Congratulations and thanks for being a part of the Glacier Chill Impact Coolshirt Beta Test Program! In this program, we are working with several elite football programs to get detailed feedback from players, coaches and other end users to help guide our final 2019 design. Please enjoy this beta team shirt but be sure to complete the feedback survey attached at the end of these instructions.

Please note that the impact coolshirt is not just a simple t-shirt. This is a sophisticated piece of equipment that will retail for nearly $200. Take a few minutes to read these instructions, and a few moments before and after workouts to care for the shirt. We have also produced a short YouTube tutorial to complement these instructions and to help familiarize users with the operation of the shirt. Also keep in mind that this equipment is not meant for contact drills. The shirt is intended to be used for strength and conditioning exercises, walk throughs etc. Neither the motor nor the flow system are designed to take direct impact, and hard plastic pieces in the jersey can injure a player if used during contact activities.

The coolshirt works by actively pumping ice water from interchangeable cooling cartridges (1) through bladders on the chest and back (2). The bladders are housed in large pockets and are accessed through side zippers. It is critical to smooth out these bladders and the inlet/outlet tubes on the right side of the jersey before each use to prevent kinking. The cooling cartridge sits in the larger zippered compartment on the back of the shirt. Below this cooling cartridge is the heart of the system- a power pack (3) that...
circulates water in a loop between the reservoir and the bladders. These components and the overall flow loop are shown schematically in Figure 1. The actual components can be visualized in Figure 2.

A button on the battery case (blue circle, Figure 3) in the powerpack activates the entire system. This button can be felt through the neoprene bag and can be activated without removing the battery case. Press once to turn the pump on, and press again to turn it off. Two rechargeable batteries in the waterproof battery case (accessed by removing two screws) power the system for 2-4 hours. When the pump is running, you should be able to feel a gentle vibration from within the powerpack.

While the tubing and bladders are housed within pockets and channels built into the shirt, they have a tendency to move around a bit between uses. The most critical aspect of using the cool shirt is to spend a few minutes after putting on the shirt to smooth out the bladders and adjust the position of the tubes to be comfortable and to make sure there are no kinks in the system. It helps to have a teammate or equipment manager spend a few moments helping to prep the system and load the cooling cartridge before activating the pump. Alternatively, you can carefully lay the shirt out on a table, flatten the bladders, connect the cooling cartridge and activate the powerpack.

Once the bladders are inflated with water and circulating to both front and rear bladders, carefully put the shirt on. Again, adjust the bladder and inlet/exit tubes to be comfortable and kink free.

The cooling capacity of the system is driven almost entirely by the amount of ice in the cartridge. The phase change of ice (solid ice at 32 degrees to liquid at 33 degrees) removes significantly more heat than a similar volume of liquid water warming from 33 to 34 degrees. Therefore, pack as much ice as possible into the cartridge, then fill the rest of the way with cold water. Fold the top of the bag close to the waterline (minimizing the air pocket in the bag) then seal with the orange closure clip (Figure 4).

Figure 3. Interior of Powerpack.

Figure 4. Insert the yellow shaft under the folded flap, and press the clip onto the bag such that the cooling cartridge plastic is trapped between the yellow shaft and the orange barrel.
The clips are a little tricky to use at first, but recognize that the clear plastic of the cooling cartridge bag has to slide in between the yellow insert of the closure clip and the outer orange shaft. Try this closing step a few times on a dry bag before trying to do on a wet bag. Once the bag has been clipped a few times, it is much easier to close along the same fold line. Note also that the bag will drain out if you aren’t careful, so grasp the tubes and hold them up above the bag. The cooling cartridge connects to male and female fittings inside the large back pocket. Pull those fittings out, and turn male ‘spin lock fittings’ firmly about ¼ turn to engage and connect to the female fitting. Again, practice connecting/disconnecting these fittings a few times with a dry system before loading with water. Once the bag is filled, and the fittings connected, place the cooling cartridge into the large rear zippered pocket with the orange closure clip end in first.

**Figure 5.** The male fitting (bottom) has a spin lock fitting that can be finger tightened onto the female fitting (top).

The excess length of the closure clip should go through the small button hole on the upper left of the rear pocket. Insert the excess length of the tubing into the pocket, again, taking care not to kink the tubes. To turn on the pump, feel for the on/off button on the battery case directly under the logo on the power pack. Remember that this process is much easier if done with a partner. Alternatively, make all of the connections with the shirt flat on a table or bench, then turn on the system, and then put the jersey on.

If one or both bladders do not inflate with cold water, check for kinks on the right side of the body. Kinks are most likely to occur near the exit from the bladders to the Y tubing. Flatten these joints and reposition the Y tubing to re-establish flow. Once the ice is gone from the pack and the water is warmed, you can quickly add a new cooling charge by taking a new, pre-filled cartridge from the cooler. Alternatively, simply remove the clip, drain most of the water, and add ice to the warmed cartridge. The pump can be left running while you quickly disconnect and reconnect the new cartridge. Each charge should last about 15 minutes.

At the end of practice, you can switch off the motor and carefully remove the shirt by peeling it up and turning it inside out as you remove it. Turn the shirt right side in, then remove and drain the cooling cartridge. Then carefully remove the motor pack. Connect the remaining male and female fittings so that
these tubes do not migrate back into the channels in the shirt. Note that this connection is for convenience only, and must be undone to properly reconnect the powerpack and cooling cartridge.

Hand wash the shirt with mild detergent with the bladders still inserted and hang dry. To recharge the batteries, open the power pack pouch and remove the battery case door with a small Phillips head screw driver. Recharge or replace the AA batteries. A good rechargeable battery should last more than 2 hours, but the system should be recharged between practices. Again, thanks for participating in our beta test program... we hope this innovative new product helps you play at your peak performance!