POSITION PAPER

29 April 2026

TEPPFA Position Paper: Ensuring Safe and Practical EMG Standards

Retaining the 1000 pg ATP/cm² Threshold

Executive Summary

The existing regulatory framework (Biomass Production Potential) (BPP)) ≤1000 pg **or** W270 ≤0.05 mL) for Enhanced Microbial Growth (EMG) provides a high level of health protection. It effectively ensures that materials are biologically inert in practice – while still being grounded in what the test methods can reliably measure and what decades of operational experience have shown to be safe.

High Variability of BPP at low levels: Inter-laboratory studies show poor reproducibility of the BPP test, especially at low ATP values. Results for the same material can differ by over an order of magnitude between labs. Setting an **extremely low threshold** (≤400 pg) lies within the noise of the method, **making pass/fail determinations unreliable and inconsistent**.

The proposal to lower the ATP/cm² level to ≤400 **pg appears to be an overreaction that is not supported by the technical realities** of microbial growth testing.

TEPPFA examined the technical evidence and practical implications and concludes **that lowering the BPP (Method 1) threshold to ≤400 pg ATP/cm² is unwarranted and inadvisable.** The current threshold of ≤1000 pg – aligned with Commission Implementing Decision (EU) 2024/368 – should be maintained. This ensures balance between precaution and practicality, and it aligns with the historically validated levels from the W270 method.

TEPPFA urges regulators to consider the evidence presented and **not pursue an unjustified tightening of the BPP threshold**. That will lead to avoid using this test method. Instead, efforts should focus on consistent implementation of current standards, further validation of the BPP method's capabilities, and continued use of the tried-and-true W270 method as a cornerstone for ensuring microbiologically safe drinking water supplies.

Key recommendations:

- **Maintain the ≤1000 pg ATP/cm² criterion** for BPP in national regulations and resist calls for ≤400 pg. This level already incorporates a significant safety margin.
- **BPP or W270** method was decided by EU harmonization. A material that passes either the ATP test at ≤1000 pg or the biofilm test at 0.05 mL is acceptable for use by all available evidence.
- **Monitor field outcomes** as the ≤1000 pg threshold and new EU system are implemented. If, over several years, data from water utilities show absolutely no microbiological issues (as expected) and BPP results consistently correlate with W270, then ≤1000pg could be potentially increased to the benchmark value of 2000pg.
- **Promote consistency and mutual recognition.** Regulators should formally agree to honour each other's test reports per the new EU framework.

Summary of the arguments

This position paper analyses the proposal of reducing the pass/fail threshold for the **Biomass Production Potential (BPP)** test (EN 16421 Method 1) from the current EU-accepted **≤1000 pg ATP/cm²** to a proposed **≤400 pg ATP/cm²**. Key points include:

- **No Scientific Basis for ≤400 pg:** There is no empirical or health-based evidence that a ≤400 pg ATP/cm² limit is needed or beneficial. Even the existing **≤1000 pg ATP/cm²** criteria (recently adopted in EU law) was a precautionary defined level lower than the references measured in the years around 2015 that were in the market and not tied to any observed problems with EMG. Lowering it further to ≤400 pg is arbitrary and unsupported by research or field experience.
- **Lab Results vs. Real-World Water Quality:** BPP test outcomes **do not correlate with actual distribution system microbiological quality**. Regulatory bodies (e.g., **ANSES France**) have noted the difficulty in relating BPP values to real-life water safety[1]. A material slightly above ≤1000 pg in the lab has **not been shown to cause any water quality issues in practice**.
- **High Variability of BPP at low levels:** Inter-laboratory studies show **poor reproducibility** of the BPP test, especially at low ATP values[2]. Results for the same material can differ by **over an order of magnitude** between labs. Setting an extremely low threshold (≤400 pg) lies within the noise of the method, making pass/fail determinations unreliable and inconsistent.
- **BPP Test Conditions – Limited Representativeness:** The BPP method uses a **30°C stagnant water incubation** with added microbes – a highly accelerated, unrealistic scenario. While useful as a worst-case screening, this does not reflect typical pipe conditions (most distribution mains run at 5–20°C with flow). Thus, failing a ≤400 pg threshold under extreme lab conditions doesn't equate to failure in real networks.
- **Proven Safety of the Volumetric Method (W270):** The alternative **Volumetric biofilm method (EN 16421 Method 2 / DVGW W270)** has a **40-year track record** of ensuring safe use of plastic pipes and is the method used by highest number of European countries. Its threshold (≤0.05 mL biofilm) has effectively protected public health for decades. Also, same material passing Method 2 test in studies are showing BPP method results of roughly ~**2000 - 2500 pg ATP/cm²** of biomass. Adopting an ultra-stringent <400 pg BPP limit would fundamentally contradict this benchmark further and would disqualify Method 1 for further use.
- **Unwarranted Exclusion of Safe Materials:** A ≤400 pg ATP criterion would **disqualify well-established materials** that have demonstrated decades of safe performance. For example, in a TEPPFA 2015 study a standard PE100 pipe **passed the W270 test** (0.05 mL) easily but had BPP results ranging **1,799–13,093 pg ATP/cm²** across labs – failing a ≤1000 pg limit in all cases. Under a ≤400 pg rule, virtually all current plastic pipes would be unjustifiably deemed non-compliant, despite no history of causing microbiological issues.
- **Regulatory Consistency & Mutual Recognition:** The EU's goal under the Drinking Water Directive is "**one standard, one test, accepted everywhere**". The recently adopted EU Implementing Decision 2024/368 sets≤**1000 pg** as the pan-European BPP threshold. Any unilateral move to ≤400 pg by a regulator would undermine this harmonization, create trade barriers, and erode confidence in the common approval scheme. Consistency at the established ≤1000 pg level (in parallel with the W270 criteria) is crucial for industry and Member States' mutual recognition of test results.

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[1] ANSES. (2013). Opinion on the assessment of the enhancement of microbial growth (EMG) potential of materials in contact with drinking water. Request No. 2012-SA-0114.

[2] TEPPFA study 2015: "Summary of EMG project BPP and W 270 methods according to prEN 16421" 2015.

Background

Criteria	BPP Method (EN 16421-1)	Volumetric Method (EN 16421-2 / W270)
Sensitivity (Detection Limit)	Very high – detects minor microbial growth via ATP. Can measure biofilms with only ~10^6–10^7 cells/cm² (tens of pg ATP) on surface, far below visible levels.	Moderate – measures only gross biofilm accumulation. Threshold of 0.05 mL corresponds to ~2×10^3 pg ATP/cm². Finer differences below this (e.g. between 1000 and 400 pg) are not discernible.
Reproducibility (Inter-lab Consistency)	**Poor** – Significant variability observed. Multi-lab trials showed results ranging by a factor of 4–7× for the same material. Coefficients of variation (CV) of 30–100% have been reported, especially at low ATP values.	**Good** – Longstanding standardized procedure yields consistent pass/fail outcomes. Biofilm volume measurements are less susceptible to small fluctuations at the acceptance limit. (In practice, materials tend to either produce clearly ≤0.05 mL or >>0.05 mL in repeated tests.)
Real-World Relevance (Simulation of Field Conditions)	**Questionable** – Batch test with **stagnant water at 30°C**, spiked with nutrients and bacteria. Represents a worst-case scenario (e.g. warm, stagnant household plumbing) rather than normal mains conditions. Overestimates growth potential relative to typical distribution networks.	**High** – **Dynamic flow test** over ~3 months at ambient temperatures (often ~20°C). Biofilm develops under flow, more akin to a real pipe environment. Proven to correlate with long-term material behavior in distribution (no adverse effects when test is passed).
Historical Use	**Newer method** – Developed in the 1990s/2000s; standardized as EN 16421 in 2014. Relatively limited field-validation. Threshold (1000 pg) set in 2024; no prior track record at that limit to demonstrate necessity of further reduction.	**Established method** – Used in Germany and Europe since **1984** for approving plastic pipes. Thousands of materials tested; effectively prevented any microbiological water quality issues attributable to materials. Threshold (~0.05 mL) validated by decades of safe operation.
Regulatory Acceptance	**Accepted with reservations** – Incorporated into EU rules (2024) at 1000 pg. However, experts (e.g., ANSES, JRC) have expressed caution about interpreting results. Wide inter-lab variance raises concerns about using extremely low limits like 400 pg as a strict regulatory cutoff.	**Widely accepted** – Long mandated in Germany (DVGW W270) and recognized by other Member States (via the 4MS initiative) as a **"benchmark"** for EMG testing. Now codified in EU law alongside BPP. Broad confidence in this method's robustness and relevance.

Table 1: Comparison of BPP (Method 1) and Volumetric/W270 (Method 2) for Enhanced Microbial Growth testing. The BPP method is more sensitive but suffers from high variability and debatable real-world significance, especially at very low ATP thresholds. The W270 method is less sensitive but has a proven safety record and better reproducibility for pass/fail assessment.

Enhanced Microbiological Growth (EMG) testing is required to ensure materials in contact with drinking water do not support microbial proliferation. The **European Drinking Water Directive (DWD)** recast (Directive (EU) 2020/2184) led to non-harmonized test methods for EMG across Europe. In early 2024, the European Commission published **Implementing Decision (EU) 2024/368**, which specifies EMG methods and their pass/fail criteria for final materials. Two methods from EN 16421 are recognized:

- **Method 1: BPP test (ATP-based)** – current pass criterion: **≤1000 pg ATP/cm²** of material surface.
- **Method 2: Volumetric biofilm test (W270)** – current pass criterion: **≤0.05 mL biofilm/800 cm²** (±0.02 mL).

These limits were set after years of discussion in the **4MS Initiative** (Germany, Netherlands, France, UK) and validation trials. The ≤1000 **pg ATP/cm²** threshold for BPP was chosen. It was not derived from a direct health risk model but rather from expert consensus and comparisons to existing national standards. In fact, industry experts pointed out at the time that **"no sound scientific basis"** existed for≤1000 pg – it was simply a cautious, agreed-upon value to start with. Notably, France's ANSES and the EU Joint Research Centre (JRC) had earlier hesitated to endorse any specific ATP cutoff due to insufficient data on real-world relevance.

Despite these acknowledged uncertainties, the EU adopted ≤1000 pg as the uniform threshold effective from 2025–2026, aiming to balance precaution with feasibility. Now, proposals have emerged to **tighten this limit to ≤400 pg ATP/cm²** – an action that would far exceed the original precaution and, as we detail, is **not justified by the evidence**. Table 1 below compares the BPP and W270 EMG methods across key parameters:

Technical Analysis and Discussion

Lack of Scientific Justification for a ≤400 pg Threshold

There is **no sound scientific or public health rationale** to impose a ≤400 pg ATP/cm² EMG limit. The current≤1000 pg threshold was already set very low in the absence of concrete evidence of risk. It was essentially an **empirical compromise**, chosen to be more conservative than the older German and UK standards for microbial growth (W270 and BS 6920). No new studies since that decision have indicated that ≤1000 pg is insufficient to protect water quality. In fact, the plastic pipe industry notes that: **"Plastic pipes have been used for drinking water systems for over 50 years in Europe… with no factual issues relating to microbiological growth based on the pipe material properties"**. In other words, standard materials that easily exceeded any ≤400 pg ATP benchmark in the lab have nonetheless delivered safe drinking water for decades.

The push for ≤400 pg appears to be driven by a **desire for extra precaution** rather than data. However, precautionary limits must still have some grounding in reality – otherwise they risk doing more harm than good. With ≤1000 pg, regulators erred well on the safe side (roughly half the biomass of the stringent W270 criterion by the comparison done). Going down to ≤400 pg would be **an order of magnitude stricter than historically required**, without any incident or outbreak to justify it. No pathogen prevention benefit has been demonstrated at that ultra-low ATP level. Moreover, as elaborated below, the BPP test's inherent uncertainty at such levels means ≤400 **pg cannot be reliably distinguished from, say, 800 pg or ≤1000 pg** in practice. Thus, implementing ≤400 pg as a hard pass/fail cutoff would be scientifically arbitrary.

In summary, absent evidence of real-world problems that would be solved by a ≤400 pg limit (and none have been documented), there is **no scientific basis** to adopt it. By contrast, substantial evidence indicates it would be problematic (see Points 3–6).

No Correlation Between BPP Results and Real-World Water Quality

Regulators must remember that **EMG lab tests are not direct predictors of distribution system microbiology**. They are stress tests under controlled conditions. A key concern raised by authorities like ANSES is the **lack of proven linkage** between a given ATP value and actual water safety. ANSES's 2013 expert review concluded: *"while the analysis of EMG may be a criterion for ranking materials… it is difficult to establish a relationship between the result of the analysis and potential impact on the microbiological quality of water in real-life situations"*. They explicitly cautioned that due to this uncertainty (and limited experience in France with BPP), *"no acceptance criteria can be set"* at that time. Although the EU eventually did set ≤1000 pg, this fundamental knowledge gap still exists.

Lowering the threshold to ≤400 pg does nothing to address the gap – it **widens it**. We would be further tightening a screw without knowing whether it's even attached to the machinery of public health protection. If a material tests at, say, 800 pg ATP/cm², the science today cannot equate that number to an expected outcome in the network (e.g., does it raise heterotrophic plate counts in delivered water? Will it increase biofilm significantly on pipe walls after years in service?). Empirical observations suggest that materials failing BPP but passing W270 have **not caused distribution issues**: for instance, polyethylene pipes that showed high ATP in lab still supply microbiologically clean water in many countries. Conversely, materials with very low BPP can still support biofilms if the system is nutrient-rich or disinfectant-free (since **"biofilms are reported to occur on all kinds of materials, including metal, copper, plastic"** regardless of material differences). In short, **context matters**: water age, residual disinfectant, temperature in the network, etc., often outweigh small material differences.

Given this weak correlation, using an even lower BPP cutoff could mislead regulators into thinking "stricter is always safer." But if BPP fails to predict actual water quality beyond a point, then enforcing ≤400 vs ≤1000 pg yields no actual safety improvement. It would be a classic case of **over-regulation without benefit** – burdening industry and limiting material choices with no tangible public health gain. A French review by UHP-Nancy (2003) emphasized that BPP tests have *"no predictive power"* on real water quality unless combined with further risk assessment. They recommended that lab EMG results be used only as a **screening tool**, and that any acceptance criteria must be vetted against field data and dynamic tests. To date, no such dynamic correlation has been established for a ≤400 pg level. Therefore, imposing it would be premature and scientifically unfounded.

High Variability and Poor Reproducibility of BPP at Low ATP Levels

One of the strongest technical arguments against a super-low BPP threshold is the **lack of precision and consistency** in the BPP test outcomes, especially near the lower detection limit. The BPP method involves multiple biological steps (inoculation, incubation, ATP assay) that introduce variability. In ring trials performed during the EU research phase (**CPDW 2003/2006 projects**), the same material often yielded a wide range of ATP results in different labs:

- In one CPDW 2006 exercise, a single material tested by 5 labs ranged from **743 to 3045 pg ATP/cm²**, a nearly 4:1 spread (Coefficient of Variation ~47%). Other materials showed CVs up to **94%** across labs.
- An earlier CPDW 2003 trial at ~25°C had even greater scatter, with variability from **34% up to 107%** CV depending on the material.
- TEPPFA's own 2015 inter-laboratory test on PE100 pipe reported BPP values of **1799, ~5000, ~8000, and 13093 pg/cm²** in four different labs – a spread by a factor of >7 between lowest and highest.

Crucially, in that TEPPFA study, all four labs tested identical pipe samples from the same batch. Yet one lab got ~1.8×10^3 pg (which would **pass** a ≤1000 pg limit only if results were averaged, but fail strictly) while another got ~1.3×10^4 pg (failing by an order of magnitude). Clearly, when real laboratories can diverge so much, setting the limit at ≤400 pg (which is **less than the lowest result any lab measured in that study**) is unrealistic. We would be effectively saying: "if any lab, in any test, even once measures above ≤400, the material is out." But as the data shows, you could send the same material to two competent labs and get 300 pg vs 1500 pg results. Which one governs? Manufacturers could never be certain their product would consistently test below ≤400 in all labs every time – in fact the odds are it would not.

At ≤1000 pg, the situation is already challenging (as seen by 1 of 4 labs failing the PE100 at ~1800 pg). At ≤400 **pg, the BPP test's variability would completely undermine the credibility of the threshold**. False failures (Type I errors) would be rampant, as normal lab variation or minor contamination could push results over ≤400 even for inherently "good" materials. The test's **signal-to-noise ratio** is simply not adequate at that level. S it was summarised in TEPPFA report: *"Repeatability of the BPP test… is not adequate to serve setting a relatively low PFC (e.g. <1000 pg)"*. Lowering it further multiplies this concern.

This inconsistency not only creates unfair compliance problems but also **confuses regulatory decision-making**. One country's lab might pass a material at 300 pg, another's might fail it at 500 pg – leading to disputes and non-harmonized outcomes (which the EU single market expressly wants to avoid). In contrast, the **W270 test has much less variability** in outcome – either a slime is visibly present above 0.05 mL or not, and repeat tests on the same material typically agree within ±0.02 mL. The volumetric method's reproducibility is aided by the longer test duration (averaging out fluctuations) and the binary nature of the criterion (no need to quantify tiny differences).

In conclusion, from a metrological standpoint, ≤400 **pg is within the "noise floor" of the BPP method**. It would be unsound regulatory practice to enforce a limit that the method cannot measure with confidence. Regulators should stick to thresholds that are **outside the error bars** of the test – ≤1000 pg is already pushing it, and ≤400 pg would clearly violate it. In regulatory terms, a compliance parameter must be robustly measurable; ≤400 pg fails that test.

Influence of Test Conditions and Representativeness of BPP

The discrepancy between BPP results and field performance can be partly explained by how **severe the test conditions** are. The BPP method, especially as refined in EN 16421, uses **30 °C incubation** to accelerate microbial growth. This temperature was selected to simulate a “worst-case” scenario of stagnant warm water in indoor plumbing dead-legs. However, for the **majority of the distribution network (buried water mains)**, such conditions are rarely, if ever, encountered. Most European groundwater-fed systems operate at <15 °C year-round; even surface water systems rarely exceed ~25 °C in summer, and water is usually moving, not stagnant for 7+ days as in the test.

Additionally, the BPP test involves **spiking the water with a cocktail of bacteria and sometimes nutrients** to ensure a standard inoculum. While this is necessary for a repeatable lab test, it means the test is effectively finding the maximum growth a material *could* support in an optimistic scenario for microbes. Real distribution systems have limiting factors that the test intentionally removes (e.g., low initial bacterial counts, low assimilable organic carbon, presence of residual disinfectant in many systems, etc.).

In setting the original ≤1000 pg threshold, regulators acknowledged these were **not real-world conditions but accelerated aging**. The idea was to build a safety margin – materials under ≤1000 pg in harsh conditions would almost certainly not cause issues in normal conditions. Pushing to ≤400 pg. It would demand that materials show nearly zero growth even under extremely artificial conditions. This is neither practical nor necessary. As UHP-Nancy researchers pointed out: biofilm formation depends on many unpredictable factors, and *“batch tests have no predictive power”* by themselves. They advocated pairing them with dynamic tests if one really wants to gauge field impact. In that context, the dynamic W270 test (flow at ambient T) is the complementary measure – and it already assures real-world safety when passed.

Another consideration is that the **30 °C BPP test condition might mis-characterize certain materials**. For example, some polymers may release a small pulse of biodegradable organics at elevated temperature that they wouldn’t at cooler temperatures. A material could fail BPP at 30 °C due to that extra leaching, whereas in actual 10 °C service it would never leach enough to matter. By insisting on ≤400 pg, we would be effectively saying “if it even slightly promotes growth in a hot stagnant scenario, it’s banned.” This could eliminate materials that are perfectly fine in the distribution mains (cool, flowing) but not “perfect” in a contrived test scenario. Regulators should ask: is it reasonable to fail a material for an extreme case that may not be relevant to its intended use? Especially if that material would pass the more directly applicable W270 test (which runs closer to actual distribution conditions). In many cases, the answer is no.

In summary, the BPP test’s stringent conditions are useful to **rank materials** (i.e. more growth vs less growth potential). But using an exceedingly low absolute cutoff like ≤400 pg ignores the gaps between lab and field. It assumes the lab condition must be met with near perfection – an assumption not borne out by experience. A more balanced approach is to pair BPP with a realistic method (W270) and to avoid setting BPP limits below the range needed to screen out obviously high-growth materials. The current ≤1000 pg does screen out outliers (e.g., very nutrient-leaching plastics, which often score >>2000 pg). Lowering to ≤400 pg would start to screen out materials that are not outliers at all, thus overshooting the goal.

Proven Track Record and Robustness of the Volumetric (W270) Method

It is important to highlight the **success of the W270 volumetric method** as a sanity check on proposals to tighten BPP. The volumetric test has been the **industry mainstay since 1984** for evaluating microbial growth on plastics in drinking water. Over **four decades**, innumerable pipe and component formulations were vetted using W270 criteria (originally ≤0.1 mL, later effectively ≤0.05 mL biofilm). During this time, Europe (and other regions adopting similar standards) did **not experience any rampant microbiological issues attributable to approved pipe materials**. This strongly suggests that the W270 threshold level was adequate to protect water quality. In other words, if a material doesn't exceed ~0.05 mL of biofilm in the test, you can be confident it won't cause problematic microbial growth in real systems. And indeed, utilities routinely report that distribution water, when using certified materials, remains stable with low heterotrophic counts.

Why is this relevant to the BPP=400 pg question? Because **0.05 mL of biofilm roughly corresponds to 1500–2000 pg ATP/cm²** in BPP units. The EU's chosen ≤1000 pg threshold is already about **half of that proven-safe level**, adding an extra safety cushion. To push down to ≤400 pg means requiring materials to have only ~20% of the biomass that has historically been deemed innocuous by W270. Such a move is not corroborated by any field evidence – it is in fact contradicted by the field evidence, since all those safe materials would fail a ≤400 pg test.

The W270 method is also inherently **robust and reproducible**. It's a long-term test that integrates microbial response over weeks, smoothing out anomalies. The measurement (volume of slime) directly reflects what a water utility would notice (biofilm accumulation) and is easy to interpret. Regulators have decades of confidence in this method – for example, the German experience since the 1980s, and the acceptance of W270 results by many other countries (including the Netherlands and UK in the 4MS framework). It is telling that **TEPPFA and the broader industry fully support W270** and consider it a "benchmark EMG method… with proven results since 1984". This is not to say BPP has no value; rather, it highlights that any new BPP limit should not discord with what W270's history teaches us.

From a regulatory consistency perspective, **any material that passes W270 should be considered microbiologically acceptable** – the EU law itself allows passing either W270 or BPP as sufficient. In TEPPFA's 2015 study, the PE100 pipe was exactly such a case: W270 acceptable, BPP not (even at ≤1000). At ≤400, this conflict would be much more widespread. We would be effectively saying the time-tested German criteria are no longer good enough, without any real-world incidents to justify that stance.

In summary, the **volumetric method's long proven safety margin argues against the need for an even tighter BPP limit**. The current alignment (1000 pg ≈ half the W270 biomass) is already cautious. Regulators should place trust in the demonstrated effectiveness of W270: if that method hasn't allowed any microbiological failures in distribution, then materials meeting its equivalent standard (which ≤1000 pg approximates) should be deemed acceptable. Requiring materials to far exceed that standard (400 pg, which is *double* or *triple* exceeding it) yields diminishing returns at best, and major downsides at worst (eliminating materials, inconsistency, etc.).

Risk of Excluding Safe and Widely Used Materials:

The implications of a ≤400 pg threshold on the market need careful consideration. Many **widely used drinking water pipe materials** today have **no history of causing microbial regrowth issues in distribution**. They have been installed by the millions of kilometers, delivering high-quality water. These materials typically satisfy existing national requirements (e.g., W270 in Germany, BS 6920 in UK, etc.). However, when subjected to the BPP test, some of these formulations can yield ATP levels moderately above ≤1000 pg.

For instance, as noted earlier, a conventional PE100 pipe failed the <1000 pg criterion in multiple labs (with values up to ~13,000 pg) despite **meeting W270** and performing excellently in actual service. If ≤1000 pg were strictly enforced alone, that pipe would have been barred, which thankfully was not the case because W270 was recognized as an alternative. Now imagine ≤400 pg enforced: nearly **all pipe grades on the European market would likely fail** that criterion, since even the best have trouble consistently staying below ≤400 pg in every lab (note: even a result of 800 pg – which is below the current ≤1000 – would be a failure under the ≤400 rule).

The **net effect would be a shrinking of the material portfolio** available for drinking water infrastructure – not based on field performance, but on over-stringent lab metrics. Water companies might lose out on using otherwise superior materials because of a marginal lab result. This runs counter to the principle of evidence-based regulation. It's worth reiterating TEPPFA's statement: *"with our industry knowledge, no factual issues relating to microbiological growth based on pipe material properties have been established for standard plastic pipe materials used"*. If we ban "standard materials" due to a ≤400 pg rule, we are essentially fixing a problem that isn't there, while potentially creating new issues (like the need for protective disinfection or more expensive materials).

In regulatory impact terms, such over-stringency could increase costs for manufacturers and utilities (qualification costs, need for new formulations or supply chain changes), potentially with no improvement in drinking water safety. It could also stifle innovation: manufacturers might be reluctant to introduce new materials if even a tiny measurable leaching would be disqualifying. Ultimately the public could bear higher costs for water infrastructure as manufacturers consolidate around only those materials that can reliably hit extremely low BPP numbers – which might even be a very short list.

To avoid this scenario, regulators should maintain a threshold that **separates truly problematic materials from acceptable ones**, rather than one that lumps almost everything into "problematic." Materials that exceed ≤1000 are often specialized or uncommon formulations with high bioavailability of carbon. At ≤400 pg, you start labeling even "bio-stable" materials as problematic, which is not correct. Therefore, for the sake of retaining safe, time-proven materials in the market, the threshold must not be arbitrarily lowered.

Importance of Regulatory Consistency and Mutual Recognition Across the EU

One of the driving forces behind the new Drinking Water Directive provisions was to achieve **harmonization** – so that a product approved in one EU country would be accepted in all, ending the patchwork of national criteria. The mantra has been "**One standard, one test, accepted everywhere in Europe**". The Implementing Act 2024/368 was a major step toward that, defining common pass/fail criteria (including ≤1000 pg for BPP and 0.05 mL for W270). These are now in the process of being implemented uniformly by Member States.

If an individual regulator or Member State now considers unilaterally imposing ≤400 pg, it threatens this hard-won alignment. We would effectively be back to a non-tariff trade barrier: a product that meets the EU law (1000 pg) could be rejected in that one country demanding ≤400 pg. This defies the spirit of the single market and could also be legally questionable unless that country can justify the deviation under EU law (which, given the earlier points, would be difficult scientifically). It may also encourage other countries to set their own different numbers (one-upmanship in strictness), resulting in fragmentation. The **mutual recognition of test results** – something TEPPFA noted was under discussion – would unravel.
From a practical standpoint, having disparate thresholds would also complicate conformity assessment. Labs would have to test to multiple criteria depending on destination market. Manufacturers might have to label or market products differently by country, increasing complexity and cost. This goes directly against the efficiency that the new unified system was supposed to create by 2026.

Regulatory consistency is also important for maintaining industry and consumer confidence. If regulators stick to the agreed ≤1000 pg threshold, it signals a stable, well-considered framework. If suddenly one authority says "no, we want ≤400 now," it may cause confusion: *Was the original process flawed? Why are others not following?* It might even undermine trust in the BPP method itself (i.e., if ≤1000 pg was wrong, is ≤400 pg right, or is BPP just arbitrary?). Pre-emptive tightening by individual regulators is premature and counterproductive to the unified approach.

Finally, it's worth mentioning that the **European Drinking Water (EDW) industry coalition** – which includes 30 associations across the value chain – is committed to uniform standards and has been part of developing the current rules. The plastic pipes industry via TEPPFA is one voice in that, and their position (as of 2017 and still today) is clearly in favor of keeping the BPP criteria at a reasonable level and relying on W270 for proven safety. No major stakeholder group has provided data to support a ≤400 pg criterion. Therefore, regulators should heed the consensus and avoid unilateral deviations.

Conclusion and Recommendations:

After examining the technical evidence and practical implications, our conclusion is that **lowering the BPP (Method 1) threshold to ≤400 pg ATP/cm² is unwarranted and inadvisable.** The current threshold of ≤1000 pg – aligned with Commission Implementing

Decision (EU) 2024/368 – should be maintained. This ensures balance between precaution and practicality, and it aligns with the historically validated levels from the W270 method.
Key recommendations and rationale:

- **Maintain the ≤1000 pg ATP/cm² criterion** for BPP in national regulations and resist calls for ≤400 pg. This level already incorporates a significant safety margin. No data demonstrate additional safety gained by ≤400 pg, whereas the downsides (test unreliability, excluding materials) are clear. Regulators should base any future changes on robust trend data (e.g., if widespread issues somehow emerge even at ≤1000 pg, which is not expected). If in doubt, recommendation will then be to use the safe W270 method.

- **BPP or W270** method was decided by EU harmonization. A material that passes either the ATP test at ≤1000 pg or the biofilm test at 0.05 mL is acceptable for use by all available evidence. Regulators should continue to accept either result. Do not impose a scenario where a material must pass both criteria or a stricter combination (e.g., passing W270 but also BPP at ≤400pg), as that undermines the equivalence principle and penalizes materials despite meeting a proven standard (W270). EN 16421 under 1 Scope confirms that there is no direct correlation between the methods as several times claimed by TEPPFA.

- **Acknowledge the limitations of the BPP test** in communication with policymakers and stakeholders. Emphasize that BPP is a useful screening tool but not an absolute predictor of water quality. This perspective supports why extremely low numeric limits are not appropriate. In fact, ongoing standardization efforts should focus on reducing the variability (perhaps via refined ATP measurement techniques or better control of inoculum) – achieving that might organically lower the typical variance and allow more confidence in results in the 500–1000 pg range. Until then, keep a comfortable buffer (1000 pg) where measurement error is less likely to cause false failures.

- **Monitor field outcomes** as the ≤1000 pg threshold and new EU system are implemented. If, over several years, data from water utilities show absolutely no microbiological issues (as expected) and BPP results consistently correlate with W270, then ≤1000pg could be potentially increased to the benchmark value of 2000pg. If any unexpected issues arise, investigate them scientifically – but do not assume that lowering the BPP number is the fix without evidence. Often distribution system issues have multifactorial causes (stagnation zones, contamination ingress, etc.), not just material growth potential.

- **Promote consistency and mutual recognition.** Regulators should formally agree to honour each other's test reports per the new EU framework. Any thought of a local deviation (like ≤400 pg in one country) should be tabled at the EU level first, to avoid unilateral action. The EDW alliance and 4MS common approach should be leveraged to keep everyone aligned. Should there ever be a push for a stricter threshold, it must go through a proper EU review, including industry consultation and scientific risk assessment. Given the current knowledge, it's unlikely such a push would succeed; hence sticking with the harmonized ≤1000 pg is both the safest and simplest course.

In conclusion, the ≤400 **pg ATP/cm² proposal appears to be an overreaction that is not supported by the technical realities** of microbial growth testing. The existing regulatory framework (BPP ≤1000 pg **or** W270 ≤0.05 mL) provides a high level of health protection – effectively ensuring materials are biologically inert in practice – while still being grounded in what the test methods can reliably measure and what decades of operational experience have shown to be safe.

We urge regulators to consider the evidence presented and **not pursue an unjustified tightening of the BPP threshold**. That will lead to avoid using this test method. Instead, efforts should focus on consistent implementation of current standards, further validation of the BPP method's capabilities, and continued use of the tried-and-true W270 method as a cornerstone for ensuring microbiologically safe drinking water supplies.

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About TEPPFA

TEPPFA is the European Plastic Pipes and Fittings Association founded in 1991 with headquarters in Brussels. TEPPFA's 14 multinational company members and 13 national associations across Europe represent 350 companies that manufacture plastic pipes and fittings. TEPPFA members' final products represent an annual production volume of 4 million tonnes, are directly employing 40,000 people with €12 billion combined annual sales. TEPPFA positions itself as polymer neutral. TEPPFA members' final products are subdivided into two application groups: above ground systems for hot and cold water, surface heating and cooling, wastewater discharge and rainwater drainage, and below ground systems for sewers, stormwater and drainage, drinking water and gas supply, and cable ducts.