TU Delft

Delft University of Technology

Correction to: Enhanced Oxygen Volumetric Mass Transfer in a Geometrically Constrained Vortex (Water, (2022), 14, 5, (771), 10.3390/w14050771)

Agostinho, Luewton L.F.; Pecnik, Rene; Woisetschläger, Jakob; de Kroon, Esther; Șișcanu, Nicolae; van de Griend, Maarten V.; Loiskandl, Willibald; Fuchs, Elmar C.

DOI
10.3390/w15132386

Publication date
2023

Document Version
Final published version

Published in
Water (Switzerland)

Citation (APA)
Agostinho, L. L. F., Pecnik, R., Woisetschläger, J., de Kroon, E., Șișcanu, N., van de Griend, M. V., Loiskandl, W., & Fuchs, E. C. (2023). Correction to: Enhanced Oxygen Volumetric Mass Transfer in a Geometrically Constrained Vortex (Water, (2022), 14, 5, (771), 10.3390/w14050771). *Water (Switzerland)*, *15*(13), Article 2386. https://doi.org/10.3390/w15132386

Important note
To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright
Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy
Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.

This work is downloaded from Delft University of Technology.
For technical reasons the number of authors shown on this cover page is limited to a maximum of 10.

water

MDPI

Correction

Correction: Agostinho et al. Enhanced Oxygen Volumetric Mass Transfer in a Geometrically Constrained Vortex. *Water* 2022, *14*, 771

Luewton L. F. Agostinho [1,2], Rene Pecnik [3], Jakob Woisetschläger [4], Esther de Kroon [1,2], Nicolae Şişcanu [1,5], Maarten V. van de Griend [1,6], Willibald Loiskandl [6] and Elmar C. Fuchs [1,7,*]

1 Wetsus, European Center of Excellence for Sustainable Water Technology, 8911 MA Leeuwarden, The Netherlands; luewton.agostinho@hvhl.nl (L.L.F.A.); esther.dekroon@hvhl.nl (E.d.K.); nick.siscanu@wur.nl (N.Ş.); maarten.vandegriend@wetsus.nl (M.V.v.d.G.)
2 Water Technology Research Group, NHL Stenden University of Applied Sciences, Rengerslaan 8-10, 8917 DD Leeuwarden, The Netherlands
3 Process and Energy Laboratory, Delft University of Technology, Leeghwaterstraat 39, 2628 CB Delft, The Netherlands; r.pecnik@tudelft.nl
4 Working Group Metrology-Laser Optical Metrology, Institute for Thermal Turbomachinery and Machine Dynamics, Graz University of Technology, Inffeldgasse 25A, 8010 Graz, Austria; jakob.woisetschlaeger@tugraz.at
5 Environmental Technology, Wageningen University & Research, Droevendaalsesteeg 4, 6708 PB Wageningen, The Netherlands
6 Institute of Soil Physics and Rural Water Management, University of Natural Resources and Life Sciences, Muthgasse 18, 1190 Vienna, Austria; willibald.loiskandl@boku.ac.at
7 Optical Sciences Group, Faculty of Science and Technology (TNW), University of Twente, Drienerlolaan 5, 7522 NB Enschede, The Netherlands
* Correspondence: elmar.fuchs@wetsus.nl

check for updates

Citation: Agostinho, L.L.F.; Pecnik, R.; Woisetschläger, J.; de Kroon, E.; Şişcanu, N.; van de Griend, M.V.; Loiskandl, W.; Fuchs, E.C. Correction: Agostinho et al. Enhanced Oxygen Volumetric Mass Transfer in a Geometrically Constrained Vortex. *Water* 2022, *14*, 771. *Water* **2023**, *15*, 2386. https://doi.org/10.3390/w15132386

Received: 15 June 2023
Accepted: 19 June 2023
Published: 28 June 2023

Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

There was an omission in the original publication [1]. The authors showed SOTR values in a figure but did not mention how these values were calculated. As a consequence, the calculations based upon the SOTR also need to be more specific, which is why "the twisted regime of" has been added in front of "the hyperbolic funnel".

An addition has been made to the paper as Supplementary Information where this information has been added, Section 3, Paragraph 5:

Figure 4 shows K_La and SOTR values (see Supplementary Information for details) dependent also as a function of flow rate. Average K_La values (for 20 °C) for air jet, impellers and paddle aerators [12] are shown for comparison. The plot shows that the K_La values obtained with the free surface vortex in a hyperbolically shaped funnel are considerably higher than those of the three commercial systems used for comparison, especially in the twisted regime. These high oxygen transfer rates are a consequence of the aforementioned combination of high area-to-volume ratios and possibly enhanced turbulence close to the interface. On the other hand, the SOTR values (up to 0.5 kg/h) [12] are comparable to air jet system and lower than those reported for impeller and paddle systems (between 1.0 and 2.5 kg/h) [12]. This is due to the short hydraulic retention times in the hyperbolic funnel (typically less than a minute). A possibility to increase the SOTR value is the application of a cascade of funnels which would multiply the HRT with a factor representing the number of funnels, whilst maintaining the desired flow regime and thus the K_La value. For practical applications the specific energy demand of such a cascade can be estimated as follows: The twisted regime of the hyperbolic funnel tested in this work has a specific energy demand of 0.01 kWh/kg O_2 (see Appendix A for calculation details). In comparison, the specific energy demands of mechanical aerators range from 0.42 to 0.83 kWh/kg O_2 [13] and the specific energy demands of air jets range from 0.74 to 1.0 kWh/kg O_2 [12]. However, the industrial applicability of this system depends on its scalability to higher flow rates in larger funnels on the one hand, and on the possibility to achieve the described regimes with

liquids of different viscosities as found in wastewater streams on the other. Thus, while the potential improvements in the energy efficiency of the aeration process seem promising, further work is required for confirmation and to exclude negative impacts on the sludge characteristics and WWTP performances.

The authors state that the scientific conclusions are unaffected. This correction was approved by the Academic Editor. The original publication has also been updated.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/w14050771/s1, The calculation method of SOTR values.

Reference

1. Agostinho, L.L.F.; Pecnik, R.; Woisetschläger, J.; de Kroon, E.; Şişcanu, N.; van de Griend, M.V.; Loiskandl, W.; Fuchs, E.C. Enhanced Oxygen Volumetric Mass Transfer in a Geometrically Constrained Vortex. *Water* **2022**, *14*, 771. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.