



SmartBimPei Suite — Technical Documentation & User Manual

Advanced Revit® Add-in Suite for Pre-Synthesis & Data Compliance Control



Introduction & Core Value Proposition

Who is this tool for?

This plugin was designed by and for **BIM Managers**, **BIM Coordinators**, **Modelers** (HVAC, Plumbing, Electrical, Architecture), and **Company Executives**.

What is its main mission?

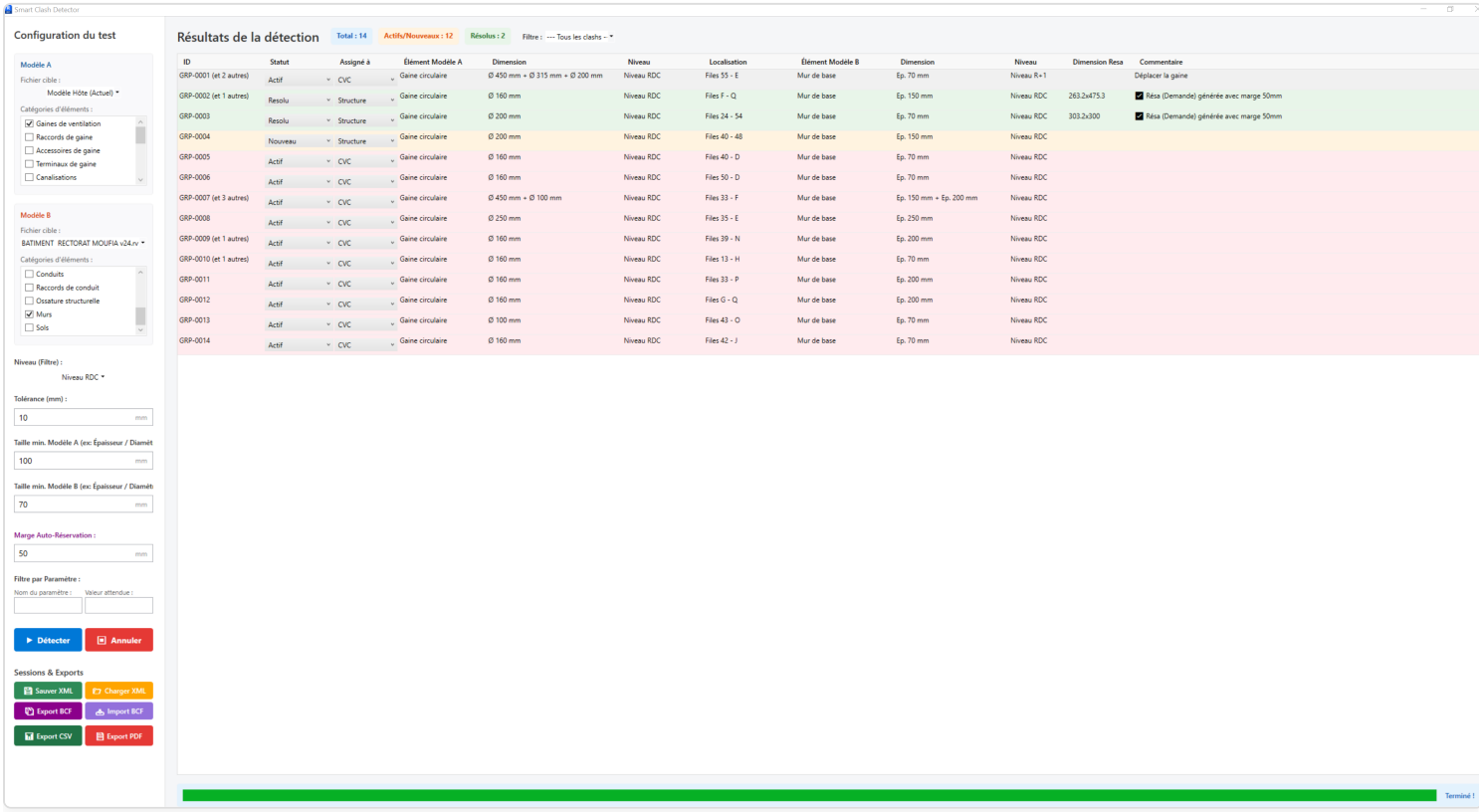
In the BIM world, clash detection and resolution (creating openings, communication) are time-consuming processes that are extremely costly for companies. SmartBimPei eliminates these bottlenecks through:

- **Intelligent Automation:** Forget creating openings manually one by one. This plugin handles complex network fusions and curved walls.
- **Standardized Communication:** By leveraging OpenBIM standards (BCF), it facilitates communication with external teams on platforms like BIMcollab or BIM Track.
- **Management Visibility:** A decision-making dashboard allows executives to evaluate the project's health at a single glance.



Module 1: Smart Clash Detector (Geometric Synthesis Engine)

This module is the heart of SmartBimPei. It doesn't just find clashes; it understands them to offer concrete solutions.



1.1 The Configuration Panel (Left side)

This panel allows you to configure your search with surgical precision.

- **Model A & Model B Selection:**
 - Usage:* Choose the models to cross-check.
 - Added Value:* Avoids analyzing the entire model unnecessarily.
- **Tolerance (mm):**
 - Usage:* Define the acceptable penetration distance.
 - Added Value:* Prevents "false positives".
- **"Min. Size" Filters:**
 - Usage:* Enter a minimum dimension below which the element is ignored.
 - Added Value:* Drastically reduces calculation time.
- **Auto-Reservation Margin:**
 - Usage:* Indicates the clearance added around the duct.
 - Added Value:* Anticipates insulation and fire stopping.

1.2 The Synthesis Table (Center)

- **Smart Grouping:**
 - What it does:* Groups close clashes into a single ID.

💡 *Added Value:* Reduces visual fatigue for the coordinator.

- **The "Resa Dimension" Column:**

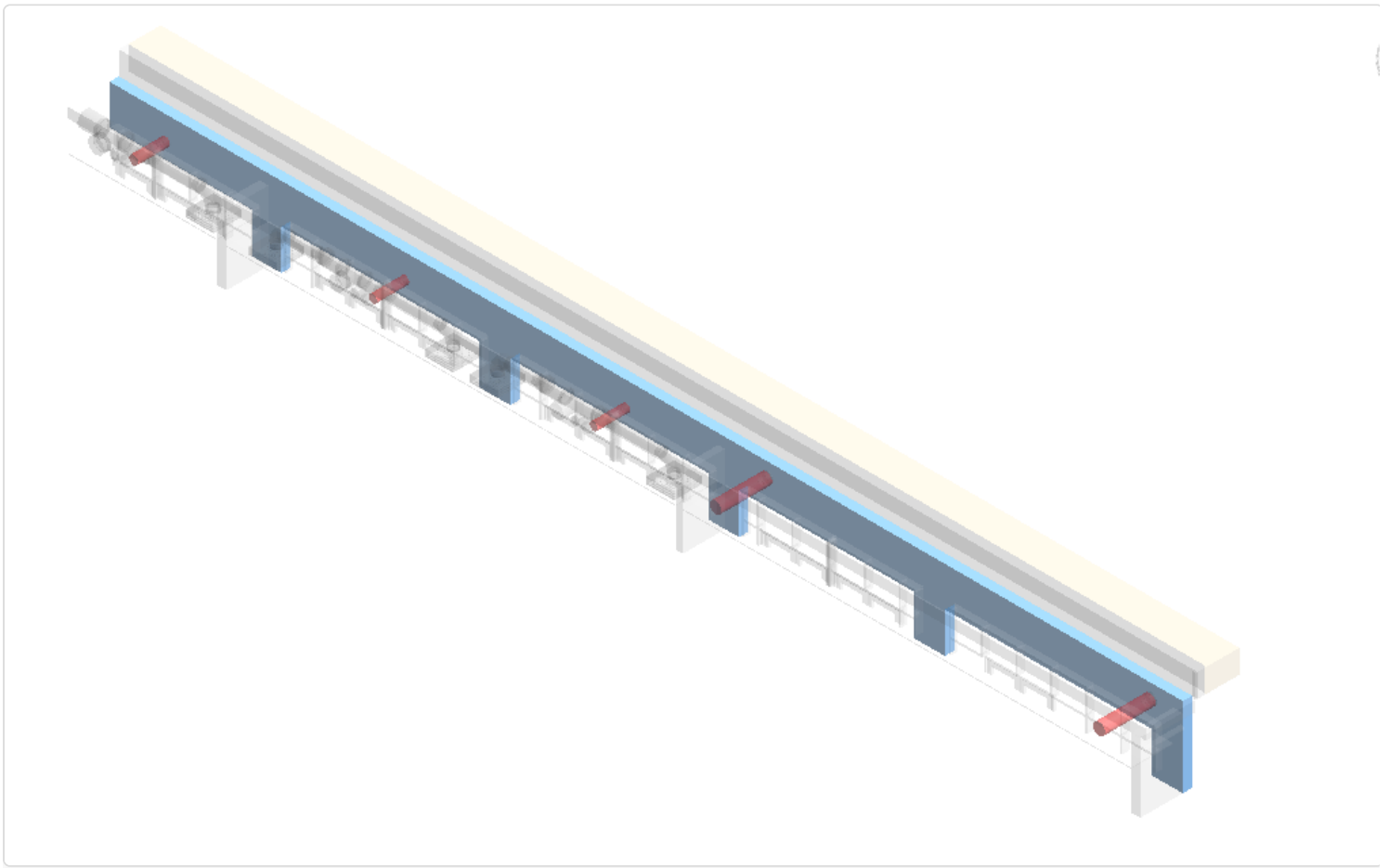
- ⚙️ *What it does:* Live display of the final hole dimensions.

- 💡 *Added Value:* Architectural impact visible instantly.

1.3 Resolution Actions (Bottom)

👁️ "Isolate Clash" Button:

- ⚙️ *Usage:* Opens a centered 3D view.
- 💡 *Added Value:* Bright colors and neutral gray background for 1-second problem understanding.



👁️ "Generate Auto-Reservation(s)" Button:

- ⚙️ *Usage:* Places parametric "void" families with a single click.
- 💡 *Added Value:* Manages Sliver Tolerance. What took 10 minutes now takes 1 millisecond.

Smart Clash Detector

mm

Taille min. Modèle A (ex: Epaisseur / Diam)

100

mm

Taille min. Modèle B (ex: Epaisseur / Diam)

0

mm

Marge Auto-Réserve :

50

mm

Filtre par Paramètre :

Résultats de la détection

Total : 69

Actifs/Nouveaux : 69

Résolus : 0

Filtre : -- Tous les clashs --

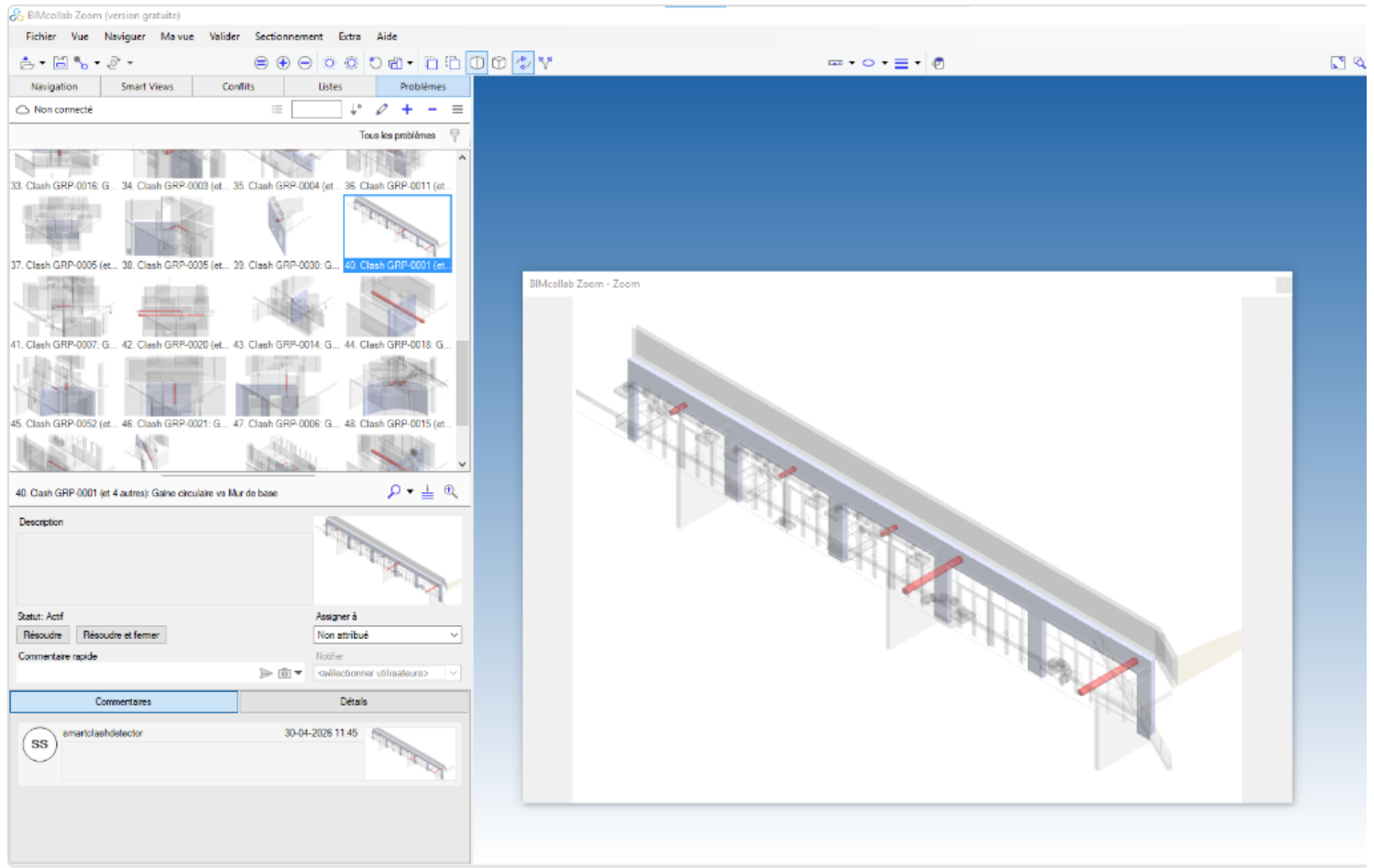
ID	Statut	Assigné à	Élément Modèle A	Dimension	Niveau	Localisation	Élément Modèle B	Dimension	Niveau	Dimension Resa	Commentaire
GRP-0001 (et 4 autres)	Actif	Structure	Gaine circulaire	Ø 260 mm + Ø 200 mm + Ø 180 mm	Niveau RDJ	Files 25 - B + Files 23 - B + Files 54 - B + Files 55 - B + Files 56 - B	Mur de base	Ep. 200 mm	Plan Niveau RDJ	363,2x363,2 + 303,2x303,2 + 283,2x283,2 + 1593,5x1420,1	Demande de réservation envoyée (marge 50mm)
GRP-0002	Nouveau		Gaine circulaire	Ø 200 mm	Niveau RDJ	Files 21 - 53	Mur de base	Ep. 150 mm	Plan Niveau RDJ		
GRP-0003 (et 1 autres)	Nouveau		Gaine circulaire	Ø 400 mm + Ø 315 mm	Niveau RDJ	Files 55 - E	Mur de base	Ep. 100 mm	Plan Niveau RDJ		
GRP-0004 (et 1 autres)	Nouveau		Gaine circulaire	Ø 230 mm	Niveau RDJ	Files 22 - C	Mur de base	Ep. 375 mm	Plan Niveau RDJ		
GRP-0005	Nouveau		Gaine circulaire	Ø 125 mm	Niveau RDJ	Files 23 - E	Mur de base	Ep. 200 mm	Plan Niveau RDJ		

Terminé !

1.4 Exports & Reports (Communication)

BCF Export (BIM Collaboration Format):

- *Usage:* Generates a standard .bcfzip file.
- *Added Value:* Imports into BIMcollab or Navisworks. No more endless email threads.



PDF & CSV Export:

-  *Usage*: Exports a visual report or Excel sheet.
-  *Added Value*: Perfect for coordination meetings.

Rapport de Synthèse - SmartClash

Date : 30/04/2026 11:49

Résumé :

Total Clashes : 55

Actifs/Nouveaux : 55

Résolus : 0

GRP-0001 (et 4 autres) Statut : Nouveau

Assigné à : Non assigné

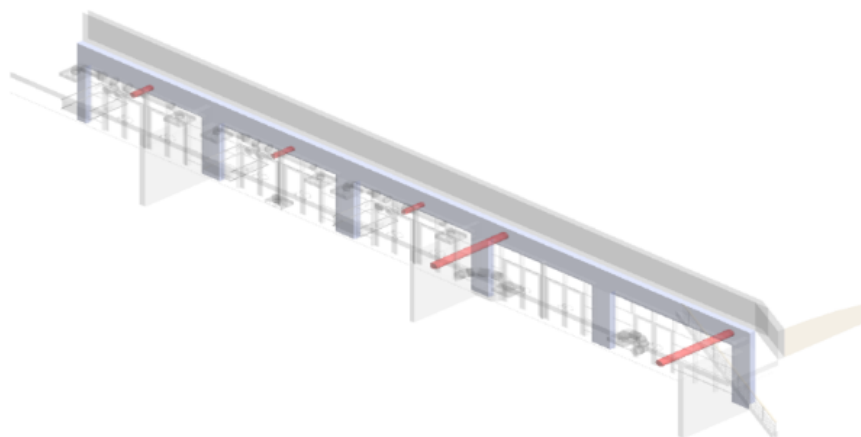
Niveau : Niveau RDJ

Localisation : Aucune grille

A: Gaine circulaire

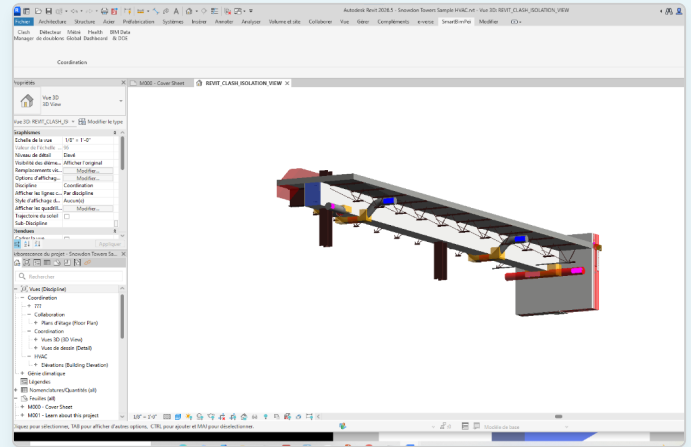
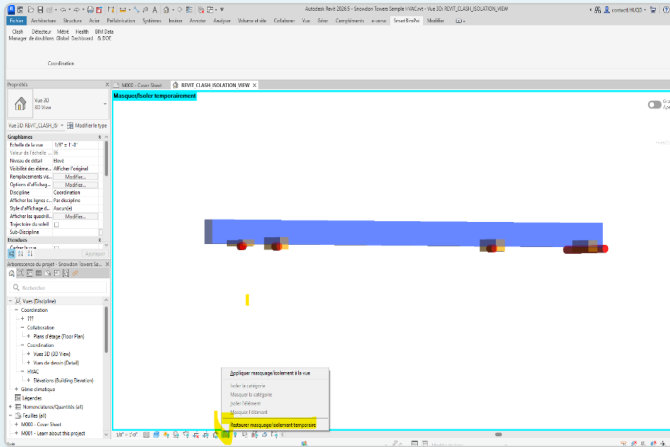
B: Mur de base

Commentaire : Aucun commentaire



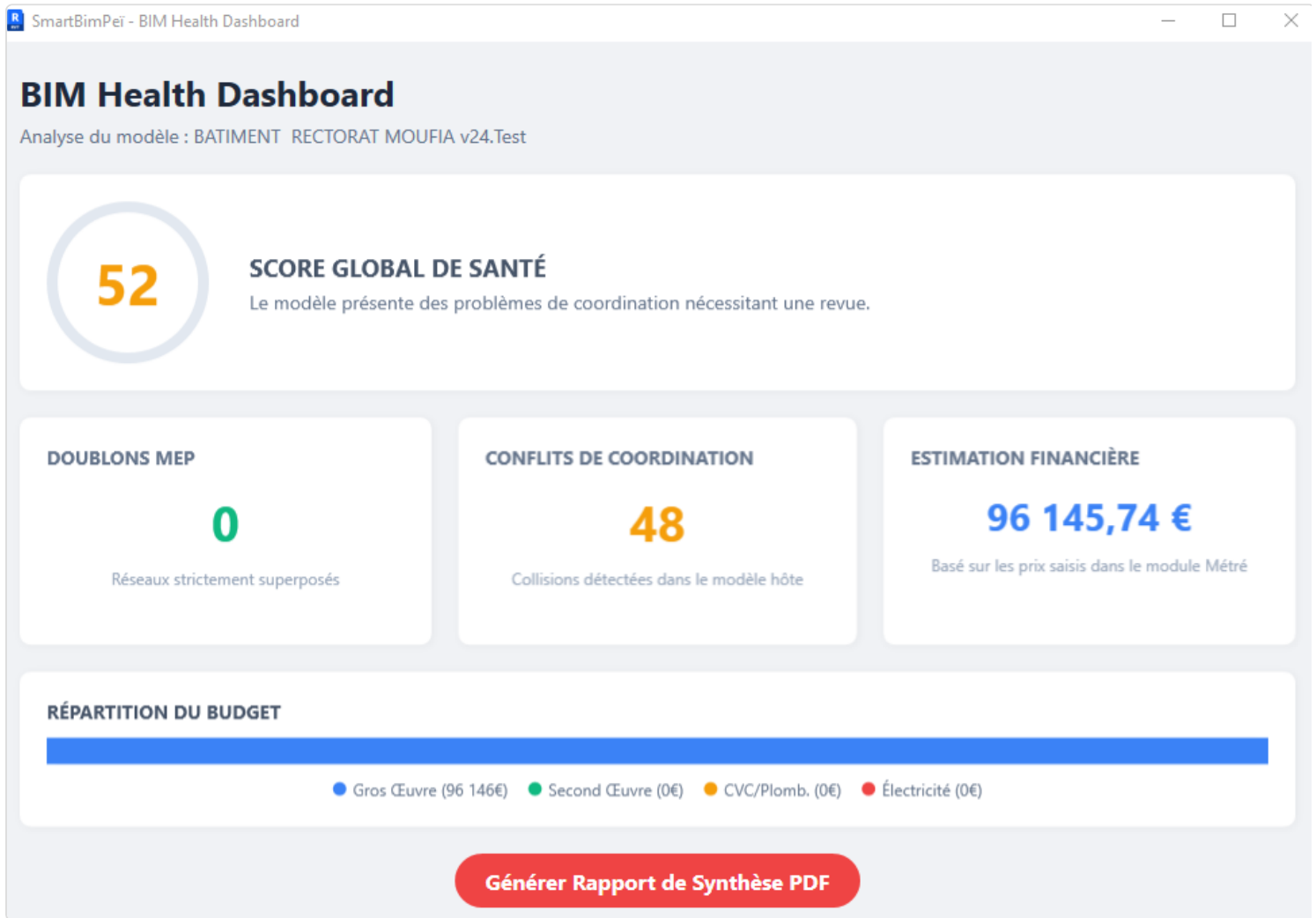
💡 PRO TIP : Visualize the building context

When SmartBimPei generates an isolation view (*REVIT_CLASH_ISOLATION_VIEW*), only the elements involved are visible. To understand exactly where you are in the building model, click on the **"Glasses"** icon at the bottom of the screen and select **"Restore Temporary Hide/Isolate"**. The rest of the building will instantly reappear around your clash!





Module 2: BIM Health Dashboard (Management Dashboard)



The executive overview: The Dashboard is the control tower of your project.

- **Usage:** Analyze key indicators (clashes, duplicates, costs).
- **Added Value:** Ultimate tool for showcasing accomplished work.

Module 3: Duplicate Detector (Model Cleaner)

Détecteur de doublons

Configuration

Catégories à scanner

☐ Matériaux

☐ Mémoires de murs-tiroirs

☐ Meubles de rangement

☐ Mobilier

☐ Modules de coordination

☐ Modules génériques

☒ Murs

☐ Images de points

☐ Ossature

☐ Couvertures de cages

Détection des doublons

Supprimer les copies

Résultats de la détection

Total : 7

Actifs/Nouveaux : 7

Résolus : 0

ID	Statut	Élément 1	Maquette 1	Élément 2	Maquette 2	Localisation	Niveau	Dimension	Commentaire
DOUBLON-0001		Mur de base	Snowdon Towers Sample Architectural	Mur de base	Snowdon Towers Sample Architectural	Fils B.1 - Y Axis	R1	Ep. 102 mm	
DOUBLON-0002		Mur de base	Snowdon Towers Sample Architectural	Mur de base	Snowdon Towers Sample Architectural	Fils B.1 - Y Axis	R1	Ep. 102 mm	
DOUBLON-0003		Mur de base	Snowdon Towers Sample Architectural	Mur de base	Snowdon Towers Sample Architectural	Fils X Axis - Y Axis	Block 39 - Parapet	Ep. 102 mm	
DOUBLON-0004		Mur de base	Snowdon Towers Sample Architectural	Mur de base	Snowdon Towers Sample Architectural	Fils X Axis - Y Axis	Block 39 - Parapet	Ep. 102 mm	
DOUBLON-0005		Mur de base	Snowdon Towers Sample Architectural	Mur de base	Snowdon Towers Sample Architectural	Fils X Axis - Y Axis	Block 39 - Parapet	Ep. 102 mm	
DOUBLON-0006		Mur de base	Snowdon Towers Sample Architectural	Mur de base	Snowdon Towers Sample Architectural	Fils C - Y Axis	Block 39 - Parapet	Ep. 102 mm	
DOUBLON-0007		Mur de base	Snowdon Towers Sample Architectural	Mur de base	Snowdon Towers Sample Architectural	Fils C - Y Axis	R2	Ep. 102 mm	

Recherche terminée dans Snowdon Towers Sample Site.rvt : 22 : emplacement <Non partagé> (10/10)

-  *Usage:* Finds MEP elements stacked in the exact same location.
-  *Added Value:* Prevents major financial errors in quantities.



Module 4: BIM Data Audit & Compliance (Quality Control & Handover)

 BIM Data & DOE - Audit Qualité

Paramètres d'Audit

Sélectionner le Corps d'état :

Électricité (CFO/CFA & Chemins) ▾

 Lancer l'audit des données

L'audit scanne les éléments du modèle pour vérifier la présence des paramètres requis selon le corps d'état sélectionné.

Rapport de non-conformité

Total Erreurs : 364

ID	Catégorie	Nom de l'élément	Problème détecté
952732	Luminaires	C1	Paramètre 'Panneau/Tableau' non renseigné.
952762	Luminaires	C1	Paramètre 'Panneau/Tableau' non renseigné.
952791	Luminaires	C1	Paramètre 'Panneau/Tableau' non renseigné.
952901	Luminaires	C1	Paramètre 'Panneau/Tableau' non renseigné.
953192	Luminaires	C1	Paramètre 'Panneau/Tableau' non renseigné.
953253	Luminaires	A1	Paramètre 'Panneau/Tableau' non renseigné.
953286	Luminaires	A1	Paramètre 'Panneau/Tableau' non renseigné.
954181	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
954217	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
954248	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
954275	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
956674	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
956697	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
956733	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
956734	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.
956759	Luminaires	A6	Paramètre 'Panneau/Tableau' non renseigné.

-  *Usage:* Scans parameters to verify the digital Handover documentation.
-  *Added Value:* Translates missing data into real impacts on building maintenance.



Module 5: Express Takeoff (Quantities & Pricing)

SmartBimPei - Mètre Global Structure & MEP

Extraction des Quantités - Maquette Globale (Bêta)

Niveau : Tous

Catégorie : Gaine

Niveau	Catégorie	Famille /	Quantité	Surf. (m²) / Long. (m)	Vol. (m³) / Dim.	Prix Unitaire (€)	Total (€)
Niveau R+1	Gaine	Accessoire de canalisation	2	2,65	ø500	0	0.00
Niveau R+1	Gaine	Accessoire de gaine	3	3,47	ø355	10	34.73
Niveau R+1	Gaine	Bouche d'aération	6	19,60	ø200	0	0.00
Niveau R+1	Gaine	Canalisation	19	25,06	ø160	10	250.59
Niveau R+1	Gaine	Equipement de génie climatique	11	22,75	ø315	0	0.00
Niveau R+1	Gaine	Gaine	22	5,28	ø100	0	0.00
Niveau R+1	Gaine	Murs	8	22,41	ø250	10	224.13
Niveau R+1	Gaine	Raccords de canalisation	72	6,14	ø80	10	61.38
Niveau R+1	Gaine	Raccords de gaine	4	2,54	ø125	10	25.36
Niveau R+2	Gaine	Gaine circulaire - France Air_Conduits spir	48	3,74	ø80	10	37.39
Niveau R+2	Gaine	Gaine circulaire - France Air_Conduits spir	6	3,41	ø350	0	0.00
Niveau R+2	Gaine	Gaine circulaire - France Air_Conduits spir	3	6,58	ø160	10	65.80
Niveau R+2	Gaine	Gaine circulaire - France Air_Conduits spir	2	2,61	ø250	10	26.08
Niveau R+2	Gaine	Gaine circulaire - France Air_Conduits spir	6	6,89	ø355	10	68.91
Niveau R+2	Gaine	Gaine circulaire - France Air_Conduits spir	2	2,81	ø330	0	0.00
Niveau R+2	Gaine	Gaine circulaire - France Air_Conduits spir	4	4,03	ø315	0	0.00
Niveau RDC	Gaine	Gaine circulaire - France Air_Conduits spir	4	3,40	ø450	0	0.00
Niveau RDC	Gaine	Gaine circulaire - France Air_Conduits spir	12	29,50	ø315	0	0.00
Niveau RDC	Gaine	Gaine circulaire - France Air_Conduits spir	13	50,49	ø200	0	0.00
Niveau RDC	Gaine	Gaine circulaire - France Air_Conduits spir	3	1,30	ø350	0	0.00
Niveau RDC	Gaine	Gaine circulaire - France Air_Conduits spir	5	1,90	ø260	0	0.00
Niveau RDC	Gaine	Gaine circulaire - France Air_Conduits spir	3	1,16	ø380	0	0.00
Niveau RDC	Gaine	Gaine circulaire - France Air_Conduits spir	4	1,13	ø290	0	0.00

MONTANT TOTAL ESTIMÉ : 3 681,42 €

Scan terminé (8555 éléments reg

Isoler

Rétablir

Actualiser

Importer (.sbp)

Exporter (.sbp)

Exporter Devis (.xlsx)

- ⚙ *Usage:* Extracts quantities and cross-references with your pricing library.
- 💎 *Added Value:* Colossal time saver for estimators.

*This manual is designed to support the upskilling of teams. **SmartBimPei** is not just a tool; it is a major competitive advantage for your BIM workflows.*

Part 2 : Detailed Interface Guide

This document details the use of the different modules in the SmartBimPei suite.

1. Clash Detection (Clash Detector)

This module is the core of SmartBimPei. It allows you to analyze two models (or a model against itself) to detect physical intersections (clashes) between elements.

1.1 Analysis Configuration

Element	Description and Operation
Model A / Model B	Select the target file (Host Model or Linked Model) for each model. The detection will be run between these two models.
Element Categories	Check the Revit categories to analyze for each model (e.g., Walls, Floors, Ducts, Pipes).
Level (Filter)	Allows restricting the analysis to one or more specific levels of the building to target results.
Sliver Tolerance (mm)	Overlap margin tolerated. If two objects touch over a depth less than this tolerance, the clash is ignored.
Min. Size (Model A & B)	Excludes elements that are too small from the analysis (e.g., ignore pipes with a diameter less than 90mm).
Auto-Provision Margin	Adds a safety margin (in mm) around the clash when creating a provision for void box.
Parameter Filter	Allows precisely targeting certain elements (Exact Parameter Name and Expected Value).
Network Orientation Filter	(Optional) Target only Horizontal or Vertical networks in the detection.
Button: Detect	Starts the detection scan. The results will be displayed in the grid on the right.

1.2 Exports and Render Mode

Element	Description and Operation
Save XML / Load XML	Allows saving the current state of your detection (with resolved/active clashes) and reloading a previous session.
Export BCF / Import BCF	Standard exchange format (BIM Collaboration Format) to send clashes to third-party coordination software (Navisworks, BIMcollab, etc.).
Render Mode (PDF/BCF)	Defines how the software should interpret the clash for the provision for void: - Automatic: Deduces the action according to the nature of the Host Model. - Force Structure Mode: To see/generate the penetrations (actual holes). - Force MEP/Coordination Mode: To see/generate the requests (orange boxes).

Data Flow and Sharing (XML File)

At each detection, SmartBimPei saves your results in an **.xml** file generated automatically in the same folder as your Revit file (.rvt).

To share your analysis with other stakeholders (e.g., Structural Engineer), **always send them the .rvt model AND the .xml file in the same folder**. They will then see the entire clash history directly in their interface!

2. Data Quality Audit (Data & As-Built)

This module automatically checks if the elements of your model are properly populated according to predefined rules.

Element	Description and Operation
Select Discipline	Choose the discipline to inspect (e.g., Architecture (Interior Finishes)). The validation rules linked to this discipline are automatically loaded in the background.
Blue button: Run data audit	Scans the entire project. If it finds non-compliant elements (missing or incorrect parameters), it will list them in the "Non-compliance report" on the right.
Green button: Auto-resolve	Applies a batch automatic correction on the detected non-compliant elements, when the rule allows it.

3. Duplicate Detector

This module scans the model to quickly identify overlapping elements (modeled twice in the same place).

Element	Description and Operation
Categories to scan	Check the object categories where you suspect duplicates (e.g., Walls, Plumbing fixtures, etc.). Very useful for checking imports or copy-paste errors.
Blue button: Detect duplicates	Analyzes the selected categories and displays the list of perfectly overlapping elements in the results table (with their ID and location).
Red button: Delete copies	Automatically deletes one of the two duplicate elements to clean up your model. Important note: This button will only delete duplicates present in your Host Model. If the duplicate comes from a Linked Model (IFC or RVT), it will be ignored because Revit prohibits modifying links (read-only).

4. Quantity Extraction (Global Takeoff)

This module generates precise quantities (lengths, areas, volumes) from your model to prepare your estimates and costing.

Element	Description and Operation
Filters (Model, Level, Category)	These drop-down menus at the top become active after extraction. They allow you to quickly filter the table display (e.g., only show Level 1).
Red button: Run Extraction	Scans the entire model (and its links) to extract the complete list of elements with their actual physical quantities.
Blue buttons: Isolate / Restore	Select a row in the table and click 'Isolate' to only show this object in 3D in Revit. 'Restore' cancels this isolation.
Green button: Export Estimate (.xlsx)	Generates a perfectly formatted Excel file containing all the data from your table, ideal for costing.
Import/Export buttons (.sbp)	Allows saving your current table (and especially your entered unit prices) to a proprietary .sbp file to reload it later.
Total Estimated Amount	Dynamically updates at the bottom right based on the unit prices you entered in the table.

5. Dashboard (Global Dashboard)

The control center that monitors the health of your projects and the progress of your BIM coordination.

Element	Description and Operation
Progress charts	Visually displays the ratio of "Resolved" vs "Active" clashes by reading the data from your XML file.

Health Indicator (Score)	Overall score given to your model based on data quality (parameters) and the presence of duplicates.
Button: Refresh data	Forces a reread of the XML file and the model to update all your charts in real time.