

Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114
(816) 333-9400

Atlanta
Chicago
Denver
Fenton, MO
Houston
Los Angeles
Miami
New York
O'Fallon, IL
Philadelphia
Phoenix
San Diego
San Francisco
St. Louis
Washington, D.C.
Wichita, KS

For more information,
contact TechBriefs at
techbriefs@burnsmcd.com

For address changes,
contact Darla Amstein at
damstein@burnsmcd.com

© 2005 Burns & McDonnell
Marketing, Communications &
Research



**A human being must
have occupation if
he or she is not to
become a nuisance
to the world.**



Dorothy L. Sayers



Printed on recycled paper

Obtaining Kosher Certification

The Engineering Implications for Food Processing

**By Lisa Morris, Jim Hays, P.E.,
and Elaine York**

With the Kosher food market growing at 15% annually, many companies realize it is time to expand their market and invest in Kosher certification. But obtaining Kosher certification is not as simple as separating meats and dairy products. There are many intricacies to Jewish dietary laws that can affect everything from lighting plant boilers to the materials used for manufacturing equipment. It is important to understand these laws and their implications before determining if Kosher certification is a reasonable goal.

Although these guidelines have been reviewed by an orthodox rabbinical authority, the organization you choose for certification and the local rabbinical inspector must be consulted, as they are the final authority.

Kosher Experts

Certifying experts fall into two categories:

- National organizations that specialize in Kosher certification services are most commonly used by large manufacturers. These groups stay current with the food processing industry and understand how changes relate to Kosher standards. Some of the most widely recognized agencies and their symbols are shown in Table 2.
- Individual rabbis associated with local Jewish communities and rabbis who operate independently provide certification for local businesses. This certification is often not widely known.

Cost is always a factor in a food manufacturer's decision to obtain (or not obtain) Kosher certification. Many certifying agencies are

nonprofit and only charge for on-site work and supervision. The Kosher supervisor is paid per visit by the certifying agency, and he typically makes less per visit than an auto mechanic does per hour. But necessary changes to the manufacturing process can be quite costly.

General Kosher Guidelines

The word "Kosher" translated literally means "fit or proper." Kosher laws are not based on health or nutrition, though many of the laws do have health benefits. Jewish dietary laws determine what is fit or proper for consumption based on what is written in the Torah (the five books of Moses). The general rules of *kashruth* (the state of being Kosher) include:

- Meat and dairy must not be mixed.
- Certain animals are forbidden.
- Allowed animals must be slaughtered in accordance with *Halacha* (Jewish Law).
- Nearly all fruits and vegetables are allowed.

IN THIS ISSUE

Obtaining Kosher Certification

The Engineering Implications
for Food Processing

Cooling Tower Water Flow Balancing

Adjusting Pumps
to Maximize Efficiency

Data Conservation in Transmission Line Design

How One Utility is Translating
Design Data Directly into Asset
Management Software

- Most insects and other invertebrates are forbidden.

It is important to note that this is merely a summary of the basic Kosher principles. There are many complex details and interpretations of these laws that are best left to the *mashgiach* (rabbinic inspector).

Ingredients Management

Kosher law does not distinguish between the status of a finished product and its ingredients. If any part of a product is non-Kosher, the entire product is non-Kosher. This makes the status of ingredients critical.

Ingredients used in food production typically fall into three categories: ingredients that are inherently Kosher, ingredients that are not acceptable for Kosher use and ingredients that require Kosher verification.

Koshering of Equipment and Utensils

Once it has been determined that all ingredients are certified Kosher, the next step – possibly the most complicated – is to ensure utensils and equipment are in compliance with the rules of *kashruth*. A key concept in complying with these laws is that of *b'lios* (absorbed flavors). Kosher law states that food coming in contact with a heated surface will cause the surface to absorb the flavor of the food and therefore take on the status of the food. Once the surface obtains a certain status it can then pass the status to another food.

B'lios (Absorbed Flavors)

There are several circumstances in which the concept of *b'lios* applies:

- A piece of equipment is rendered non-Kosher if it is used to cook a non-Kosher food at a temperature above *yad soledes bo* (Table 1). This includes pots, pans, cooking sheets, grills, griddles, steam-jacketed kettles, fryers, distillation equipment,

pasteurizers and homogenizers.

- Equipment and utensils that cook or heat meat products may not cook or heat dairy products and vice versa.
- Any foods cooked in the same space where their flavors can be absorbed by one another will pass their non-Kosher status along with their absorbed flavors.
- If two products share a common wall, *b'lios* can be transferred through that wall.
- If a food is soaked in a hot liquid, the liquid obtains the status of the food. If the liquid is at ambient or refrigerated temperatures, *b'lios* is only a concern if the food is soaked for an extended period (usually 24 hours).

Once a piece of equipment has been affected by *b'lios*, it can only return to its *pareve* (neutral) status through koshering. Koshering can take equipment used in non-Kosher food production and make it fit for Kosher food production as well as take a piece of equipment from meat or dairy status back to neutral status.

There are three koshering processes: *hag'olah*, *libun*, and cleaning with caustic/soap and water. Which process is appropriate depends on the temperature of the food product when it contacts the equipment, what material the equipment is made of, and if it is a wet or dry process. Koshering processes always require the supervision of a *mashgiach* if changing from dairy to meat or meat to dairy.

If a product comes into contact with a utensil or piece of equipment at less than “cooking” temperature, then the utensil or equipment may be koshered through a thorough cleaning with caustic/soap and water.

Hag'olah (A Koshering Process)

B'lios are commonly purged from equipment that has a wet cooking process through *hag'olah*. This method involves cleaning the equipment

Table 1.

Union of Orthodox Jewish Congregations Sanitizing Temperatures	
120°F	<i>Yad soledes bo</i> Threshold temperature for food contacting a surface that must be koshered. If food contacts equipment at a lower temperature, it may be cleaned with caustic/soap and water and then considered ready for use in Kosher production.
160°F	<i>Libun kal</i> Koshering of a surface may be done with a direct flame to the top of the surface until the temperature on the bottom surface reaches 160°F.
176°F	<i>Bishul or pas yisroel</i> Minimum temperature required to maintain cooking or baking status. If an oven or boiler drops below 176°F, it may not be relied by a non-Jew.
212°F	<i>Hag'olah</i> Required temperature of water used to wash equipment before it can be given Kosher status or changed from meat to dairy or dairy to meat use. It is irrelevant if the water is boiling or not.
450°F	<i>Libun kal</i> Temperature the equipment must reach for 1½ hours to be koshered when a direct flame is not used.
550°F	<i>Libun kal</i> Temperature the equipment must reach for 1 hour to be koshered when a direct flame is not used.
900°F	<i>Libun gamur</i> Temperature at which a dry piece of equipment must be heated to become koshered.



Lisa Morris is a mechanical engineer in the Burns & McDonnell Process & Industrial Group. She has a bachelor's degree in mechanical engineering from the University of Missouri.



Jim Hays, P.E., is a department manager in the Burns & McDonnell Process & Industrial Group. He has a bachelor's degree from the University of Missouri-Rolla and master's degrees from the University of Missouri-Kansas City.



Elaine York is a food process engineer in the Burns & McDonnell Process & Industrial Group. She has a bachelor's degree in chemical engineering from the Massachusetts Institute of Technology.

with “boiling” water, defined as water at or above 212°F (Table 1). *Hag’olah* is a three-step process:

- The equipment or utensil must be cleaned with caustic/soap and water and free of residue.
- The equipment must sit clean for 24 hours. Sometimes a bittering agent known as *pogem* can be used in lieu of the 24-hour wait.
- The equipment or utensil is then washed with boiling water. Vessels are filled with water and then heated to a boil. Utensils are to be soaked in boiling water. There are differing opinions on whether *hag’olah* can be performed by washing equipment in water above 212°F.

Not all materials can be koshered by *hag’olah*. The criteria is based on the materials’ ability to release the flavors trapped in them during food processing.

Libun

A process that uses dry heat to cook food, such as an oven, may use a koshering process known as *libun*. This procedure purges the equipment from *b’lios* through an intense heating process. There are two levels of *libun*. *Libun gamur* is the treatment of the equipment at such an extreme temperature that all *b’lios* are destroyed (Table 1). The amount of time the equipment must be at this temperature varies with the type of equipment. In most cases the equipment is held at 900°F for an extended period. The advantage of koshering by *libun gamur* is it is effective for all types of foods on all types of equipment. Materials that cannot be koshered through *hag’olah* are not excluded from *libun gamur*. This process also does not require prior cleaning or the 24-hour wait.

Libun kal (or literally “lesser *libun*”) is a method of koshering in which surfaces are heated to lower temperatures for a longer period

of time. This process does not require the 24-hour wait period. If a direct flame is used, *libun kal* can be performed at 160°F by placing the direct flame on the backside of the surface. Without using a direct flame, the temperature the equipment must reach varies with the time that temperature is maintained (Table 1).





Utility Concerns

The concept of *b’lios* can also affect the hot water and steam systems in a plant. Hot water or steam directly added to food would pass along its status to the food product. Hot water and steam can also transfer *b’lios* through a wall when it is used for heating a food product. Therefore, careful attention must be paid to the Kosher status of the systems.

Summary

A basic understanding of Jewish dietary laws is just the beginning step in the process of gaining a Kosher certification for a food product. Grasping how these laws will affect the engineering aspect of your plant is key. Kosher law is not black and white, and there will be questions about what is acceptable. Once a preliminary analysis has been made, it is important to get the *mashgiach* involved. He is the expert and has had extensive training in how Jewish law will affect a food process. He is the ultimate authority on the certification of your product.

Table 2.

Some National Kashruth Agencies and Symbols		
	The Union of Orthodox Jewish Congregations (OU)	 “Star-K” Kosher Certification (STAR-K)
	The Organized Kashrus Laboratories (Circle K)	 “KOF-K” Kosher Supervision (KOF-K)

For more information on this subject, please send an e-mail to the following addresses: Lisa Morris <techbriefs@burnsmcd.com>, Jim Hays <techbriefs@burnsmcd.com> or Elaine York <techbriefs@burnsmcd.com>.