**A list of systematic studies regarding nonwoven wipes and sewer systems**

**Category A – A collection of studies that assessed product composition, product strength, and sewer-disintegration of nonwoven wipes**

1. Pedersen, A.F., A. A. Vasquez, J. S. Thorsby, M. Gorell, A-M. V. Petriv, C.J. Miller, and T. R. Baker. 2022. Sewage transport volumes and physical degradation rates of personal care wipes. Journal of The American Water Resources Association, 58(6), 1421-1432. DOI: 10.1111/1752-1688.13046
2. Eren, B., Nigdelioglu M., and Karadagli F. 2022. Evaluation of fiber compositions, strength indicators, and disintegration patterns of flushable sanitary products in relevance to what is flushable. Urban Water Journal, 19(6), 579-588. DOI: 10.1080/1573062X.2022.2062394
3. Atasagun, H.G., and Bhat, G.S. 2020. Assessing the structural, mechanical and dispersible characteristics of flushable nonwovens. Textile Research Journal, vol. 90 (5-6), pp. 581-592. DOI: 10.1177/0040517519873055
4. Joksimovic, D., Khan, A., Orr, B. 2020. Inappropriate disposal of ‘flushable’ consumer products – reasons for concern. Water Science and Technology, 81(1), pp. 102-108.
5. Durukan, S., Karadagli, F. 2019. Physical characteristics, fiber compositions, and tensile properties of nonwoven wipes and toilet papers in relevance to what is flushable. Science of The Total Environment, 697, 134135. DOI: 10.1016/j.scitotenv.2019.134135
6. Atasagun, H., and G. Bhat. 2018. Advancement in flushable wipes: Modern technologies and characterization. Journal of Industrial Textiles, 49(6)722-747. DOI: 10.1177/1528083718795910
7. Munoz, L.P., Baez, A.G., McKinney, D., Garelick, H., 2018. Characterization of “flushable” and “non-flushable” commercial wet wipes using microRaman, FTIR spectroscopy, and fluorescence microscopy: To flush or not to flush. Environmental Science and Pollution Research, 25, 20268 – 20279.

**Category B – Representative studies that quantified sewer flow velocities and sewer residence times**

1. Kapo, K. E., M. Paschka, R. Vamshi, M. Sebasky, K. McDonough, 2017. Estimation of U.S. sewer residence time distributions for national-scale risk assessment of down-the-drain chemicals. Science of the Total Environment, vol. 603-604, pp. 445-452. DOI:10.1016/j.scitotenv.2017.06.075
2. Pomeroy, R. D. 1967. Flow velocities in small sewers. Journal of Water Pollution Control Federation, vol. 39, No.9, pp. 1525-1548.

**Category C – Representative studies on transport of large-solids in sewers**

1. Peng, X., D. Z. Zhu, W. Zhang. 2024. Transport of non-flushable wipes in sewers and its application in sewer management. Journal of Cleaner Production, 434, 139876. DOI: 10.1016/j.jclepro.2023.139876
2. Walski, T., J. Falco, M. McAloon, B. Whitman. 2011. Transport of large solids in unsteady flow in sewers. Urban Water Journal 8(3): 179-187.
3. Vongvisessomjai N., T. Tingsanchali, M. S. Babel. 2010. Non-deposition design criteria for sewers with part-full flow. Urban Water Journal, 7(1), 61-77. DOI: 10.1080/15730620903242824
4. Mcdougall, J. A. & J. A. Swaffield. 2007. Transport of deformable solids within building drainage networks. Building Research and Information, 35(2), 220-232. DOI: 10.1080/09613210600913540

**Category D - Studies that assessed large-solids in actual sewers**

1. Mitchell, R-L., P. U. Thamsen, M. Gunkel, J. Waschnewski. 2017. Investigations into wastewater composition focusing on nonwoven wet wipes. Technical Transactions, 2017-1, 125-135. DOI: 10.4467/2353737XCT.17.010.6107

**Category E – Various products that are patented as “flushable” anda re registered with The United States Patent and Trademark Office,** [**https://www.uspto.gov/**](https://www.uspto.gov/)

1. Pederson, O., Forbjerg-Larsen, J., Giori, C. 2011. **Peelable and flushable ostomy pouch and method of use**. U.S. Patent No: 7,931,631, assigned to Hollister Inc. of Libertyville, IL, USA.
2. Strandqvist, M. 2009. **Flushable moist wipe or hygiene tissue**. U.S. Patent No: 8,668,808 assigned to SCA Hygiene Products AB (Gothenburg, Sweden).
3. Tomarchio, V., and A. Piccini. 2001. **Flushable hard surface cleaning wet wipe**. U.S. Patent No: 7,605,096, assigned to Procter and Gamble Company, Cincinatti, Ohio, USA.
4. Keyes, D. E., and Johnsen, K. 1994. **Flushable ostomy pouch with mechanical coupling.** U.S. Patent No: 5,380,309, assigned to E. R. Squibb & Sons, Inc. of Princeton, NJ, USA.
5. George D.K., and Angel, J.H. 1975. **Process for manufacturing a flushable fibrous sheet material for use in sanitary products.** U.S. Patent No: 3923592A, assigned to Riegel Textile Corporation, New York, NY, USA.
6. Beebe, E.V. and Singh, E. M. 1970. **Flushable sanitary napkins.** U.S. Patent No: 3542028A, assigned to E.I. Du Pont de Nemours and Company, Wilmington, Delaware, USA.