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**Review of the initial treatment and avoidance of scald injuries**

Bourdon RT *et al*. Predict and treat scald injuries

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**Abstract**

Scald injuries, which describe burns to living tissue from hot liquids, are a very common injury that occur across geographical, social, economic, and national boundaries. Despite their ubiquitous nature, a complete understanding of the conditions which are required to cause scald burns is not yet available. In addition, clear guidance to medical practitioners is available through various guidelines however in actual situations, the extent of the burn is not fully known and this lack of knowledge complicates care. Here, a comprehensive review is made of the available knowledge of temperatures and scald durations which lead to skin-burn injuries. The range of volumes and liquid temperatures are typical of those found in heated consumer beverages. This review can help medical practitioners design initial treatment protocols and can be used by manufacturers of hot-liquid products to avoid the most severe burns. Next, within the context of this ability to quantify burn depths, a review of current burn treatment guidelines is given. Included in this review is a visual recognition of the extent of burns into the dermal layer as well as decision guidelines for selection of patients which would benefit from referral to a dedicated burn center. It is hoped that by bringing together both the quantified burn-depth information and current treatment guidelines, this review can be used as a resource for persons in the medical, manufacturing, beverage service, and other industries to reduce the human impact of scald injuries.

**Key words:** Scald injury; Skin burns; Biological heating; Hot beverages; Burn depth

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**Core tip:** This paper presents a concise summary that relates hot-beverage spills to burn injury risk. Not only can this paper be used to predict the depth of burn injuries, but it can also show how service temperature and cooling time can be set to reduce the threat of injury. Results are presented in simple to use tables and graphs for ease to medical practitioners.

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**INTRODUCTION**

Burn injuries are a common type of injury that can occur in many situations around the globe. Within the category of burn injuries, scald wounds caused by hot liquids are among the most common. Scald injuries can occur in kitchens, baths, industrial and manufacturing environments, restaurants, and other locations. The extent of scald injuries can vary from mild to death causing. Mild burns are almost always treated without medical attention, while extreme burn injuries often result in referral to dedicated burn centers. Because of the large variation in harm caused by burns, it is important to create environments which lessen burn injuries. It is also important for medical responders to quickly and correctly categorize a burn so that appropriate treatment is initiated.

Scald burns, which here refer to any thermal injury caused by heated liquid, can occur anywhere on the body; however, they are most common on the skin. Since the vast majority of scalds are skin burns, they will be the sole focus of this review.

The severity of a skin burn is quantified by two measurements. The first is the depth of the burn into the tissue. The second measure is an estimation of the size of the surface area involved. Both of these measures will now be discussed.

**BURN CLASSIFICATION**

***Burn depth***

Both within the medical community as well as with the general public, the degree classification is most often used to describe burn depth. Within this classification, the description first-degree burn describes burns that kill tissue only within the outermost layer of skin (the epidermis). As a consequence, the burns generally heal quickly and without medical attention. The injuries may be painful and result in hyperemia and flaking of the necrosed epidermis following the incident.

Second-degree burns pass through the epidermal layer and into the dermis. They lead to thermal necrosis of tissue within that layer and consequently damage the skin structures which are housed there, such as hair follicles, sweat glands, capillaries, among others.

Third-degree burns pass through the dermis and enter the underlying hypodermis tissue and possibly into muscle. Since the burn completely destroys the dermis, the functions of this layer are also halted (such as blood flow and sensation). Consequently, the skin is ischemic. While it may appear hyperemic, when the skin is compressed, reperfusion of the tissue is very slow to occur if at all. The pain associated with third-degree burns is often less than that of second- or first-degree burns because the innervation to the tissue is compromised. For third-degree burns, slow healing occurs and medical attention such as surgical excision and grating is required. If large parts of the body are burned, shock, hypothermia, and infection can occur[1-3].

Within the academic and bioheat transfer community, different descriptions are used. In this community, superficial burns are the equivalent to burns of first degree. Superficial-partial-thickness burns are those that pass through the epidermis and into the external part of the dermal layer - generally not beyond the dermal midplane. Next, deep-partial-thickness burns pass through the dermal midplane and into the lower half of this layer. Finally, full-thickness burns are essentially the same as third-degree burns – they extend through the dermal layer and into underlying tissue. As with third-degree burns, they often require skin grafting[4-6]. The primary difference between the two modes of burn classification is that in the latter, a separate accounting is made for burns that either are confined to the outer half of the dermis and those that pass into the lower half of the dermal layer.

Regardless of the preferred nomenclature, it is a challenge to visually assess burn depth. Many times, the visual estimation is not accurate[5,7-10]. A summary image is provided in Figure 1 to bring together the various burn extents which have already been discussed in the accompanying text.

***Burn area***

Total burn surface area (TBSA) is also an important measure of injury. TBSA is most commonly reported as a % of the body area that a burn covers. With this method, the body is subdivided into major regions (head, torso, legs, arms, *etc.*). Each region is allocated a numerical value which is a typical percentage of the region compared to the total body surface. An example of such a regional breakdown is provided in Figure 2. Since many of the body regions are multiples of 9%, this regional breakdown is often referred to as the Rule of Nines. The Rule of Nines is endorsed by both the American Burn Association and the European Practice Guidelines for Burn Care. While other burn area criteria have been studied, the widespread current usage of this metric motivated its inclusion here.

More information will be provided in a later section of this report related to decision making of medical professionals. First, however, quantitative information on the depth of the burn will be provided.

***Prediction of burn depth***

Burn depth studies have been performed since the late 1940s. Pioneering work[11-14] quantified the complex temperature-time relationship required for burns on porcine and human skin. It was discovered that the physiologic response to elevated temperatures was complex and that for small increases in exposure temperature, large changes in burn injury rates were observed. The outcome of this work was a quantification of the rate of cellular damage and the amount of viable cells still within the heated zone which is expressed mathematically as

(1)

Here, *C* represents the concentration of viable cells either initially or at some time *t*. *A* is the frequency factor (1/s), *Ea* is the activation energy (J/mol), *R* is the universal gas constant (8.3143 J/mol-K), *T* is the temperature in Kelvin, *e* is the constant 2.718, and *t* is the time (s)[15-31]. The fitted terms are obtained through experimental correlation, and they depend on the tissue type and body location. To illustrate the wide-ranging values of these parameters, Table 1 has been prepared.

The prediction of injury [through Equation (1)] is achieved by solving for the conduction of heat through perfused tissue using the Pennes model[32] which is expressed in Equation (2).

(2)

The calculation method outlined here has a long history of use and has been corroborated with experimental results. Results from those works have been adopted to predict skin burns using modern computational techniques[33-57].An outcome of these efforts is the ability to predict the distribution of an injury parameter throughout the various layers of tissue that have been heated. Values of are taken to correspond to completely necrosed tissue as they generally represent tissue which has too few viable cells to regenerate.

In the present study, focus is given on a subclass of scald burns – those caused by hot beverages. While the spill scenario can vary dramatically (volume of liquid spilled, temperature of liquid, spill pattern, presence or absence of clothing, speed of spill, thickness of skin, ability of victim to remove heat and apply cooling duration of hot liquid cooling prior to spill, among others), it is possible to generalize the results in a way that can provide meaningful information to treating physicians. To enable the generalization, the following ranges of parameters were used in the experiments:

Volume of liquid spilled: 8-16oz (237-473 mL)

Temperature of liquid spilled: 158-203 oF (70-95 oC)

Tye of clothing: 1 layer of a cotton shirt

Spills of cups that had caps as well as cups without caps.

Other parameters, such as the constitution of the cup, the presence or absence of an insulating sleeve, *etc.* had a very small impact on the results and so for simplicity are not included here[46].

The experiments, which were carried out involving spills on living human tissue and on a tissue surrogate are described in[46] and are not discussed in detail here. The experiments were carried out in typical ambient conditions of about 20 oC. The temperature during the cooling period for an 8 ounce (237 mL) beverages without a protective cover are shown below in Table 2. Corresponding information for covered beverages are provided in Table 3. These tables are followed immediately by information for larger volume beverages (16 ounces) both with and without protective caps (Tables 4 and 5).

The calculations were continued until the temperatures within the tissue reduced to levels which would no longer cause injury. Interested readers are invited to references[46] andwhich discuss both the cooling effect[56], the impact of rapid cooling after a burn, and the duration of time needed to bring tissue temperatures to safe levels.

From the experiments and calculations completed[46], verified by a simplified model[56] and by the comparison between models and physical observations which were contained therein, it is possible to create a visual reference which allows the estimation of burn risk caused by hot-liquid spills. The reference is provided in Figure 3.

The information presented in Figure 3 and the preceding tables can be brought together in a simple to use manner as seen in Tables 6-9. These tables list the initial beverage temperature, the volume, and the cooling time which should occur to bring the beverage to a low enough temperature so that a threshold mid-dermal burn may not occur. Table 6 corresponds to small (237 mL) cups cooling with a protective cap; Table 7 is the counterpart for the no-cap situation. Tables 8 and 9 present information for 473 mL cups with and without a protective cap, respectively.

These data show that beverage service temperatures, which are often in excess of 180oF are at levels which have the potential to cause serious physical harm. Furthermore, some beverage service temperatures are above the preferred temperature for the consumers[57-61]. It seems reasonable to promote the service of beverages at temperatures which are both preferred by consumers and safe so that serious mid-dermal burns are unlikely. The cooling results set forth here are corroborated by other mutually reinforcing studies[62-64].

It should also be noted that while the above tables correspond to typical adults and children (whose skin thickness is approximately 70% that of an adult), great care must be given to their use[55,65,66]. Also, as summarized in[55],skin thickness varies by body location[67-70]. For locations or persons whose skin is thinner than that used in the current study, lower temperatures or longer cooling durations are recommended. On the other hand, for persons whose skin is thicker than 2 mm, higher temperatures and/or shorter cooling durations can be used.

In addition to skin thickness, clothing type and the ability of someone to remove heat quickly and apply cool or cold temperatures should be a consideration. For persons whose mobility is limited, such as children or elderly, a spill may remain in contact with skin for a longer duration than for someone who quickly removes the source of heat (the spilled liquid and any saturated clothing). Consequently, for these mobility-challenged persons, lower temperatures and/or longer cooling durations are recommended.

With respect to clothing, it has two competing effects. First, clothing can insulate the skin against the hottest temperatures of the liquid. Second, the clothing can hold the hot liquid against the skin, extending the scald and delaying cooling. From a heat transfer perspective, a first responder should immediately remove the source of heat by removing saturated clothing if possible. In addition, the responder should apply cool/cold temperatures to quickly reduce the skin temperature. Room temperature liquids are often available and an excellent choice. It is recommended that if cool liquids such as room temperature water or other beverages are available nearby, they can be applied directly to the burn location and even through clothing. Burns occur very quickly and even a few second delay in the application of cooling can make an impact on burn depth.

Not only does cooling reduce temperatures and thereby reduce burn depth[55-56], but it also provides palliative relief[71-84]. Many of these studies have investigated the speed at which cooling should be applied to maximize the benefit. Others have considered the optimal temperatures for the cooling. While the consensus is that temperatures in the range of 10 oC-20 oC (50 oF-70 oF) are effective, in our opinion, speed is of critical importance. A delay of a second or two can make the difference between a superficial-partial-thickness burn and a deep-partial-thickness burn. In some instances, ice is used to cause cooling. Ice should be used with care, because very cold temperatures can caused vasoconstriction which inhibits blood flow to the injured region and slows healing. Extended application of cold temperatures can even cause cryological injuries[85-92].

**BURN ASSESSMENT**

Depth of the burn, TBSA involved, and the location of the burn all are necessary to develop a treatment plan. Burn depth occurs on a continuum and accurate assessment of burn depth is often difficult immediately after the injury[3,6-10,13-21]. Burn depth assessment helps predict which injuries will require excision and grafting as deep-partial-thickness burns and full-thickness burns often require this treatment.

First-degree (superficial) burns are red, have a dry surface, and typically are associated with discomfort. These burns do not blister. The affected skin will blanch with pressure and quickly reperfuse. A typical sunburn is an example of a first-degree burn.

Superficial second-degree (superficial-partial-thickness) burns are painful and form blisters. The surface under the blister is typically red, hypersensitive and moist. This surface will blanch with pressure.

Deep second-degree (deep-partial-thickness) burns blister and may be less painful than superficial partial thickness burns. The tissue underlying the blister will be moist and may appear mottled, red, or even white. Reperfusion after blanching is slow or absent. Sensation of the damaged tissue maybe diminished when tested with pin prick.

Third-degree (full-thickness) burns extend into subcutaneous fat or connective tissue. These injuries appear white or tan and are insensate. They do not blanch as there is no perfusion to this area of the burn due to damage of the capillaries.

Fourth-degree (full-thickness) burns extend into deep structures such as muscle or bone. These injuries are easily identified.

The size of the burn is estimated based on the percentage of total body surface area involved. Only partial-thickness burns and deeper are used when estimating TBSA burned. This estimation informs intravenous fluid resuscitation needs and is used to determine if a patient would benefit from a referral to a burn center. A common method for estimating TBSA burned is the Rule of Nines as described above. This method is endorsed by the American Burn Association, but several other methods exist. For smaller burns, the patient’s hand (palm and fingers) can be used as a reference as this surface area is approximately 1% TBSA.

The final aspect of the initial burn assessment involves noting the area of the body involved. Partial thickness and deep burns involving the face, hands, feet, perineum, genitals, and major joints often require consultation with a burn center.

**INITIAL MANAGEMENT AND TREATMENT CONSIDERATIONS FOR SCALD INJURIES**

***Prehospital care***

Immediate removal of the burn source and cooling of the affected area is critical to prevent further tissue damage. Cooling is most easily accomplished by application of cool or even room temperature water. If immediate removal of any overlying clothing is possible this may be done before application of water. Otherwise, liquid can be poured directly on porous clothing to begin the cooling process. Cool water is a safe, effective, and soothing intervention. Therefore, continue with the application of cool water until the burning process is completely halted.

***Initial emergency center care***

Serious burns require initial treatment at an emergency center. A complete review of the initial care of the burned patient is beyond the scope of this paper. The following text will therefore focus on how the burn assessment informs subsequent treatment. After any life threatening injuries and medical complications have been addressed, the burning process has been halted, and any necessary analgesics have been administered a burn assessment can be performed. The clinician will need to assess all burns noting location and depth. Next, TBSA burned can be estimated using only partial thickness burns and deeper for this calculation.

***Initial fluid resuscitation***

Fluid loss through damaged skin and loss into the interstitial space can result in hypovolemic shock and thus inadequate tissue perfusion. This can lead to not only viable skin becoming nonviable, but also to end organ dysfunction. Resuscitation with intravenous fluid is the mainstay for addressing and preventing burn shock. As noted previously, first degree burns are not included in the TBSA estimation for fluid resuscitation calculations[2,3]. Adult patients with less than 20% TBSA affected and pediatric patients will less than 10% TBSA affected can often be managed with oral hydration alone[3]. Larger burns require intravenous fluid resuscitation with crystalloids and ringer’s lactate solution is commonly used. Multiple formulas exist for estimating intravenous fluid needs in the first 24 to 48 h after a burn. The Parkland Formula is one of the most popular. This formula uses the variables TBSA burned and patient weight in kilograms. The Parkland formula estimates the milliliters of intravenous fluid to be given in the first 24 h after the burn occurs. Half of the volume is administered over the first 8 h and the second half of the volume is administered over the following 16 h.

The Parkland Formula:

(3)

**BURN CENTER REFERRAL CRITERIA**

The American Burn Association has published guidelines to help clinicians determine which patients would benefit from referral to a burn center[1].

Criteria recommended by the American Burn Association for burn center referrals are: (1) Partial thickness burns greater than 10% of body area; (2) burns of hands, feet, face, genitals, perineum, or major joints; (3) third degree burns; (4) electrical burns (including lightning); (5) chemical burns; (6) inhalation burns; (7) burns in patients with pre-existing conditions that could complicate management; (8) concomitant trauma which increases morbidity or mortality risk; (9) burns of minors treated in hospitals without qualified personnel or equipment; and (10) burn injury which requires social, emotional or rehabilitation intervention.

**CONCLUDING REMARKS**

Here, a two-fold presentation of information is given. First, the relationship of liquid temperature to burn depth is showcased with an easy-to-use graph. Included in the results is information regarding how the cooling time between hot-beverage service and a spill incident will reduce burn depth. With this information, it is possible to predict, within a reasonable degree of certainty, the depth of a burn injury. In addition, required beverage cooling times to avoid mid-dermal burns are listed.

In addition, the information presented here can be used by the beverage service industry to make safer hot-liquid beverages. Often times, service temperatures are above those preferred by consumers and these elevated temperatures pose an unnecessary risk of injury.

While the focus in this study was on mid-dermal burns, it should be recognized that lesser burns can also be injurious. Also, readers should recognize that mid-dermal burns can be caused at lower temperatures on areas where the skin is thinner, when victim mobility is challenged, or when the situation makes difficult the removal of the source of heat and the application of cooling.

With respect to medical care, there are a number of care phases that occur. First care starts prior to arrival at a medical center and involves the removal of heat and application of cooling. Next, there is a stage of initial medical care which may include fluid resuscitation. For severe burn situations, referral to a burn center is made. Guidance for all these care phases is provided here with reference to published guidelines.

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**Figure 1 Illustration of burn depths and characteristics (courtesy of Amicus Medical Images).**



**Figure 2 The Rule of Nines for adults and children (Courtesy of Brookside Associates).**



**Figure 3 Burn depth and spill temperature relationship with annotations for mid dermal burns in adults and children.**

Table 1 Injury parameters for skin tissue

|  |  |  |
| --- | --- | --- |
| **Ref.** | **A (1/s)** | **Ea (J/kmole)** |
| [14,23] | 3.1e98 | 6.28e8 |
| [25] | 2.90e37 | 2.44e8 |
| [26] | 9.09e37 | 2.49e8 |
| [27] | 4.33e64, T < 50  9.39e104, T > 50 | 24.19e8, T < 50  6.70e8, T > 50 |
| [13,24] | 3.1e98 | 6.28e8 |
| [28] | 2.19e124, T < 50  1.82e51, T > 50 | 7.78e8, T < 50  3.25e8, T > 50 |
| [29] | 1.43e72 | 4.57e8 |
| [29] | 2.86e69 | 4.61e8 |
| [29] | 4.32e54, T < 50  9.39e104, T < 60 | 4.16e8, T < 50  6.65e8, T < 60 |
| [30] | 3.1e98, T < 55  5e45, T > 55 | 6.27e8, T < 55  2.96e8, T > 55 |
| [31] | 2.19e124, T < 50  1.82e51, T > 50 | 7.82e8, T < 50  3.27e8, T > 50 |
| [27] | 4.33e64, T < 50  9.39e104, T > 50 | 4.18e8, T < 50  6.69e8, T > 50 |

**Table 2 Cooling of an 8 ounce (237 mL) heated beverage without a protective cap**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooling time (min)** | **Service Temperature, oC (oF)** | | | | | |
| **70 (158)** | **75 (167)** | **80 (176)** | **85 (185)** | **90 (194)** | **95 (203)** |
| 0 | 70 | 75 | 80 | 85 | 90 | 95 |
| 5 | 58.1 | 61.9 | 61.9 | 69.5 | 73.4 | 77.2 |
| 10 | 50.4 | 53.4 | 53.4 | 59.5 | 62.5 | 65.5 |
| 15 | 45.1 | 47.6 | 47.6 | 52.6 | 55.2 | 57.7 |
| 20 | 42.4 | 44.6 | 44.6 | 49.1 | 51.4 | 53.6 |
| 25 | 42.2 | 44.4 | 44.4 | 48.9 | 51.1 | 53.3 |

**Table 3 Cooling of an 8 ounce (237 mL) heated beverage with a protective cap**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooling time (min)** | **Service Temperature, oC (oF)** | | | | | |
| **70 (158)** | **75 (167)** | **80 (176)** | **85 (185)** | **90 (194)** | **95 (203)** |
| 0 | 70 | 75 | 80 | 85 | 90 | 95 |
| 5 | 62.5 | 66.7 | 66.7 | 75.2 | 79.5 | 83.7 |
| 10 | 56.9 | 60.6 | 60.6 | 67.9 | 71.6 | 75.3 |
| 15 | 52.5 | 55.8 | 55.8 | 62.3 | 65.6 | 68.8 |
| 20 | 49.5 | 52.5 | 52.5 | 58.4 | 61.3 | 64.3 |
| 25 | 47.7 | 50.5 | 50.5 | 56.1 | 58.8 | 61.6 |

**Table 4 Cooling of a 16 ounce (473 mL) heated beverage without a protective cap**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooling time (min)** | **Service Temperature, oC (oF)** | | | | | |
| **70 (158)** | **75 (167)** | **80 (176)** | **85 (185)** | **90 (194)** | **95 (203)** |
| 0 | 70 | 75 | 80 | 85 | 90 | 95 |
| 5 | 61.5 | 65.7 | 69.8 | 74.0 | 78.1 | 82.3 |
| 10 | 55.9 | 59.5 | 63.1 | 66.7 | 70.3 | 73.9 |
| 15 | 51.9 | 55.1 | 58.3 | 61.5 | 64.7 | 67.9 |
| 20 | 49.6 | 52.5 | 55.5 | 58.5 | 61.4 | 64.4 |
| 25 | 48.9 | 51.8 | 54.7 | 57.5 | 60.4 | 63.3 |

**Table 5 Cooling of a 16 ounce (473 mL) heated beverage with a protective cap**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooling time (min)** | **Service temperature, oC (oF)** | | | | | |
| **70 (158)** | **75 (167)** | **80 (176)** | **85 (185)** | **90 (194)** | **95 (203)** |
| 0 | 70 | 75 | 80 | 85 | 90 | 95 |
| 5 | 65.0 | 69.5 | 74.0 | 78.5 | 83.0 | 87.5 |
| 10 | 61.5 | 65.7 | 69.8 | 74.0 | 78.1 | 82.3 |
| 15 | 58.8 | 62.7 | 66.6 | 70.5 | 74.4 | 78.3 |
| 20 | 57.0 | 60.7 | 64.4 | 68.1 | 71.8 | 75.5 |
| 25 | 56.0 | 59.6 | 63.2 | 66.8 | 70.4 | 74.0 |

**Table 6** **Cooling times required for various service temperatures in order to cause threshold mid-dermal burns, 8-ounce (237 mL) cups with a protective cap**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Service temperature** | | **Cooling time for adult mid-dermal burns (min)** | **Cooling time for children mid-dermal burns (min)** | |
| **(oC)** | **(oF)** |
| 95 | 203 | 8 | | 12 |
| 90 | 194 | 5 | | 9 |
| 85 | 185 | 2 | | 6 |
| 80 | 176 | NA | | 3 |

**Table 7** **Cooling times required for various service temperatures in order to cause threshold mid-dermal burns, 8-ounce (237 mL) cups without a protective cap**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Service temperature** | | **Cooling time for adult mid-dermal burns (min)** | **Cooling time for children mid-dermal burns (min)** | |
| **(oC)** | **(oF)** |
| 95 | 203 | 4 | | 6 |
| 90 | 194 | 2 | | 4 |
| 85 | 185 | 1 | | 3 |
| 80 | 176 | NA | | 1 |

**Table 8 Cooling times required for various service temperatures in order to cause threshold mid-dermal burns, 16-ounce (473 mL) cups with a protective cap**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Service temperature** | | **Cooling time for adult mid-dermal burns (min)** | **Cooling time for children mid-dermal burns (min)** | |
| **(oC)** | **(oF)** |
| 95 | 203 | 11 | | 18 |
| 90 | 194 | 7 | | 12 |
| 85 | 185 | 2 | | 8 |
| 80 | 176 | NA | | 3 |

**Table 9 Cooling times required for various service temperatures in order to cause threshold mid-dermal burns, 16-ounce (473 mL) cups without a protective cap**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Service temperature** | | **Cooling time for adult mid-dermal burns (min)** | **Cooling time for children mid-dermal burns (min)** | |
| **(oC)** | **(oF)** |
| 95 | 203 | 6 | | 9 |
| 90 | 194 | 4 | | 6 |
| 85 | 185 | 2 | | 4 |
| 80 | 176 | NA | | 2 |