Hush Little Baby

HLB's BPA-free bottle design eliminates possible behavioral disorders and decreases colic with a revolutionary Air Wave venting system.

by Meaghan Ziemba

Plastic, it's everywhere from household electronics and clothes to appliances and bottles. One common plastic product? The baby bottle.

For some, this may not be a big deal, but for others, like Marlene Sirota, mother of six, and president and co-founder of Key Baby and Weil Baby, it caused some concern. Many baby bottles are molded using Polycarbonate (PC), a glass-clear plastic that contains Bisphenol-A (BPA) – an organic compound used in the production of PC that has raised questions about certain health effects.

"I wanted to develop a BPA-free baby bottle after surviving cancer and becoming concerned with cancer-causing chemicals in food and food dispenser products. Key Baby engaged HLB to develop a new and differentiated baby bottle that would meet the needs of new moms," Sirota states.

Key Baby also began to work with Dr. Andrew Weil, founder of Weil Lifestyle – a resource for integrative medicine education in response to concerns about the BPA levels that were found in infant care products.

"Reasonable evidence has shown an increase in aggressiveness, nervousness and behavioral disorders as well as an early onset of puberty, which might be related to BPA," explains Natan Pheil, mechanical engineer, HLB. "A lot of manufacturers were unprepared when the market demanded BPA-free products."

To prepare for the sudden demand, Eastman Chemical Company was contacted for their new generation copolyester material, Eastman Tritan.

Eastman Tritan appealed to Key Baby because it was manufactured without BPA and provided infant-care products with superior clarity, dishwater durability and toughness.

"With Eastman Tritan, the material is as clear as polyethylene terephthalate (PET) but with a significantly increased heat resistance," explains Martin Rathgeber, director of mechanical engineering, project manager, HLB. "The bottles can be exposed to higher temperatures – as in dishwashers or if boiled – which standard PET bottles would not survive."

Injection Blow Molding

When Tritan is used in injection-blow molding, the stretch ratio has to be limited to avoid the possibility of finger prints being left behind on the bottles when they are boiled.

"There is no need to boil baby bottles, but you cannot rule out that someone will still do so," says Rathgeber. "The current bottle design takes this into account."

Air Wave

The Weil Baby bottles Air Wave venting system consists of four waves at the top of the bottle neck that provide a means for air to enter

An inner skirt on the nipple, Pheil explains, hugs the inner diameter of the bottle neck and acts like a check valve, keeping the liquid in the bottle, while allowing the air to flow in to equalize the pressure.

the bottle when the baby sucks on the bottle nipple.

An inner skirt on the nipple, Pheil explains, hugs the inner diameter of the bottle neck and acts like a check valve, keeping the liquid in the bottle, while allowing the air to flow in to equalize the pressure. This creates a better flow and helps to decrease colic, which is associated with insufficiently venting baby bottles.

The flap of the bottle (inner annual ring) is crucial to the venting system. "It seals against the inside of the bottle neck, thereby allowing air to enter the bottle but no fluid to leak out," says Pheil. Without the flap, the venting system would not exist.

Adam Ruggles, industrial designer and Gary Prokop, director of industrial design, HLB, were in charge of the aesthetics, initial concept and form of the bottle.

"We focused on the venting system and wanted to match it with an iconic shape," Ruggles and Prokop explain. "The bottle's shape is unique in the industry, providing stability and enhancing the baby brand."

The bottles are available in glass and sippy cup styles. The sippy cups are interchangeable with the bottles with four nipples and two sippy cup spouts that are designed for various age groups.

Ruggles and Prokop explain how the designs were developed from hand sketches.

Renderings of the designs were completed in Photoshop and the 3-D data was created in SolidWorks. Foam models were produced to confirm the product had the right look and feel. All designs were approved and endorsed by Dr. Weil. With a variety of suppliers for the various components, there was a lot of mixing and matching, and communication to get a stable design for the venting system and the simple silhouette of the bottle.

The air wave design eliminates additional parts to clean, drop on the floor or lose. The parts are durable enough for babies to drop and play with, and the materials make the bottle a safe feeding product for infants and toddlers. PDD

What's Inside: Venting System

1. Neck ring threads and bottle neck threads that mate the neck ring and nipple assembly to the bottle.
2. An outer ring on the nipple that grabs the bottle neck and seats the nipple in the correct orientation.
3. The bottle neck has four notches that provide a means for air to enter the bottle.
4. An inner annular ring on the nipple rests against the inside surface of the bottle neck, allowing air to flow into the bottle but preventing fluid from leaking out.