Tech Design Spec – Stress-Test Engine

Product: Stress-Test Engine (Diagnostic Risk Scanner for CBAM Reports)

Version: v1.0

Prepared By: Filentra Founder

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1. PURPOSE

The Stress-Test Engine enables declarants or internal teams to test the risk exposure of CBAM XML or XLS files before submission. It detects overuse of defaults, verifier field gaps, emissions outliers, and schema compliance issues. The goal is to prevent high-risk filings and generate interest in Filentra’s paid CBAM services.

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2. INPUT STRUCTURE

Accepted Input Types:

- CBAM-compliant XML files

- Structured XLS files based on EU transitional schema

Input Channels:

- File upload via Filentra site (standalone tool or dashboard widget)

Required Fields per Entry:

- CN Code

- Country of Origin

- Net Mass

- Direct Emissions (kg CO₂e/tonne)

- Indirect Emissions (kg CO₂e/tonne)

- Verifier Presence (Y/N or blank)

- Emission Source (Actual/Default)

- Timestamp of Submission

- Correction Log Timestamp (if any)

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3. OUTPUT STRUCTURE

Delivered via:

- Downloadable ZIP bundle

Contains:

- PDF Memo: Diagnostic summary

- Table of red/yellow/green flags

- Explanatory notes per issue

- Suggestions for improvement

- README: Disclaimer & Metadata

- Bundle Timestamp: SHA256 checksum + creation time

Optional:

- Attachment to Risk Vault (if client)

Filename Convention:

StressReport\_{EORI}\_{Quarter}\_{FileType}\_v1.zip

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4. FLAGGING ENGINE (RULES)

4.1 Default Overuse Rule

- Default usage >20% of total imports → Critical Red Flag

4.2 Copy-Paste Detection

- Emission value matches EU default exactly (within 0.001 precision) → Medium Yellow Flag

4.3 Outlier Rule

- Emissions ≥2.5× EU median or ≤0.4× → High Red Flag

4.4 Verifier Field Missing

- Empty verifier\_present field → Warning Yellow Flag

- Post Jan 2026, this becomes Critical

4.5 Correction Log Gaps

- Absence of correction timestamp when discrepancy exists → Compliance Yellow Flag

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5. MODULE STRUCTURE

5.1 File Parser

- Schema validation for XML

- Header + column matcher for XLS

- Converts to standard DataFrame

5.2 Risk Detection Core

- Applies 5 rules above

- Annotates risk\_flag column per entry

- Generates summary counts + severity breakdown

5.3 Memo Generator

- Markdown to PDF converter

- Builds dynamic diagnostic table

- Injects suggestion list per flag

5.4 ZIP Builder

- Adds memo + README + hash

- Optionally adds to Risk Vault

5.5 Delivery Hooks

- Email response with download link

- Dashboard card UI if logged-in

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6. UX/UI FLOW

- User lands on Stress-Test tool

- Uploads file (drag-drop or browse)

- Spinner → Email confirmation + dashboard status

- Result = ZIP available via dashboard or inbox

- Conversion CTA: “Fix your XML with Filentra Express”

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7. EDGE CASES

- Invalid XML/XLS schema → hard reject

- Missing emissions fields → flagged as parsing error

- No CN Code match → soft warning

- >10 errors → “Bulk risk detected” header

- Post-Jan 2026 flag override (Verifier Y/N)

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8. STORAGE & SECURITY

- All files deleted after 30 days

- Risk logs anonymized

- GDPR compliant: no contact or ID retained

- SHA256 bundle hash stored for integrity

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9. API ENDPOINTS (INTERNAL)

- POST /stress/upload

- GET /stress/status/{file\_id}

- GET /stress/download/{eori}/{quarter}

- POST /stress/trigger\_upsell

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10. ANALYTICS EVENTS

- stress\_upload

- risk\_flagged

- memo\_downloaded

- conversion\_attempted

Funnel:

Upload → Risk Flags → Fix CTA Clicked → Express Fix Bought

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11. DEPENDENCIES

- EU Default Value Dataset (XLS → JSON)

- Express Fix schema validator

- Markdown → PDF generator

- Risk Vault Engine (for ZIP delivery)

- PostHog or GA4 for funnel analytics

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12. OWNER

- Product Owner: Filentra Founder

- QA Lead: TBD

- Delivery: Self-serve + Email