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Strangled by disposables

Sewer "activists" are asking nonwoven fabrics manufacturers to help teach the public not to treat toilets like trash cans.

By Nick J. Arhontes PE

Editor's note: Every time my seventh-grade gym teacher referred to a tampon, she'd hold it up, stare us down, and say: "Never, *ever*, flush this — or the applicator — down the toilet." Whether she was required to say it or married to a plumber, I don't know. Didn't matter. We got the message.

We need to re-educate people about what can and can't be flushed. Toilets are more robust than when I was in junior high (and no, I'm not telling you the year). Back then property owners clogged their own plumbing; today our sanitary sewer systems are taking the hit.

This article talks a lot about wet wipes, but they're not the only culprit. Like toilet paper, which disintegrates in about 1 minute, some wipes disperse rapidly. But many other items do not. According to Association of the Nonwoven Fabrics Industry (INDA) field tests with wastewater utilities, nondispersibles break down as:

- 50% paper towels from public restrooms; they get to the treatment plant relatively intact and build up on bar screens
- 25% baby wipes
- 25% feminine hygiene, household cleaning, and cosmetic wipes; tampon strings wrap around other stuff to create a solid mass of material.

The public "demands" convenience, but only because nonwoven fabrics (see sidebar on page 38) enable The Procter & Gamble Co., Kimberly-Clark Corp., and other companies to dispense household cleaners, fabric softeners, hemorrhoid cream, and hundreds of other consumer packaged goods via a single sheet, or wipe. In 2002, the market for wet wipes was worth $2 billion. This year, according to The New England Consulting Group of Norwalk, Conn., it's $5 billion. Five years from now: $6.5 to $7 billion.

Companies market them as "flushable," "biodegradable," and "safe for sewers and septic systems," but I wouldn't be writing this if they're *also* dispersible; i.e., dissolvable in water. Here's how the wastewater industry is responding.

Next month we'll give you some solutions.

— Stephanie Johnston

Wet wipes and other disposable sheets seem so harmless. Just flush them down the toilet and they magically disappear, right? Wrong. Unlike toilet paper, some contain plastic and other nonsolubles that render them "nondispersible," the wastewater industry's term for material that doesn't dissolve quickly in water. Instead of disintegrating, they settle in gravity sewer mains or get tangled in pump impellers.

The Orange County Sanitation District in Fountain Valley is the third-largest wastewater treatment agency in California. We treat 210 mgd through two treatment plants and own 587 miles of sewers and 15 pump stations; 4,513 miles of satellite sewer system feed into our trunklines. Our 479-square-mile service area includes 21 cities, 3 special districts, and 2.5 million people.

In 2010 – 2011, we conducted 971 preventive or corrective de-ragging maintenance calls on 10 pump stations. Total labor cost: $320,000. We continue to work diligently to avert clogging that could lead to a sewer spill. Every Monday and Thursday our crews remove nondispersibles from our three hardest-hit stations. A minimum of three pumps at each is taken out of service, opened, and de-ragged, a task that takes two employees up to two hours at each station to complete.

For more information

- Maine Wastewater Control Association
- National Association of Clean Water Agencies "The Water Voice"
- Orange County Sanitation District
- Water Environment Federation's Collections System Committee

Our capital improvements project called for installing Wemco-Hidrostal screw centrifugal pumps at project locations, but they don't solve the ragging problem. Our investment in more powerful equipment just moves the problem downstream to the treatment plant. On Aug. 13, the equivalent of 40 large trash bags of nondispersible material entered the headworks at one plant, most likely from a newer trunkline that runs under a riverbed, which overburdened or completely plugged three washer compactors. It took six to eight hours and up to 10 plant employees to restore normal operation.

As the multibillion-dollar feminine hygiene and urinary incontinence market continues to develop new products like disposable undergarments, we anticipate the "flushable" issue will only get worse.

Flushability vs. dispersibility

Manufacturers voluntarily test products for flushability, but federal law doesn't require third-party assessment or verification. Nor is there a required protocol for package labeling, one that would forcefully instruct consumers to throw the used product in the garbage. I've been working with the Water Environment Federation (WEF) and colleagues in California, Maine, New Jersey, Oregon, and Washington State to advocate that wipes labeled as "flushable" also be "rapidly dispersible" and that such claims be verified by a third party like NSF International.

I got involved with this issue in 2003 by sharing information at Southern California Alliance of Publicly Owned Treatment Works meetings. At about the same time, but unbeknownst to me, the Water Environment Research Foundation (WERF) and Procter & Gamble published Protocols to Assess the Breakdown of Flushable Consumer Products (WERF Stock No. 02CTS7P).

Visit here to download this logo and see the results of the Association of the Nonwoven Fabrics Industry's (INDA) study of clog materials at California's Central Contra Costa Sanitary District in the Town of Moraga. Source: INDA

Credit: INDA

In 2005, the Association of the Nonwoven Fabrics Industry (INDA) used the protocols to develop a voluntary guideline for assessing the flushability of wet wipes and other products dispensed on nonwoven fabrics. In 2009, INDA and its counterpart, the European Disposables and Nonwoven Association (EDANA), released a second edition as well as the Don't Flush logo at right.

As it turned out, the research upon which the test methods are based focused on the wastewater treatment process and plant impacts. It didn't fully address upstream collections systems. So it wasn't until 2010 that I and a few others in the wastewater industry realized the disconnect between upstream/downstream impacts and the need for flushables to disperse more rapidly.

In 2010, California Assembly Member Jared Huffman introduced legislation (AB 2256) to amend the state's Health and Safety Code to require labeling and third-party verification

of flushability and dispersibility. The bill was moving through committee with passing votes but placed on hold at INDA's request. INDA funded a field study at the Central Contra Costa Sanitary District's Moraga pump station, where pumps seized three to four times a month. Clog composition, more details of which are here, include:

- 70% household cleaning wipes and personal hygiene (baby wipes, facial wipes, strong nonwoven articles with a sheet size of 6x8 inches, and baby/toddler embossed patterns)
- 19% feminine hygiene (tampons, feminine pads, liners, tampon applicators, and wrappers for tampons and pads)
- 10% other (including but not limited to condoms, floss, plastics, plastic packaging/wrapper, bottle tops, and roots)
- 1% paper towels

INDA agreed to improve product labeling, testing, and public education but attempted to shift the focus from "flushable wipes" to the broader category of "disposable products."

In the near future, INDA plans to release a third edition of the *Guidance Document for Assessing the Flushability of Nonwoven Consumer Products*.

In 2011, Maine became the second state to introduce legislation (LD 781) establishing standards for consumer products advertised as flushable.

The Joint Standing Committee on Environment and Natural Resources voted "Ought Not Pass" in January 2012 with the condition that manufacturers gain a better understanding of and propose solutions to the problem. INDA agreed to participate in a pilot public education program targeting products that had been identified in a two-day field study at the Portland Water District's Westbrook pump station and customers that live near the pump station where acute clogging persists. On Aug. 1 – 2, 2012, INDA conducted the first consumer focus group study in Maine and we're waiting for the official report.

Our ammunition: metrics

One problem we hear about a lot is that consumers are confused by all the different product labeling. If they exist at all, instructions for proper disposal are inconsistent, printed in tiny type, and hidden on the back of packaging. In Europe, EDANA has been much more successful with implementing a universal nonflushable symbol and has a standardized "Manufacturers' Code of Practice on Communicating Disposal Pathways for Personal Hygiene Wet Wipes."

But here in North America, wastewater agencies have been leading the way. WEF is working on adding instructions for nondispersibles to its "It's a Toilet, Not a Trashcan" bill stuffer. Many of you have spent taxpayer dollars telling those same taxpayers what they shouldn't flush. We here in Orange County have conducted outreach for many years and just launched a new campaign called "What 2 Flush" (www.what2flush.com). We've boiled down our message to three elements: Flush only the "three Ps" — pee, poo, and toilet paper.

I think the only way we're going to influence meaningful change is to join forces and demonstrate what's happening on a national scale. The American Public Works Association (APWA) and National Association of Clean Water Agencies (NACWA) are working with WEF. You can help by:

1. Conducting characterization studies or forensics to determine the cause and composition of clogs and identify the material responsible. Collect data on types of material and volume. The Maine Wastewater Control Association's "Standard Operating Procedure for Evaluation Materials in Pump Clogs and Sewer Obstructions" is a good start for a standardized methodology.

2. Collecting and documenting all costs: labor hours, labor costs, preventive and corrective maintenance

events, equipment repair and replacement costs, hauling fees, and sanitary sewer overflow fines.

3. Working with your local APWA, NACWA, and/or WEF chapter on understanding local issues and providing information they can use at the national level.

Bottom line: We must focus on keeping nondispersibles out of the toilet. Labeling and proper disposal instructions need to be improved and universally consistent to avoid consumer confusion. We also need to advocate for “dispersibility vs. flushability” and extended producer responsibility.

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Nonwoven Fabrics

It can look like fabric, but it isn’t. Unlike cotton or wool, the raw ingredient in “nonwoven fabrics” — softwood fluff pulp fibers — doesn’t have to be converted to yarn before being woven or knitted. Instead, the fibers are separated and then bound with plastic-based foam or fused with heat.

The Association of the Nonwoven Fabrics Industry, known internationally as INDA, defines nonwovens as:

A fabric made directly from a web of fiber, without the yarn preparation necessary for weaving and knitting. In a nonwoven, the assembly of textile fibers is held together by:

1) Mechanical interlocking in a random web or mat

2) Fusing of the fibers, the case of thermoplastic fibers

3) Bonding with a cementing medium such as starch, casein, rubber latex, a cellulose derivative, or synthetic resin.

Initially, the fibers may be oriented in one direction or may be deposited in a random manner. This web or sheet is then bonded together by one of the methods described above. Fiber lengths can range from 0.25 inch to 6 inches for crimped fibers up to continuous filament in spunbonded fabrics.

In addition to water filters, a subset of nonwoven fabrics called geotextiles is used to repair asphalt cracks, control erosion, and seal landfills. Their liquid and flame repellency, strength, and filtering capability make them ideal for such applications, but also render them nondispersible: difficult to break down in water.

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