A “Flushable Wipe” Epidemic?

By Pete Lies - Electric Pump
While jokes and stories abound at wastewater gatherings and conferences regarding items found in our municipal collection systems, one class of items has emerged as no laughing matter. In fact, the ramifications have taken the discussion to the national stage. The items in question are “flushable wipes.” As you will see later in this article, the term flushable is greatly exaggerated in almost all cases. A majority of wastewater operators and maintenance technicians are familiar with the problems these solids cause in the waste stream. Problems like full trash baskets, plugged pumps and blinded screens directly impact municipalities where they can least afford it, the checkbook. Costs associated with equipment damage, additional man hours spent, lift stations cleaning services and emergency call outs can be significant and have prompted manufacturers such as JWC Environmental and Flygt Corporation to devote time and resources to study the problem and provide potential solutions. The findings listed below have been gathered by those manufacturers and includes information on the progress that has been made to reduce the impact of “flushable wipes.”

JWC Environmental Inc., manufacturer of the "Muffin Monster" wastewater grinder and related screening products has compiled the following information which outlines the problem, puts forth some current solutions and discusses what action is being pursued currently with various associations and agencies. The perpetrators of these costs, the wipes, are showing an increase in sales of 16 percent per year resulting in a 12-14 billion dollar per year industry. While the term "wipes" encompasses the following items; paper towels, baby wipes, cleaning wipes, feminine hygiene products and flushable wipes, it should be noted that 92 percent of these products are not considered truly flushable.

In an effort to reduce the increasing costs to collection systems, efforts have been made in the areas of wipe technology, public education and pump station equipment technology. Kimberly Clark, makers of Cottonelle wipes have reformulated the wipe itself with smaller fibers. The smaller fibers break up and disperse after two hours in water. These reformulated wipes were tested by Xylem in one of their submersible pump installations and resulted in no clogging or increase in electrical draw on the pump motors. The goal is to improve wipe technology to the point where it approaches the dispensability of toilet paper in water. Guidelines set forth by WEF and wastewater professionals are to disperse the wipe fibers within 30-60 minutes.

As the changing wipe technology is coming closer to the target for dispersibility, the best way to address the issue is by keeping the wipes out of the waste stream altogether. Customer education should begin with the wipes packaging. There seems to be no consistency with the warning labeling that identifies the products as non-flushable. In addition, many of the warnings are hidden by folds in the packaging. Public service announcements have been made to get the message out to the public. These attempts have met with positive results when the message is consistently broadcast by television or radio but have fallen short when the public is no longer exposed to the messages. Public education seems to make the most impact when focused on dangers, such as clogged pipes, to the

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individual homeowner. Unfortunately there seems to be a disconnect between the potential cost to the individual homeowner and the big picture costs to the collection system as a whole.

The financial impact to municipal budgets has forced operators to look at pump station technology to combat the increasing maintenance costs. One potential solution is to change the lift station pump type from a standard non-clog design to a chopper or grinder unit design with the capability to reduce solid size. JWC and other manufacturers have developed screening technologies to combat the issues at both the pump station and the headworks locations. Bar screens, fine screens, auger/screen combinations and band screens are all viable options when the goal is to remove the solids from the waste stream before downstream treatment issues are encountered. These screening technologies are estimated to capture anywhere from 42 to 93 percent of solids in the waste-stream. Finally, the Muffin Monster wastewater grinder by JWC is available with a special cross cut blade design specifically suited to reduce the flushable wipes to a size that will not clog downstream processes.

As all of these solutions are being explored by individual municipalities, there are initiatives that have taken shape in the area of new regulations for the manufacturers of "flushable wipes." WEF is working with INDA (the association of wipes makers) in conjunction with other wastewater groups including NACWA, APWA, and the Canadian water and wastewater association to develop solutions to the problem. The focus is development of flushability guidelines wastewater professionals can agree with and to educate the public on what to flush. Finally, the Federal Trade Commission has reached a settlement with NicePak (one of the world’s largest makers of wipes) to label wipes as flushable only if they can substantiate the claim.

While awareness is growing regarding the issue at hand, Xylem Corporation, manufacturer of Flygt submersible wastewater pumps, has done research of their own. Flygt pumps are located in lift station and wastewater treatment applications worldwide. The efficiency and longevity of these pumps is directly affected by the problem of flushable wipe. While the pumps can pass these solids on an individual basis, large volume of such non-dispersible debris can be problematic.

Xylem research indicates that the wipes industry is introducing 3-4 new products monthly to a five billion dollar and growing market. Not only does the increase in market growth present a challenge in the quantity of wipes consumed, but the EPA emphasis on low/no flow toilets and low flow shower heads reduces the flowable nature of wastewater collections. Based on inquiries made by Xylem to INDA (Industry of Non-woven Mfg.), INDA member companies attitudes seem to be working counter to resolution of the issues identified by municipalities and wastewater associations. Wipe manufacturers are not very willing to put 'Do not flush' logo on valuable front of package marketing space. While INDA has developed a 'Flushability Assessment,’ it contains some vague language and is voluntary to member organizations.

Flygt is being used as an external consultant for the current project to determine a wipes’ flushability. In fact Flygt pumps are being used as a basis for product certification as flushable by the INDA. The INDA standards to list a product as flushable are as follows:
• Product must clear toilets and properly maintained drainage pipe systems under expected product usage conditions.
• Product must be compatible with existing wastewater conveyance treatment, reuse and disposal system.
• Product must become unrecognizable in a "reasonable" period of time and be safe in the natural receiving environments.

While flushability continues to be a focus, the immediate costs and problems associated with wipes continue to plague municipal collection systems. In an effort to service end users' needs, Flygt and other pump manufacturers have developed pump impeller technology better suited to handle the problems of "flushable wipes."

Flygt began by identifying the typical problem areas of the standard non-clog design which allow pump clogging. The first problem spot is rags/wipes that get caught on the impeller vane or in the eye of the impeller. Second, the impeller can be jammed by rags caught between the impeller and wear ring. Finally, vortex non-clog designs are susceptible to solids plugging the volute full and not allowing any product to pass. The result of extensive testing and design research is the Flygt N impeller design. This two vane semi-open impeller design operates with a self-cleaning, hydraulically efficient design. Since the year 2000, more than 100,000 pumps utilizing this impeller design have been successfully pumping raw unscreened sewage and sludge. In numerous documented case studies the impeller technology has been successful in reducing energy and maintenance costs associated with clogging caused by rags and wipes of all types.

In conclusion, it is evident that the disposable wipes industry is showing no signs of slowing down. While a reduction of wipes in the waste-stream resulting from education of the general public is the best possible solution, municipalities continue to deal with the cost of the problems at hand. As evidenced by the research provided above; national and state associations in partnership with manufacturers have been pursuing more stringent regulations and solutions to provide truly "flushable" wipe technology. At present it seems that awareness of the problem and the efforts of manufacturers such as JWC Environmental and Flygt to provide technologies effective at handling the debris in our waste streams is the most immediate way to deal with the "flushable wipe" epidemic.

References: Statistics and data provided by JWC Environmental and Xylem-Flygt Corporation.