

# NFM Ballistic Solution

## Overview

### Description

The document describes the specifications of the requirements and the proposed approach for the project aimed at changing the processes related to ordering and testing tests at the shooting range, as well as designing the ballistic system.

### Change justification

1. Speed, security (access and availability) and functionality of the current solution (Excel)
2. Increased efficiency through improvements such as structure search, etc.
3. Integration with IoT devices
4. Lack of transparent UX of the current solution
5. Possibility for future improvements like AI/machine learning

### Goal

Users have an intuitive system for creating test orders, performing tests, designing new ballistic systems and carrying out their tests (in the shortened path). Solution allows Power BI analysis of collected data from SQL DB.

## Construction Creator

### Description

App for creating Material, Material Stack, Operation, Construction, Product and Ballistic System

### Requirements

1. Construction Creator app
  - 1.1. User can create Material, Material Stack, Operation, Construction, Product and Ballistic System.
  - 1.2. User can create Material, Material Stack, Operation, Construction, Product and Ballistic System from existing Material, Material Stack, Operation, Construction, Product and Ballistic System.
  - 1.3. During the creation of Material Stack and Construction costs, thickness and weight have to automatically calculate in case of add/remove new Material or Material Stack
  - 1.4. User can display all Material, Material Stack, Operation, Construction, Product and Ballistic System and edit Material
  - 1.5. Weight, Thickness and price are sum up to the final construction
  - 1.6. Materials as well as Material Stacks can be stitched with specific type of stitching

### Approach

PowerApps, Canvas

- Data Visualization
- Custom UI and UX design
- Connectors with CDS

CDS

- Database

Microsoft Flow:

Name	Category	Description
Create Material Stack And Construction record	Workaround/Integration	Create new record in NBS MaterialStackAndConstruction Entity. Relate selected <b>“Material Stacks”</b> with <b>“Construction”</b>
Create Construction Material Stack Stitching record	Workaround/integration	Create new record in NBS ConstructionMaterialStackOperation Entity. Relate selected MaterialStackAndConstruction with <b>“Operation”</b>
Create New ICW Product	Workaround/integration	Create new record in NBS ICW Product Entity. Relate selected <b>“Products”</b> with <b>“Ballistic System”</b>

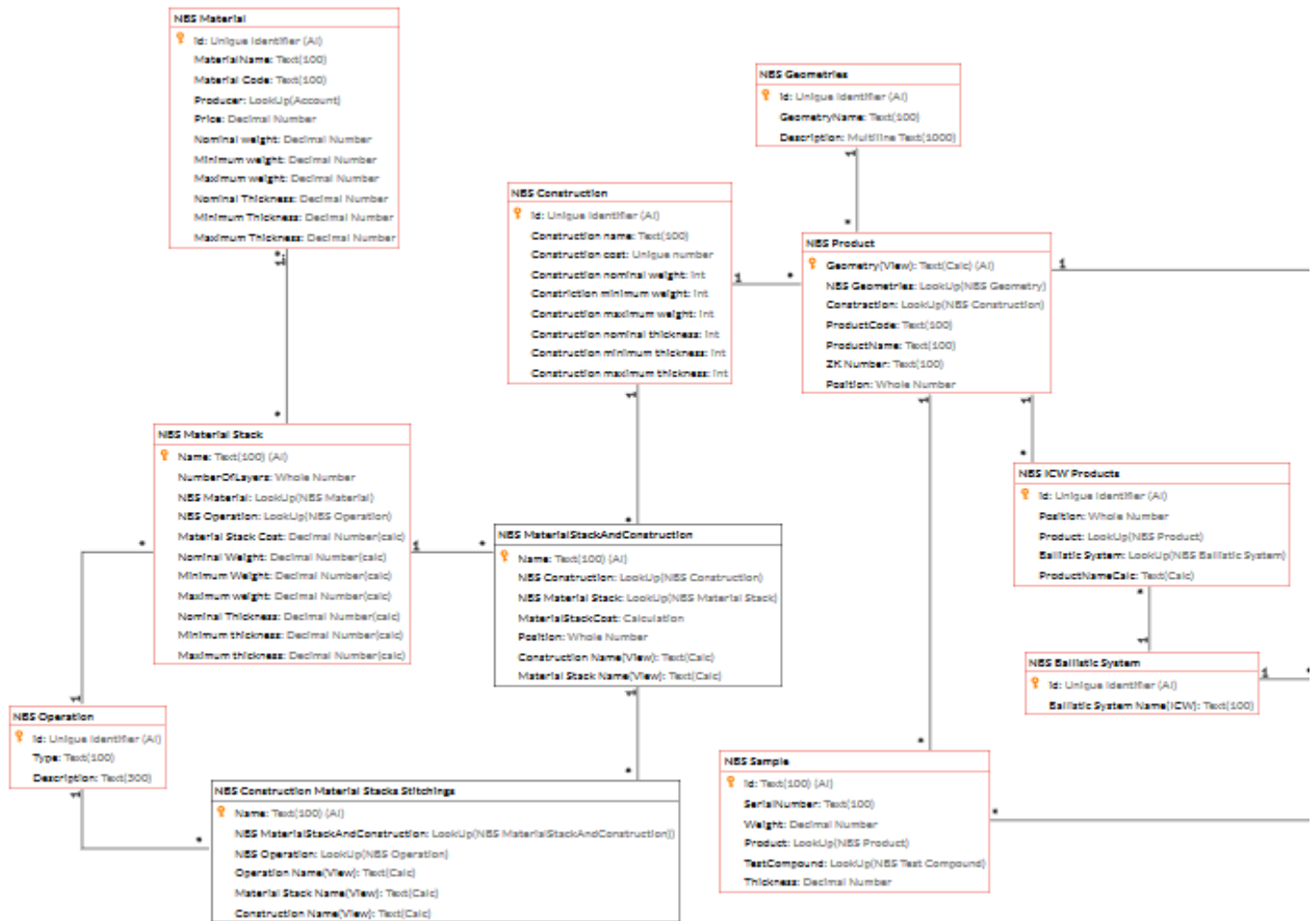
### Dictionary

Word/Phrase	Meaning	Synonyms
<b>Construction</b>	It's compound of multiple <b>“Material stacks”</b> in specific order and <b>“Operation”</b>	Composite, Solution

Product	It is a <b>“Construction”</b> with a specific geometry	Component of the System
<b>Ballistic System</b>	<b>“Product”</b> or set of <b>“Products”</b> that will be tested with <b>“Tested Product”</b>	ICW, In Conjunction With, Panel, Soft ballistic
<b>Material</b>	Basic ingredient of every <b>“Construction”</b> . It has its own price, weight and thickness	
<b>Material Stack</b>	Is a <b>“Material”</b> of 1 type stacked in a number of layers	
<b>Operation</b>	Type of stitching for <b>“Materials”</b> in <b>“Material Stack”</b> and for <b>“Material Stacks”</b> in <b>“Construction”</b>	
<b>Shooting Order App</b>	App to request a <b>“Shooting Test”</b> for the specific <b>“Product”</b> . Such test may be described with multiple properties i.e. client, project, custom standard detail etc	
<b>Testing Dashboard App</b>	App for conducting a <b>“Shooting test”</b>	
<b>Construction Creator App</b>	App for creating ballistic constructions	

## Architecture

Project database diagram <https://dbdesign.online/model/3TJ612sF5wXE>



## CDS Entities Description

NBS Material			
Display name	Data type	Required	Additional notes
NBS Material	Unique Identifier	Yes	
Material Name	Text(100)		Primary field
Material Code	Text(100)		
Producer	Lookup		Account
Price	Decimal Number		
Nominal weight	Decimal Number		
Minimum weight	Decimal Number		
Maximum weight	Decimal Number		
Nominal Thickness	Decimal Number		
Minimum Thickness	Decimal Number		
Maximum Thickness	Decimal Number		

NBS Material Stack			
Display name	Data type	Required	Additional notes
NBS Material Stack	Unique Identifier	Yes	
Name	Text(100)		Primary field
Number of Layers	Whole Number		
NBS Material	Lookup		NBS Material
NBS Operation	Lookup		NBS Operation
Material Stack Cost	Decimal Number		Calculation field
MS Nominal weight	Decimal Number		Calculation field
MS Minimum weight	Decimal Number		Calculation field
MS Maximum weight	Decimal Number		Calculation field
MS Nominal Thickness	Decimal Number		Calculation field
MS Minimum Thickness	Decimal Number		Calculation field
MS Maximum Thickness	Decimal Number		Calculation field

NBS Operation			
Display name	Data type	Required	Additional notes
NBS Operation	Unique Identifier	Yes	
Type	Text(100)		Primary field
Description	Text(300)		

NBS Product			
Display name	Data type	Required	Additional notes
Geometry (View)	Text		Calculation field
Position	Whole Number		
Product Code	Text		
Construction	Lookup		NBS Construction
Product Name	Text	Yes	Primary Field
NBS Geometries	Lookup		NBS Geometry
ZK Number	Text		

NBS Geometry			
Display name	Data type	Required	Additional notes
NBS Geometry	Unique Identifier	Yes	
Geometry Name	Text(100)		Primary field
Description	Multiline Text(1000)		

NBS Construction			
Display name	Data type	Required	Additional notes
NBS Construction	Unique Identifier	Yes	
Construction Name	Text(100)		Primary field
Construction Cost	Decimal Number		Calculation field
Construction Nominal weight	Decimal Number		Calculation field
Construction Minimum weight	Decimal Number		Calculation field
Construction Maximum weight	Decimal Number		Calculation field

Construction Nominal Thickness	Decimal Number		Calculation field
Construction Minimum Thickness	Decimal Number		Calculation field
Construction Maximum Thickness	Decimal Number		Calculation field

NBS ICW Product			
Display name	Data type	Required	Additional notes
Id	Autonumber		Primary Field
BallisticSystem	Lookup		NBS Ballistic System
Product	Lookup		NBS Product
Product Name Calc	Text		Calculation field
Position	Whole Number		

NBS Ballistic System			
Display name	Data type	Required	Additional notes
Ballistic System Name(ICW)	Text	Yes	Primary Field

NBS MaterialStackAndConstruction			
Display name	Data type	Required	Additional notes
Name	Text(100)		Primary field
NBS Construction	Lookup		NBS Construction
NBS Material Stack	Lookup		NBS Material Stack
MaterialStackCost	Decimal Number		Calculation field
Position	Whole Number		
Construction Name(View)	Text(100)		Calculation field
Material Stack Name(View)	Text(100)		Calculation field

NBS Construction MaterialStack Stitching			
Display name	Data type	Required	Additional notes
Name	Text(100)		Primary field
NBS MaterialStackAndConstruction	Lookup		NBS MaterialStackAndConstruction
NBS Operation	Lookup		NBS Operation
Operation Name(View)	Text(100)		Calculation field
Construction Name(View)	Text(100)		Calculation field
Material Stack Name(View)	Text(100)		Calculation field

Components

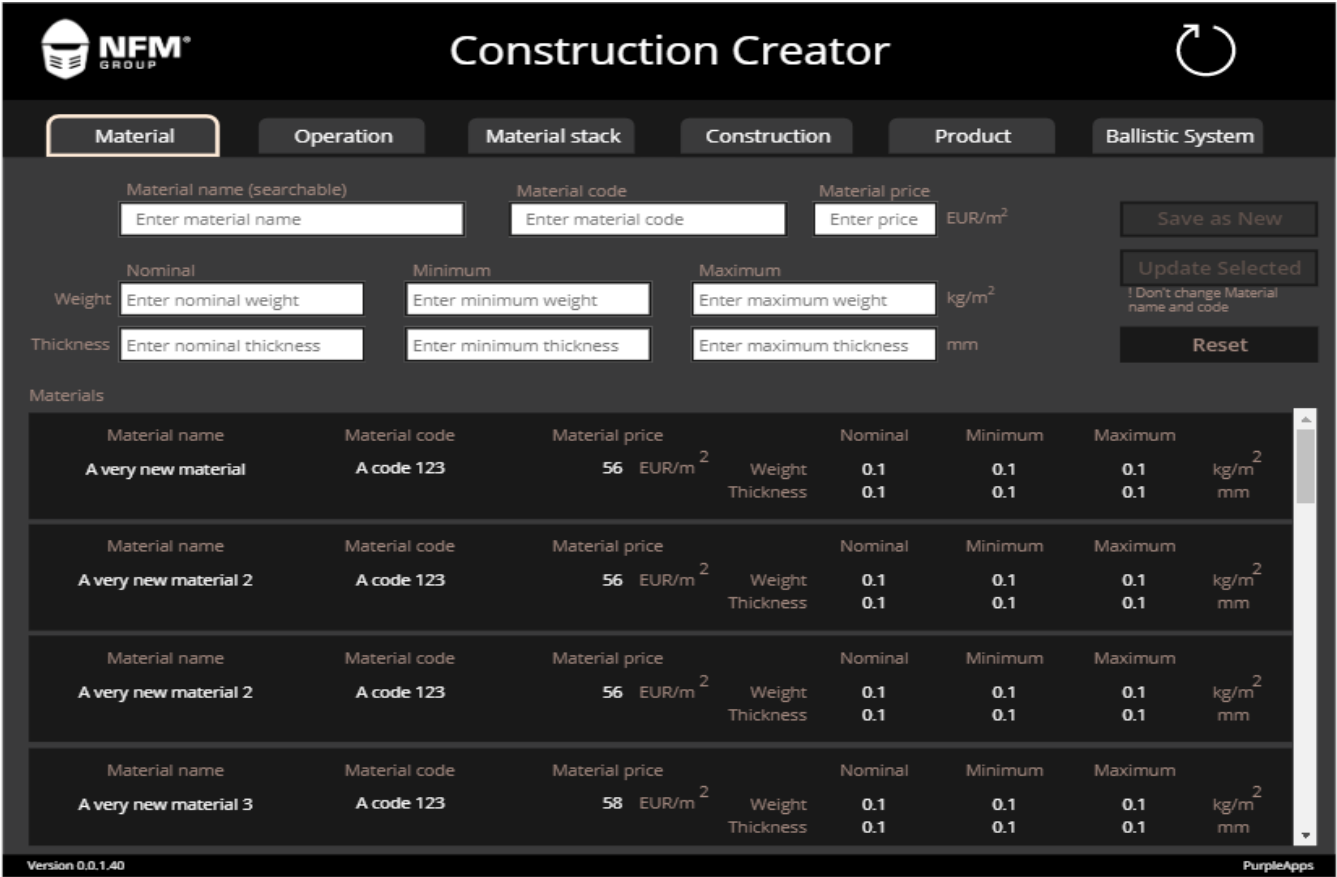
- 1. Navbar component.



Requirements 1.1.


Screens

- 1. Screen 1: Material




Requirements: 1.1., 1.2., 1.4.

- 2. Screen2. Operation



# Construction Creator



Material
Operation
Material stack
Construction
Product
Ballistic System

Operation name (searchable)

Operation description

Save as New

Reset


### Operations

Operation name	Operation description
Operation 1	New operation for test functionality
Operation 112233	
Operation 2	New operation for test functionality 2
Operation 5	Test only

Version 0.0.1.40
PurplApps

Requirements: 1.1, 1.2, 1.4.

### 3. Screen 3. Material Stack



# Construction Creator

Material
Operation
Material stack
Construction
Product
Ballistic System

Material stack name(searchable)

No of layers

Material

Operation

Save as New

Reset

### Material Stacks

Material stack name	Costs	EUR/m <sup>2</sup>	Operation name	Nominal	Minimum	Maximum	Weight	Thickness
3ParOp2	52		Operation 2	1	0.8	1.2	kg/m <sup>2</sup>	24
Material name	No of layers		Operation description					
Paralon	4		New operation for test functionality 2					
3ParOp234	78		Operation 2	1.5	1.2	1.8	kg/m <sup>2</sup>	36
Material name	No of layers		Operation description					
Paralon	6		New operation for test functionality 2					
Cotton Stack	9.76		Stitching type 3	1.2	0.8	1.6	kg/m <sup>2</sup>	216
Material name	No of layers		Operation description					
Coton	8		At vero eos et accusamus et iusto odio dignissimos ducimus					

Version 0.0.1.40
PurplApps

Requirements: 1.1., 1.2., 1.3., 1.4., 1.6..



4. Screen 4. Construction

**Construction Creator**

Material | Operation | Material stack | **Construction** | Product | Ballistic System

Construction name: Enter construction name | Material Stacks: Choose Material Stack | Save as New | Reset | Add Operation

Construction name	Construction costs	Material stacks	Weight Thickness	Nominal	Minimum	Maximum	
Construction 111	878 EUR/m <sup>2</sup>	Steel Wafer stack, Cotton wool Stack, Synthetic stack	7.94	236	6.9	162	9 292 kg/m <sup>2</sup> mm
Construction 123	625 EUR/m <sup>2</sup>	3ParOp234, 3ParOp2, Steel Wafer stack, Cotton wool Stack	6.55	168	5.6	122	7.5 205 kg/m <sup>2</sup> mm
Construction 123	533.07 EUR/m <sup>2</sup>	Material Stack 3-23.10, Material Stack 22, Steel Wafer stack	50.2	186	47.6	142	52.88 220 kg/m <sup>2</sup> mm

Version 0.0.1.40 | PurpleApps

Requirements: 1.1, 1.2., 1.3., 1.4., 1.5., 1.6.

5. Screen 5. Product

**Construction Creator**

Material | Operation | Material stack | Construction | **Product** | Ballistic System


Product name(searchable): Enter product name | Product code: Enter product code | ZK Number: Enter ZK number | Save as New | Reset

Construction: Choose Construction | Geometry: Choose Geometry


Product name	Product code	Construction Cost	ZK Number	Geometry
019		EUR/m <sup>2</sup>		
019	P-S-00019-C2742-TF5-0T1T2	EUR/m <sup>2</sup>	2213122312313	C2742 torso front
019 - 1	P-S-00019-C2742-TF5-0T1T2	384.94 EUR/m <sup>2</sup>	2213122312312	C2742 torso front
019 - 2	123	649.94 EUR/m <sup>2</sup>	123	RD01

Version 0.0.1.40 | PurpleApps

Requirements: 1.1., 1.2., 1.4.

**NFM**  
GROUP

# Construction Creator



Material

Operation

Material stack

Construction

Product

Ballistic System

Ballistic System name (searchable)  
Enter Ballistic system name

Products  
Choose Products

Save as New

Reset

Ballistic Systems

Ballistic system name S/A				
Ballistic system name test Ballistic system	Product PE01	Product PE100	Product PE31	Product 019
Ballistic system name test Ballistic system 1	Product 019	Product PE31	Product PE01	Product PE100
Ballistic system name test Ballistic system2				

Version 0.0.1.40

PurpleApps

## Use Cases

[illegible]

## UC 2: Create new Element (Material, Operation, Material Stack, Product, Ballistic System) from existing Element

### UC1-Screen 1a

Material name (optional):

Material code:  Material price:

Weight:  Thickness:

Material name	Material code	Material price	Weight	Thickness	Minimum	Maximum
Cotton	0001	1.22 £/kg	0.15	27	0.1	0.2
Cotton wool	0002	0.90 £/kg	0.16	5	0.13	0.2

Action: User can enter name of Element and find it in existing.

### UC1-Screen 1b

Material name (optional):

Material code:  Material price:

Weight:  Thickness:

Material name	Material code	Material price	Weight	Thickness	Minimum	Maximum
Cotton	0001	1.22 £/kg	0.15	27	0.1	0.2
Cotton wool	0002	0.90 £/kg	0.16	5	0.13	0.2

Action: User select existing Element to copy data

### UC1-Screen 1c

Material name (optional):

Material code:  Material price:

Weight:  Thickness:

Material name	Material code	Material price	Weight	Thickness	Minimum	Maximum
Cotton	0001	1.22 £/kg	0.15	27	0.1	0.2
Cotton wool	0002	0.90 £/kg	0.16	5	0.13	0.2

Action: Operator change necessary data

### UC1-Screen 1c

Material name (optional):

Material code:  Material price:

Weight:  Thickness:

Material name	Material code	Material price	Weight	Thickness	Minimum	Maximum
Cotton	0001	1.22 £/kg	0.15	27	0.1	0.2
Cotton wool	0002	0.90 £/kg	0.16	5	0.13	0.2

Action: Operator can Save new Element

## UC 3: Update Material

### UC1-Screen 1a

Material name (optional):

Material code:  Material price:

Weight:  Thickness:

Material name	Material code	Material price	Weight	Thickness	Minimum	Maximum
Cotton	0001	1.22 £/kg	0.15	27	0.1	0.2
Cotton wool	0002	0.90 £/kg	0.16	5	0.13	0.2

Action: User can enter name of "Materiala" and check if this element have already exist.

### UC1-Screen 1b

Material name (optional):

Material code:  Material price:

Weight:  Thickness:

Material name	Material code	Material price	Weight	Thickness	Minimum	Maximum
Cotton	0001	1.22 £/kg	0.15	27	0.1	0.2
Cotton wool	0002	0.90 £/kg	0.16	5	0.13	0.2

Action: User select existing "Material" to update

### UC1-Screen 1c

Material name (optional):

Material code:  Material price:

Weight:  Thickness:

Material name	Material code	Material price	Weight	Thickness	Minimum	Maximum
Cotton	0001	1.22 £/kg	0.15	27	0.1	0.2
Cotton wool	0002	0.90 £/kg	0.16	5	0.13	0.2

Action: Operator can Update selected "Material"

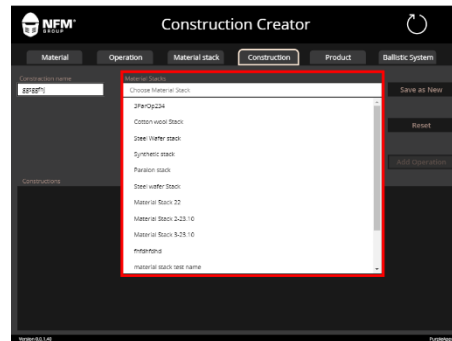
## UC 4: Create Construction

UC4-Screen 1a



Action: User can enter name of **“Construction”** and check if this element have already exist.

UC4-Screen 1b



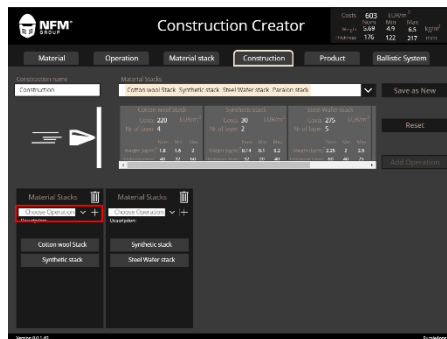
Action: User select **“Material Stacks”**

UC4-Screen 1c



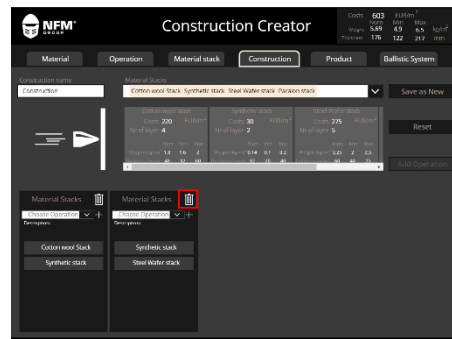
Action: User choose **“Material Stacks”** and press Add Operation

UC4-Screen 1d



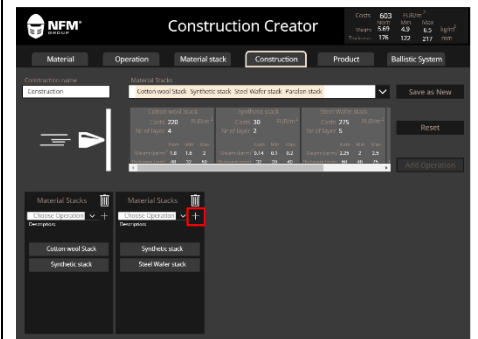
Action: User choose **“Operation”** for selected **“Material Stacks”**

UC4-Screen 1e



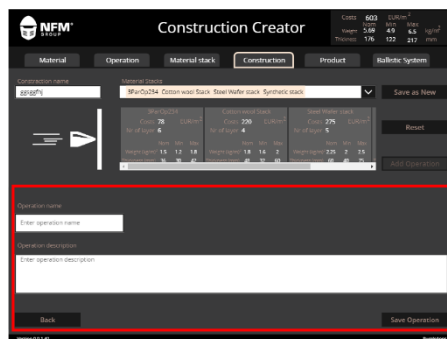
Action: User can delete **“Material stacks”** for Operation

UC4-Screen 1f



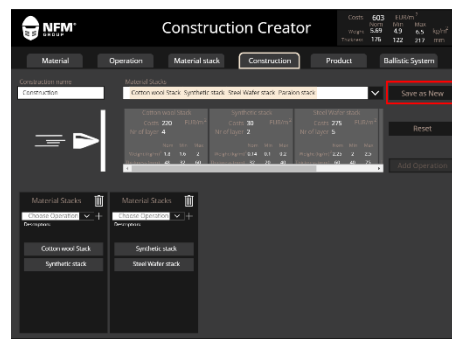
Action: User can add new **“Operation”**

UC4-Screen 1g



Action: User can save **“Operation”** data or return back to Screen 1f

UC4-Screen 1e



Action: User saved New Construction