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FREEDOM-TO-OPERATE REPORT

SAMPLE REPORT



CASE
FlowBalance CP-1

CLIENT
Sample / Illustrative Case

REPORT DATE
25 October 2026

REFERENCE
SINC-FTO-001

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01 / Executive summary

This illustrative Freedom-to-Operate (FTO) assessment demonstrates Sincore IP's patent intelligence methodology using **FlowBalance CP-1**, a fictional liquid cooling plate for electric vehicle batteries.

The defined CP-1 Rev. 2 design incorporates eight parallel coolant channels and differently sized fixed-area inlet restrictions integral to the cooling plate at each individual channel entrance. It uses no separate perforated distribution insert, terminal return chambers or channel-entering end-cap projections. Selected patent searches and granted-claim comparisons address Germany, France and the Netherlands.

Key findings

Family / Right	Status at Cut-off	Why It Remains Relevant	Current Treatment
FR3127560B1 — Sogefi	FR: In force; renewal 22 Sep 2026	Different-size distribution openings; claim 1 and claim 6 structures	Highest technical attention: integral plate restrictions differ from disclosed intervening distributor; residual scope question.
FR3068774B1 — Valeo	FR: In force	Return-chamber restrictions in battery cooling system	Lower correspondence: CP-1 excludes terminal return chambers.
EP2696433B1 — Magna	FR/DE: In force; NL: Lapsed	End-cap projections into cooling channels	Lower correspondence: no channel-entering end-cap projections.
EP2113099B1 — Liebert	FR/DE: In force; NL: Lapsed	Flow regulation among multiple cold plates	Conditional system-level relevance: CP-1 balances channels within one plate.
EP4405629B1 — Sogefi	FR/DE: In force; NL: Lapsed	Distribution conduit, gasket and staple-type fixing	Lower correspondence on defined plate; external connection design requires confirmation.
FR3127562B1 — Sogefi	FR: In force; renewal 22 Sep 2026	Same family as EP4405629B1; broader claim 1 (fixing means in any form)	Lower correspondence: CP-1 has no gasketed distributor duct fixed to the plate surface; connector design requires confirmation.
EP4481892B1 — Hithium	FR/DE: In force; NL: Lapsed	Perpendicular cooling portions, detour segments and connecting pipe	Lower correspondence: CP-1 uses flat parallel-channel architecture.

Interpretation and immediate design questions

The principal technical focus is the distinction between CP-1’s integral channel-entry restrictions and claimed intervening coolant distribution structures, particularly in FR3127560B1. A separate system-level question arises under EP2113099B1 if the final installation distributes coolant among multiple cold plates. The illustrative design assumes inlet/outlet pipe stubs directly joined to the manifolds, without an external plate-face gasket-and-staple connector.

The defined CP-1 Rev. 2 configuration locates the differently sized restrictions directly at individual channel entrances as integral features of the plate; no separate distribution insert is included. The final external inlet/outlet connector and fastening design remains outside the defined product detail.

The defined flow path has common inlet and outlet manifolds and excludes terminal flow-reversal chambers; this is a material distinction from the return-chamber configuration of FR3068774B1.

Territorial and evidentiary boundary

Claim-oriented review covers seven granted patent documents. Reported territorial status: the three French patents are in force in France; the four selected EP rights are in force in France and Germany and lapsed in the Netherlands. Other family members and later legal events have not been comprehensively verified.

Territorial status is recorded from the jurisdiction-specific legal-status findings supplied for this assessment, with a reference date of 25 October 2026. The findings are treated as completed status screening for the seven selected rights; underlying legal-status extracts are not reproduced in this public sample.

Accordingly, the findings represent a preliminary, design-specific assessment of selected patent rights and do not establish freedom to operate in any of the target jurisdictions.

02 / Scope, territories and controlling assumptions

2.1 Product Technical Specifications

The FlowBalance CP-1 is a conceptual liquid cooling plate designed for electric vehicle battery thermal management. The following technical features define the product configuration considered in this illustrative FTO assessment.

Feature	Defined technical configuration	FTO significance
F1	Two formed aluminium sheets joined into one cooling plate	Plate structure; joining and external connection details remain illustrative
F2	Eight parallel internal coolant channels	Channel arrangement and number of flow paths
F3	Common inlet and outlet manifolds	Potential distributor/collector interfaces
F4	Differently sized fixed-area restriction openings integral to the plate, directly at each individual channel entrance; no separate perforated insert or manifold-mounted restrictor	Principal structural feature for Sogefi comparison
F5	Passive hydraulic-resistance balancing; no valves, electronics or active control	Intended effect; not a substitute for claimed structure
F6	Thermal contact with an EV battery module	Application context for battery thermal-management claims
F7	Externally pumped closed-loop water–glycol circuit	Operating context; no active valves/electronic controls
F8	External inlet/outlet pipe stubs directly joined to the corresponding manifolds; no gasketed plate-face connector with staple-type fixing	Illustrative connector architecture for EP4405629B1 comparison

2.2 Territories and timing

The illustrative FTO assessment covers Germany, France and the Netherlands, with a reference date of 25 October 2026.

The assessment considers selected patent publications and their relevance to the defined FlowBalance CP-1 product configuration. Territorial patent coverage and legal status are addressed within the limitations of this sample study.

2.3 Known, owned or licensed IP context

No existing patent ownership, licensing arrangements or other contractual IP rights have been assumed for FlowBalance CP-1 in this illustrative assessment.

2.4 Assessment Basis and Limitations

The assessment is based on selected patent search results, published patent documents, granted claims and available legal-status information.

Patent relevance was evaluated through technical screening and comparison of selected claim limitations against the defined FlowBalance CP-1 configuration.

The seven selected rights received claim-oriented review and jurisdiction-specific status screening for the target territories. The study does not claim exhaustive screening of every patent family or all third-party rights, nor does it provide a legal infringement opinion.

03 / Product Architecture and FTO Assessment Focus

FlowBalance CP-1 employs a passive flow-balancing arrangement in which coolant is distributed from a common inlet manifold into eight parallel cooling channels. Differently sized fixed apertures at the channel entrances regulate hydraulic resistance to support balanced coolant distribution.

The principal technical FTO consideration is the construction of integral, differently sized restriction apertures directly at each individual channel entrance, rather than a separate distributor or manifold-mounted restriction element.

The assessment also considers whether the overall coolant-flow architecture corresponds to claimed arrangements involving distribution structures, flow restrictions or return chambers.

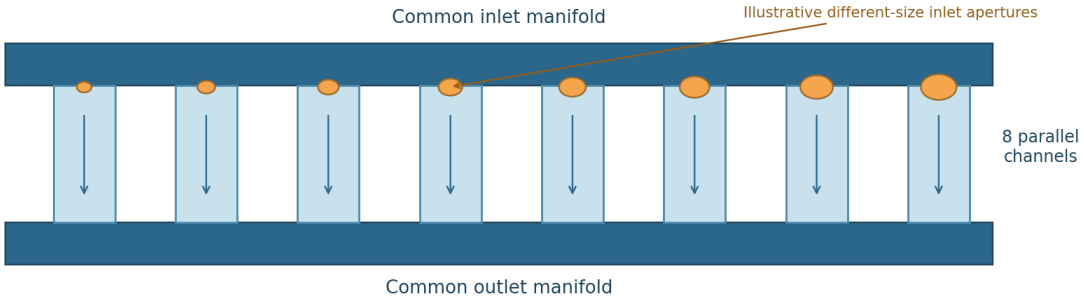


Figure 1. Conceptual flow arrangement of FlowBalance CP-1.

The schematic illustrates eight parallel channels supplied by a common inlet manifold and differently sized inlet restrictions. It is conceptual, not to scale; CP-1 Rev. 2 defines the restrictions as integral to the plate at individual channel entrances. External connector details are not represented.

3.1 Core FTO question

Do the structural features of FlowBalance CP-1, particularly its inlet-distribution and passive flow-balancing arrangement, fall within the scope of relevant patent claims effective in Germany, France or the Netherlands?

3.2 Technical Features Relevant to the FTO Assessment

The FTO assessment focuses on the following technical aspects of FlowBalance CP-1:

Technical Area	CP-1 Configuration	FTO Assessment Focus
Cooling Plate Structure	Two formed aluminium sheets enclosing eight parallel coolant channels	Structural arrangement of the cooling plate and flow passages
Inlet Distribution System	Common inlet manifold with differently sized fixed restrictor apertures	Distribution structures, aperture geometry and positioning
Flow Regulation	Passive hydraulic resistance balancing	Location and configuration of flow-restriction features
Coolant Circulation	Externally pumped water–glycol circuit with a common outlet manifold	Flow-path configuration and potential return-chamber arrangements

04 / Search Methodology

The patent search strategy was developed around the technical configuration of FlowBalance CP-1, with particular emphasis on liquid cooling plates, parallel coolant channels, manifold-based fluid distribution and passive flow-restriction mechanisms.

A structured, iterative approach was applied, combining keyword searches, patent classification analysis and targeted searches directed at the product's distinguishing technical features.

Retrieved patent publications were screened for technical relevance, with selected documents examined further through patent-family review and claim analysis. Particular attention was given to identifying claim limitations potentially corresponding to the proposed inlet-distribution and flow-balancing arrangements.

4.1 Search concepts and representative terminology

Feature	Concept	Keywords / Search Terms
Application	EV battery thermal management	batter*, "battery module*", "battery pack*", "battery cell*", "traction batter*", "electric vehicle*", EV, "energy storage system*", "thermal management", "battery cooling"
Cooling Structure	Liquid cooling plates and heat-exchanger assemblies	"cooling plate*", "cold plate*", "coolant plate*", "liquid cooling plate*", "heat exchang*", "heat transfer plate*", "thermal management plate*", "cooling panel*", "cooling assembl*"
Flow-Path Layout	Parallel coolant channels and internal flow passages	"parallel channel*", "coolant channel*", "cooling channel*", "flow passage*", "fluid passage*", "flow path*", "parallel flow*", "multiple channel*", "fluid circuit*", "serpentine channel*"
Fluid Distribution	Inlet/outlet manifolds and coolant distribution structures	manifold*, header*, distribut*, collector*, "inlet manifold*", "outlet manifold*", "distribution duct*", "distribution chamber*", "flow distribut*", "fluid distribut*", "flow uniformity"
Flow Restriction	Passive hydraulic resistance and flow balancing	orifice*, restrict*, throttl*, "flow resist*", "hydraulic resist*", "pressure drop*", "pressure loss*", "flow balanc*", "flow regulat*", "flow control*", "passive balanc*", "metering aperture*"
Aperture Geometry	Differently sized openings and variable flow cross-sections	aperture*, opening*, perforat*, "through hole*", "through-hole*", "variable diameter*", "different diameter*", "varying diameter*", "different size*", "cross section*", "cross-sectional area*", "graduated orifice*", "unequal opening*"

4.2 Classification development

Relevant IPC and CPC classifications were identified and evaluated based on the technical features, structural characteristics and operating principles of FlowBalance CP-1. The selected classifications provide a framework for identifying potentially relevant patent documents across the applicable technology areas.

The classifications considered relevant to each technical feature are summarised below.

Technical Feature	Selected IPC/CPC Classification	Technical Relevance
F1 — Cooling Plate Construction	H01M10/6556; F28F3/12; F28F3/00; F28F21/084	Cooling structures incorporating internal flow passages, plate-like heat exchanger elements and aluminium construction.
F2 — Parallel Cooling Channels	H01M10/6556; F28F3/12	Cooling structures containing internal coolant passages. Parallel channel arrangements require additional keyword searching.
F3 — Inlet and Outlet Manifolds	F28F9/02; F28F9/00	Header boxes and associated structures for distributing and collecting heat-exchange fluids.
F4 — Differently Sized Inlet Apertures	F28F27/02; F28F9/026*; F15D1/00	Static flow restriction at integral channel entrances; manifold-mounted restriction features excluded in CP-1 Rev. 2

Technical Feature	Selected IPC/CPC Classification	Technical Relevance
F5 — Passive Flow Balancing	F28F27/02; F28F27/00	Control of heat-exchange fluid distribution between channels, including passive hydraulic flow-balancing arrangements.
F6 — Battery Thermal Management	H01M10/625; H01M10/6556; H01M10/613	Vehicle battery applications, heat-exchange structures incorporating flow passages and battery cooling.
F7 — External Liquid Cooling Circuit	H01M10/6567; H01M10/6568; H01M10/613	Liquid heat-exchange media, external coolant flow circuits and battery cooling arrangements.

** F28F9/026 remains a search-expansion classification for header-associated restrictions; CP-1 Rev. 2 places its fixed restrictions in the cooling plate at channel entrances, not in the header.*

Classification Search Strategy

The selected classifications provide complementary search coverage across battery thermal management (H01M), heat exchanger construction (F28D/F28F), fluid distribution and flow control (F28F), and general fluid-flow arrangements (F15D).

Classification-based searches should be supplemented with feature-specific keywords, particularly for differently sized inlet apertures, fixed flow restrictions, parallel coolant channels and passive hydraulic balancing. No single classification identified in this assessment uniquely describes the complete CP-1 configuration.

The classification mapping represents a technically screened set of search candidates rather than a determination that CP-1 is classified under every listed group. Broader and overlapping classifications may be combined or refined during the patent search process.

4.3 Integrated search architecture and observed sets

The search strategy was developed through an iterative approach combining technical keywords, IPC/CPC classifications, and targeted patent searches. Rather than relying on a single search expression, the approach considered the structural and functional characteristics of FlowBalance CP-1 through complementary search perspectives.

The flow below shows how the retrieval routes, consolidation and review stages relate to one another. The stages overlap in practice because the search was iterative.

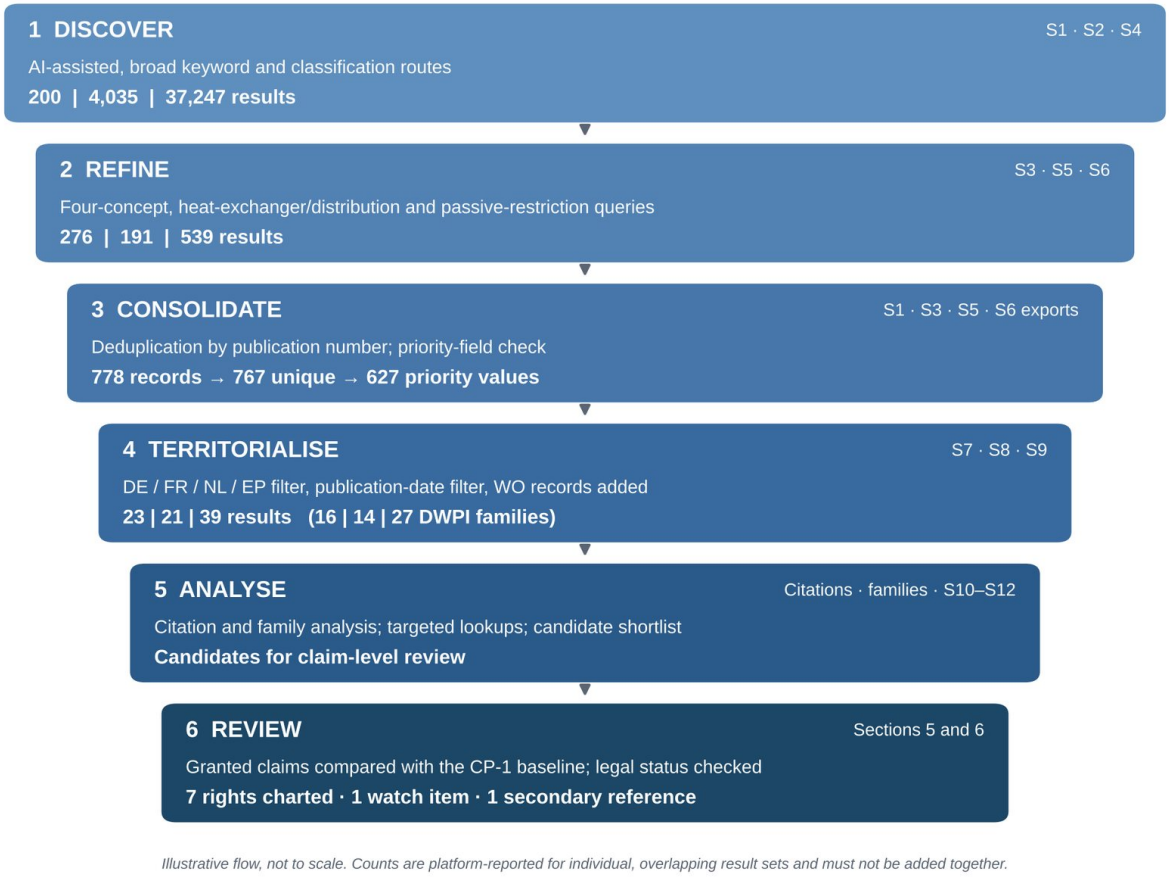


Figure 2. Search and screening flow for FlowBalance CP-1 (illustrative).

Initial Technology Exploration

The initial search focused on liquid-cooled battery systems, cooling plate constructions, internal coolant channels, and heat exchanger arrangements. Broad technical terminology was used to identify relevant technology areas, alternative design approaches, and terminology commonly encountered in patent disclosures.

Feature-Specific Search Refinement

The search focus was progressively narrowed to the technical features most relevant to the FTO assessment, particularly:

- Distribution of coolant through common inlet and outlet manifolds.
- Fixed restriction apertures positioned at individual channel entrances.
- Differences in aperture dimensions or cross-sectional areas.
- Passive regulation of hydraulic resistance and coolant distribution between parallel channels.

Alternative terminology and structural descriptions were considered to address variations in how similar technical solutions may be described in patent documents.

Classification-Assisted Searching

Relevant IPC/CPC classifications were incorporated to complement keyword-based retrieval. Classification-oriented searches supported the identification of documents relating to battery thermal management, heat exchanger construction, fluid distribution, and flow-control arrangements.

Keyword and classification concepts were considered both independently and in combination to broaden technical coverage while improving the relevance of retrieved documents.

Targeted Searching and Candidate Review

The subsequent search stages focused on patent documents describing potentially comparable fluid-distribution structures, restriction arrangements, and cooling plate configurations. Relevant patent documents and their associated family information provided additional starting points for targeted investigation.

Candidate documents were prioritised according to their technical correspondence with the defined CP-1 features, with particular attention to the location and configuration of flow restrictions, the relationship between distribution structures and cooling channels, and the claimed fluid-flow architecture.

Search Interpretation

The iterative approach supported the identification and technical screening of patent documents for further claim-based assessment. Search results were evaluated in the context of the defined product configuration and target jurisdictions rather than by retrieval counts alone.

The methodology does not establish that every potentially relevant patent right has been identified. Any FTO conclusion remains dependent on the scope of the claims, applicable territorial rights, verified legal status, and the final product configuration.

4.3.1 Search log — observed retrieval volumes

The log below lists each search route with its concept focus and the funnel stage it serves. Result counts are platform-reported (search cut-off 25 October 2026) for individual, overlapping sets, not unique patents across the combined strategy. DWPI-family counts are database-reported within each set and must not be added together.

ID	Search route	Concept focus	Results	DWPI families	Funnel stage
S1	AI-assisted concept exploration	Free-text description of the CP-1 concept; all concept blocks	200	200	1 Discover
S2	Broad keyword retrieval	Application, cooling structure, flow path, distribution and restriction blocks (Section 4.1)	4,035	1,798	1 Discover
S3	Refined four-concept keyword query	Four-concept combination of the Section 4.1 blocks	276	178	2 Refine
S4	Battery thermal-management classification route	IPC/CPC classes of Section 4.2	37,247	21,266	1 Discover
S5	Heat-exchanger and coolant-distribution refinement	Cooling-structure and fluid-distribution concepts	191	54	2 Refine
S6	Passive flow-restriction refinement	Flow-restriction and aperture-geometry concepts	539	209	2 Refine
S7	Territorial filter	DE / FR / NL / EP	23	16	4 Territorialise
S8	Territorial and publication-date filter	S7 with a publication-date limit	21	14	4 Territorialise
S9	WO expansion	Territorial and date approach with WO records added	39	27	4 Territorialise
S10	Targeted lookup: EP2113099B1	Claims and family data of the publication	1	1	5 Analyse
S11	Targeted lookup: EP4481892B1	Claims and family data of the publication	1	1	5 Analyse
S12	Targeted lookup: WO2025252210A1	Watch item (Section 6)	1	1	5 Analyse

Note: S9 is not a subset of S8, so its count can be higher. The date filter refers to publication date, not priority date. S10–S12 are targeted publication lookups, not independent coverage searches. S12 (WO2025252210A1) is a targeted lookup retained as a watch item rather than a claim-charted right. Espacenet records a notification that WIPO informed the EPO of the EP designation (28 January 2026), and the other family members identified are Chinese. No granted right in DE, FR or NL is established, and entry into the European regional phase has not been verified. See Section 6.

4.3.2 Screening funnel

The funnel runs from broad retrieval to a small set of rights compared claim by claim. Figures are those supported by the search exports and platform counts; the criteria show how documents move from one stage to the next.

Stage	Activity	Figures	Criteria and outcome
1 Discover	Broad retrieval to map terminology, technology areas and alternative designs (S1, S2, S4)	200 / 4,035 / 37,247 results	No screening at this stage; terminology and classes are noted for refinement.
2 Refine	Concept-block and feature-specific queries (S3, S5, S6)	276 / 191 / 539 results	Queries narrowed to distribution structures, restriction arrangements and cooling-plate configurations.
3 Consolidate	Export of four result sets (S1, S3, S5, S6) and deduplication	778 records; 767 unique publications; 627 distinct priority values	Duplicates removed by publication number. Priority values indicate family diversity; they are not a verified family count.
4 Territorialise	Territorial, date and WO filters (S7–S9)	23 / 21 / 39 results; 16 / 14 / 27 DWPI families	Retained: publications with possible effect in DE, FR or NL through a national, EP or WO route.
5 Analyse	Screening of titles, abstracts and drawings; citation and family analysis; targeted lookups (S10–S12)	Record-level counts are listed in the search-log annex of a delivered report	Retained: a distribution, restriction or cooling-plate architecture comparable to CP-1 and a right with possible effect in DE, FR or NL. Excluded: different technology or architecture, no effect in the target territories, duplicate family members.
6 Review	Independent-claim comparison and legal-status check	7 rights charted; 1 watch item; 1 secondary reference	Results in Sections 5 and 6.

Documentation: the record-level decisions behind stage 5 (query strings, timestamps, per-stage counts and exclusion reasons) are kept in the search log, which accompanies a delivered report as a separate annex. This sample is an illustrative excerpt: it shows the structure of that log and the figures the exports support.

4.4 Search screening, retention and stopping rule

Patent documents were retained for further consideration where their titles, abstracts, drawings or available claims indicated potential relevance to battery cooling, fluid distribution structures, restriction apertures or parallel-channel flow control. Screening distinguished technical similarities in the disclosed concepts from the specific limitations of granted patent claims.

Selected patent families were prioritised to illustrate different levels of claim correspondence with the defined CP-1 configuration. The screening did not include exhaustive family deduplication or a claim-by-claim assessment of all retrieved records.

The search was conducted iteratively: results were reviewed in successive rounds, and searching was concluded when further queries returned predominantly similar results and already-identified families. Citation and family analyses were then carried out on the retrieved records, and the final candidates for detailed review were selected.

The seven rights in Section 5 are a documented claim-review subset of the retained records, not a claim that every record from S1–S12 was screened to completion.

4.5 Selection and screening rationale

The seven rights were retained for detailed independent-claim comparison because they illustrate different structural routes to coolant distribution or battery cooling, with reported territorial effects in at least one target country. This is a documented seven-right assessment subset, not a claim that every record from S1–S12 was screened to completion.

Selected right	Reason for detailed review	Decisive technical question
FR3127560B1	Differently sized distribution openings; FR in force	Does an integral channel-entry restriction correspond to the claimed intervening distribution structure?
FR3068774B1	Battery coolant distribution with restrictions; FR in force	Are the claimed terminal return chambers present?
EP2696433B1	Channel flow regulation; FR/DE in force	Are end-cap projections extending different depths into channels present?
EP2113099B1	Orifice balancing; FR/DE in force	Does the installed system distribute flow among multiple cold plates?
EP4405629B1	Cooling plate fluid distributor; FR/DE in force	Is the claimed gasketed, staple-fixed conduit connection used?
FR3127562B1	Same family as EP4405629B1; broader claim 1; FR in force	Is a gasketed duct with a complementary bearing surface fixed to the plate, in any fixing form?
EP4481892B1	Battery cooling plate; FR/DE in force	Does the plate use the claimed orthogonal, detour-and-pipe architecture?

Other records: The available working shortlist includes additional EP, WO, US, FR and CN publications. Their presence in the search results does not demonstrate a DE/FR/NL enforceable right. The complete shortlist has not been reconciled through an exhaustive family-level screening and exclusion log; accordingly, those documents are not presented as cleared or irrelevant.

05 / Selected granted-claim comparisons

The following claim-oriented assessments use the seven selected granted patent documents. Each claimed element is mapped to the fictional product and accompanied by a reasoned searcher's comment and a status. Purple text identifies claim-side features and teal text identifies product-side correspondence; these colours are reading aids, not infringement ratings. The assessments support technical decision-making and are not legal infringement opinions.

Status	Meaning	Treatment in this report
MET	The claimed element is positively present in the defined CP-1 baseline.	Counts toward claim correspondence.
OPEN	The baseline does not define enough to decide, or the element turns on claim construction. An information gap, not a finding of difference.	Treated as potentially met until clarified.
NOT MET	The baseline specifies a documented difference from the claimed element.	Stated with its basis; reassessed if the design changes.
NOTE	Interpretation point that is not itself a claim element.	Informs weighting of the other elements.

*A claim reads on the product only if every one of its elements is met. * Marks a status that holds on the documented baseline (CP-1 Rev. 2 and F8) and falls away if the design changes. The F8 connector design is an assumed baseline that the client confirms against the actual product. MET* also depends on another element, as stated in the comment.*

5.1 FR3127560B1 — Sogefi Air & Cooling

1. Patent overview

Item	Details
Patent	FR3127560B1
Proprietor	Sogefi Air & Cooling
Title	Structure de répartition de fluide caloporteur
Filing date	24 September 2021 (priority FR 2110060 of the same date)
Grant publication	4 April 2025
Relevant independent claims	Claims 1 and 6
Territorial legal status	FR: reported in force; renewal fee paid 22 September 2026
Claim basis	Claims of the granted FR text, in French; the chart paraphrases them in English
Legal-status source	Espacenet (INPADOC legal-event data), extracted 25 October 2026

2. Claim analysis

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 1				
1A	Coolant distribution structure positioned between a distribution conduit and a cooling-plate circulation opening	CP-1 has an inlet manifold, but its restriction openings are integral to the plate; no intervening distribution structure is specified.	**OPEN**	Claim language does not expressly require a separately manufactured piece; integrated geometry must still be interpreted.
1B	At least one distribution through-hole extending through the thickness of the distribution structure	Integral channel-entry restrictions are present, but a distinct distribution structure with through-thickness holes is not identified.	**OPEN**	Partial functional similarity; depends on how 1A is construed.
1C	Multiple distribution openings having different shapes and/or dimensions	CP-1 incorporates differently sized inlet apertures (F4).	**MET***	Dimensional limitation present; its attribution to a distribution structure depends on 1A.
Claim-level result: Cannot be excluded on a purposive reading. Elements 1A and 1B turn on how "distribution structure" is construed against integral plate geometry; literal correspondence is reduced.				

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 6				
6A	Assembly comprising a cooling plate with a coolant circulation opening and a distribution structure positioned between the distribution conduit and the plate opening	Plate and manifold present; no separate intervening distribution structure in CP-1 Rev. 2.	**NOT MET**	Structural distinction.
6B	Distribution structure substantially complementary in shape to, and covering, the cooling-plate circulation opening	No covering distribution structure is included in the defined CP-1 configuration.	**NOT MET**	Claim 6 requires the specified covering distribution structure; none is defined for CP-1.
6C	At least one distribution through-hole extending through the thickness of the distribution structure	Integral restriction openings are present; no holes through a separate covering distribution structure are specified.	**NOT MET**	Structural distinction.
Claim-level result: Not met on the current baseline (6A–6C NOT MET). Reassess if the final connector introduces a covering distribution structure.				

3. Relevant patent figures

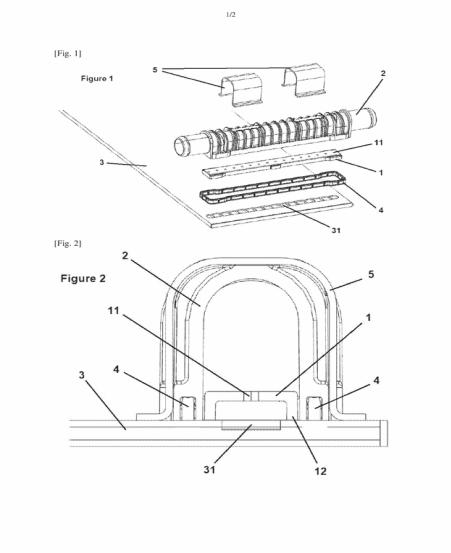


Figure 3. Distribution structure (1), distribution conduit (2), cooling plate (3), distribution opening (11), and cooling-plate circulation opening (31), as illustrated in FR3127560B1 (original Figures 1–2).

4. Technical assessment and FTO implications

FR3127560B1 remains technically relevant because its distribution openings of differing dimensions correspond in function to CP-1's fixed channel-entry restrictions. However, CP-1 forms its restrictions integrally within the plate rather than providing an intervening distribution structure.

The relevant distinction is structural: the patent describes a distribution structure positioned between a conduit and a cooling-plate circulation opening, whereas CP-1 has no separately identified intervening structure. Specification paragraph [0014] describes a structurally independent element, although independent claim 1 does not expressly require a separately manufactured part.

Independent claim 6 additionally requires a complementary distribution structure covering a cooling-plate circulation opening; it does not require differently sized openings. No separate covering distribution structure is defined for CP-1.

Preliminary technical assessment: Material structural distinction identified; the differently sized openings remain a relevant similarity. Literal claim correspondence appears reduced for the defined CP-1 architecture, subject to claim construction and equivalents.

Recommended action: Retain the integrated channel-entry geometry in the design record and confirm that the final inlet connector does not introduce an intervening covering distribution structure. Seek French legal interpretation if this patent becomes commercially decisive.

5.2 FR3068774B1 — Valeo Systèmes Thermiques

1. Patent overview

Item	Details
Patent	FR3068774B1
Proprietor	Valeo Systèmes Thermiques SAS
Title	Dispositif de régulation thermique d'au moins un élément de stockage d'énergie électrique
Filing date	6 July 2017 (priority FR 1756358 of the same date)
Grant publication	20 December 2019
Relevant independent claims	Claim 1
Territorial legal status	FR: reported in force
Claim basis	Claims of the granted FR text, in French; the chart paraphrases them in English
Legal-status source	Espacenet (INPADOC legal-event data), extracted 25 October 2026

2. Claim analysis

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 1				
1A	Thermal regulation device comprising a heat exchanger for an electrical energy storage element	CP-1 is a liquid cooling plate for an EV battery module.	**MET**	Present.
1B	Inlet distribution means and outlet collection means connected to respective inlet and outlet conduits	CP-1 has inlet and outlet manifolds, but their complete connection arrangement is undefined.	**OPEN**	Potential.
1C	Coolant flowing in opposite directions through inlet and outlet conduits	CP-1 has parallel flow from common inlet to outlet; no terminal reversal.	**NOT MET**	Structural distinction.
1D	Multiple return chambers at the opposite ends of the conduits, connecting inlet and outlet flow paths	CP-1 explicitly has no terminal return chambers.	**NOT MET**	Structural distinction.
1E	Return chambers formed within a single partitioned return header or within separate return headers	No return-header chambers in the defined CP-1 architecture.	**NOT MET**	Structural distinction.
1F	Each return chamber incorporates a perforated partition or a narrowed section of the return header to restrict coolant flow	Restrictions are integral to channel entrances, not return chambers.	**NOT MET**	Structural distinction.
Claim-level result: Not met on the current baseline (1C–1F NOT MET; 1B OPEN). Reassess if return chambers or return-side restrictions are introduced.				

Dependent claims

Claim	Additional limitation	CP-1 product mapping	Status
2	Inlet and outlet means are header boxes	CP-1 includes manifolds; correspondence with header boxes is unverified.	OPEN

Claim	Additional limitation	CP-1 product mapping	Status
3	Some or all restriction openings in return-chamber partitions have different cross-sectional areas	CP-1 has different-sized inlet apertures, but at channel entrances, not in return-chamber partitions.	NOT MET
4	Tubular header boxes of different diameters	Not specified.	OPEN
5	Fluid conduits comprise multiple channels	CP-1 has multiple channels; correspondence with the claimed conduits is unverified.	OPEN

3. Relevant patent figures

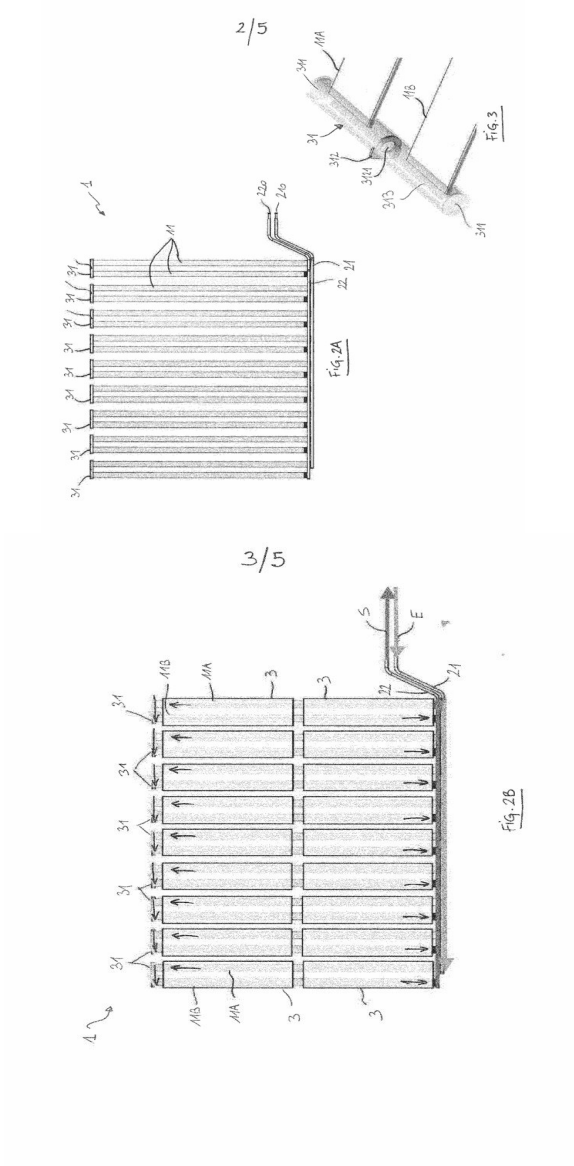


Figure 4. Coolant flow architecture and return-chamber restriction arrangement disclosed in FR3068774B1. Original Figures 2B and 3 illustrate the oppositely directed inlet and outlet conduits, return chambers (313), and perforated restriction partitions (312) incorporating calibrated openings (3121). Source: FR3068774B1, drawing sheets 2/5 and 3/5.

4. Technical assessment and FTO implications

FR3068774B1 was retained for further consideration because it concerns liquid-based thermal regulation of electrical energy storage elements and the regulation of coolant distribution within a heat-exchange arrangement.

The principal technical distinction concerns the location and configuration of the flow restrictions. The claim architecture identified during preliminary screening involves return chambers and

associated restriction means, whereas CP-1 incorporates fixed restriction apertures at individual parallel-channel entrances.

CP-1 Rev. 2 expressly excludes terminal flow-reversal chambers. Its restrictions are located at individual channel entrances, not in return chambers, providing a material distinction from independent claim 1.

Preliminary technical assessment: Lower claim correspondence due to the absence of the claimed return-chamber restriction architecture.

Recommended action: Preserve the defined parallel-channel flow architecture and reassess only if the final design introduces return chambers or restrictions associated with them.

5.3 EP2696433B1 — Magna Steyr Battery Systems

1. Patent overview

Item	Details
Patent	EP2696433B1
Proprietor	Magna Steyr Battery Systems
Title	Battery cooling device for a car battery
Filing date	8 August 2012
Grant publication	4 March 2015
Relevant independent claims	Claim 1
Territorial legal status	FR/DE: reported in force; NL: reported lapsed
Claim basis	Claims of the granted EP B1 text, which apply in the validated states; national translations were not reviewed separately
Legal-status source	Espacenet (INPADOC legal-event data), extracted 25 October 2026

2. Claim analysis

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 1				
1A	Battery cooling device for a vehicle battery with battery cells, comprising a cooling body with coolant channels intended for thermal contact with the cells	Cooling plate with eight parallel internal channels in thermal contact with a battery module.	**MET**	Broad technical correspondence.
1B	End cap at at least one end of the cooling body, with at least some channels opening into it	CP-1 has common inlet and outlet manifolds at the channel ends; whether a manifold is an “end cap” in the claimed sense is a construction question.	**OPEN**	Manifold-to-end-cap correspondence is not established.
1C	Projections formed at the end cap project into at least some channels; projections for at least two channels are designed differently and project to different extents	CP-1 expressly excludes end-cap projections into the channels; flow restriction is integral at channel entrances.	**NOT MET**	Material structural distinction.
Claim-level result: Not met on the current baseline (1C NOT MET): the required channel-entering projections are absent from CP-1 Rev. 2. Reassess only if such projections are introduced.				

3. Relevant patent figures

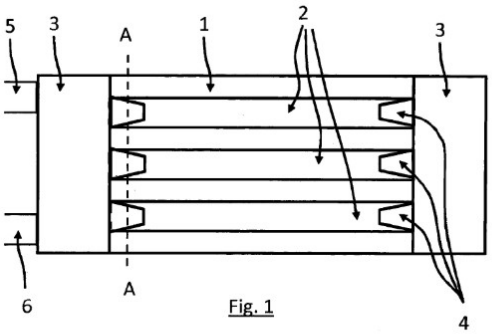


Fig. 1

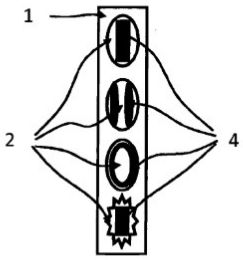


Fig. 2

Figure 5. Cooling body (1) with coolant channels (2), end caps (3), projections (4), inlet (5) and outlet (6) (Fig. 1), and section A–A showing the differently designed projections (4) in the channels (Fig. 2), as illustrated in EP2696433B1 (original Figures 1–2).

4. Technical assessment and FTO implications

Material structural distinction; lower preliminary technical correspondence.
Recommended action: Reassess only if channel-entering projections are introduced.

5.4 EP2113099B1 — Liebert Corporation

1. Patent overview

Item	Details
Patent	EP2113099B1
Proprietor	Liebert Corporation
Title	Cooling fluid flow regulation and distribution system and method
Filing date	19 February 2008 (PCT/US2008/054293); priority US 60/890,555 of 19 February 2007
Grant publication	2 January 2013
Relevant independent claims	Claims 1 and 7
Territorial legal status	FR/DE: reported in force; NL: reported lapsed
Claim basis	Claims of the granted EP B1 text, which apply in the validated states; national translations were not reviewed separately
Legal-status source	Espacenet (INPADOC legal-event data), extracted 25 October 2026

2. Claim analysis

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 1 (system)				
1A	System for regulating and distributing cooling fluid through a plurality of cold plates coupled to one or more electronic devices, comprising a flow regulator coupled to a system pressure source	CP-1 is externally pumped, but no system-level regulator is specified; CP-1 cools an EV battery module rather than a rack of electronic devices.	**OPEN**	Not established at system level; “electronic devices” is a construction point.
1B	Distribution header coupled to the regulator with multiple distribution lines	CP-1 has a common inlet manifold distributing among channels within one plate.	**NOT MET**	Different distribution architecture.
1C	Multiple cold plates coupled to respective distribution lines	The assessed CP-1 product is one plate with eight internal channels.	**NOT MET**	Material product-level distinction.
1D	Orifice structures downstream of the regulator/header and upstream of the cold plates, balancing flow among plates	Integral differently sized restrictions are upstream of individual channels, not of multiple plates.	**NOT MET**	Similar function; different location and destination.
Claim-level result: Not met for CP-1 as a single plate (1C NOT MET). Relevant at system level if the installation supplies several cold plates through a regulated header.				
Independent claim 7 (method)				
7A	Method: flowing fluid through at least one flow regulator, reducing pressure through a plurality of orifice structures to distribute fluid substantially uniformly among a plurality of cold plates, and flowing it through the cold plates	CP-1 balances flow among channels of one plate; an installation with multiple plates and a regulator is unspecified.	**OPEN**	Conditional system-level relevance.
Claim-level result: OPEN at system level: depends on whether regulated multi-plate distribution is used in the installation.				
Interpretation note				
[0031]	Specification: an orifice may be incorporated at an inlet of a cold plate	Integral manufacture alone is not a reliable distinction from this patent.	**NOTE**	Important interpretation constraint.
Claim-level result: Not a claim element; it limits the weight that can be placed on the integral construction of CP-1.				

3. Relevant patent figures

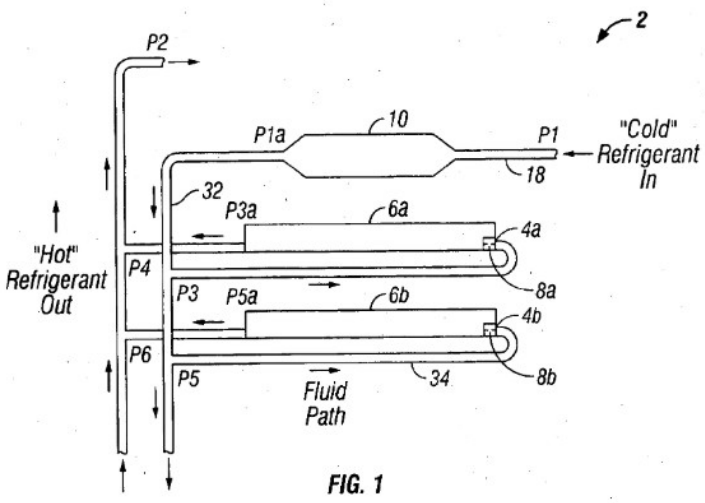


FIG. 1

Figure 6. Arrangement of EP2113099B1 (original Figure 1): flow regulator (10), distribution header (32) with distribution lines (34), cold plates (6a, 6b) and orifice structures (8a, 8b). The drawing is a refrigerant circuit; claim 1 recites a cooling fluid.

4. Technical assessment and FTO implications

Conditional system-level relevance: an integral orifice alone does not distinguish the patent; the plural-cold-plate architecture is the key difference.
Recommended action: Confirm whether the eventual cooling installation includes regulated distribution among multiple cold plates.

5.5 EP4405629B1 — Sogefi Air & Cooling

1. Patent overview

Item	Details
Patent	EP4405629B1
Proprietor	Sogefi Air & Cooling
Title	Device for dispensing heat-transfer fluid
Filing date	22 September 2022 (PCT/EP2022/076391); priority FR 2110058 of 24 September 2021
Grant publication	3 September 2025
Relevant independent claims	Claim 1; assembly claim 8 incorporating claims 1–6
Territorial legal status	FR/DE: reported in force; NL: reported lapsed
Claim basis	Claims of the granted EP B1 text, which apply in the validated states; national translations were not reviewed separately
Legal-status source	Espacenet (INPADOC legal-event data), extracted 25 October 2026
Family check	Separate family from FR3127560B1: the priorities are different French applications (FR 2110058 and FR 2110060) filed on the same day. The family of EP4405629B1 includes the French patent FR3127562B1, charted separately in 5.6 because its claim 1 is broader than EP claim 1.

2. Claim analysis

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 1 and assembly claim 8				
1A	Coolant conduit with a distribution orifice facing a cooling-plate circulation opening	CP-1 inlet/outlet pipe stubs are directly joined to the manifolds (F8), not arranged as a separate distributor conduit fixed against the plate surface.	**NOT MET***	Material connector-architecture distinction.
1B	Complementary bearing/support surface surrounding the conduit distribution opening	CP-1 has no external plate-face bearing/support surface surrounding a distributor conduit orifice.	**NOT MET***	Not identified in the defined product.
1C	Gasket along the support surface sealing the conduit-to-plate joint	CP-1 excludes a gasketed distributor-conduit-to-plate-face joint; its pipe stubs join directly to manifolds.	**NOT MET***	Material structural distinction.
1D	Fixing means in the form of a staple arranged to surround part of the duct, each of its two ends having a fixing interface that interacts with the plate surface	CP-1 excludes a staple-form fixing structure surrounding an external distributor conduit and fixed at two plate-surface interfaces.	**NOT MET***	Material structural distinction.
8A	Assembly including a distribution device according to claims 1–6 attached to a cooling plate	The CP-1 plate does not incorporate the distributor device and fastening features required by claims 1–6.	**NOT MET***	Claimed assembly arrangement not identified.
Note	Claim 1 does not require differently sized internal channel-entry apertures	CP-1 feature F4 does not itself establish correspondence with this fastening patent.	**NOTE**	Separate from FR3127560B1 (subject to the family check above).

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Claim-level result: Not met on the current baseline (F8 pipe stubs). The connector design is illustrative and not yet final; do not assume the absence of gasket and staple-type fixing features. Reassess when the final connector is defined.				

3. Relevant patent figures

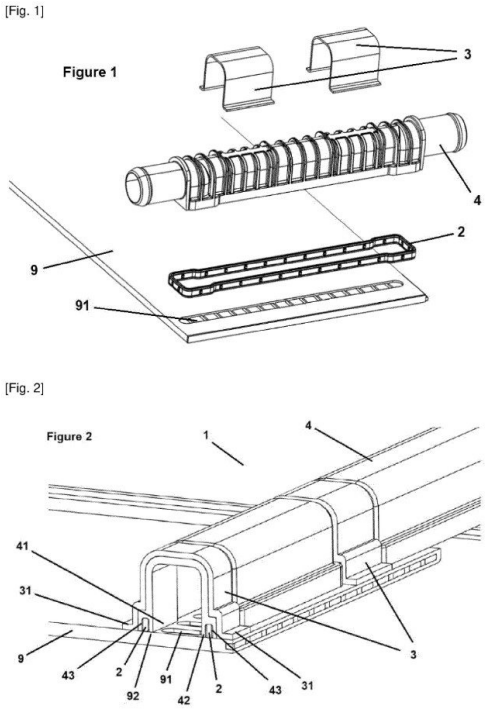


Figure 7. Exploded view (Fig. 1) and assembled view (Fig. 2): heat-transfer fluid duct (4), seal (2), staple-form fixing means (3) and cooling plate (9) with circulation orifice (91); in Fig. 2 also the dispensing-orifice region (41), bearing surface (42), seal recess (43) and fixing interfaces (31) on the plate surface (92), as illustrated in EP4405629B1 (original Figures 1–2).

4. Technical assessment and FTO implications

Lower technical correspondence on the defined plate; connector-level assessment remains conditional.
Recommended action: Confirm final inlet/outlet connector, gasket and staple-type fixing details. Do not assume their absence solely from the plate specification.

5.6 FR3127562B1 — Sogefi Air & Cooling

1. Patent overview

Item	Details
Patent	FR3127562B1
Proprietor	Sogefi Air & Cooling
Title	Dispositif de distribution de liquide caloporteur
Filing date	24 September 2021 (priority FR 2110058 of the same date)
Grant publication	19 January 2024
Relevant independent claims	Claim 1; assembly claim 9 incorporating claims 1–7
Territorial legal status	France: reported in force; renewal fee paid 22 September 2026
Claim basis	Claims of the granted FR text, in French; the chart paraphrases them in English
Legal-status source	Espacenet (INPADOC legal-event data), extracted 25 October 2026
Family check	Same family as EP4405629B1 (priority FR 2110058). Claim 1 here is broader than EP claim 1: the staple-form fixing means appears only in dependent claim 6.

2. Claim analysis

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 1 and assembly claim 9				
1A	Distribution device for coolant at plate circulation orifices, with a coolant duct having a dispensing orifice positioned facing a circulation orifice	CP-1 inlet/outlet pipe stubs are directly joined to the manifolds (F8), not arranged as a separate distributor conduit placed against the plate surface.	**NOT MET***	Material connector-architecture distinction.
1B	Bearing surface of complementary shape to the plate-surface portion bearing the circulation orifice, surrounding at least part of the dispensing orifice	CP-1 has no external plate-face bearing/support surface surrounding a distributor conduit orifice.	**NOT MET***	Not identified in the defined product.
1C	Seal positioned along at least part of the bearing surface, sealing the join of the dispensing orifice with a cooling plate	CP-1 excludes a gasketed distributor-conduit-to-plate-face joint; its pipe stubs join directly to manifolds.	**NOT MET***	Material structural distinction.
1D	Fixing means for fixing the duct to the surface of a cooling plate (any form; the staple form is claimed only in claim 6)	CP-1 has no separate duct fixed to the plate surface; its pipe stubs join directly to the manifolds.	**NOT MET***	Broader than EP4405629B1 claim 1, but the element is not identified in the defined product.
9A	Assembly comprising at least one distribution device according to claims 1–7 fixed to at least one cooling plate	The CP-1 plate does not incorporate such a distribution device.	**NOT MET***	Claimed assembly arrangement not identified.
Note	Claim 1 does not require the staple-form fixing (claim 6) or differently sized channel-entry apertures	CP-1 feature F4 does not itself establish correspondence with this sealing and fastening patent.	**NOTE**	Broader than the EP counterpart; the assessment rests on 1A–1D.
Claim-level result: Not met on the current baseline (1A–1D NOT MET*; F8 pipe stubs). Claim 1 is broader than the EP counterpart, so reassess on the final connector design, in particular any gasketed external distributor duct, even without a staple-type fixing.				

3. Relevant patent figures

FR3127562B1 is the French member of the EP4405629B1 family. Its drawings correspond to Figure 7 in Section 5.5; no separate figures are reproduced.

4. Technical assessment and FTO implications

Lower technical correspondence on the defined plate. Claim 1 is broader than EP4405629B1 claim 1, so the assessment depends on the final connector design.
Recommended action: Confirm whether any external inlet/outlet duct is sealed with a gasket against the plate face, whatever the fixing form. Do not assume its absence solely from the plate specification.

5.7 EP4481892B1 — Hithium Tech HK Limited

1. Patent overview

Item	Details
Patent	EP4481892B1
Proprietor	Hithium Tech HK Limited
Title	Liquid cooling plate and battery module
Filing date	13 June 2024; priority CN 202310736886 of 21 June 2023
Grant publication	18 March 2026
Relevant independent claims	Claim 1; battery-module claim 10 incorporating claims 1–9
Territorial legal status	FR/DE: reported in force; NL: reported lapsed
Claim basis	Claims of the granted EP B1 text, which apply in the validated states; national translations were not reviewed separately
Legal-status source	Espacenet (INPADOC legal-event data), extracted 25 October 2026

2. Claim analysis

Ref	Claimed element	CP-1 product mapping	Status	Searcher's comment
Independent claim 1 and battery-module claim 10				
1A	First and second perpendicular cooling portions, the first at the middle of the second	CP-1 is a flat plate with parallel channels; no T-shaped perpendicular cooling portions.	**NOT MET**	Material structural distinction.
1B	One-piece first plate body with four consecutive parts: the first and fourth parts form a cover body portion, and the second and third parts carry opposed flow sub-channels forming the first flow channel	CP-1 comprises two formed aluminium sheets joined into one flat plate.	**NOT MET**	Material structural distinction.
1C	One-piece second plate body fixed to the cover body portion, defining a second flow channel in communication with the first	CP-1 does not include the claimed two-part perpendicular cooling arrangement.	**NOT MET**	Material structural distinction.
1D	In each flow channel, two parallel straight segments joined at one end by a detour segment, with the other ends open to ports (first port as liquid inlet)	CP-1 uses eight parallel channels between common manifolds and excludes terminal return chambers.	**NOT MET**	Material structural distinction.
1E	Second port of the first flow channel connected to a same-side port of the second flow channel through an external pipe; the other port is the liquid outlet	No separate perpendicular portions or connecting pipe in CP-1 Rev. 2.	**NOT MET**	Material structural distinction.
10	Battery module with at least two cells and a cooling plate according to claims 1–9	Battery-module use is relevant, but the incorporated cooling-plate limitations remain different.	**NOT MET**	Application overlap; architecture differs.
Claim-level result: Not met on the current baseline (1A–1E NOT MET). Reassess if the plate architecture is redesigned with perpendicular portions or interconnected U-turn flow paths.				

3. Relevant patent figures

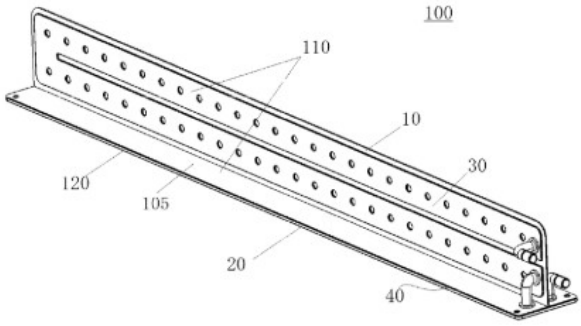


FIG. 1

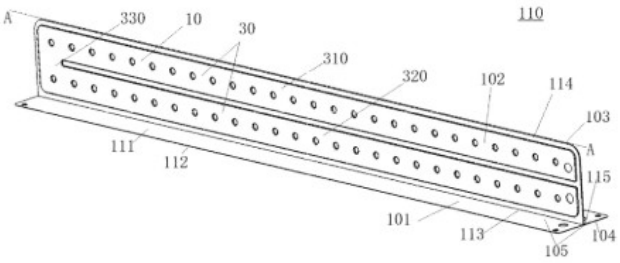


FIG. 2

Figure 8. Liquid cooling plate (100) with first (10) and second (20) liquid cooling portions, first plate body (110), second plate body (120) and cover body portion (105) (Fig. 1); first plate body (110) with parts 101–104 and flow channel (30) comprising straight segments (310, 320) and a detour segment (330) (Fig. 2), as illustrated in EP4481892B1 (original Figures 1–2).

4. Technical assessment and FTO implications

Material structural differences across multiple required claim features; lower preliminary technical correspondence.
Recommended action: Reassess if the plate architecture is redesigned with perpendicular portions or interconnected U-turn flow paths.

5.8 Territorial status matrix — selected rights

The status entries below reflect jurisdiction-specific findings provided for the seven selected rights as of 25 October 2026. “Family not established” means that no DE or NL family member was identified; it is distinct from “no patent-family protection exists”. The four EP Netherlands entries are reported lapsed; this is not a clearance conclusion for the Netherlands.

Selected patent right	France (FR)	Germany (DE)	Netherlands (NL)	Nominal expiry*
FR3127560B1	In force; renewal 22 Sep 2026	FR national right; DE family not established	FR national right; NL family not established	24 Sep 2041
FR3068774B1	In force	FR national right; DE family not established	FR national right; NL family not established	6 Jul 2037
EP2696433B1	In force	In force	Lapsed (event 30 Sep 2015)	8 Aug 2032
EP2113099B1	In force	In force	Lapsed (event 30 Aug 2013)	19 Feb 2028
EP4405629B1	In force	In force	Lapsed (event 16 Feb 2026)	22 Sep 2042
FR3127562B1	In force; renewal 22 Sep 2026	FR national right; DE covered by EP4405629B1	FR national right; NL covered by EP4405629B1 (lapsed)	24 Sep 2041
EP4481892B1	In force	In force	Lapsed (event 18 Aug 2026)	13 Jun 2044

Family coverage note: Espacenet family data show that FR3127560B1 (one application, two publications) has no EP, DE or NL family member, and that FR3068774B1 has family members

only in WO and CN, so no DE/NL right is asserted for either French patent. EP2696433B1 is a single-application family. EP2113099B1, EP4405629B1 and EP4481892B1 have wider families (including US and CN members), which are outside the assessed territories and have not been reviewed. EP4405629B1 has a French family member, FR3127562B1, which is charted in Section 5.6.

** Nominal expiry = filing date + 20 years, before any extension, early lapse or fee default. Legal status is taken from Espacenet INPADOC legal events (not an official register); lapse dates are the dates of the recorded events. Opposition, limitation and revocation proceedings were not checked. Before any reliance, status should be confirmed in the EP Register and the national registers.*

06 / Additional retained publications

The following publications were retained as secondary references. The four additional granted European patents previously identified in screening are addressed in Section 5, alongside the three French patents.

US4578324A provides background on passive distribution through differently sized manifold openings; no enforceable DE/FR/NL right has been established on the basis of this US publication alone. WO2025252210A1 is a pending international application designating the EP, retained as a watch item because a later European patent could take effect in the target territories.

Publication / Proprietor	Why Retained	Key Structural Distinction	Current Treatment
US4578324A	Historical technical reference concerning fluid distribution through manifold openings of differing dimensions.	Relevant to the general principle of passive flow distribution, but its technical context and claim requirements have not been mapped to CP-1 in detail.	Peripheral — technical background. No DE/FR/NL enforceable right established from this US publication.
WO2025252210A1	Targeted seed lookup (S12). Espacenet records a notification (28 January 2026) that the EP was designated; the other family members identified are Chinese.	Not claim-charted; correspondence with CP-1 has not been assessed in detail.	Watch item. No granted DE/FR/NL right established; European regional-phase entry not verified. Monitor for any EP grant and validation.

07 / Conclusions and recommended next actions

7.1 Overall FTO Assessment

The illustrative FTO assessment compared seven selected granted patent documents with FlowBalance CP-1 Rev. 2. Their reported territorial effects were considered separately from technical claim correspondence. The most relevant feature is the integral, differently sized restriction at each channel entrance.

FR3127560B1 (Sogefi Air & Cooling) remains the principal claim-scope attention item because its differently dimensioned distribution openings resemble CP-1's flow-balancing concept. CP-1's integral channel-entry restrictions provide a material structural distinction from an intervening distribution structure, although claim interpretation remains relevant.

FR3068774B1 (Valeo) has lower technical correspondence because CP-1 excludes the claimed terminal return-chamber restrictions. EP2696433B1 (Magna) similarly differs through the absence of channel-entering end-cap projections.

EP2113099B1 (Liebert) remains conditionally relevant to any eventual multi-plate coolant distribution system. EP4405629B1 and its French family member FR3127562B1 (Sogefi) concern an external conduit sealing and fastening assembly; because claim 1 of FR3127562B1 is broader, the final connector design is the deciding factor for both. EP4481892B1 (Hithium) differs materially in its perpendicular, bent-body and detour-flow architecture.

Overall preliminary technical assessment: One priority claim-scope issue (FR3127560B1), one conditional system-level issue (EP2113099B1), and five patents with identified material structural distinctions on the current baseline. These categories indicate assessment attention, not legal infringement probabilities.

The selected claim comparisons identify design-specific technical distinctions. These findings do not establish comprehensive clearance: search-set deduplication, potentially relevant unreviewed families and actual system/connector implementation are outside the completed seven-right analysis.

This illustrative study does not constitute comprehensive FTO clearance, a legal opinion or an infringement/non-infringement determination for Germany, France or the Netherlands.

7.2 Design Verification Priorities

Priority	Design Question	Relevant Patent	Required Action
High	Does the final connector introduce a distribution structure covering a plate opening?	FR3127560B1	Preserve documented integral channel-entry restriction design; confirm connector geometry.
Medium	Will the installed cooling system distribute regulated flow among multiple cold plates?	EP2113099B1	Review system-level header, regulator and orifice arrangements.
Medium	Will external conduits be sealed with a gasket against the plate face, with or without a staple-type fixing?	EP4405629B1	Check final inlet/outlet connection drawings.
Conditional	Will any U-turn chambers, channel-entering projections or perpendicular plate sections be added?	FR3068774B1; EP2696433B1; EP4481892B1	Reassess relevant claims if the defined architecture changes.

7.3 Territorial Status and Targeted Follow-up

The technical claim assessment is separate from the reported territorial status of the selected rights. Based on the legal-status findings recorded in Section 5.8, the three French patents are in

force in France; all four selected EP patents are in force in France and Germany and lapsed in the Netherlands. FR3127560B1 and FR3127562B1 have reported renewal payments on 22 September 2026. The legal-status source and extract date for each right are listed in Appendix A.

The seven selected patent rights have already been screened for their reported FR/DE/NL status. For an actual market launch, the remaining actions concern developments after the assessment date, unreviewed family rights and final product implementation—not repetition of the completed seven-right status screening.

- France: Monitor material post-cut-off changes affecting the seven rights reported in force, and investigate other potentially relevant family rights identified by any extended search.
- Germany and the Netherlands: Retain the recorded FR/DE in-force and NL lapsed findings for the four EP rights; check any later reinstatement or new family right before a real launch decision.
- Watch item WO2025252210A1: Verify in the EP Register whether the application has entered the European regional phase, and monitor for any grant and validation in DE, FR or NL. Perform a claim comparison only if it proceeds.
- European patent rights: Where a commercial decision depends on claim wording or territorial effect, obtain the applicable national claim text and event history for the relevant right.
- Final product configuration: Confirm external connector details and system-level use, while retaining the defined CP-1 Rev. 2 internal architecture.

The completed status screening supports this illustrative technical assessment. The broader search and legal scope remain limited to the expressly selected rights and the defined CP-1 design.

7.4 Final reporting note

This report is an illustrative Patent Intelligence deliverable prepared to demonstrate a structured approach to patent searching, technical screening and claim-based FTO assessment.

The analysis is based on the defined FlowBalance CP-1 configuration and selected patent publications. It is not an exhaustive patent search, a legal opinion or a determination of freedom to operate.

Any commercial FTO assessment would require confirmation of the final product design, comprehensive jurisdiction-specific searching, patent-family and legal-status verification, and assessment of all materially relevant claims.

Appendix A / Document and data references

The following references make the technical evidence traceable without reproducing national-register screenshots or fee-event histories. Publication links identify patent documents; they are not independent proof of current national legal status.

Patent publication	Reviewed evidence	Publication reference	Legal-status source
FR3127560B1	FR grant, claims 1 and 6; specification [0014]	https://patents.google.com/patent/FR3127560B1/en	Espacenet (INPADOC), extracted 25 Oct 2026
FR3068774B1	FR grant, claim 1 and return-chamber drawings	https://patents.google.com/patent/FR3068774B1/en	Espacenet (INPADOC), extracted 25 Oct 2026
EP2696433B1	EP grant, claim 1	https://patents.google.com/patent/EP2696433B1/en	Espacenet (INPADOC), extracted 25 Oct 2026
EP2113099B1	EP grant, claims 1 and 7; description [0031]	https://patents.google.com/patent/EP2113099B1/en	Espacenet (INPADOC), extracted 25 Oct 2026
EP4405629B1	EP grant, claims 1 and 8	https://patents.google.com/patent/EP4405629B1/en	Espacenet (INPADOC), extracted 25 Oct 2026
FR3127562B1	FR grant, claims 1 and 9 (French-language text)	https://patents.google.com/patent/FR3127562B1/en	Espacenet (INPADOC), extracted 25 Oct 2026
EP4481892B1	EP grant, claims 1 and 10	https://patents.google.com/patent/EP4481892B1/en	Espacenet (INPADOC), extracted 25 Oct 2026

Search dataset: CP-1 search log (S1–S12), search cut-off 25 October 2026; result counts and DWPI-family counts as reported by the search platform, with exports from S1, S3, S5 and S6. Legal status: Espacenet (INPADOC) events extracted 25 October 2026 for the seven rights (FR, DE, NL); FR3127560B1 and FR3127562B1 renewal payments dated 22 September 2026. This report does not reproduce the underlying legal-status extracts.

Appendix B / Evidence and source-status key

The following key explains the evidentiary basis and verification status of the information presented in this illustrative FTO report.

Evidence / Source Category	Description	Treatment in This Report
Product specification (illustrative)	Hypothetical FlowBalance CP-1 configuration, including features F1–F8.	Used as the technical baseline for claim comparison. Not supported by actual engineering drawings or manufacturing documentation.
Patent publication (document-based)	Published patent specifications, granted claims and drawings examined for the selected references.	Used to identify claimed technical features and assess their apparent correspondence with CP-1.
Technical interpretation	Analytical comparison between patent claim limitations and the defined CP-1 features.	Represents the report's technical assessment, not a verified infringement or non-infringement determination.
Design information outstanding	External connector and fastening details, multi-plate system integration, and final engineering drawings	Identified as matters requiring engineering confirmation before final claim correspondence can be assessed.
Reported territorial legal status	Jurisdiction-specific findings for the seven selected rights in France, Germany and the Netherlands, supplied for this assessment.	Included as completed territorial screening for these seven rights. Source extracts are held outside this public sample; no claim is made regarding all family rights or later legal events.

Interpretation note: A patent publication's inclusion in this report does not, by itself, establish the existence of an enforceable right in any target jurisdiction. Similarly, the absence of identified claim correspondence on the illustrative product baseline does not constitute a finding of freedom to operate.