ISO 11011 COMPRESSED AIR SYSTEM ASSESSMENT

Mainz plant

Valtena Packaging GmbH

Draft — engineering review pending

Report reference af000000-2026-08-20

Generated 2026-08-20

EasyCAS engine — not declared

Pinned baseline af000000 · no comparison pinned

Prepared for Valtena Packaging GmbH. Not for distribution without consent.

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2. Executive summary

ANNUAL ENERGY	ANNUAL COST	ANNUAL CO_2
~710,400 kWh	~EUR 127,872	~264,269 kg
estimated · basis: Setup schedule, 6,000 h/yr	estimated · basis: Setup schedule, 6,000 h/yr	estimated · basis: Setup schedule, 6,000 h/yr

Not available

Improvement assessment pending an optimized model.

This report documents the frozen baseline of Mainz plant: 0 modeled element(s) across the Supply, Transmission and Demand subsystems, 0 engine finding(s). Improvement assessment is pending an optimized model paired against this baseline.

Baseline model validation status not recorded

No validation status was recorded for the baseline model at the time this report was issued. Whether the model was compared against measured data is not on the record.

3. Roles and responsibilities

Assessor	not stated
Assessor organisation	not stated
Competency / qualification (as stated)	not stated
Client representative	not stated
Client representative role	not stated
Date of assessment activity	not stated

DATA PROVIDED BY

Data source	Provided by	Organisation	Date supplied
Manual baseline entry	not stated	not stated	not stated
Logger / measurement upload	not stated	not stated	not stated
Site audit	not stated	not stated	not stated
Audit report	not stated	not stated	not stated
Questionnaire	not stated	not stated	not stated
Equipment records (DCT)	not stated	not stated	not stated

Roles were recorded by the assessment team in Setup and frozen into this report at generation. Where a role reads "not stated", no name was supplied — the account that generated this report is never substituted for it. Frozen with this report on 8/20/2026, 4:59:13 PM — later edits to the roles record do not change this document; regenerate the report to pick them up.

4. Assessment scope & boundary

Site	Mainz plant
Client	Valtena Packaging GmbH
Sector	packaging
Assessment boundary	Compressed air generation, treatment and distribution across the Mainz packaging hall, quality lab and despatch.
Operating schedule	6,000 h/yr
Schedule note	Two shifts Mon–Fri plus Saturday morning packaging runs.
Energy tariff	0.18 EUR/kWh
Reference condition	ISO 1217 Annex C — 20 °C, 1 bar(a), 0 % RH
CO_2 factor	372 g/kWh

ROLES

Assessor	elvira.rakova@direktin.com
Client contact	*not declared*
Assessment type	Modeling-based assessment (EasyCAS digital twin)

5. Data quality & measurement basis

Grade A — measured

Grade A — the baseline is supported by measured field data. A 'low coverage' qualifier means the measured campaign covered less than 60% of its own span.

Measured campaign: 309.1 h covered of a 336 h span (92%), 3 fragment(s), 1 major gap(s), 4 minor gap(s). Every statistic below is qualified by that coverage.

COVERED HOURS	CAMPAIGN SPAN	COVERAGE
309.1 h	336 h	92%
measured	measured	measured

MEAN FLOW	P95 FLOW
118.4 Nm3/h	168.2 Nm3/h
measured	measured

Simulation model	no parsed export is attached to the frozen baseline
Measured data	1 logger summary row(s), primary channel flow (Nm3/h)
Inventory	3 inventory record(s)
Desktop annexes	*none*

PROVENANCE LEGEND

Provenance marks apply to every number in this document. Measured — field data recorded by a logger or instrument on the installation. Quantified — computed by the EasyCAS simulation engine from the declared model. Declared — read from the model file or from records entered by the assessment team; neither measured nor engine-computed. Estimated — derived from mixed or incomplete inputs and prefixed with '~'; a derivation that mixes measured and estimated inputs is always labelled estimated. A figure marked '†' carries no traceable origin and is stated as source not recorded. Measured and estimated values are never summed or averaged into an unlabelled result.

6. System description

Not available

diagram not available for this model format

System diagram

No model diagrams attached.

Not available

The frozen baseline carries no parsed elements — no composition can be stated.

7. Baseline assessment by subsystem

Not available

No parsed export is attached to the frozen baseline — subsystem figures cannot be stated.

6.1 Supply

Conversion of electrical energy into compressed air (source, compressors, treatment).

0 element(s) in the frozen baseline model.

ANNUAL ENERGY
~710,400 kWh
estimated · basis: Setup schedule, 6,000 h/yr

ANNUAL COST
~EUR 127,872
estimated · basis: Setup schedule, 6,000 h/yr

ANNUAL CO_2
~264,269 kg
estimated · basis: Setup schedule, 6,000 h/yr

INSTALLED CAPACITY (DECLARED COMPRESSOR ROOM)
~182 kW / 28.1 m³/min
estimated · 3 machine(s) declared on the Data step

SPECIFIC POWER — INVENTORY-DERIVED
~6.48 kW/(m³/min)
estimated · Σ rated kW / Σ rated FAD, at the rated point

FLEET ANNUAL ENERGY — DECLARED DUTY
~737,240 kWh
estimated · basis: entered duty hours in the compressor room, not the Setup schedule

DUTY-WEIGHTED LOADED SHARE
~44.5%
estimated · Σ loaded hours / Σ declared duty hours

COMPRESSOR ROOM — DECLARED DUTY

Atlas-class GA90 VP (Fixed speed (on/off))	90 kW · loaded 5,200 h · ~59.4% loaded · ~475,600 kWh/yr
Kaeser-class SK55 SFC (Variable speed (VSD))	55 kW · loaded 5,600 h · ~63.9% loaded · ~229,600 kWh/yr
Boge-class S37-2 HP (Load / unload)	37 kW · loaded 900 h · ~10.3% loaded · ~32,040 kWh/yr

FINDINGS

The engine reports no finding in this subsystem.

6.2 Transmission

Movement of compressed air from the point of generation to the points of use (piping, fittings).

0 element(s) in the frozen baseline model.

No transmission element is present in the frozen baseline model.

HIGHEST PRESSURE DROP (PIPES, TEES, FITTINGS)

no pipe or fitting in this model reports a pressure drop

HIGHEST ENERGY LOSS

no transmission element reports an energy loss

FINDINGS

The engine reports no finding in this subsystem.

6.3 Demand

All consumers of compressed air, including waste (actuators, valves, throttles, exhausts).

0 element(s) in the frozen baseline model.

DECLARED CONSUMERS (AIR DEMAND MAP)

~6 across 5 area(s), 3 high criticality

estimated · declared on the Data step

Σ DECLARED FLOW REQUIREMENT

~13.5 m³/min

estimated · sum of declared consumer flows, unsimultaneous

MAX PRESSURE REQUIRED

~9.5 bar

estimated · highest declared consumer requirement

DECLARED ANNUAL CONSUMPTION

~2,791,080 m³

estimated · flow × duty fraction × declared consumer hours

LARGEST CONSUMERS BY ENERGY

no consumer reports an energy figure

THROTTLE DISSIPATION RANKING (PRESSURE DESTROYED AT THE CONSUMER)

no throttle element in this model reports a pressure drop

CONSUMER INVENTORY BY AREA

Packaging hall (2 consumer(s), 2 high criticality)	~7 m³/min · max 6 bar · ~1,388,520 m³/yr
Compressor room (1 consumer(s), 0 high criticality)	~1.1 m³/min · max 6.2 bar · ~396,000 m³/yr
Whole site (1 consumer(s), 0 high criticality)	~1.9 m³/min · max 6 bar · ~684,000 m³/yr
Quality lab (1 consumer(s), 1 high criticality)	~1.4 m³/min · max 9.5 bar · ~60,480 m³/yr
Despatch (1 consumer(s), 0 high criticality)	~2.1 m³/min · max 5.8 bar · ~262,080 m³/yr

FINDINGS

The engine reports no finding in this subsystem.

Demand requires 9.5 bar; system runs at 10.5 bar — gap 1 bar. Basis: declared demand map against the highest compressor setpoint. Quantify the energy impact by simulating a reduced-pressure scenario in EasyCAS.

8. Improvement assessment

Not available

Improvement assessment pending an optimized model paired against the baseline.

9. Savings summary

Not available

No savings are stated: this report pins a baseline only.

10. Action plan

Not available

No actions defined.

11. Bill of materials

Not available

No bill of materials yet — components selected during modeling appear here.

12. Measurement & verification

MODELED IN THIS ASSESSMENT

No parsed export is attached to the frozen baseline — nothing in this assessment is engine-quantified.
The baseline export carries no scheme totals — source economics are absent, not zero.

MEASURED IN THIS ASSESSMENT

flow (Nm3/h) logged over 336 h with 92% coverage.
1 logger summary row(s) are pinned to this report.
Measured 710.4 MWh vs fleet estimate 737.2 MWh (+3.8%). The measured basis (logger × Setup schedule) and the declared fleet basis (entered duty hours) are stated side by side and never merged.

RECOMMENDED NEXT MEASUREMENTS

The evidence state of this assessment calls for no additional measurement.

13. Annexes & references

ATTACHED DESKTOP FULL REPORT PDFS

No desktop FULL REPORT PDF was attached when this report was generated.

Element detail — Supply

No element of this subsystem in the frozen baseline model.

Element detail — Transmission

No element of this subsystem in the frozen baseline model.

Element detail — Demand

No element of this subsystem in the frozen baseline model.

Element detail — Unassigned

No element of this subsystem in the frozen baseline model.

NORMATIVE REFERENCES

ISO 11011 — Compressed air — Energy efficiency — Assessment
ISO 6358 — Pneumatic fluid power — Determination of flow-rate characteristics of components
ISO 8573-1 — Compressed air — Contaminants and purity classes
ISO 1217 — Displacement compressors — Acceptance tests

† source not recorded