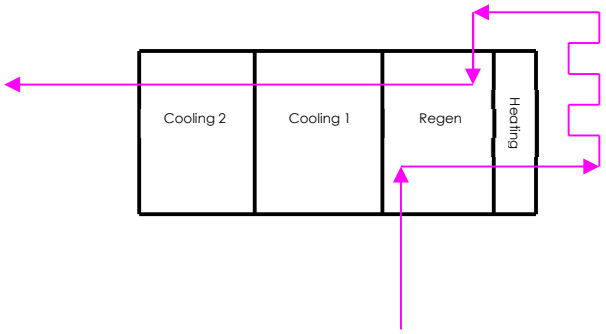
אלול תשפ"א / August 2021 Volume 8

דרך קצרה

Brief summaries of cRc Kashrus Policies

Heat Exchanger With Regeneration

The simple heat exchanger described in the previous installment has just one function – heating product – and the product makes just one pass through the heat exchanger. A heat exchanger with regeneration is considerably more sophisticated; it typically has two different functions – heating and cooling – and usually has 4 separate sections to accomplish those functions. For example, orange juice might enter the regeneration section (described below) at 40° F where it is heated to 120° F; move to the heating section where it reaches 165° F; pass through holding tubes out of the heat exchanger; return to the other side of the regeneration section, where it cools to 80° F; and then pass through 2 cooling sections which bring it to the storage and bottling temperature of 40° F.



Aside from having both heating and cooling capabilities, the heart of the system is the regeneration section, known colloquially as the "regen", which operates as follows: Instead of having steam or hot water serve as the heating media, the cold, incoming orange juice on one side of the heat exchanger plates is heated by hot, already-pasteurized orange juice flowing on the "other" side of the plates! This efficiently serves the dual function of heating the incoming juice while simultaneously cooling the outgoing juice.

The setup of a typical heat exchanger with regeneration is shown in the accompanying diagram. In the simplified diagram, a colored line shows the product starting (cold) in the regeneration section, moving to the heating section, out of the heat exchanger to the holding tubes, and then back (hot) to the "other side" of the regeneration section, and finally to the two cooling sections of the heat exchanger. [Heating and cooling media are not shown].

After the product leaves the holding tubes its temperature is measured to ascertain whether the minimum pasteurization temperature was met. If the product is at the required temperature, it continues to flow as described above and is said to be in "forward flow". But if the temperature is too low, the product is diverted to the balance tank so it can be pasteurized once again; in such cases, the product is said to be in "divert flow".

cRc Kosher Certification

Text summarized from Chapter 6 of the forthcoming *Imrei Dovid*, *Kashering*, by Rabbi Dovid Cohen
cRc Policies are from the cRc בית דין.

In establishing a *kashering* protocol, one must consider the following:

- There is a range of temperature in the heat exchanger, with about half of it being above *yad soledes bo*. The letter of the law is that *hag'alah* requires water which is just above the production temperature (i.e., *k'bol'oh kach polto*), but *l'chatchilah* one should always *kasher* at *roschin*.
- The *hag'alah* water must contact the utensil from the side which had contact with the non-kosher food. This is relevant in the regeneration section where the non-kosher food was itself the heating media, such that *hag'alah* water must pass on both sides of the plates.
- Due to "divert", the balance tank, first parts of the regen section, and piping to and from the heat exchanger will occasionally have contact with non-kosher product and must be *kashered* appropriately. [Some of these might not be included in the company's own sterilization procedures].

cRc Policies

23. **Should *hag'alah* be performed with water that is a few degrees above production temperature (כבולעו כך פולטו) or with water that it *roschin*?**

    Wherever possible, the water should be *roschin* (or at least a temperature that qualifies as *roschin*, see Chapter 10), but where that is not possible then a few degrees over production temperature suffices.

24. **How should one *kasher* a heat exchanger which has regeneration?**

    First, (1) drain the heating media, (2) turn off the pumps which control the cooling media, (3) fill the balance tank with water, set the heat exchanger's set-point for 212° F, and being flow of water, (4) manually put the system into divert flow, (5) maintain this flow until the red/hot pencil indicates that the water is at 212° F for a few minutes. Then (6) switch the system into forward flow, and (7) have the water flow from the finished product tank back to the balance tank and maintain this flow for a few minutes.

25. **If it is expensive or logistically difficult to have a *Mashgiach* present for *kashering*, is it acceptable to approve a *kashering* based on monitoring of charts and similar technological means?**

    Yes, assuming the charts are automated and reliable.

    The charts etc. will show that the *kashering* protocol was followed, and this should be supplemented with (a) the company's schedule and handwritten logs which indicate that kosher product was only produced after the *kashering*, (b) unannounced *Mashgiach* visits to ensure kosher and non-kosher are produced at the "right" times and with the appropriate ingredients, and (c) occasionally the *Mashgiach* should be present for a *kashering* to verify that the protocol is appropriate.

מראה מקומות

שולחן ערוך סימן תנ"א סעיפים ב' וה'
דרכי משה יו"ד סימן קכ"א ס"ק ז'
אגרות משה יו"ד חלק א' סימן ס'