

Technical Recovery and End-of-Life Routes for VPP Materials

Evidence, material quality, losses and facility acceptance without automatic circularity or compostability claims

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Highlights

- IPA-free cleaning is described through SDS, compatibility and validated performance, not as universally safe.
- The identified OECD result is reported separately from ready-biodegradability criteria.
- Controlled-compost methods do not establish certification without a named scheme and scope.
- Dissolved or liquefied outputs are not assumed dischargeable.
- Recovery routes require yield, quality retention, cycles and losses before a closed-loop claim.

Abstract

Circular-economy claims require evidence for material flows, quality retention, losses and accepted downstream routes.

An OECD 301F result is reported for the identified test item and conditions, with a separate statement on validity and ready-pass criteria. ISO 14855 or ASTM D5338 tests are not automatically certification.

Disposal, composting or recovery depends on composition, contaminants, local classification and facility approval. A technical liquefaction route is not proof of favourable lifecycle performance.

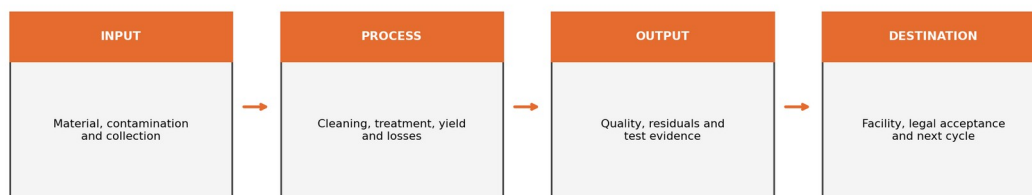
Keywords circular economy · liquefaction · depolymerization · composting · waste acceptance · recovery

Source use. Product evidence is in [1]; biodegradation/compost/packaging methods in [2–5]; lifecycle interpretation in [6].

1. Cleaning and collection

The workflow records cleaning fluid, contaminated inputs, material compatibility, SDS, segregation and validated cleaning acceptance.

- Do not use safe as a property.
- Prevent uncontrolled discharge.
- Track all waste streams.



Release requires traceable evidence at every gate; a catalogue label cannot bypass the chain.

Figure 1. WP-48 evidence gates from controlled material description to final acceptance.

2. Recovery/end-of-life evidence

Each route identifies test item, method, yield/degradation, quality, losses, energy/material inputs and facility acceptance.

- Separate OECD and compost tests.
- Name certification scheme if claimed.
- Do not transfer EN 13432 beyond scope.

3. Circularity interpretation

Closed-loop language requires repeated-cycle evidence, product-quality retention and a mass balance. Otherwise the route is described as a technical recovery option.

4. Minimum controlled evidence before release

Control field	Required record	Release interpretation
Input	Material, contamination and collection	Catalogue description only until evidence is linked
Process	Cleaning, treatment, yield and losses	Control process variables and change triggers
Output	Quality, residuals and test evidence	Report method, result, uncertainty and limits
Destination	Facility, legal acceptance and next cycle	Apply final acceptance and responsibility boundary



Description ≠ measured result ≠ certification or finished-device approval

Figure 2. WP-48 separates catalogue positioning, measured evidence and final application decisions.

KEY INSIGHT

Precise product or application language is retained only when the exact formulation, method, processed specimen and controlled evidence can be traced.

5. Limitations

- Safe/biocompatible cleaner wording is removed.
- OECD results are not compost certification.
- No discharge route is implied.
- EN 13432 is not transferred automatically.
- Technical recovery is not proof of closed-loop circularity.

6. Conclusions

- IPA-free cleaning is described through SDS, compatibility and validated performance, not as universally safe.
- The identified OECD result is reported separately from ready-biodegradability criteria.
- Recovery routes require yield, quality retention, cycles and losses before a closed-loop claim.
- This corrected candidate remains local and on HOLD until series-wide scientific, metadata and visual release checks are complete.

Revision note

Version 5.5 removes safe, discharge, certified-compostable and closed-loop shortcuts and introduces method-, mass-balance-, quality- and facility-specific route evidence.

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Disclosure. Dr. Juan Segurola is founder and Scientific Director of 3Dresyns by Resyner Technologies S.L., the supplier of the materials discussed.

References

- [1] 3Dresyns. Current cleaning/Liquefier TDS/SDS and controlled test reports.
- [2] OECD. Test No. 301F: Manometric Respirometry Test.
- [3] ISO 14855-2:2018. Aerobic biodegradability under controlled composting conditions—Part 2; monitor replacement edition.
- [4] ASTM D5338. Aerobic biodegradation under controlled composting conditions.
- [5] EN 13432:2000. Packaging—Requirements for packaging recoverable through composting and biodegradation.
- [6] ISO 14040:2006 and ISO 14044:2006. Life cycle assessment.