Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 24 October 2025

Case Number: T 0600/24 - 3.3.05

Application Number: 18727623.3

Publication Number: 3790847

IPC: C02F3/10, C02F3/12, C02F3/30

Language of the proceedings: EN

Title of invention:
PRETREATMENT TO REMOVE AMMONIA FROM HIGH STRENGTH WASTEWATER WITH MEMRBANE AERATED BIOFILM SIDESTREAM

Applicant:
BL Technologies, Inc.

Headword:
AMMONIA REMOVAL WITH MEMRBANE AERATED BIOFILM SIDESTREAM/ BL Technologies

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 13(2)

Keyword:
Amendment after summons - exceptional circumstances (yes)
Inventive step - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0

Case Number: T 0600/24 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 24 October 2025

Appellant: (Applicant)	BL Technologies, Inc. 5951 Clearwater Drive Minnetonka MN 55343 (US)
Representative:	Hamer, Christopher K. Mathys & Squire The Shard 32 London Bridge Street London SE1 9SG (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 22 December 2023 refusing European patent application No. 18727623.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairwoman	O. Loizou
Members:	J. Roider
	S. Besselmann

Summary of Facts and Submissions

I. The appeal lies from the examining division's decision to refuse patent application No. 18 727 623.3 on the grounds that the then main request and auxiliary requests 1, 2 and 4 lacked an inventive step, and that auxiliary request 3 was unclear.

II. The following documents had already been cited by the examining division:

D2 EOIN SYRON ET AL: "Membrane-Aerated Biofilms for High Rate Biotreatment: Performance Appraisal, Engineering Principles, Scale-up, and Development Requirements", ENVIRONMENTAL SCIENCE & TECHNOLOGY, vol. 42, no. 6, 2 July 2008, pages 1833-44

D3 NICHOLAS LANDES ET AL: "Including Nitrite as an Intermediate in Simultaneous Nitrification/ Denitrification Membrane-Aerated Biofilm Reactor Models", ENVIRONMENTAL ENGINEERING SCIENCE, vol. 30, no. 10, October 2013, pages 606-16

D4 US 5,811,009 A

III. In the communication under Article 15(1) RPBA, the board raised a number of objections under Article 84 EPC for the first time.

IV. On 4 September 2025, the appellant filed a new set of claims as the main request.

V. Claim 1 of the main request reads as follows:

1. A process for treating wastewater comprising the

steps of,
a) treating a first wastewater by way of an activated sludge process;
b) pre-treating a second wastewater with a membrane aerated biofilm to produce an effluent with reduced ammonia concentration;
c) treating the effluent with reduced ammonia concentration in the activated sludge process,
wherein the second wastewater has a higher concentration of ammonia than the first wastewater.

Claims 2 to 7 concern particular embodiments of the process according to claim 1.

VI. The appellant (patent applicant) argued that the main request met the requirements of Article 56 EPC.

VII. The appellant requested that the decision under appeal be set aside and that a patent be granted based on the main request, filed on 4 September 2025.

Reasons for the Decision

1. Main request, admission into appeal proceedings, Article 13(2) RPBA

The present main request was filed after the communication under Article 15(1) RPBA and is therefore subject to the assessment under Article 13(2) RPBA.

Since the board raised a number of objections under Article 84 EPC for the first time, it is appropriate and fair to give the appellant an opportunity to react to these objections. It is immediately apparent that with the amendment the new main request overcomes the

objections raised.

Therefore the new main request is considered and admitted into the proceedings.

2. Main request, inventive step, Article 56 EPC

The invention relates to a process (claim 1) for treating wastewater.

2.1 D4 also concerns a process for treating wastewater with sidestream processing and is considered a suitable starting point for an inventive-step objection. The appellant does not dispute this premise.

2.2 The problem the patent aims to solve is, according to the appellant, the treatment of high-strength wastewater. Such wastewater can cause the activated sludge process effluent to exceed permitted ammonia levels and can decrease the alkalinity of the activated sludge reactor such that biological nitrification is inhibited (statement of grounds of appeal, paragraph 13.; application as originally filed paragraphs [0002] and [0004]).

2.3 It is proposed to solve the technical problem by the features of process claim 1, which differ from D4 in that the reactor used for pre-treating the second wastewater is a membrane-aerated biofilm reactor (MABR) rather than the reactors disclosed in D4, column 5, lines 7 to 15.

2.4 However, nothing in D4 suggests, or is convincing, that the wastewater treatment system disclosed therein exceeded the ammonia levels or suffered from an inhibition of biological nitrification. Therefore the

technical problem stated by the appellant has already been solved by D4.

The technical problem must therefore be reformulated as a less ambitious problem, which is to find an alternative process.

2.5 It needs to be determined whether, starting from D4, in view of the technical problem to be considered, the solution is obvious in view of the prior art.

D4 is directed to a method for improved biological nitrification of wastewater at low temperature using a sidestream biological nitrification process where nitrifiers are produced in the sidestream, and these supplemental nitrifiers are transferred to carry out a mainstream nitrification process (D4, column 2, lines 20 to 26).

The examining division considered that column 5, lines 7 to 14 of D4 contained an open list of suitable sidestream process reactors ("and so forth and so on") and that biofilm reactors (trickling filters, rotating biological contactors) were already disclosed. The examining division further considered that MABRs were comparable to these biofilm reactors with regard to the attachment of the biofilm to a carrier. According to the examining division, D2 and D3 demonstrated the suitability of MABRs for nitrogen removal and high-strength wastewater treatment, which would lead the skilled person to the claimed subject-matter.

As already summarised above, D4 focuses on producing supplemental nitrifiers in the sidestream and transferring them to the mainstream to enable a low sludge age operation in the mainstream process. To

achieve this, the ammonia concentrated solution undergoes nitrification using any conventional nitrification process so as to produce an abundant supply of supplemental nitrifiers. Any process that can perform this function is encompassed by the invention of D4 (D4: column 2, lines 46 to 56; column 4, line 61 to column 5, line 14; and column 6, lines 12 to 19).

It is however clear that D4 teaches away from processes in the sidestream that do not produce supplemental nitrifiers *that can be transferred* to the mainstream.

The MABR technology described in D2 and D3, with its stratified biofilm structure (aerobic inner layer, anoxic outer layer), is primarily designed for simultaneous nitrification and denitrification rather than nitrifier production (D2: page 1835, point 1). The biofilm of the MABR contains an aerobic layer adjacent to the MABR membrane. The nitrifiers grow in this layer. The attachment to the membrane enhances their retention and, together with an outer anaerobic biofilm, protects them from biofilm erosion (D2: Figure 1, page 1834, left-hand column; page 1835, point 3).

D2 does not disclose that the bulk liquid contains nitrifiers. This is not evident either in view of the outer anaerobic layer of the biofilm as depicted in Figure 1 of D2, which does not contain nitrifiers. Unlike in conventional biofilm reactors, the biofilm in an MABR receives the required oxygen through the membrane to which it is attached, rather than through its outer surface (D2: Introduction).
Therefore, although conventional biofilm reactors contain nitrifiers in the bulk liquid, this cannot be assumed for MABRs due to their different oxygen supply

mechanism. There is also no evidence to suggest otherwise.

The examining division referred to D2, page 1840, left-hand column, "Biofilm Thickness Control", which states that an MABR can also produce surplus sludge caused by detachment or endogenous decay. However, D2 also states that biofilm detachment rate is "highly variable" and a "very difficult parameter to control in practical operations" (ibid.), meaning that there is no reliable production of detached, i.e. transferable, sludge. Moreover, this passage does not clarify the nature of the sludge. In particular, it does not specify whether it concerns nitrifiers or denitrifiers. Nor does it clarify whether, if detached, nitrifiers can exist in sufficient quantities in the bulk liquid for the skilled person to consider them in the context of D4.

Although the skilled person would not need any motivation to provide an alternative process as correctly observed by the examining division, they would not consider a process that does not provide reliable production of essential quantities of transferable supplemental nitrifiers. Therefore the skilled person would not use an MABR in the process or system according to D4, given that the MABR operation is designed for complete nitrogen removal and does not purposively and reliably produce nitrifiers in the bulk liquid that can be transferred to the mainstream.

The same conclusion applies to D3, which does not disclose the content of nitrifiers in the bulk liquid either and is less relevant in that it merely presents mathematical membrane-aerated biofilm models.

The requirements of Article 56 EPC are met.

2.6 The dependent claims 2-7 contain all the features of independent claim 1 and thus meet the requirements of Article 54(1) and (2) EPC and Article 56 EPC for the same reasons.

2.7 No other objections were raised against the main request by the examining division.

2.8 The formal deficiencies, particularly under Article 84 EPC, which were first raised by the board in its communication under Article 15(1) RPBA, are overcome with the amended set of claims, filed on 4 September 2025.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent based on the main request, filed on 4 September 2025, and a description to be adapted to the new claims, also reflecting the state of the art of D2 and D4.

The Registrar: The Chairwoman:

C. Vodz O. Loizou

Decision electronically authenticated