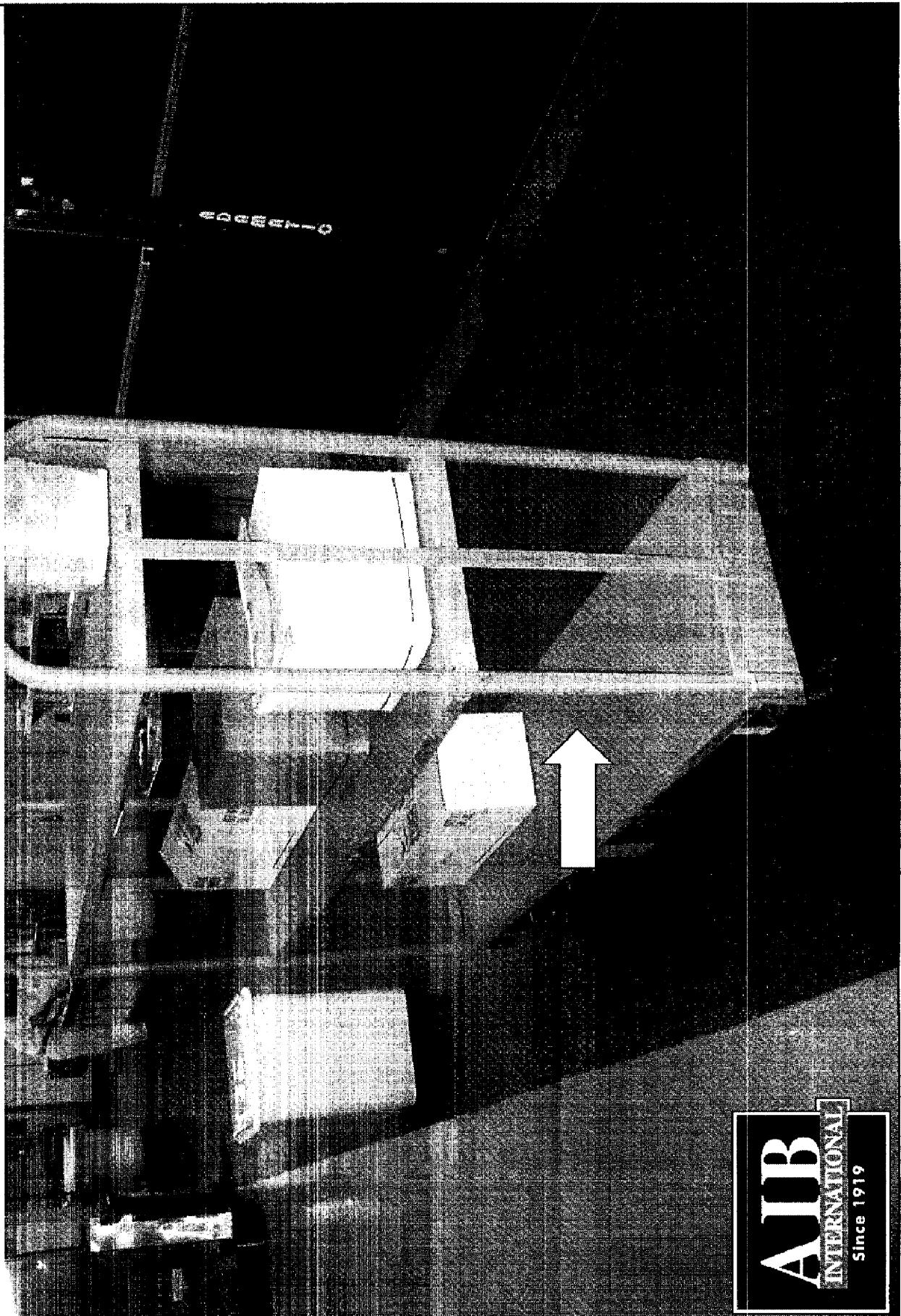




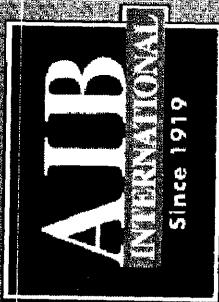
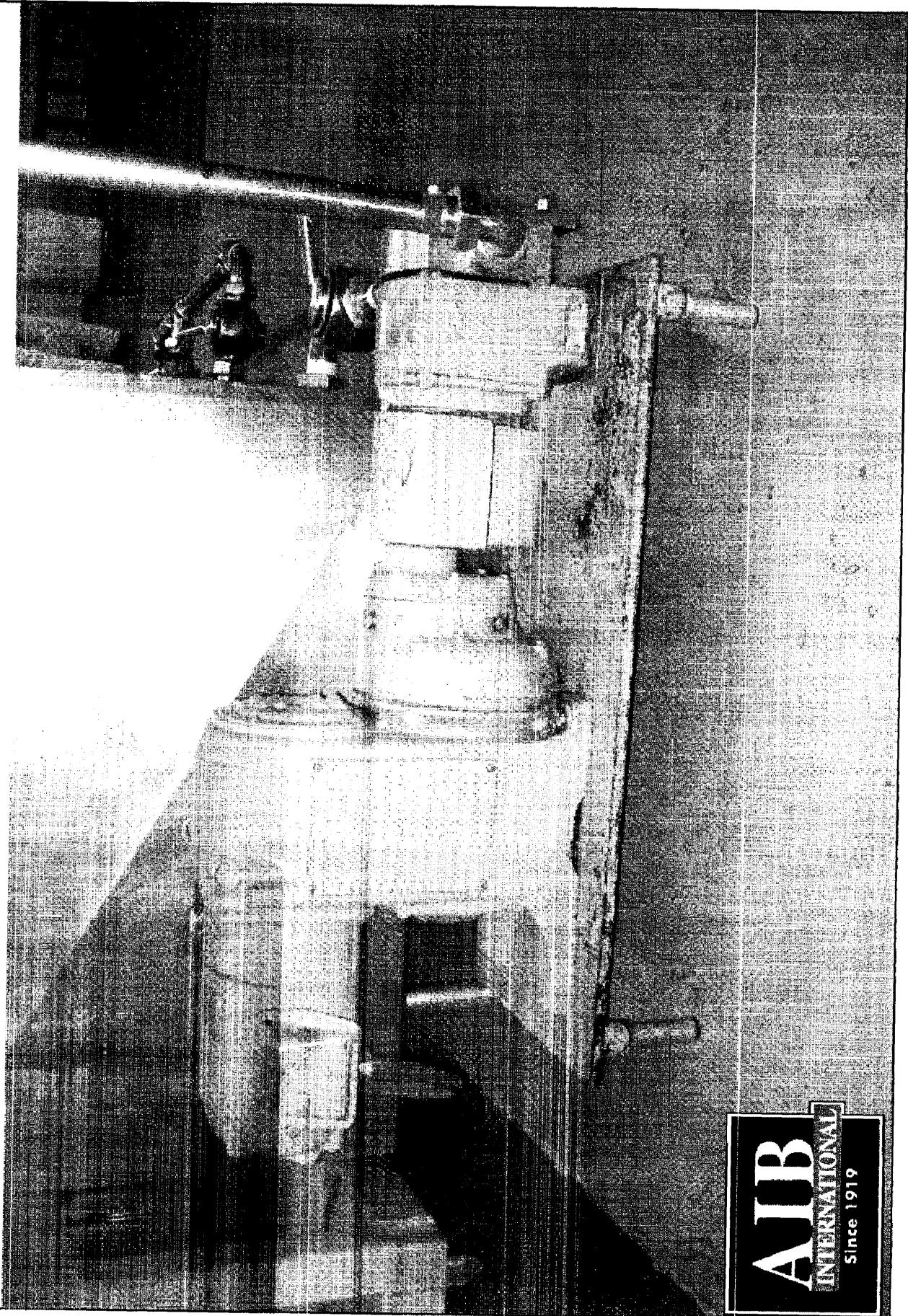
Insect Light Trap

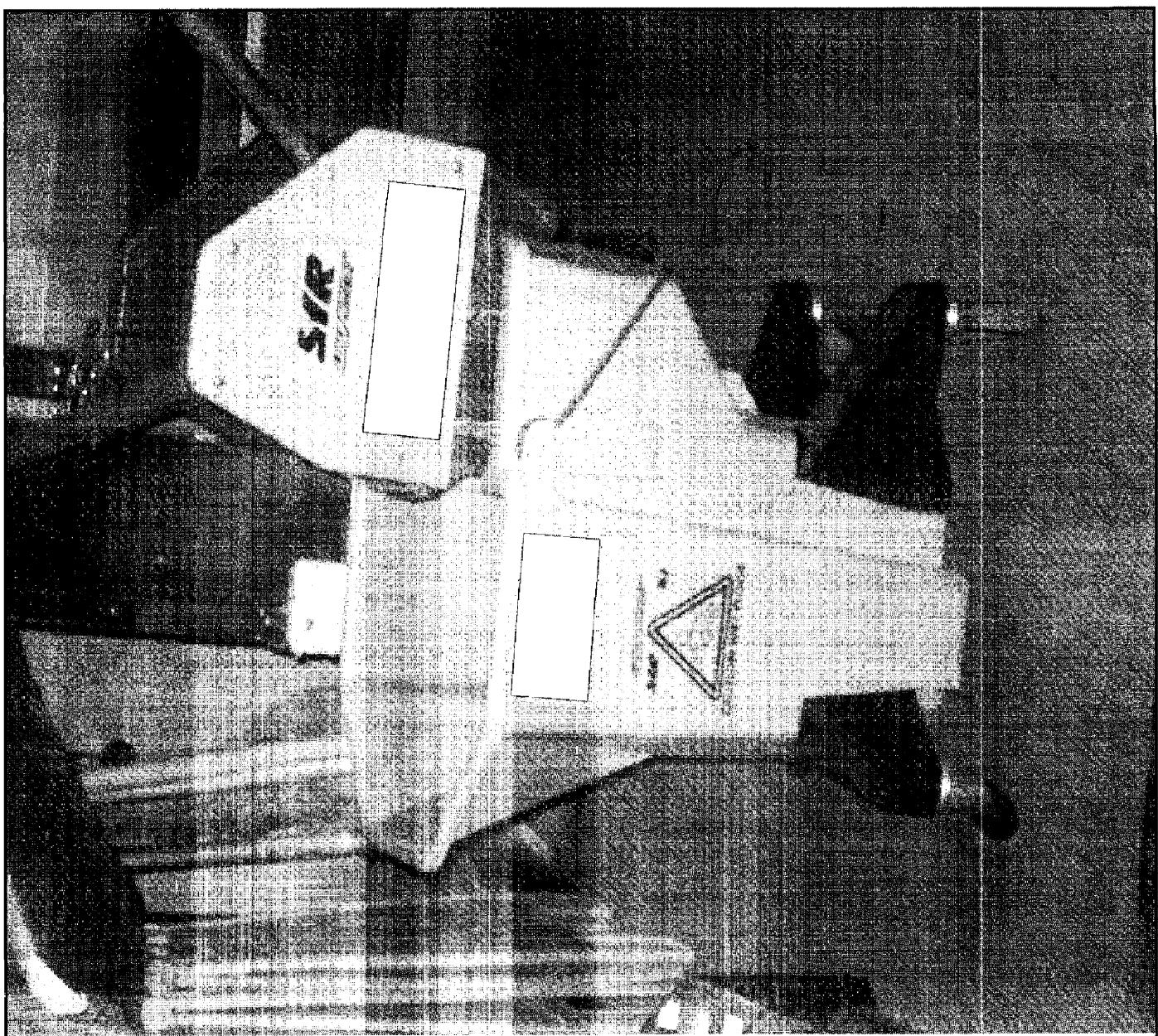


## Ingredient Cart

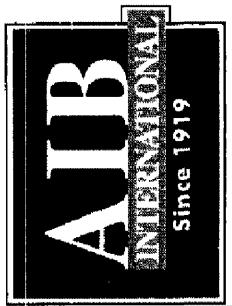


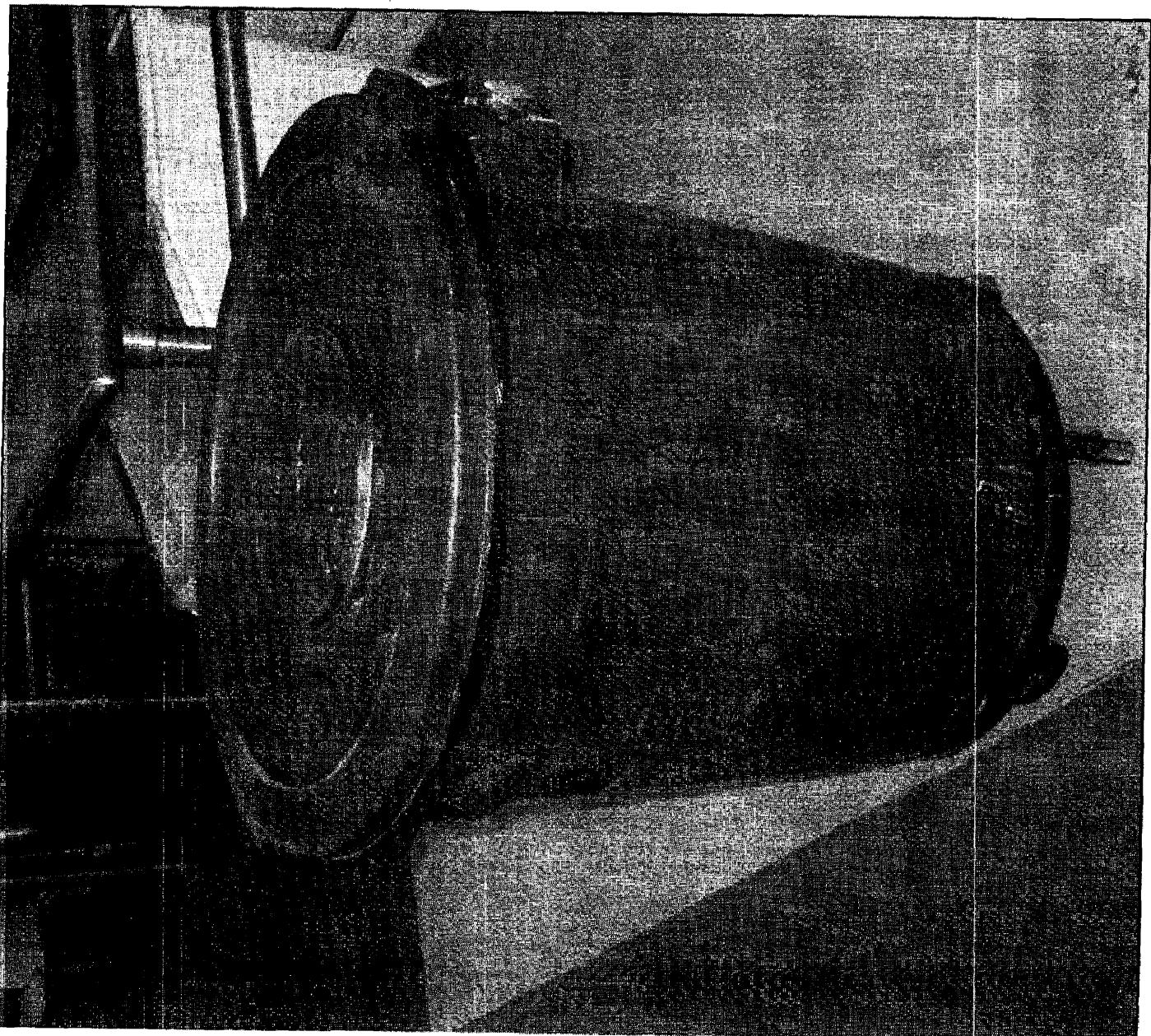
## Ingredient Pump



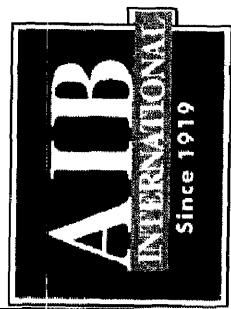


**Mop Bucket and Mop**

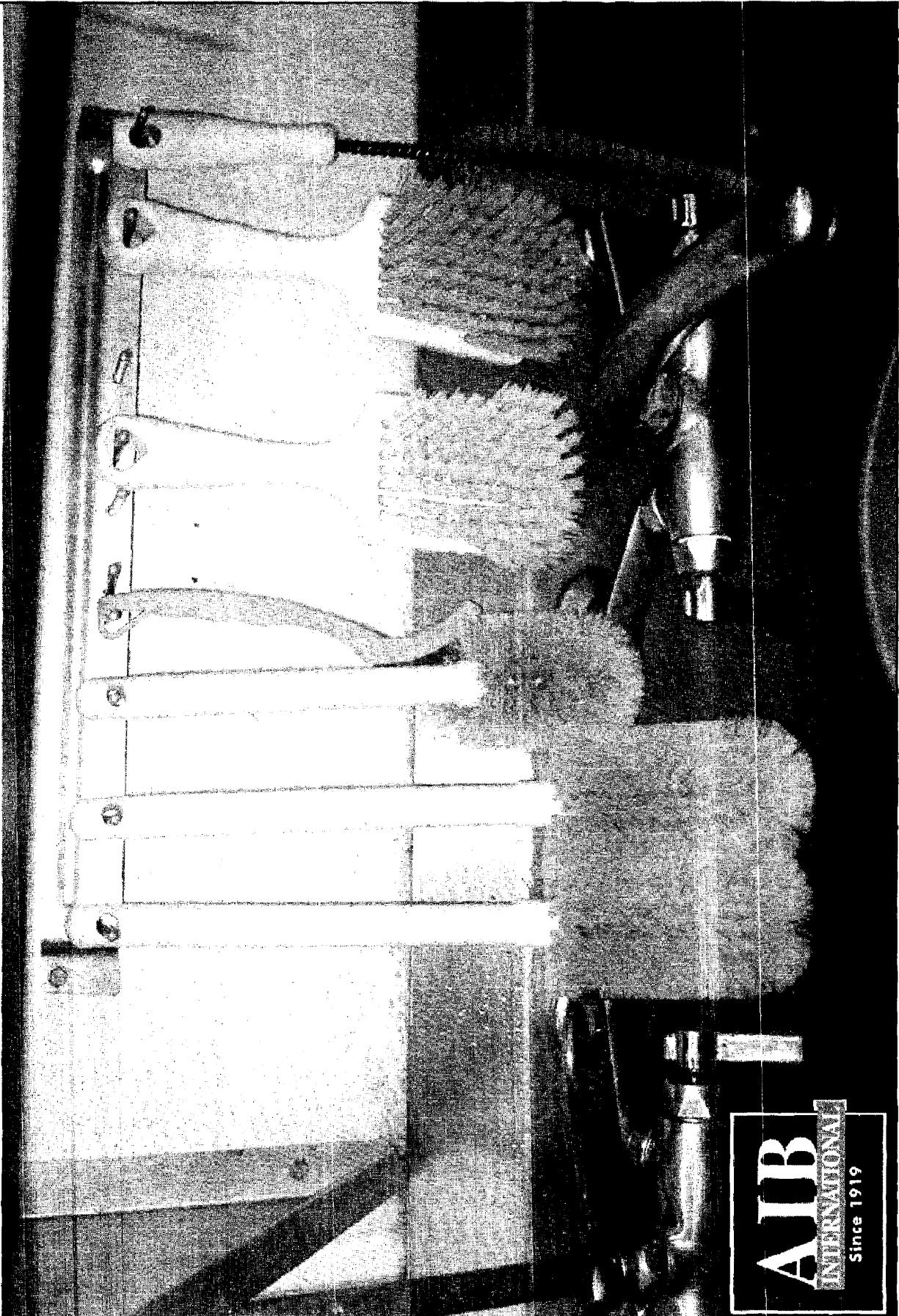




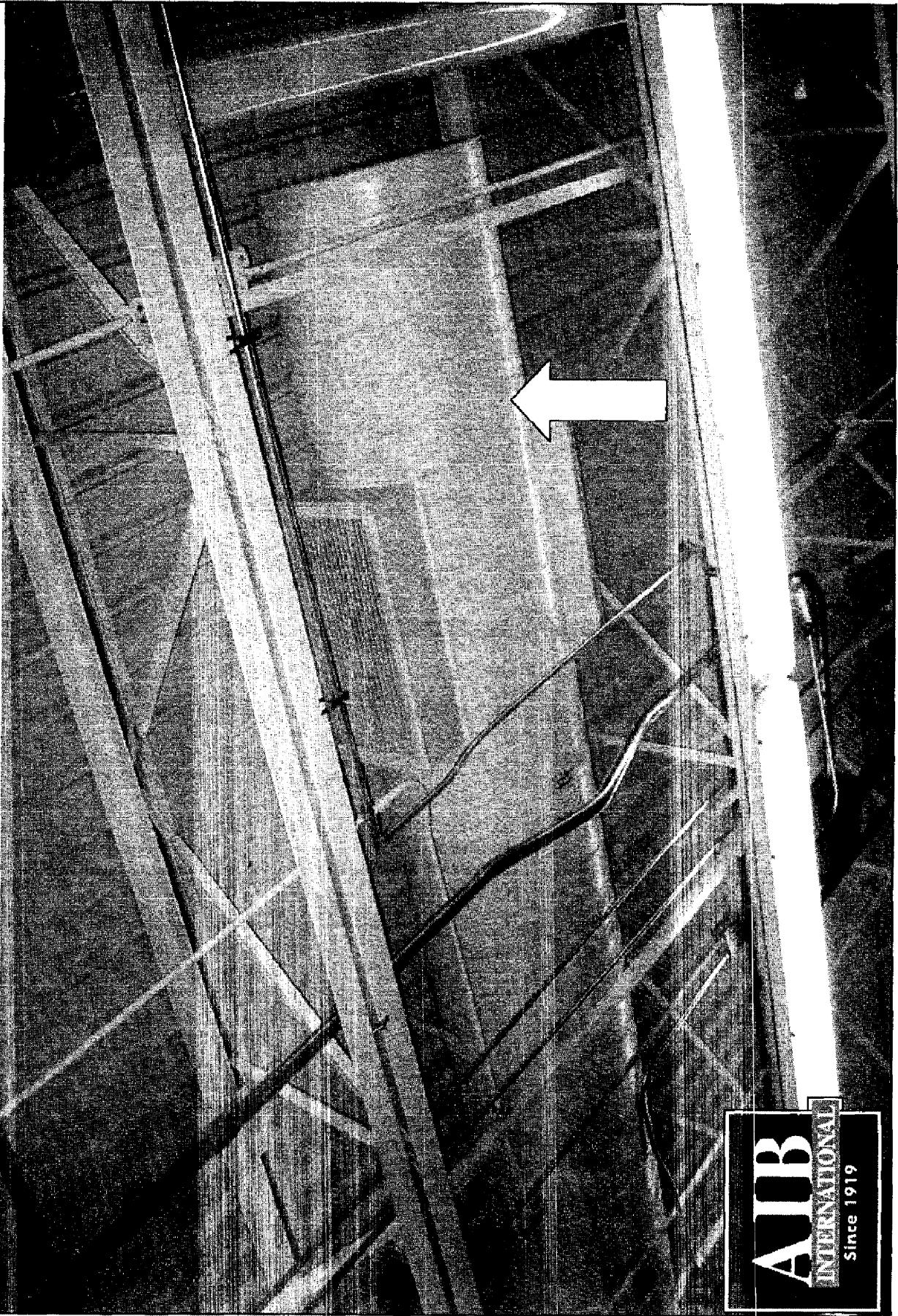
Trash Can



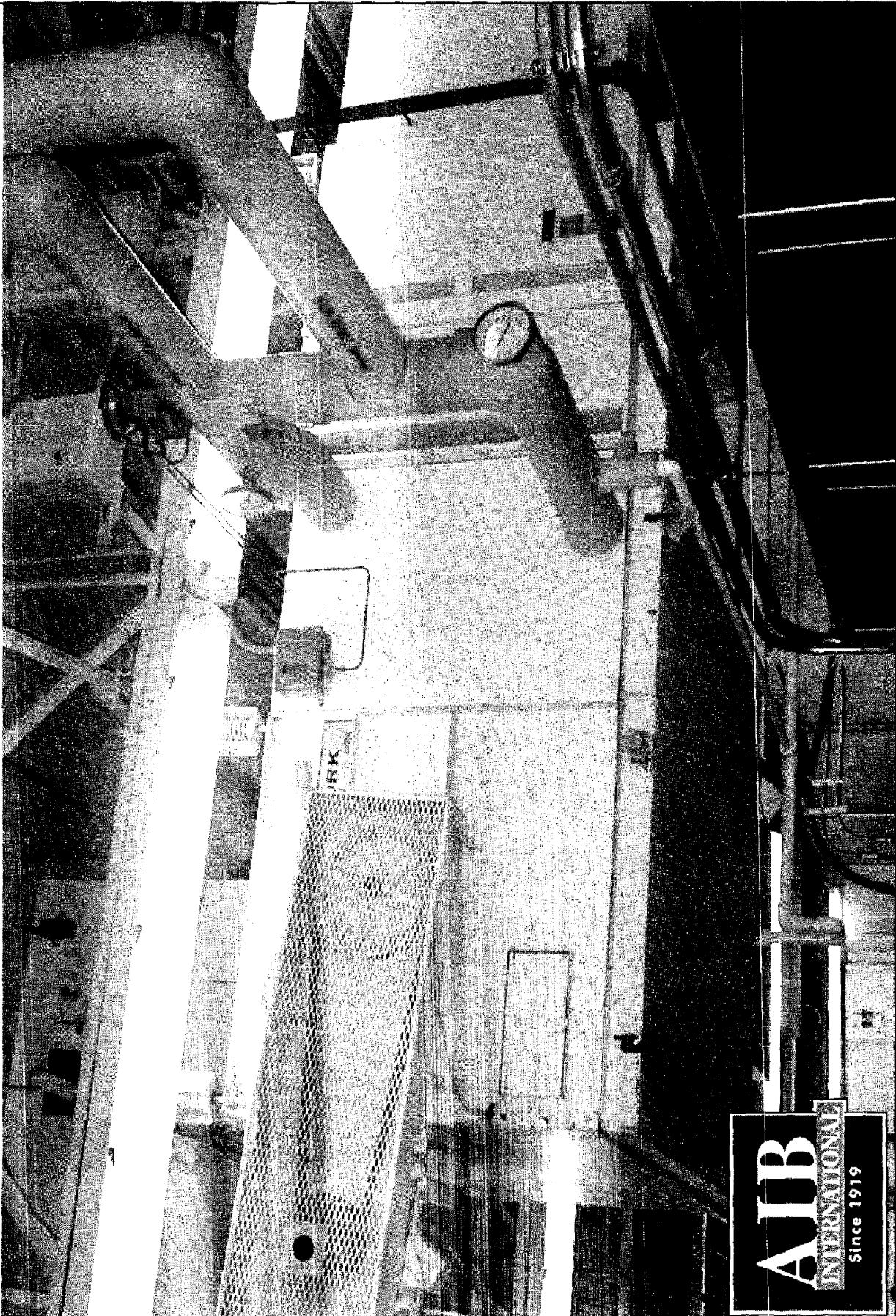
## Cleaning Brushes



## Ventilation Duct Work



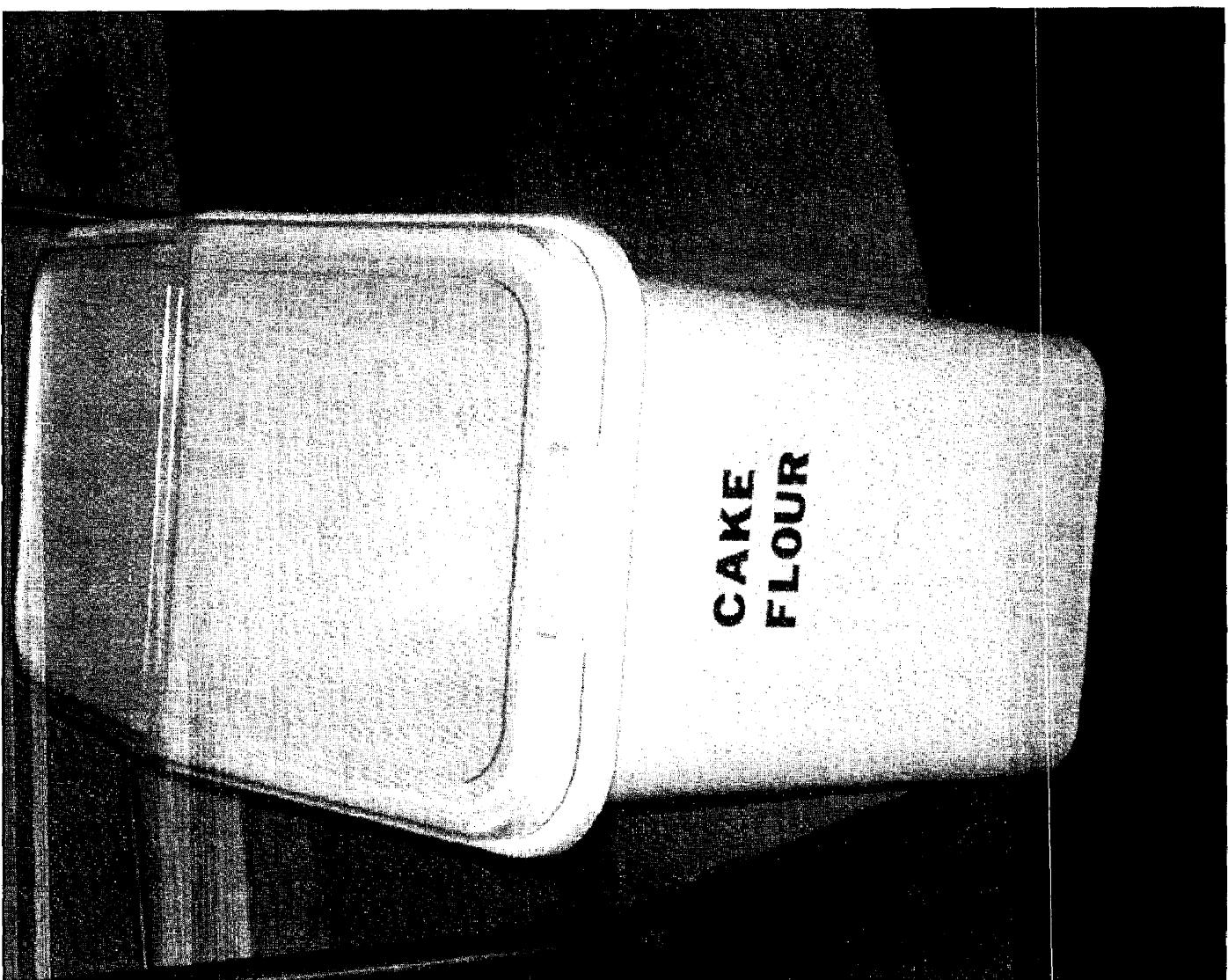
## Air Handling System



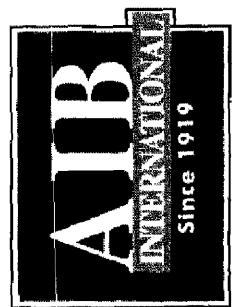
**AIB**  
INTERNATIONAL  
Since 1919

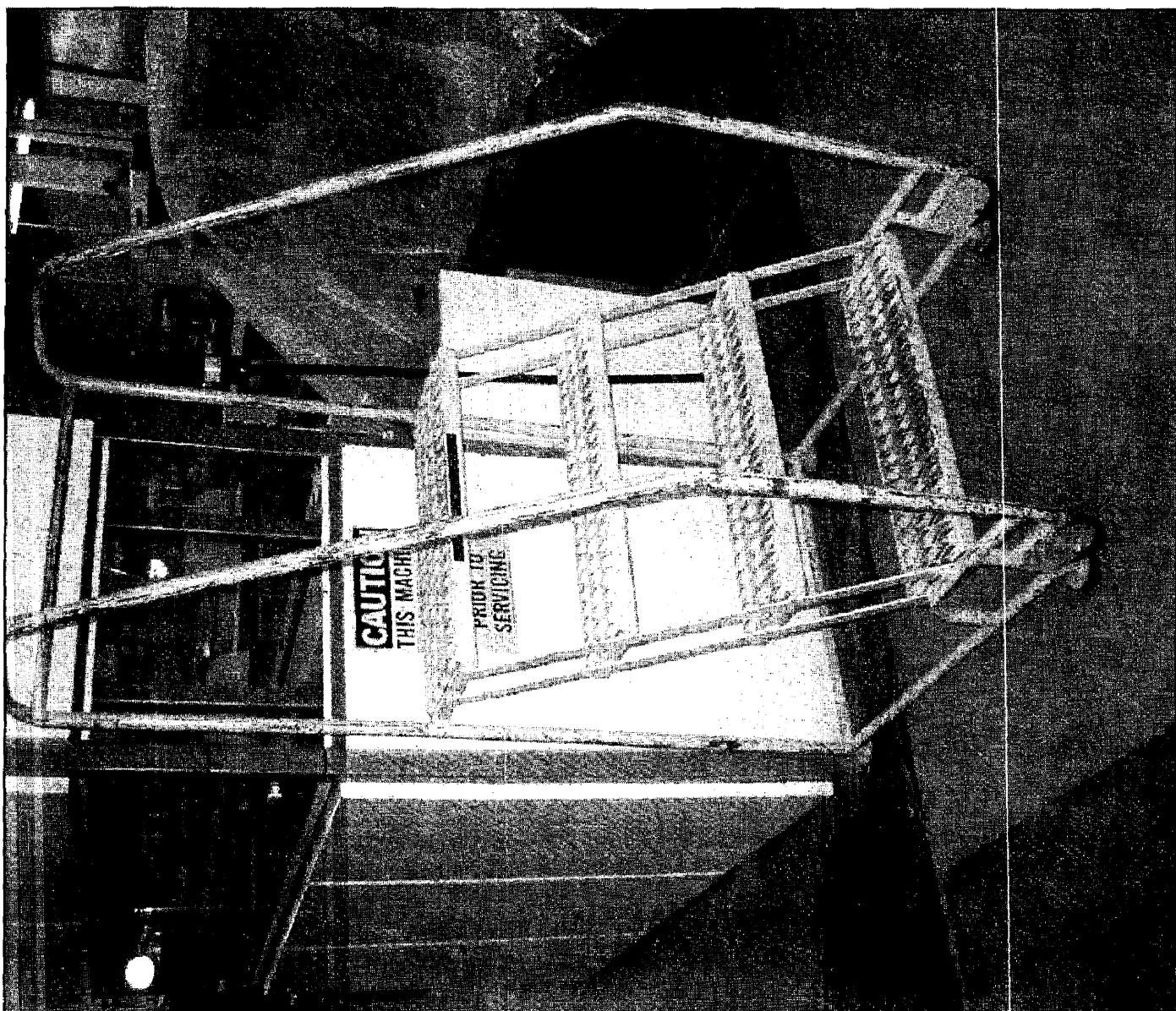
## Hand Washing Sink





## Ingredient Container



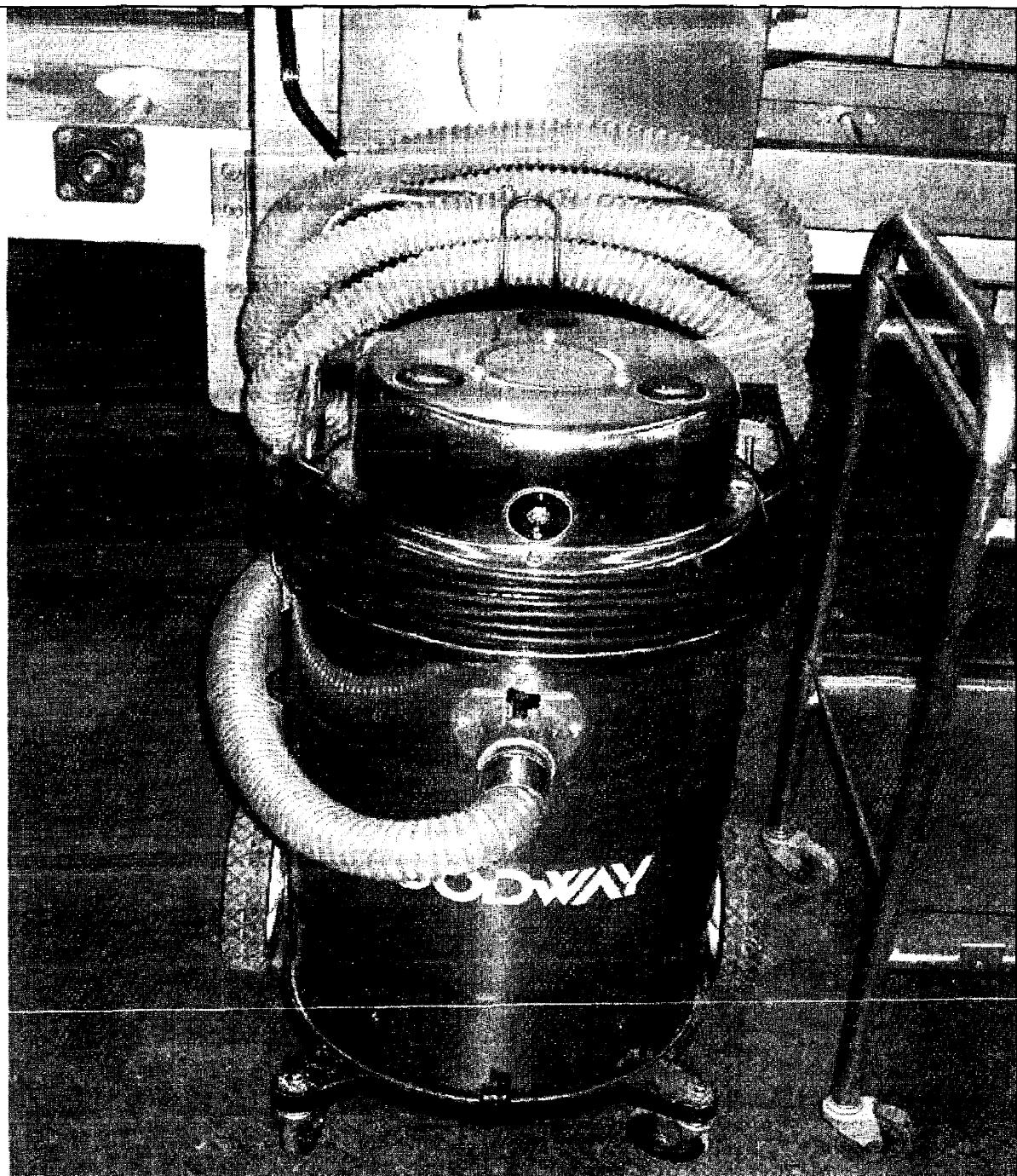


## Step Ladder





## Vacuum Cleaner



55807 6653

# Appendices

## **APPENDIX I**

### **SOIL IDENTIFICATION CHART CAUSES - REMOVAL - PREVENTION**

## SOIL IDENTIFICATION CHART

FILM/DEPOSIT	DESCRIPTION OR IDENTIFICATION	CAUSE	REMOVAL	PREVENTION
Protein	Blue rainbow hue, varnish-like "apple sauce"	1. Inadequate post-rinse 2. Using inadequate cleaner 3. Improper cleaning 4. Too weak detergent solution 5. Excessive water temperature	1. Initial cleanup with a chlorinated alkaline detergent at higher concentration 2. Acid wash	1. Proper pre-rinse temperature 2. Adequate pre-rinse 3. Use of chlorinated alkaline detergent
Milkstone, Vegetable stone or Beerstone	White to yellow	1. Minerals from milk 2. Minerals from vegetables 3. Minerals from beer	1. Initial cleanup with a chelated alkaline detergent 2. Acid wash	1. Regular cleaning with proper cleaning procedures and products 2. Acid rinse
Fat or Grease	Hanging water droplets Greasy (white appearance) Oil	1. Inadequate post-rinse 2. Inadequate rinse or detergent application temperature 3. Regular use of acid cleaners in place of alkaline detergents	Initial cleanup with alkaline detergent	1. Proper detergent selection 2. Correct temperature selection
Mineral Scale	White, chalky to gray	1. Improper rinsing 2. Drop-out of minerals from water supply 3. No acidified rinse 4. Non-compatible alkaline detergent 5. Improper water temperature	Acid wash	1. Use of products with good water hardness compatibility 2. Proper water temperature 3. Water softner or treatment 4. Final rinse with an acidic product

05a.I.Soil Identification Chart #1

## SOIL IDENTIFICATION CHART

FILM/DEPOSIT	DESCRIPTION OR IDENTIFICATION	CAUSE	REMOVAL	PREVENTION
Iron	Red to brown/black	1. Iron in water supply 2. Iron from system components 3. Improper use of chlorine (cleaner or sanitizer)	Acid Wash	1. Regular effective acid temperature 2. Water treatment 3. Proper selection of cleaners and sanitizers
Silica	White to gray glazed appearance	1. Use of a mechanical cleaner for a manual cleaning 2. Poor rinsing 3. Water supply 4. Failure to manually clean outside surfaces of equipment cleaned inside mechanically	Special acid wash	1. Complete post-rinse 2. Regular effective acid rinse 3. Water treatment 4. Manually clean outside surfaces of equipment cleaned inside mechanically
Wetting Agent	Bluish haze	Poor or inadequate rinsing	Initial cleaning	1. Complete rinsing 2. Proper selection of cleaners
Corrosion	Rust, pitting, oxidation	1. Iron, trapped metal particles 2. Improper chemical selection or usage	1. Acid wash and abrasive action 2. Repolishing (buffing) if excessive corrosion - repassivation	1. Proper cleaning procedures and products 2. Passivating acid rinse
Etching	Pitting and white discoloration "imbedded" in stainless steel surfaces	Misuse of chlorinated detergents	1. Repolish the surface 2. Repassivation	1. Proper cleaning procedures and products 2. Passivating acid rinse

05a.l. Soil Identification Chart #2

## **APPENDIX II**

### **AIB CONSOLIDATED STANDARDS FOR FOOD SAFETY**

### **INTERPRETATION OF MASTER CLEANING SCHEDULE**

**&**

### **REFERENCES**

**AIB CONSOLIDATED STANDARDS FOR FOOD SAFETY (CSFS)  
MASTER CLEANING SCHEDULE (MCS)  
(Documentation Needed for Review - Item #4)**

**AIB STANDARD (I.E.)**

A Master Cleaning Schedule (MCS) for periodic cleaning assignments and a daily housekeeping schedule **shall** be undertaken as a formalized, written plan. It must specify frequency, responsibility, and post-cleaning evaluation and **shall** be up to date. This schedule should include the outside grounds, building, drains, utensils, and equipment, including refrigeration equipment.

The cleaning tasks should be divided into three general areas and included on the appropriate schedule:

<b>Type of Task</b>	<b>Appropriate Schedule</b>
Periodic deep cleaning tasks performed other than daily	Master Cleaning Schedule
Maintenance cleaning	Master Cleaning Schedule
Daily "housekeeping" tasks	Housekeeping Schedule

**DISCUSSION**

Keep in mind that the MCS does not necessarily have to conform to the suggested examples. However, it should be in a relatively easy to understand format. The MCS in its most effective design easily allows supervision to recognize which jobs have been completed and what work remains to be done. This can be very difficult to ascertain in systems that only list the jobs being performed and completed without these being associated with all scheduled tasks assigned within a specific time frame. However, in a small warehouse where only a few tasks would be required, even this type of documentation would work.

With numerous computer database programs and spreadsheets available, there are many options. If the system appears to be working for the plant, the person in charge can explain it, and the audit observations support it, then the system should be considered to be effective.

**A. Master Cleaning Schedule**

1. The MCS should include all equipment and structures, such as overheads, walls, lights, outside areas, bulk receiving areas, compactor area, trash cans, under dock leveler plates, catwalks, safety cages, interior of bulk silos, sifters, utensils, bins, etc.
2. The cleaning frequency, target date, and responsibility should be defined for each task. Schedules should be on file and up to date.
3. Completion of tasks and post-cleaning evaluation should be documented. This evaluation could be conducted by visual inspection and/or rapid method test kits for residues/microbes. Preoperational inspection of the lines can also be conducted for post-cleaning evaluation. It is

recommended that both the supervisor and employee sign off for the satisfactory completion of the items listed on the MCS.

**B. Detailed/Deep Cleaning**

1. The use of air hoses for cleaning is permitted only for inaccessible equipment and in conjunction with detailed cleaning. The preferred methods of dry cleaning are vacuuming and sweeping.
2. Cleaning activities should be carried out in compliance with applicable safety laws and regulations and according to formally established equipment cleaning procedures ([Link to CSFS I.F.](#)). Following all regulations and procedures, all equipment guards, trims, and panels should be removed for inspection and cleaning of the interior of all equipment according to the MCS.
3. Equipment and structural "overheads", such as lights, pipes, beams, vent grids, etc., should be scheduled for detailed cleaning according to the MCS to prevent the development of insects, mold, or accumulation of foreign material.

**C. Maintenance Cleaning**

1. Non-sealed electrical panels and boxes shall be cleaned and/or inspected every four weeks to disrupt the life cycle of stored product insects. The life cycle (egg, larva, pupa, and adult) is 21-28 days for most stored product insects, and this life cycle must be interrupted to prevent a potential pest problem.
2. Maintenance debris created during repairs or alterations shall be promptly removed. Emphasis shall be directed to full accounting of nuts, bolts, washers, wire pieces, tape, welding rods, and other small items that can readily contaminate food.
3. Grease smears and excess lubricant shall be promptly removed from equipment.
4. Only clean tools and wipers shall be used on product zones, and maintenance personnel shall observe proper hygienic practices when working on product zones or similar equipment. The use of wire brushes or sponges on product zones or areas shall be prohibited.

**D. Daily Housekeeping/Cosmetic Cleaning**

1. Daily housekeeping assignments should be undertaken to ensure work and support areas are maintained during normal working hours. This program can take the form of a list of daily housekeeping activities that is communicated to employees. It is not required that documentation be maintained of the completion of the daily tasks. However, many companies find it beneficial to monitor and document these activities through the daily self-inspection program ([Link to CSFS I.C.](#))

**E. Post-Cleaning Evaluation**

1. Post-cleaning evaluation can range from a visual inspection of the equipment after cleaning to check for visible residual food particles, brush bristles, and maintenance debris to swabs for protein residues, organic materials, and bacteria. The degree of evaluation needed to ensure a safe environment for food processing will be influenced largely by the inherent food safety risks of the products being produced in the plant.
2. Quick tests for potential biological residuals are available in the form of ATP (adenosine triphosphate) or bioluminescence test swabs. ATP is an amorphous ester that plays a role in most biological processes that require or produce energy. ATP is present in the cells of nearly all living organisms. The presence of ATP is equivalent to the presence of biological soil. Bioluminescence is measured using a luminometer to determine the amount of ATP on a surface. The light is created when the enzyme luciferase comes in contact with ATP.
3. Allergen risks may require scheduled validation of the cleaning procedure effectiveness through ELISA swabs for residual proteins. Test kits that give a reading in 30 minutes are currently available for peanuts, eggs, casein, and whey. Swabs for plating for microorganisms may be included in the post-cleaning evaluation; however, since the results are not immediately available, the program will most likely be included with the microbiological sampling program (Link to CSFS I.T). Preoperative inspection checklists or MCS are most often used to document the post-cleaning evaluation inspections.

## **FORMS, LETTERS, POLICIES**

ABC Everyday Bread Company Daily Sanitation Audit Form ([Link](#))  
AIB MCS FORM ([Link](#))  
Order MCS Form from AIB -(Explain How and [Link](#))  
[MCS Example 1](#) ([Link](#))  
[MCS Example 2](#) ([Link](#))

## **REFERENCES**

Cleaning Frequencies from AIB Basic Food Plant Sanitation Manual Pages 206 through 208 ([Link](#))

AIB Food Processing Sanitation/Hygiene Correspondence Course Lesson 3 ([Link](#))

Bioluminescence Information:

International Food Information Service [www.ifis.org/index.html](http://www.ifis.org/index.html)  
<http://www.chem.msu.su:8081/eng/journals/vmgu/00add/27.pdf>

Food Quality Magazine: Light Up Your Plant March 1997  
<http://www.foodquality.com/liteplt2.htm>

**Food Quality Magazine: Investing in Sanitation: A Clear Priority**  
<http://www.foodquality.com/investng.html>

**Food Allergen Testing Information:**

**Food Allergy Research and Resource Program (FARRP)**  
<http://www.foodsci.unl.edu.farrp/whatsarp.htm>

**Detection of Food Allergens**  
[http://www.ift.org/publications/docshop/ft\\_shop/09-01/09\\_01pdfs/09-01-p&t-lab.pdf](http://www.ift.org/publications/docshop/ft_shop/09-01/09_01pdfs/09-01-p&t-lab.pdf)

## **APPENDIX III**

## **MASTER CLEANING SCHEDULE TEMPLATE**

## **MASTER CLEANING SCHEDULE (TASKS OTHER THAN DAILY)**

**DATES / INSERT DATES, WEEKS BY NUMBER, OR PERIODS**



## **APPENDIX IV**

### **EXAMPLES OF CLEANING FREQUENCIES**

## CLEANING FREQUENCIES

### EQUIPMENT HOUSEKEEPING

Equipment	Frequency
Conventional Flour Handling Equipment	Every three weeks
Bulk Flour Equipment - All Pneumatic	Every four weeks (under controlled conditions - 6 weeks)
Sifters	Weekly
Mixers - Horizontal	Product zone - Daily Scrape and wash at least weekly, preferably daily Water inlets - Daily Housings - Weekly
Mixers - Vertical	Product zone - Daily Housings - Weekly
Water Coolers - nonsealed chilled water tanks	Weekly
Water Coolers - Drinking Fountains	Four weeks
Yeast Emulsifiers	Daily
Ingrediators or Pre-Mixers	Daily
Ingredient Containers	Dry- 3 weeks Wet - Daily
Syrup or Liquid Sugar Storage Tanks	Permanent - 6-12 Months Portable - Weekly
Fermentation Room	Floor - Daily Walls - Weekly Top - 4 weeks
Troughs	Inside - Daily Outside - 3 weeks
Humidifiers	Pot-type - Weekly Recirculated - Weekly Ducts - 4 weeks
Dough Chutes	Product zone - Daily Housings - Weekly
Dividers	Product zone - Daily Housings - Weekly

Taken from the:  
AIB Basic Food Plant Sanitation Manual  
pp 206-208

<b>Equipment</b>	<b>Frequency</b>
Depositors	Product zone - Daily Housings - Weekly
Rounders	Product zone - Daily Housings - Weekly
Moulder	Product zone - Daily Housings - Weekly
Dusting Hoppers	Weekly
Overhead Proofers	Fabric sleeves laundered - 3-6 weeks Pockets, Structures - 3 weeks
Proof Box	Floors - Daily Walls - Weekly Top - 4 weeks
Duct Systems	4 weeks
Ovens	Interior - Weekly Tops - 4 weeks
Bread Coolers	Interior - Daily Trays - 4 weeks Top - 4 weeks
Refrigerators or Walk-in Coolers	Weekly
Bakery pans	Cake - Daily Bread - Sufficiently often so that carbonized material does not flake off into bread Pie - Daily Sweet Goods - Daily
Icing Trays	Daily
Rye Boards	Weekly
Wrappers	Daily 4 weeks - thorough cleaning with solvent

Taken from the:  
AIB Basic Food Plant Sanitation Manual  
pp 206-208

## **STRUCTURAL HOUSEKEEPING**

<b>Item</b>	<b>Area</b>	<b>Frequency</b>
Floors	Flour Storage	Weekly
Floors	Other Storage	Weekly
Floors	Production	Daily
Floors	Locker Room & Toilets	Daily
Floors	Shipping	Daily
Floors	Garage	Weekly
Scale Pits	Receiving	4 weeks
Scale Pits	Production	2 weeks
Elevator Pits	All	4 weeks if dry 2 weeks if damp or wet
Pipes & Overhead	Flour Dust Areas	Every 3 weeks
Structures	Other	Every 6 weeks
Walls	Dusty Areas	Rough walls every 3 weeks - others as needed
Floors Drains	All	Weekly
Sump Pits	All	4 weeks
Windows	Dusty Areas	Dry cleaned every 3 weeks. Glass cleaned as needed
Electrical Fixtures	All	4 weeks
Ceilings	All	As needed
Lockers	All	4 weeks

Taken from the:  
AIB Basic Food Plant Sanitation Manual  
pp 206-208

**APPENDIX V**

**EXAMPLES OF**

**MASTER CLEANING SCHEDULES**

Second Shift

## MASTER CLEANING SCHEDULE

Associate Name: \_\_\_\_\_

Month of: \_\_\_\_\_

WEEKLY OR AS NEEDED	1st Week						2nd Week						3rd Week						4th Week						5th Week						
	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F	S	
1 Mop downstairs breakroom floors																															
2 Mop downstairs driver area restroom																															
3 Mop downstairs associate restroom																															
4 Mop upstairs breakroom																															
5 Mop upstairs locker room																															
6 Mop QA area (office and restroom)																															
7 Inside dock doors (front side)																															
8 Inside dock doors (back side)																															
9 Wipe down yellow curb/poles (front side)																															
10 Wipe down yellow curb in hallway																															
11 Wipe down yellow curb/poles (backside)																															
12 Mop Back Dock Supervisor's office																															
13 Mop L.M.S. office																															
14 Upstairs refrigerator																															
15																															
16																															
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32																															

I.E. 05e.V.MCS Example 1

# MASTER CLEANING SCHEDULE

Manager: \_\_\_\_\_

Month of: \_\_\_\_\_

	1st Week					2nd Week					3rd Week					4th Week					5th Week								
	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	F	S	M	T	W	T	F	S
<b>WEEKLY</b>																													
1	Receiving and shipping bay swept																												
2	Salvage area rotated out for cleaning																												
3	All waste food removed																												
4	No damaged stock left in storage																												
5	All waste barrels cleaned																												
6	Restroom floor, urinals, commodes cleaned																												
7	All offices/reception area mopped or vacuumed																												
8	Rotational cleaning of dock plants (list#)																												
9	All floor-wall junctions swept/list area																												
10	External perimeter of building picked up																												
11	All chemical spillage cleaned up and segregated																												
12	Roof and floor drains checked																												
13	All rodent traps checked and in good repair																												
<b>MONTHLY</b>																													
1	Record fogging or residual spray use																												
2	Bait stations cleaned																												
3	Overhead lights and fans cleaned																												
4	Air handling systems cleaned																												
5	Pressure wash tractor trailers																												
<b>PERIODIC</b>																													
1	All walls and overhead fixtures cleaned																												
2	All overhead doors cleaned																												
3	Upper level racks cleaned																												
4	Repaint 18-inch border and aisle slots #																												
5	Refrigeration units and catch pans cleaned																												

## **ANNEX VI**

### **AIB CONSOLIDATED STANDARDS FOR FOOD SAFETY**

### **INTERPRETATION OF BUILDING AND EQUIPMENT CLEANING PROCEDURES**

**&**

### **REFERENCES**

**AIB CONSOLIDATED STANDARDS FOR FOOD SAFETY (CSFS)  
BUILDING EQUIPMENT CLEANING PROCEDURES  
(Documentation Needed for Review - Item #5)**

**AIB STANDARD (I.F.)**

Detailed equipment cleaning procedures **shall** be developed for personnel training and maintaining the hygiene level of the equipment. These written cleaning procedures **shall** be developed and utilized for cleaning all equipment used for food storage, processing and packaging and for all building areas and outside grounds.

**DISCUSSION**

Detailed, written cleaning procedures should be developed and on file for all cleaning tasks in the facility. These procedures should include the chemicals, concentrations, tools, and disassembly instructions for equipment at the level needed to facilitate the appropriate sanitation maintenance of the processing and packaging equipment, building areas, and outside grounds. The cleaning procedures should be used for employee training and reference purposes.

Only cleaning compounds and sanitizers approved for food-contact surfaces shall be used for cleaning. Verification procedures should be implemented to ensure the concentration of cleaning chemicals is consistent with the product label.

Separate and distinct cleaning utensils shall be used for cleaning food-contact surfaces (product zones) and structural cleaning (product areas). Utensils used for cleaning rest rooms, toilet fixtures, or floor drains should not be used for any other purpose. A color-coding method should be used to differentiate the utensils used for cleaning product zones, product areas, drains, and toilets. These utensils should be cleaned after use and properly stored segregated in a designated location.

Cleaning procedures generally employ the use of wet cleaning methods or dry cleaning methods:

**DRY CLEANING**

**LIFE CYCLE** – of some stored product pests is as short as 21 days (egg, larva, pupa, adult).

**OBJECTIVE** – reduces potential for contamination of food, renders surface clean by removing residues, reduces amount of bacteria.

**PROCEDURES** – Follow safety lockout procedures, disassemble, scrape, brush, vacuum, change filters, examine screens, vacuum cracks and crevices. Refer to cleaning procedures, which should be updated as needed.

**BULK EQUIPMENT PROCEDURES** – remove air relief bags, clean head space, clean bottom hatch and sides, clean air slide, install clean socks and bags, check gaskets, remove tools and close system.

**SOLVENT CLEANING** – used for nonfood-contact surface cleaning of interior machine parts, such as sprockets and gears. Use appropriate material and safety gear. Wipe off parts and surrounding areas thoroughly.

## **WET CLEANING**

### **1. PRE-RINSE**

Pre-rinse water at 110-130°F (43.3-54.4°C) removes 90% of soil

### **2. WASH**

Fundamental principle is that the chemical must modify the nature of the water so it can penetrate, dislodge, and carry away the soil. Cleaning must prevent the re-depositing of soil onto clean equipment. Time, temperature, chemical concentration, and velocity should be included in this step.

Wet cleaning procedures should follow these steps:

- a. Protect electrical, lockout equipment
- b. Flush (pre-rinse) to remove 90% of soil
- c. Disassemble parts and place in COP wash tank.
- d. Use correct chemicals, check concentration, pH test papers, etc.
- e. Maintain correct temperature
- f. Maintain correct velocity, agitation and time
- g. Drain and rinse
- h. Acid cleaner if necessary

### **3. POST-RINSE**

To remove soil and detergent residues

### **4. SANITIZE**

The surface must be clean to be effectively sanitized. Sanitizing is the reduction of the microbial population to levels that are judged as safe by public health agencies. The method used to reduce the microbial load is dependent on:

- a. Kinds of organisms, spores
- b. Nature of material being sanitized
- c. Concentration of sanitizer
- d. Intensity of the physical agent, high heat
- e. Contact time
- f. Temperature

## **CLEANING CHEMICAL SUPPLIERS**

Many cleaning chemical suppliers offer consulting help in developing cleaning procedures for maximum effectiveness of the chemicals they supply. Consider using these resources as needed to maximize the cleaning efforts and potentially minimize the associated costs.

## **FORMS AND PROCEDURES**

- Cleaning Procedures Example Form #1 ([Link](#))
- Cleaning Procedures Example Form #2 ([Link](#))
- CIP Cleaning Procedure Example 1 ([Link](#))

## **REFERENCES**

- Food Processing Sanitation/Hygiene Correspondence Course Lesson 3 ([Link](#))
- Food Processing Sanitation/Hygiene Correspondence Course Lesson 13 ([Link](#))
- CIP Procedure ([Link to CSFS V.B.](#))
- Soil Identification Chart #1 ([Link](#))
- Soil Identification Chart #2 ([Link](#))

## **APPENDIX VII**

### **CLEANING PROCEDURES TEMPLATES**

Equipment to Clean:		AREA / EQUIPMENT PROCEDURES	
		CLEANING PROCEDURES	PROCEDURE #
EQUIPMENT CLEANING PROCEDURES			
<b>Products:</b>	<b>Ratio:</b>		
<b>Rinse Temperature:</b>			
<b>Application Equipment:</b>			
<b>Rinsing Equipment:</b>			
<b>Frequency:</b> Weekly			
<b>Required Safety Equipment:</b>			
Boots			
Gloves			
Rain Suit			
Goggles			
Respirator			
<b>Personnel Assigned:</b>			
		<b>Critical Areas to Check:</b>	
<b>Time Required to Clean:</b>			

**PRODUCTION AREA CLEANING PROCEDURES**

EQUIPMENT CLEANING PROCEDURE		PROCEDURE #	
Equipment to be Cleaned		Rinsing Temperature	None
Personnel Assigned		Required Safety Equipment	Boots Gloves Rain Suit Goggles
Frequency			Time Needed
Chemical Name	Ratio	Chemical Name	Ratio

## **APPENDIX VIII**

### **CLEANING PROCEDURES EXAMPLES**

<b>Equipment to Clean:</b>		<b>AREA / EQUIPMENT PROCEDURES</b>	
		<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
<b>EQUIPMENT CLEANING PROCEDURES</b>			
<b>Products:</b>	<b>Ratio:</b>		
<b>Rinse Temperature:</b>			
<b>Application Equipment:</b>			
<b>Rinsing Equipment:</b>			
<b>Frequency: Weekly</b>			
<b>Required Safety Equipment:</b>			
<b>Boots</b>			
<b>Gloves</b>			
<b>Rain Suit</b>			
<b>Goggles</b>			
<b>Respirator</b>			
<b>Personnel Assigned:</b>			
<b>Critical Areas to Check:</b>			
<b>Time Required to Clean:</b>			

**PRODUCTION AREA CLEANING PROCEDURES**

EQUIPMENT CLEANING PROCEDURE		PROCEDURE #		
<b>Equipment to be Cleaned</b>		Rinsing Temperature		
<b>Personnel Assigned</b>		Required Safety Equipment	Boots	Gloves
<b>Frequency</b>		Time Needed	Rain Suit	Goggles
Chemical Name	Ratio	Chemical Name	Ratio	Application Equipment

<b>Equipment to Clean:</b>		
Stairway to Packaging Mezzanine		
<b>Products:</b>	<b>Ratio:</b>	
ABC Cleaner	3 oz/gal	
<b>Rinse Temperature:</b>		
N/A		
<b>Application Equipment:</b>		
Water bucket, wet and dry cleaning brush, rag, scrub pad wet mop and bucket, Wet Floor Signs		
<b>Rinsing Equipment:</b>		
<b>Frequency:</b> Weekly		
<b>Required Safety Equipment:</b>		
Boots		
Gloves	YES	
Rain Suit		
Goggles	YES	
Respirator		
<b>Personnel Assigned:</b>		
2nd shift Sanitation		
<b>Time Required to Clean:</b>		
20 minutes		

<b>AREA / EQUIPMENT PROCEDURES</b>	
<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
	A376
<b>EQUIPMENT CLEANING PROCEDURES</b>	
<b>Critical Areas to Check:</b>	

<b>Equipment to Clean:</b>	
Stairway to Packaging Mezzanine	
<b>Products:</b>	<b>Ratio:</b>
ABC Cleaner	3 oz/gal
<b>Rinse Temperature:</b>	
N/A	
<b>Application Equipment:</b>	
Water bucket, wet and dry cleaning brush, rag, scrub pad, wet mop and bucket, Wet Floor Signs	
<b>Rinsing Equipment:</b>	
<b>Frequency:</b> Weekly	
<b>Required Safety Equipment:</b>	
Boots	
Gloves	YES

<b>AREA / EQUIPMENT PROCEDURES</b>	
<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
<b>EQUIPMENT CLEANING PROCEDURES</b>	
1.0 Get the Wet Floor signs and cleaning material from the Sanitation storage room	
2.0 Place the "Wet Floor" signs at the top and bottom of stairs so they can be easily seen.	
3.0 Beginning at top of stairs, dry brush the stairs to remove loose product residue. Pick up material and place in trash bin.	
4.0 Wearing gloves and goggles, mix 3 oz ABC cleaner in one gallon warm water.	
5.0 Apply cleaning solution to stairs using brush or scrub pad to remove visible dirt. Wipe stairs with cloth rag to remove residue and cleaner	
6.0 Fill mop bucket with clear warm water.	
7.0 Wet mop head with water in the bucket and rinse excess water with ringer.	
8. Remove all water and detergent from floor around and beneath the stairs.	

Rain Suit	
Goggles	YES
Respirator	
<b>Personnel Assigned:</b>	
2nd shift Sanitation	
<b>Time Required to Clean:</b>	
20 minutes	

**Critical Areas to Check:**

<b>Equipment to Clean:</b>	
Stairway to Packaging Mezzanine	
<b>Products:</b>	<b>Ratio:</b>
ABC Cleaner	3 oz/gal
<b>Rinse Temperature:</b>	
N/A	
<b>Application Equipment:</b>	
Water bucket, wet and dry cleaning brush, rag, scrub pad, wet mop and bucket, Wet Floor Signs	
<b>Rinsing Equipment:</b>	
<b>Frequency:</b> Weekly	

<b>AREA / EQUIPMENT PROCEDURES</b>	
<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
<b>EQUIPMENT CLEANING PROCEDURES</b>	
<p>1.0 Get the Wet Floor signs and cleaning material from the Sanitation storage room</p> <p>2.0 Place the "Wet Floor" signs at the top and bottom of stairs so they can be easily seen.</p> <p>3.0 Beginning at top of stairs, dry-brush the stairs to remove loose product residue. Pick up material and place in trash bin.</p> <p>4.0 Wearing gloves and goggles, mix 3 oz ABC cleaner in one gallon warm water.</p> <p>5.0 Apply cleaning solution to stairs using brush or scrub pad to remove visible dirt.</p> <p>Wipe stairs with cloth rag to remove residue and cleaner</p> <p>6.0 Fill mop bucket with clear warm water.</p> <p>7.0 Wet mop head with water in the bucket and rinse excess water with ringer.</p> <p>8. Remove all water and detergent from floor around and beneath the stairs.</p> <p>9. Leave Wet Floor signs in-place until floor and stairs have dried to touch. Once dry, remove signs and return them to sanitation room.</p> <p>10. Return all equipment to sanitation room. Rinse all cleaning equipment with clean warm water and hang to dry on racks provided.</p> <p>11. Complete task paperwork and turn it in to supervisor at end of shift.</p>	

<b>Required Safety Equipment:</b>	
Boots	
Gloves	YES
Rain Suit	
Goggles	YES
Respirator	
<b>Personnel Assigned:</b>	
2nd shift Sanitation	
<b>Time Required to Clean:</b>	
20 minutes	

**Critical Areas to Check:**

<b>Equipment to Clean:</b>	
Stairway to Packaging Mezzanine	
<b>Products:</b>	<b>Ratio:</b>
ABC Cleaner	3 oz/gal
<b>Rinse Temperature:</b>	
N/A	
<b>Application Equipment:</b>	
Water bucket, wet and dry cleaning brush, rag, scrub pad, wet mop and bucket, Wet Floor Signs	
<b>Rinsing Equipment:</b>	
<b>Frequency:</b> Weekly	

<b>AREA / EQUIPMENT PROCEDURES</b>	
<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
<b>EQUIPMENT CLEANING PROCEDURES</b>	
<p>1.0 Get the Wet Floor signs and cleaning material from the Sanitation storage room</p> <p>2.0 Place the "Wet Floor" signs at the top and bottom of stairs so they can be easily seen.</p> <p>3.0 Beginning at top of stairs, dry-brush the stairs to remove loose product residue. Pick up material and place in trash bin.</p> <p>4.0 Wearing gloves and goggles, mix 3 oz ABC cleaner in one gallon warm water.</p> <p>5.0 Apply cleaning solution to stairs using brush or scrub pad to remove visible dirt.</p> <p>Wipe stairs with cloth rag to remove residue and cleaner</p> <p>6.0 Fill mop bucket with clear warm water.</p> <p>7.0 Wet mop head with water in the bucket and rinse excess water with ringer.</p> <p>8. Remove all water and detergent from floor around and beneath the stairs.</p> <p>9. Leave Wet Floor signs in-place until floor and stairs have dried to touch. Once dry, remove signs and return them to sanitation room.</p> <p>10. Return all equipment to sanitation room. Rinse all cleaning equipment with clean warm water and hang to dry on racks provided.</p> <p>11. Complete task paperwork and turn it in to supervisor at end of shift.</p>	

<b>Required Safety Equipment:</b>	
Boots	
Gloves	YES
Rain Suit	
Goggles	YES
Respirator	
<b>Personnel Assigned:</b>	
2nd shift Sanitation	
<b>Time Required to Clean:</b>	
20 minutes	

**Critical Areas to Check:** Check to make sure stairs are dry before removing Wet Floor signs.

**APPENDIX IX**

**CHEMICAL CONCENTRATION  
VERIFICATION CHART**

## **Chemical Concentration Verification Chart**

**APPENDIX X**

**EXAMPLE**

**DAILY SANITATION AUDIT FORM**

**ABC EVERYDAY BREAD CO.**  
**Daily Sanitation Audit Form**

<b>Sanitation Condition</b>	<b>Time Pre-Op Pass/Fail</b>	<b>Time Pass/Fail</b>	<b>Time Pass/Fail</b>	<b>Comments/Corrections</b>
	-----	-----	-----	
1. Equipment cleaning and sanitizing				
a. Equipment cleaned and sanitized before startup				
b. Product residue removed from equipment during breaks				
c. Ready-to-eat product equipment cleaned and sanitized equipment (ppm)				
d. Concentration of chlorine used for sanitizing equipment (ppm)				
2. Employee attire				
a. Gloves and aprons clean and in good repair				
3. Cross-contamination				
a. Employees' hands, gloves, equipment, and utensils that contact unsanitary objects are washed and sanitized before contacting product				
b. Employees on raw side wash and sanitize hands, gloves, and aprons before moving to cooked side.				
4. Hand washing and sanitizing facilities				
a. Adequate supplies				
b. Concentration of iodine in hand dips (ppm)				
Front entrance				
Rear entrance				
Side entrance				
Start of line 1				
End of line 1				
Start of line 2				
End of line 2				
Firm Name:	Address:			
Date:	Supervisor/Technician:			

**ABC EVERYDAY BREAD CO.**  
**Daily Sanitation Audit Form**

<b>Sanitation Condition</b>	Time _____ <b>Pre-Op Pass/Fail</b>	Time _____ <b>Pass/Fail</b>	Time _____ <b>Pass/Fail</b>	<b>Comments/Corrections</b>
5. Protection from adulterants				
a. Cleaning compounds labeled and stored properly				
b. Lubricants labeled and stored properly				
c. Pesticides labeled and stored properly				
d. Product protected from condensate				
e. Product protected from floor splash				
6. Cooler storage				
a. Unpackaged, cooked product separated from a raw product				
7. Employee health				
a. Employees do not show signs of medical problems that could compromise product				
8. Toilet facilities				
a. Toilets are clean and properly functioning				
9. Pests				
a. No pests in the processing area				
Firm Name: _____	Address: _____			
Date: _____	Supervisor/Technician: _____			

## **APPENDIX XI**

### **AIB CONSOLIDATED STANDARDS FOR FOOD SAFETY DOCUMENTED PROCEDURES/TESTING OF CIP SYSTEMS AND OTHER CLEANING CHEMICALS**

**AIB CONSOLIDATED STANDARDS FOR FOOD SAFETY (CSFS)  
DOCUMENTED PROCEDURES/TESTING OF CIP SYSTEMS AND  
OTHER CLEANING CHEMICALS**  
**(Documentation Needed for Review - Item #32)**

**AIB STANDARD: (V.B)**

Only cleaning compounds and sanitizers authorized for food contact surfaces shall be used for cleaning. Appropriate verification procedures or testing shall be done periodically to ensure that the concentration of CIP and other cleaning chemicals are consistent with the product labeling.

**DISCUSSION**

The following dialogue covers the essentials of CIP systems found in dairies. These are the most sophisticated and necessarily so. However, CIP cleaning can be found with products having less risk and cleaning more associated with quality, such as, the cleaning of bakery brew equipment, the cleaning of crème yeast tanks, cleaning of juice manufacturing equipment, and similar types of tank, line, and enclosed system cleaning. The companies providing these systems usually have well defined cleaning procedures that the facilities using them should have on file and follow.

The CIP system shall be maintained and monitored to ensure the cleaning of the internal pipes and pumps are maintained. The CIP system should have properly calibrated thermometers and recording devices. Documentation of the calibration of these items should be maintained on file for review. The facility also should have separate or dedicated lines for the CIP system. Having different size connection lines or a color coding system could help in eliminating cross contamination between the CIP lines and the actual production lines. The employees who are responsible for the operation of the system need to be trained on not only the operation of the system but also what type of issues can result from improper operation of the system.

**TRAINING**

All employees who work need to be trained on chemical usage and equipment operation to ensure the CIP system not only works properly but is properly maintained. The CIP lines should be inspected for damage to ensure all lines are completely cleaned. The spray balls should also be inspected to ensure they are clean and free from materials such as gasket materials undissolved soap or chemicals. The gaskets and pumps should also be inspected to ensure the impellers and gaskets are in good condition. The impellers if damaged could result in metal contamination. The gaskets could also crack and deteriorate and plug the small holes of the spray balls, which would not allow for complete and proper cleaning of the lines and tanks that are to be cleaned. Chemical training should also be conducted with the employees to ensure the right chemical is used as well as the right concentration. Some CIP systems depending on the equipment to be cleaned also require specific temperatures and times that must be maintained. Although not part of the CIP system but very important in ensuring the equipment has been properly cleaned is a Bioluminescence monitoring unit which could be very beneficial to check the effectiveness of the cleaning. The equipment should be swabbed focusing on the food contact surfaces.

## **PROCEDURE**

It is required that the CIP system be monitored and maintained to ensure the facility can be properly cleaned. A color-coding system should be developed to differentiate process lines from CIP lines. Thermometers as well as other monitoring devices such as indicating charts should also be utilized to ensure proper time and temperatures are maintained. A complete inspection of the CIP system should be developed and implemented to ensure any damage is noted and that connections are properly installed. The chemical solutions used in the system should also be checked for proper concentration as well as temperatures. The gaskets should be inspected to identify any cracking or deterioration. Once the connections and monitoring devices have been put in place the system shall be operated and monitored by a trained employee. Once the equipment and lines have been cleaned the entire system shall be inspected to ensure the equipment has been properly sanitized. Swab tests as well as Bioluminescence testing could assist in verifying the cleaning.

## **ISSUES THAT CAN CONTRIBUTE TO INEFFECTIVE CIP CLEANING**

1. Plugged up spray balls
2. Damaged pipes or tanks where cleaning solution does not reach all areas.
3. Monitoring devices such as thermometers and charts not calibrated.
4. Inadequately trained employees
5. Cleaning solutions not at the right concentrations.
6. Leaks on equipment such as pumps and connections.
7. Dry cleaning solutions not completely dissolved
8. Deteriorated gaskets that can result in leaks.
9. CIP pressure equipment not adequate

## **CHEMICAL SOLUTION CONCENTRATION VERIFICATION**

In order to ensure that all chemicals used for cleaning and sanitizing food processing equipment are mixed at the proper concentration, it is necessary to follow the label directions. Samples of the cleaners and sanitizers solutions should be routinely tested for concentration. Some analyses will be conducted using titration. Color change test strips are available for testing chlorine, quaternary ammonium compounds, and iodine sanitizers. These test strips are usually available from the chemical supply company. Since sanitizers require a rinse with potable water if they exceed the limit concentration and are less effective at lower concentrations, verification of the solution strength is a key component of the food safety program.

## **FORMS AND PROCEDURES**

- [Chemical Concentration Verification Chart \(Link\)](#)
- [CIP System Chemical Sampling Procedure \(Link\)](#)
- [CIP Chart Procedure Example \(Link\)](#)

## **REFERENCES**

- [AIB Food Processing Sanitation/Hygiene Correspondence Course Lesson 13 \(Link\)](#)

## **APPENDIX XII**

### **CIP PROCEDURE EXAMPLES**

## ITEM #33

### C.I.P CLEANING SYSTEM

#### I. AIB STANDARD: (V.B)

All CIP systems **Shall** be Operational and recording thermometers and pressure sensors **Shall** be used to monitor the system. Proper CIP recording charts and records **Shall** be maintained. Separate CIP systems for raw or pasteurized products **Shall** be used. Operators of the CIP units **Shall** be properly trained in cleaning compounds, sanitizers, and the operation of the equipment.

#### II. DISCUSSION :

The following dialogue covers the essentials of Clean-in-Place (CIP) systems found in dairies. These are the most sophisticated and necessarily so. However, CIP cleaning can be found with products having less risk and cleaning more associated with quality, such as, the cleaning of bakery brew equipment, the cleaning of crème yeast tanks, cleaning of juice manufacturing equipment, and similar types of tank, line, and enclosed system cleaning. The companies providing these systems usually have well defined cleaning procedures that the facilities using them should have on file and follow.

The CIP system shall be maintained and monitored to ensure the cleaning of the internal pipes and pumps are maintained. The CIP system shall have properly calibrated thermometers and recording devices. Documentation of the calibration of these items shall be maintained on file for review. The facility **Shall** also have separate or dedicated lines for the CIP system. Having different size connection lines or a color coding system could help in eliminating cross contamination between the CIP lines and the actual production lines. The employees who are responsible for the operation of the system **Shall** be trained on not only the operation of the system but also what type of issues can result from improper operation of the system.

#### III. TRAINING:

All employees who work shall be trained on chemical usage and equipment operation to ensure the CIP system not only works properly but also is properly maintained. The CIP lines should be inspected for damage to ensure all lines are completely cleaned. The spray balls should also be inspected to ensure they are clean and free from materials such as gasket materials un-dissolved soap or chemicals. The gaskets and pumps should also be inspected to ensure the impellers and gaskets are in good condition. The impellers if damaged could result in metal contamination. The gaskets could also crack and deteriorate and plug the small holes of the spray balls, which would not allow for complete and proper cleaning of the lines and tanks that are to be cleaned. Chemical training should also be conducted with the employees to ensure the right chemical is used as well as the right concentration. Some CIP systems depending on the equipment to be cleaned also require specific temperatures and times that must be maintained. Although not part of the CIP system but very important in ensuring the equipment has been properly cleaned is a Bioluminescence monitoring unit which could be very beneficial to check the effectiveness of the cleaning. The equipment should be swabbed focusing on the food contact surfaces.

#### **IV. PROCEDURE**

The CIP system shall be monitored and maintained to ensure the facility can be properly cleaned. A color coding system shall be developed to designate process lines from CIP lines. Thermometers as well as other monitoring devices such as indicating charts should also be utilized to ensure proper time and temperatures are maintained. A complete inspection of the CIP system shall be developed to ensure any damage is noted as well as proper connections are conducted. The chemicals should also be checked for proper concentration as well as temperatures. The gaskets should be inspected to identify any cracking or deterioration. Once the connections and monitoring devices have been put in place the system shall be operated and monitored by a trained employee. Once the equipment and lines have been cleaned the entire system shall be inspected to ensure the equipment has been properly sanitized. Swab tests as well as Bioluminescence testing could assist in verifying the cleaning.

**V. Issues that can contribute to an ineffective CIP cleaning**

1. Plugged up spray balls
2. Damaged pipes or tanks where cleaning solution does not reach all areas.
3. Monitoring devices such as thermometers and charts not calibrated.
4. Inadequately trained employees
5. Cleaning solutions not at the right concentrations.
6. Leaks on equipment such as pumps and connections.
7. Dry cleaning solutions not completely dissolved
8. Deteriorated gaskets that can result in leaks.
9. CIP pressure equipment not adequate

## SUBJECT CHART LABELING

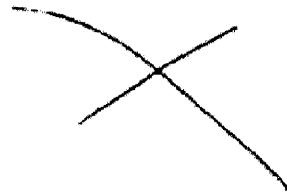
### CIP CHARTS:

1. Date the chart.
2. Make sure times coincide when chart is put on recorder.
3. When wash cycle is over, write in type of equipment washed and initial, (i.e. vat #5, or truck 964.)
4. Remove and replace chart so overlapping of times does not occur.

### TEMPERATURE AND HTST CHARTS:

1. Date the chart, label it as to which equipment and/or product it is recording, and initial.
2. Make sure times coincide when chart is placed on recorder.
3. For HTST vat pasteurizers: Cut-in and cut-out temperatures are reached as indicated on the chart by an up and down line. The chart provides a record of the function of this system. (See below):

STRIKE MARK MADE BY PEN ARM



4. Label the cut-in temperature as to type of product being processed and its initial and destination tanks, (such as skim, TR to TI7).
5. Compare indicating thermometer to recording thermometer and strike pen arm. Record temperature and product.
6. Remove and replace chart so overlapping of times does not occur.
7. When changing separators or tanks, or when equipment fails, make note on chart as to what happened, or any unusual circumstances.

**SUBJECT** CHART LABELING

8. The following is an example of a stamp that can be used on HTST charts.

LOCATION: \_\_\_\_\_

DATE: \_\_\_\_\_

PRODUCT: \_\_\_\_\_

INDICATING THERMOMETER: \_\_\_\_\_

CUT-IN TEMPERATURE: \_\_\_\_\_

CUT-OUT TEMPERATURE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

NOTE: Charts must be reviewed daily by Quality Assurance Supervisor.

## **SUBJECT**

Following the cleaning and rinsing of equipment, it is essential that it be properly drained and stored in such a manner as to prevent recontamination. In order to ensure proper cleaning, surveys should be made on a regular basis, preferably weekly.

During each cleaning operation, inspect gaskets for cuts, wear and cracking. If any are present, replace immediately. Exercise care to prevent cutting or scratching gaskets.

CIP recorder charts on CIP systems are very important. Charts should be observed by operator after each circuit. Check for proper time, temperature, identify circuit, initial and file at end of day. Charts should be monitored by Quality Assurance Supervisor and any discrepancies brought to plant management for corrective action.

Good housekeeping habits by each employee contribute to an orderly work area and overall plant appearance, which is pleasing to both casual visitors and regulatory people.

**SUBJECT****GENERAL INFORMATION - CIP UNIT**

1. Remove return temperature recorder chart from previous day CIP operation and store in quality control lab.
2. If an unusual pattern is noticed on the chart, notify supervisor.
3. Install a new return temperature recorder chart with the date and initials of person changing the chart. Position chart at correct time of day. Record the line circuit, tank circuit or tanker number on the pattern after CIP cycle is complete.
4. Refill recording pens with ink - red for temperature, green for pressure.
5. Prior to Step 6, read and understand Chemical Safety.
6. Check chemical drums, chemical surge tanks or bulk tanks for fill level.
  - a. If chemical drum or drums are empty, remove and replace with a full drum. Record the changing of the chemical drum on the return temperature recorder chart, indicating what chemical was replaced and who replaced the drum.
  - b. In case a bulk system is used with surge tanks at the CIP unit and fill level is low, charge tank to full level. If surge tanks are not used, make sure enough chemicals are in the bulk storage tanks for at least 5 days of cleaning.
  - c. If chemical feed system has level probes for indication of low level and the low level alarm is on, replace with a full drum or recharge surge tank.
7. The return temperature recorder should be tested and calibrated monthly. This should be a part of the Plant Preventive Maintenance Program.
8. On a re-use type CIP unit, check the wash solution tank for evidence of soils such as butter, fat, etc. During the cleaning of tanks and lines, if soil does exist, stop the CIP unit and turn off the manual steam and water valve. Open the drain valve or remove the drain cap, drain the wash tank and rinse out with fresh potable water. Close the drain device and begin to fill with fresh potable water; when the level of water is approximately 6" above the steam injector and sensing device, turn on the steam. Recharge with chemical to proper strength.

NOTE: The wash solution tank must be dumped and recharged daily with use.

**SUBJECT** GENERAL INFORMATION CIP UNIT

9. Daily checklist by operator to include:
  - a. Observe valves for leakage of water, steam, and solution. If leakage occurs, notify maintenance.
  - b. Sample at least one line circuit and one tank circuit for concentration of chemical. (See Procedure for CIP Sampling.)
  - c. Check gauges for proper air pressure, sanitary air valves 45 PSI to 60 PSI, air blow 50 PSI to 80 PSI and manufacturer's specifications apply to utility valves.

**SUBJECT** GENERAL MANUAL CLEANING INSTRUCTIONS

**PRE-RINSING:**

1. Thoroughly rinse all equipment immediately after it is used. This aids in the removal of milk solids and fat.
2. The proper rinse temperature is 90 - 110°F (32.2 – 43.3°C). Excessive rinse temperature causes the soil to stick tighter and creates a more difficult cleaning job.

**WASHING:**

1. Prepare a manual cleaning solution by adding recommended amount of chlorinated alkaline detergent to 120°F (48.9°C) water in a clean five-gallon pail.
2. Remove all gaskets, seals, and "O" rings and totally dismantle all parts.
3. All surfaces should be washed thoroughly by hand brushing or with a pipe washer. It is important that all surfaces be brushed since cleansers used for hand washing depend on mechanical action for removal of milk solids.

**FINAL RINSE:**

1. A final hose rinse of the equipment with warm water should be used immediately after washing to remove cleanser solution.
2. For hand cleaned pipe, place the pipe in the storage rack and hose rinse. The pipe should be turned during rinsing so that the rinse water will contact all interior surfaces of the pipe.
3. A quick inspection of each piece of equipment should be made to ensure it is clean.
4. When possible, parts should be allowed to air dry before reassembling.

**SANITIZING:**

1. Prepare a standard sanitizing solution utilizing acid or alkaline-based material, combined with potable water according to the product label directions. For example, final solution strength if using chlorine sanitizers would be 200 ppm.
2. All parts not sanitized in circuit during start-up sanitizing should be dipped or spray sanitized with the above acid sanitizer solution.

**SUBJECT** CIP SYSTEM SAMPLING PROCEDURE

**TANKS. #1 HOLDING TANK- PROCESSING:**

1. Take detergent/cleaner sample from wash solution tank about midway through wash cycle and after maximum temperature is reached.
2. Take sanitizer sample from last amount drained from outlet valve after air-blow is complete.

**ALL LINE CIRCUITS:**

1. Take detergent/cleaner sample from wash solution tank about midway through cycle and after maximum temperature is reached.
2. Take sanitizer sample from the line returning to the CIP system. Sample must be taken last few seconds of air-blow cycle to be accurate. Sample will not be accurate if taken before air-blow. Spot check different sections of line by collecting sample from broken joints. **BE CAREFUL: DO NOT CONTAMINATE FITTING.**

## **SUBJECT**

1. Many cleaning products contain ingredients that could be harmful. Understanding and applying the safety techniques required for these products is essential to their safe use. With proper handling and application, the products will produce the desired results without harm to personnel, equipment or user's products.
2. **KNOW THE PRODUCT:** Read the container label. Use correct product for each application. The label and product sheet covers intended use and normal procedure safety practices and precautions.
3. **PROTECT YOURSELF:** Use your safety glasses; wear proper gloves, aprons, and boots when working directly with chemicals.
4. When water or chemical solutions are spilled or drained onto floors, they create slippery conditions. Work and walk with care. Use skid-proof boots or shoes for better footing. Hose down as soon as possible.
5. **AVOID IMPROPER MIXING:** Many products, especially caustic, give off heat when mixing with water. **ALWAYS** add product slowly and carefully to water with agitation to avoid violent reaction. Add caustic to cold water slowly.
6. **DO NOT MIX CLEANING COMPOUNDS:** Unless advised to do so by informed personnel. Chlorine compounds may react violently if mixed with acids, water (hot), alkalis, or organic matter. They may give off undesirable gasses. Use clean, dry scoops to remove compounds from factory packages. If in doubt as to cleaner identification, do not use it.
7. **CONTAINER HANDLING:** Avoid lifting more than can be safely handled. Use care when opening container to avoid splash, fumes and dust. Replace covers after use. Store containers so as to prevent injury or spillage.
8. **STORAGE:** Store cleaners in clean, dry area. Temperature, ventilation and adjacent products must be considered. **NEVER** store cleaners next to food products; avoid eating and smoking in storage areas. Keep cleaners out of reach of children.
9. **EMERGENCY MEASURES:** The best first aid treatment for chemical burns is **immediate** application of cold, running *water*. Remove saturated clothing. Get immediate medical attention if required.

## SUBJECT SANITARY PUMPS

1. Centrifugal pumps which have internal seals and which are designed for circulation cleaning may be effectively cleaned in place (CIP). These pumps are normally cleaned in conjunction with the CIP cleaning of a line circuit.
2. Positive pumps may be cleaned in place (CIP) after the rotors have been removed and the pump head and gasket replaced. The rotors can be washed by brushing. Remove housing and clean seal/seat and "O" rings daily. Be careful. Do not damage seals. Inspect "O" rings for cracks, etc. and replace if needed.
3. Centrifugal pumps which are externally sealed cannot be properly cleaned by CIP methods and must be cleaned manually as follows: This should be done daily:
  - a. Disconnect pump.
  - b. Disassemble completely. This includes removal of pump back plate. This is a prime source of contamination.
  - c. Rinse all parts with clear water.
4. Prepare manual cleaning solution by adding recommended amount of chlorinated alkaline detergent to 120°F (48.9°C) water.
5. Brush wash all pump parts, gaskets and "O" rings.
6. Rinse with tap water.
7. Inspect gaskets and "O" rings for cracks and replace any cracked gaskets or "O" rings.
8. Sanitize prior to use by submersing in a pail of acid sanitizer, 200-ppm chlorine equivalent.

- **SUBJECT** CIP - SILOS

1. When preparing to wash the silo, disconnect the vent pipes and connect CIP inlet lines to vent lines and also to the milk inlet line. Connect the milk outlet pipe to the CIP return line. Disassemble the air agitator assembly and, if applicable, the petcock and door gasket. These items should be cleaned manually using recommended amount of acid sanitizer, 200 ppm chlorine equivalent.
2. Insert a "False Door" in the silo tank. This will prevent a sucking-in of silo and keep silo vented, as well as conserving CIP solutions. (See also procedures for venting silo tanks).
3. Before starting the CIP system, check all the chemical containers for enough detergent and sanitizers.
4. Make appropriate connections at changeover stations or juniper pipes in order to make a complete circuit.
5. Make the appropriate selections on the CIP panel board and start the CIP system.
6. Observe the washing of the tank. Check for leaks and correct. The proper steps in the CIP system are:
  - a. Pre-rinse — @ 100°F (37.8°C). or less.
  - b. Wash - temperature of solution must reach 135°F (57.2°C) at return to CIP system prior to system going into timed wash portion of cleaning cycle. Temperature of solution must not exceed 145°F (62.8°C) at return to CIP system.
  - c. Post-rinse.
  - d. Sanitize - standard acid sanitizer solution, 200-ppm chlorine equivalent.
7. Observe tank for cleanliness and reassemble parts after sanitizing, using standard acid sanitizer solution. Pay particular attention to cleanliness of band cleaned parts, (\*1) above and door, probe fittings and around door connection.
8. Proper housekeeping should be maintained in area, especially the cleaning of the alcove, floors, and wall surrounding the silo.
9. Rewash and resanitize tank immediately before use if unused for more than 24 hours.
10. Label silo recording chart and CIP recording chart with date installed, silo number, initials, when CIP performed. Make sure times and days coincide with actual.

**SUBJECT** VAT PASTEURIZERS

1. Pre-rinse with clear water.
2. Remove excessive burn-on by scraping vat interior surfaces with non-metal scraper.
3. Rinse with clear water.
4. Remove plug valve from valve body. Brush wash valve plug and valve body with manual cleaner made by adding recommended amount of chlorinated alkaline cleaner per gallon of water. Rinse and sanitize with standard acid sanitizer, 200 ppm chlorine equivalent solution, while reassembling.
5. Remove and brush wash the air space thermometer. Where a rosette is used as an air space heater, the cap should be removed and all parts thoroughly brush washed. Rinse, sanitize and reassemble.
6. If agitator is removable, it should be removed and the area under the attaching sleeve and the indentation in the bottom of the agitator shaft checked for cleanliness and brush washed if necessary.
7. Connect CIP jumpers and start CIP system, or other recirculating cleaning method.
  - a. Pre-rinse - @100°F (37.8°C) or less.
  - b. Wash-temperature must reach 135°F (57.2°C) at return to CIP system prior to system going into timed wash portion of cleaning cycle. Temperature of solution must not exceed 145°F (62.8°C) at return to CIP system.
  - c. Post-rinse.
  - d. Sanitize - acid sanitizer, 200 ppm chlorine equivalent solution.

**SUBJECT** CIP - HORIZONTAL STORAGE TANKS - RAW AND PASTEURIZED

1. When preparing to wash the tank, disconnect inlet and outlet lines, remove mechanical agitators, sample cocks, door gaskets, goose necks, etc., and hand brush, using a manual cleaner at recommended strength, in 120°F (48.9°C) water, or place in a COP parts washer. (See Manual and/or COP Cleaning Procedures D412). Hand wash manhole, door, fill inlets, gaskets, valves, sight glasses, high level probes, vent inlet and cap. Rinse off all parts and sanitize, using standard 200 ppm chlorine equivalent acid sanitizer solution.
2. Insert a "false door" in the storage tank. This will prevent a sucking-in of tank, keep tank vented, and conserve CIP cleaning solutions.
3. Before starting the CIP system, check all the chemical containers for enough detergent and sanitizers.
4. Make appropriate connections at changeover stations or juniper pipes in order to make a complete circuit.
5. Select the appropriate program on the CIP panel board and start the CIP system.
6. Observe the washing of the tank. Check for leaks and correct. The proper steps in the CIP system are:
  - a. Pre-rinse @ 100°F (37.8°C) or less.
  - b. Wash temperature of solution must reach 135°F (57.2°C) at return to CIP system prior to system going into timed wash portion of cleaning cycle. Temperature of solution must not exceed 145°F (62.8°C) at return to CIP system.
  - c. Post-rinse.
  - d. Sanitize- acid sanitizer, 200 ppm chlorine equivalent solution.
7. Observe tank for cleanliness and reassemble parts after sanitizing with standard 20 ppm chlorine equivalent acid sanitizer. Pay particular attention to cleanliness of parts (#1 above) and around probes, door, and valves.
8. Proper housekeeping should be maintained in area, especially the cleaning of the alcove, floors and walls surrounding the tank.
9. Re-sanitize the tank immediately before use if unused for more than 24 hours.
10. Weekly spray device should be removed and checked for extraneous materials and plugged holes.

**SUBJECT** CIP - PASTEURIZED LINE CIRCUITS

1. Hook up all jumper lines.
2. Rinse until clear of milk.
3. Disassemble and hand clean all plug valves, valve bodies. Use brush and recommended amounts chlorinated alkaline detergent and water. Rinse. Sanitize by dipping in acid sanitizer, 200 ppm chlorine equivalent solution. Lubricate, resanitize, and seat valve plug. Sanitize valve retaining plate and nut; assemble, correctly turning valve.
4. Hand clean or COP short pipe sections and fittings. Check gaskets for cracks and replace as needed. Sanitize gaskets and pipes on reassembly. (See Manual Cleaning Procedures.)
5. Operate CIP system through cycle. Proper steps in cycle are:
  - a. Pre-rinse @ 100°F (37.8°C) or less.
  - b. Wash temperature of solution must reach 135°F (57.2°C) at return to CIP system prior to system going into timed wash portion of cleaning cycle. Temperature of solution must not exceed 145°F (62.8°C) at return to CIP system.
  - c. Post-rinse @ 100°F (37.8°C).
  - d. Sanitize acid sanitizer, 200 ppm chlorine equivalent solution.

**SUBJECT** COP Vats

1. Fill COP vat with water.
2. Pre-rinse parts with warm water.
3. Place parts in COP vats for good circulation. (Use racks for separation of parts.) Do not use galvanized racks or milk cases. Do not inter-mix white metal fittings or brass parts with stainless steel parts.
4. Turn ON the circulating pump.
5. Turn steam on: 140°F - 160°F (60°C - 71.1°C). Steam feed line should have temperature controller valve set at 140°F. - 160°F (60°C - 71.1°C). Valve must be of the same size as the steam line.
6. Add chlorinated alkaline detergent at recommended strengths.
7. Circulate for 20 minutes at 140°F. - 160°F (60°C – 71.1°C).
8. Turn OFF steam.
9. Overflow COP vat by turning on cold water to skim dirt off top of water until water temperature cools down to 100°F (37.8°C).
10. Open outlet valve of parts washer and drain.
11. Rinse parts with cold-water hose.
12. Remove parts from parts washer:
  - a. Place on racks or
  - b. Sanitize and reassemble.
13. Always sanitize parts prior to use with acid sanitizer solution, 200 ppm chlorine equivalent.
14. NOTE:
  - a. Pipes placed in COP vat should not extend beyond length of vat.
  - b. Do not put excessive amount of parts in a COP vat; this would cause poor circulation.
  - c. Fill vat with enough water to cover fittings. Too much water causes poor circulation.

## SUBJECT SAFETY PRECAUTIONS - SILOS

### FILLING:

The 3" screened vent must stay attached to a 3" vent line during all operations. As milk enters the bottom of the silo, it displaces places the air. Air escapes through the 3" vent. If the vent becomes blocked during filling operation, both fluid and air pressure will begin to develop. As the milk level rises, it begins to compress the internal air above the level. The extent of this pressure depends entirely on the size of the pump or the maximum pressure it will deliver against a given head. Although a silo tank can stand considerably more pressure than a vacuum, excessive pressure from a large milk pump could cause the tank to rupture. Almost all manufacturers specify not to exceed 7 PSI on silo tanks.

SOLUTION TO PRESSURE PROBLEM: Keep 3" vent line open and unobstructed.

### OVER-FILLING: (OVERFLOWING)

If silo is equipped with a probe to eliminate the possibility of overflow and provided this is on a fully automated product flow system, when the milk level contacts probe, the receiving pump will stop and outlet valve will close. In the case of manual product flow the probe will be wired to a bell or horn. When the alarm is heard, immediately stop the pump and close the inlet valve. In case of silos without probe or if the probe fails, the milk will start pouring down the 3" vent into the alcove. If this happens the following steps should be taken immediately:

1. Stop pump.
2. Close both inlet and outlet valves.
3. Let milk overflow until vent line is completely emptied.
4. Do not under any circumstances attempt to unload or transfer from tank while vent is overflowing. To do so will guarantee the collapse of the tank.
5. After vent has completely stopped overflowing remove at least 20 gallons of milk from sample cock.
6. Tank can now be safely unloaded.

NOTE: The 3" vent when kept open and unobstructed is adequate to let air in and out of silo during filling and unloading operations.

- ■ **SUBJECT** Safety Precautions - Silos

- ■ CIP:

- 1. All silo tanks should be equipped with a tamper proof "fail-safe" device which should make it impossible to make a CIP supply hook-up with the manhole door closed. Regardless of whether this device is foolproof or not, employees should be aware of the fact that if the tank is cleaned with the manhole door closed collapse is guaranteed. The 3" vent is not sufficient to allow the high volume of air to flow into the silo when the CIP system goes from hot wash to cold rinse.
- 2. All CIP system cleaning silo tanks [wash temp 140°F to 145°F (60°C – 62.8°C)] should be equipped with a high temperature cut out [155°F to 160°F (68.3°C to 71.1°C)]

- ■ **INSTALLATION AND OPERATION AS FOLLOWS:**

- 1. Thermal coupling installed in wash tank.
- 2. "Open on rise" contacts wired to line voltage to CIP programmer.
- 3. "Close on rise" contacts wired to signal light and horn.
- 4. High temp cut out to be operative either in "off" cycle or "on" cycle.
  - a. If wash tank overheats when CIP system is in "off" cycle light will come on, horn will sound and system will not start until wash tank is cooled down.
  - b. The same happens if CIP system is in "on" cycle-system will stop, light will come on and horn will sound. System will not re-start until wash tank is cooled down.

- ■ **FREEZING WEATHER CONDITIONS: (CIP)**

During winter operations the CIP supply and failsafe hook-up in alcove must be disconnected immediately after the CIP cycle is complete. This is especially true at night. It is possible to freeze both the vent line and the CIP supply line.

## NOTES

**NOTES**

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## **NOTES**

## **NOTES**

# Miscellaneous

# **Developing and Implementing a Sanitation Program**

## Workshop: Answer Packet

- Roll-up door
- Electrical plug
- Electrical box
- Insect-o-cuter
- Mop bucket
- Trash can
- Ingredient container

*To be distributed to participants at the end of  
the seminar*

<b>Equipment to Clean:</b> Roll- up door #7, south entrance to production area		<b>AREA / EQUIPMENT PROCEDURES</b> Mechanical roll-up metal door, electrical opener	
		<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
<b>EQUIPMENT CLEANING PROCEDURES</b>			
<b>Products:</b>	<b>Ratio:</b>	<p>1.1 Locate and lock out and tag electrical service to all electrical elements at junction box Pz228 on the wall at left side of roll-up door. Check operation of door to ensure electrical service has been stopped according to Lock-out procedure S114 located in the shift supervisor office and lunch room.</p> <p>1.2 Put on apron, gloves, and goggles prior to placing six ounces of cleaning solution GDX120 into the red sanitation bucket and transfer bucket to the sink in production area designated for sanitation use. The use of more cleaning solution will result in the damage of painted surfaces and this must be avoided. Add 2 gallons of hot water (approximately 110°F) into the bucket.</p> <p>2.0 With door in closed position, dust door slats with brush beginning at the top working your way down to floor level. While working on ladder, relocate the ladder frequently to avoid over extending and creating a fall potential.</p> <p>2.1 Vacuum inside of top cover using dust brush tool.</p> <p>2.2 Once the door has been cleaned to remove the visible dust residue. Place wet floor signs in visible areas at both sides of the door. Beginning at bottom and apply detergent solution with cloth working to the top of the door on both sides of the door. Apply scrubbing action where needed with brush to remove residue material. Rinse cloth frequently and change water when it becomes visibly dirty.</p> <p>2.3 Once door has been washed, remove all standing water with the floor mop from the floor and empty mop bucket and red bucket in slop sink in the sanitation room. Keep wet floor signs in place until floor is visibly dry, then remove them and return to sanitation storeroom. Return all cleaning equipment to the designated storage and properly clean equipment</p>	
GDX 120	3 oz / gal		

<b>Rinse Temperature:</b>	
110° F (43.3° C)	
<b>Application Equipment:</b>	
Damp cloth, red sanitation bucket, red scrub brush, red bristle dust brush, ladder, vacuum mop and mop bucket, wet floor signs	
<b>Rinsing Equipment:</b>	
Water hose	
<b>Frequency:</b>	
Monthly	
<b>Required Safety Equipment:</b>	
Boots	X
Gloves	X
Rain Suit	X
Goggles	X
Respirator	
<b>Personnel Assigned:</b>	
3rd shift Sanitor, processing	
<b>Time Required to Clean:</b>	
45 minutes	

prior to placing into storage. Refer to procedures S443 for vacuum cleaning procedures and S045 for mop and bucket cleaning.

2.4 Remove lock-out device and restore power to the door.

**Critical Areas to Check:** Power source is properly secured; floor is dry before removing wet floor signs.

<b>Equipment to Clean:</b>	
Electrical Plug	
<b>Products:</b>	<b>Ratio:</b>
N/A	
<b>Rinse Temperature:</b>	
N/A	
<b>Application Equipment:</b>	
N/A	
<b>Rinsing Equipment:</b>	
N/A	
<b>Frequency:</b>	
Monthly	
<b>Required Safety Equipment:</b>	
Boots	
Gloves	
Rain Suit	
Goggles	XXX
Respirator	

<b>AREA / EQUIPMENT PROCEDURES</b>	
<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
<b>EQUIPMENT CLEANING PROCEDURES</b>	
1.0	Disconnect the plug from the power source.
2.0	Using a Phillips head screw driver, loosen the screws attaching the cover for the wire into the plug. Remove the cover and set aside.
2.1	Inspect for the accumulation of product dust and insect activity. Vacuum any flour residue from the space using a plastic crack and crevice tool. Report any insect activity in the pest sighting log located in the sanitation office or in the supervisors' office
2.2	Inspect the wire connections for wear and repair as needed.
2.3	Replace the cover and secure in-place with the screws.
2.4	Upon completion, empty the vacuum cleaner and return it to the maintenance shop.

<b>Personnel Assigned:</b>
Maintenance
<b>Time Required to Clean:</b>
15 minutes

<b>Critical Areas to Check:</b>

<b>Equipment to Clean:</b> Electrical Control Box 5A		<b>AREA / EQUIPMENT PROCEDURES</b>			
		<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b> <b>M2252</b>		
<b>EQUIPMENT CLEANING PROCEDURES</b>					
<b>Products:</b>	<b>Ratio:</b>	1.0 Lock out and tag electrical supply to this box in accordance with Electrical Worker Safety Practices and the Lock-out Tag-out procedures.			
None		1.1 Put on goggles before beginning work.			
		2.1 Lower arm on electrical box to secure power and install pad lock for lock out. Open electrical box and check with voltage meter to make sure electrical source has been isolated.			
		3.1 Examine the interior of the electrical box for the presence of insect activity and debris.			
		3.2 Using vacuum with plastic attachments, vacuum all product dust and debris from the box interior and exterior.			
		3.3 Close cover and check for proper closure.			
		3.4 Check that equipment powered through this box is off and it is safe to energize this box and then restore power from the main feed before removing lock and lifting handle to recharge the electrical box.			
		3.5 Empty and clean vacuum according to procedure S443 and return vacuum to the shop.			
<b>Rinse Temperature:</b>					
None					
<b>Application Equipment:</b>					
Vacuum					
<b>Rinsing Equipment:</b>					
None					
<b>Frequency:</b> Monthly					
<b>Required Safety Equipment:</b>					
Boots					
Gloves					

Rain Suit	
Goggles	XXXXX
Respirator	
<b>Personnel Assigned:</b>	
Maintenance	
Maintenance Electrician	
<b>Time Required to Clean:</b>	
10 minutes	

**Critical Areas to Check:** Report any insect activity to supervisor.

## **PRODUCTION AREA CLEANING PROCEDURES**

EQUIPMENT CLEANING PROCEDURE				PROCEDURE #			
Equipment to be Cleaned		Insect Light Trap Insect-o-cutor model		Rinsing Temperature	None		
Personnel Assigned				Required Safety Equipment	Boots	XXX	
Pest Management Sanitation Personnel					Gloves		
Frequency: 2X/yr				Time Needed	0.5 hr		
Chemical Name	Ratio	Chemical Name	Ratio	Application Equipment	2 cleaning rags		
ABC	60ml/lt				Vacuum		

- 1.0 Collect required cleaning materials from the sanitation storage room.
  - 2.0 Put on gloves and goggles and mix 60 ml of ABC cleaning solution in red sanitation bucket with each liter of warm water prior to leaving the sanitation area.
  - 3.0 Disconnect electrical cord from the electrical outlet before working on the unit.
  - 4.0 Open protective grill by releasing the locking hinge.
  - 5.0 Remove collection tray and place insects into a plastic bag to be taken to the sanitation office for identification.
  - 6.0 Verify dust filter is in-place on the vacuum cleaner before plugging electrical cord into the outlet. Replace if missing. DO NOT USE VACUUM WITHOUT DUST FILTER IN-PLACE.
  - 7.0 With vacuum cleaner on, vacuum the entire unit to remove dust and insect fragments.
  - 8.0 Dampen rag in cleaning solution and wipe all surfaces of the unit to remove any remaining dust or residue material. Pay particular attention to the electrifying grid and light bulbs to remove all residue material.
  - 9.0 Re-wipe surfaces with dry rag.
  - 10.0 Replace catch tray, close and secure protective grill.
  - 11.0 Plug unit into the outlet and verify lights are on.
  - 12.0 Sign tag on unit with the date cleaned and your initials.
  - 13.0 Take insects and cleaning equipment to sanitation room.
  - 14.0 Empty and clean sanitation bucket and rags. Store in the designated location.
  - 15.0 Fill out cleaning log with the number assigned to the unit and submit paperwork to the shift supervisor.

## PRODUCTION AREA CLEANING PROCEDURES

EQUIPMENT CLEANING PROCEDURE		PROCEDURE # 175		
<b>Equipment to be Cleaned</b>	Mop bucket and mop for the bakery test lab	<b>Rinsing Temperature</b>	110°F (43.3°C)	
<b>Personnel Assigned</b>	Bakery Sanitation Personnel	<b>Required Safety Equipment</b>	Boots Gloves Rain Suit Goggles	XXX XXX
<b>Frequency</b>		<b>Time Needed</b>	10 min	
<b>Chemical Name</b>	<b>Ratio</b>	<b>Chemical Name</b>	<b>Ratio</b>	<b>Application Equipment</b>
ABC General purpose cleaner	4 oz/gal 30ml/ltr			Manual/brush Red scrub brush Water hose

- 1.0 Transport the mop bucket to the wash area.
- 2.0 Put on goggles and gloves.
- 3.0 Install wet floor signs.
- 4.0 Compress water from wet mop using the compression unit on the bucket and set aside.  
Remove compression unit from the bucket and set aside.
- 5.0 Empty water from mop bucket into the floor drain.
- 6.0 Remove any mop strings or other large debris from the floor drain strainer and place in the trashcan.
- 7.0 Using the water hose, completely rinse the mop bucket.
- 8.0 With mop on the floor with the strands spread out, rinse thoroughly with the water hose.
- 9.0 Replace compression unit. Compress water out of the strands and hang the mop on the rack provided. Remove compression unit again.
- 10.0 Apply detergent with the scrub brush and cover all surfaces inside and outside of the bucket. Scrub with the brush to remove all residue material.
- 11.0 Rinse bucket thoroughly to remove all detergent and place on rack inverted to dry.
- 12.0 Repeat this procedure for the compression unit.
- 13.0 Rinse floor area to remove all detergent residues.

<b>Equipment to Clean:</b>		<b>AREA / EQUIPMENT PROCEDURES</b>	
Trash can, Production room			
<b>Products:</b>	<b>Ratio:</b>	<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #003</b>
GPC 10	60 ml/ liter	1.0 Wear all protective equipment while mixing and using the cleaning solutions. 2.0 Cover container and remove to the dumpster area. 2.1 Remove all solid materials by scraping or tapping the container at the dumpster before bringing to the sanitation wash area. 2.2 Using the water hose, rinse the interior and exterior of the container wetting all surfaces. 2.3 Using the brush, apply the cleaning solution to all surfaces and allow the detergent to remain on the surfaces for 5 minutes. 2.4 Fill container with 3-4 liters of hot water and detergent and scrub all surfaces, including the cover with the detergent solution. 2.5 Empty detergent solution into the floor drain in the wash area and rinse container thoroughly. 3.0 Once rinsed thoroughly, apply sanitizing solution with brush to all surfaces and allow container to dry. 4.1 Once dried, install plastic liner, cover, and return to the production room.	
SAN 12	45 ml/ liter		
<b>Rinse Temperature:</b>			
104° F (40° C)			
<b>Application Equipment:</b>			
Bucket, scrub brush, water hose and nozzle			
<b>Rinsing Equipment:</b>			
Water hose			
<b>Frequency:</b>			
Daily			

<b>Required Safety Equipment:</b>	
Boots	XXX
Gloves	XXX
Rain Suit	XXX
Goggles	XXX
Respirator	
<b>Personnel Assigned:</b>	
Sanitation	
<b>Time Required to Clean:</b>	
25 minutes	

**Critical Areas to Check:**

<b>Equipment to Clean:</b>		<b>AREA / EQUIPMENT PROCEDURES</b>	
Ingredient container, batching area			
<b>Products:</b>	<b>Ratio:</b>	<b>CLEANING PROCEDURES</b>	<b>PROCEDURE #</b>
<b>EQUIPMENT CLEANING PROCEDURES</b>			
GPC 200	60 ml/ liter	<p>1.0 Container and lid may be hot after washing; wear gloves to avoid burns</p> <p>2.0 Container should be empty of all ingredients before transferring to sanitation wash area. If not, transfer materials to a clean container and label for contents.</p> <p>2.1 Wet container with water hose to remove most residue materials.</p> <p>2.2 Place container and lid in the washer in the inverted position. Close the door to the washer.</p> <p>2.3 Start cleaning cycle by pressing the green button.</p> <p>2.4 Allow the washer to complete entire cleaning and sanitizing cycle before removing from the washer.</p> <p>2.5 Inspect the container for any remaining product residue. If residue is noted, repeat cleaning cycle. Scrape or brush residue between washing to remove residue material.</p> <p>2.6 Inspect interior of the container for cracks or loose plastic. Remove all loose plastic before returning to production. Cracked container must be repaired or replaced.</p> <p>3.0 Return the container and cover to the batching area. Check to ensure labeling was not removed by wash cycle. Re-label if needed.</p>	
<b>Rinse Temperature:</b>	194° F (90° C)		
<b>Application Equipment:</b>	Mechanical washer		
<b>Rinsing Equipment:</b>			
<b>Frequency:</b>	Weekly		

<b>Required Safety Equipment:</b>	
Boots	
Gloves	XXX
Rain Suit	
Goggles	XXX
Respirator	
<b>Personnel Assigned:</b>	
Sanitation	
<b>Time Required to Clean:</b>	
25 min	

**Critical Areas to Check:**