



**SOLIDProof**  
*Bring trust into your projects*

**Blockchain Security | Smart Contract Audits | KYC**

MADE IN GERMANY

**v1.0: 29. January, 2022**

**v1.1: 01. February, 2022**

# Audit

**Security Assessment**  
**10. February, 2022**

**For**



**Beli Finance**

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Version	Date	Description
1.0	29. January 2022	<ul style="list-style-type: none"><li>• Layout project</li><li>• Automated- /Manual-Security Testing</li><li>• Summary</li></ul>
1.1	01. February 2022	<ul style="list-style-type: none"><li>• Reaudit</li></ul>
1.1	10. February 2022	<ul style="list-style-type: none"><li>• Mainnet added</li></ul>

## **Network**

Binance Smart Chain (BEP20)

## **Website**

<https://beli.finance/>



## Description

Beli Finance is a decentralized reserve policy-controlled currency protocol, Multi-Chain Yield Optimizer Aggregator platform that convert yield farm into \$BELI token and still earn small compound interest on their crypto holdings automatically. Each \$BELI token is backed by a basket of assets (e.g., USDT, BNB, BUSD Tokens etc etc) in the treasury, giving it an intrinsic value that it cannot fall below. Beli Finance also introduces economic and game-theoretic dynamics into the market through staking and compounding.

## Project Engagement

During the 27th of January 2022, **Beli Finance Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

## Logo



# Beli Finance

## Contract Link

### v1.0

- Github
  - <https://github.com/belifinance/beli-finance>
  - Commit: fe03b705871f742e0eabe3cad79ba9e75c781ff6

### v1.1

- Github
  - <https://github.com/belifinance/beli-finance>
  - Commit: b4038bd4f1426e7d9bbf283e11bbb2caafef9139

### v1.2

- <https://bscscan.com/address/0x805ea3a05d0385593aead0d357d7b5a989a5c45b#code>

# Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
<b>Critical</b>	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
<b>High</b>	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
<b>Medium</b>	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
<b>Low</b>	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
<b>Informational</b>	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

# Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

## **Methodology**

The auditing process follows a routine series of steps:

1. Code review that includes the following:
  - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
  - ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
  - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
2. Testing and automated analysis that includes the following:
  - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
  - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

## Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

```
./helpers/ERC20.sol  
./libraries/Address.sol  
./libraries/SafeERC20.sol  
./helpers/Ownable.sol
```





# Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

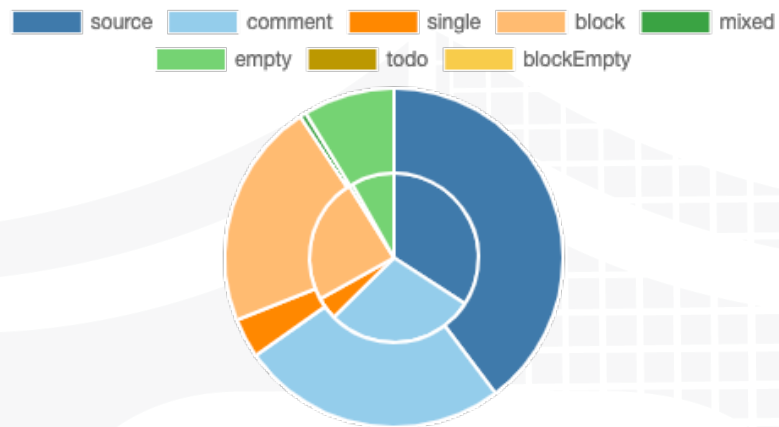
*A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.*

## v1.0

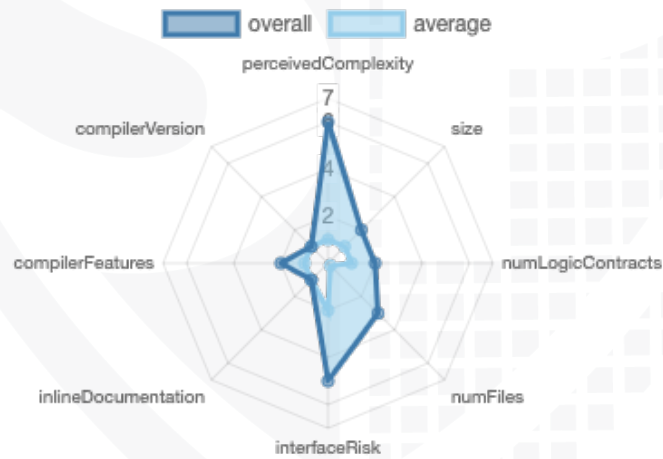
File Name	SHA-1 Hash
contracts/LiquidityLocker.sol	6c288a231f056ddb9561de798f8ef31d9c67823
contracts/interfaces/IFarm.sol	1f113afd8084573e154fd87243932a453534d9cc
contracts/interfaces/IFeeReceiver.sol	59494838b301b4fe7a245c7daa2060a4a287bc83
contracts/interfaces/ILocker.sol	164a536f14b263d8f219391c884890d9655d01e2
contracts/interfaces/IPancakeswapFarm.sol	70329126e7295a7e648c0a40755f8c48a27d7517
contracts/interfaces/IReferral.sol	ceff967b0354f9259cd458a66b0bfed5b49daf15
contracts/interfaces/IPancakeRouter02.sol	464cfb67e696411142cf03786eea8d5bb60cfbfe
contracts/interfaces/IPancakeRouter01.sol	d36e679a84938d5bd06c2548ba13d47f7e22f81d
contracts/interfaces/IVault.sol	e90638e1d89bcf47aa306faef410e2110811f1f5
contracts/interfaces/IWBNB.sol	adf33802d70f1b5660b1c4523bac19bbeaca6d8a
contracts/interfaces/IERC20.sol	347c58c28cbce34e2d6376f870c7ac45d8d82400
contracts/helpers/AccessControl.sol	5eb32cb05cdab14507bce2ca40ef20d42830cad5
contracts/helpers/Context.sol	b9599e1bf4c3eff19e61490e31db3a18ccb72dd3
contracts/helpers/Ownable.sol	72716c08c4af60b8e10550b94dfb348bd377e02e
contracts/helpers/Pausable.sol	8bcd3e3e43173dd4b7576eb131cfe81990ad2aa0
contracts/helpers/ERC20.sol	8d193f5737a404caa24c1f3817231c74e4078249
contracts/helpers/ReentrancyGuard.sol	2fa15db6f6bc0f1822b3658a60fa471e3ae3c624
contracts/libraries/EnumerableSet.sol	c206160e3aa76ce5e6d5394f2a3367491aa61dd8
contracts/libraries/Address.sol	32626bab7e8068c3c5f578532d3222771d17647d
contracts/libraries/SafeMath.sol	c1193bc1ea44695594726881e36783e641eb5214
contracts/libraries/SafeERC20.sol	24a84d83d8bd2015df22c14f512edf0b5e01bcda
contracts/BeliToken.sol	2929f4a111a10afcf71bc6642880a1ce65836a95

# Metrics

## Source Lines v1.0



## Risk Level v1.0



## Capabilities

### Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	4	4	10	4

### Exposed Functions

*This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.*

Version	Public	Payable
1.0	123	5

Version	External	Internal	Private	Pure	View
1.0	90	166	10	14	56

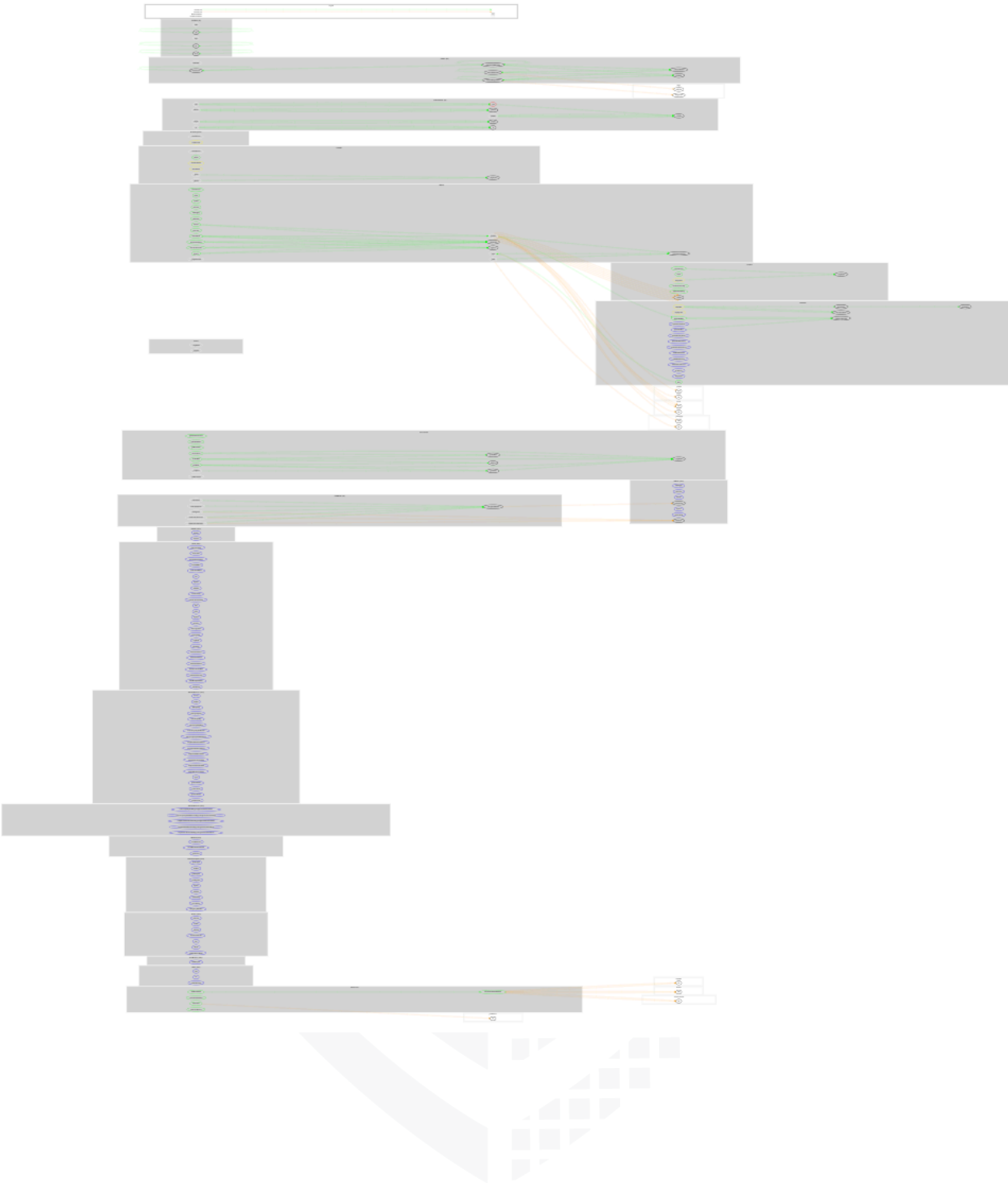
### State Variables

Version	Total	Public
1.0	35	22

### Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	0.6.12 ^0.6.12		yes	yes (2 asm blocks)	





## Scope of Work/Verify Claims

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

### Correct implementation of Token standard

Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	✓	✓	✓
BalanceOf	provides account balance of the owner's account	✓	✓	✓
Transfer	executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	executes transfers of a specified number of tokens from a specified address	✓	✓	✓
Approve	allow a spender to withdraw a set number of tokens from a specified account	✓	✓	✓
Allowance	returns a set number of tokens from a spender to the owner	✓	✓	✓

## Write functions of contract v1.0

updateTransferLimit  
updateFeeRate  
updateTreasuryFactor  
updateBeliStakeFactor  
updateBeliLPStakeFactor  
setWhaleExclusion  
setBeliFeeReceiver  
setBeliLPFeeReceiver  
setTreasury  
setOperator  
mint

transfer  
approve  
transferFrom  
increaseAllowance  
decreaseAllowance  
renounceOwnership  
transferOwnership

## Deployer cannot mint any new tokens

Name	Exist	Tested	Status
Deployer cannot mint	✓	✓	✓
Max / Total Supply	-		

Comments:

### v1.2

- Owner is Beli Farm
  - <https://bscscan.com/address/0xf3e703acaf8c633d0a3dceeb2a0580e2c468b6f6#code>



## Deployer cannot burn or lock user funds

Name	Exist	Tested	Status
Deployer cannot lock	✓	✓	✓
Deployer cannot burn	✓	✓	✓

Comments:

### v1.0

- Tokens will burn while transfer
- Owner is Beli Farm
  - <https://bscscan.com/address/0xf3e703acaf8c633d0a3dceeb2a0580e2c468b6f6#code>

## Deployer cannot pause the contract

Name	Exist	Tested	Status
Deployer cannot pause	—	—	—



## Overall checkup (Smart Contract Security)












Tested	Verified
✓	✓




### Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	🚩
Unverified / Not checked	✗
Not available	—

## Modifiers and public functions

v1.0

- ✓  updateTransferLimit
  - Ⓜ onlyOperator
- ✓  updateFeeRate
  - Ⓜ onlyOperator
- ✓  updateTreasuryFactor
  - Ⓜ onlyOperator
- ✓  updateBeliStakeFactor
  - Ⓜ onlyOperator
- ✓  updateBeliLPStakeFactor
  - Ⓜ onlyOperator
- ✓  setWhaleExclusion
  - Ⓜ onlyOperator
- ✓  setBeliFeeReceiver
  - Ⓜ onlyOperator
- ✓  setBeliLPFeeReceiver
  - Ⓜ onlyOperator
- ✓  setTreasury
  - Ⓜ onlyOperator
- ✓  setOperator
  - Ⓜ onlyOperator
- ✓  mint
  - Ⓜ onlyOwner

-  lockTokens
-  extendLockDuration
-  withdrawTokens





































### Comments

- Deployer can mint new tokens without limitations

**Please check if an OnlyOwner or similar restrictive modifier has been forgotten.**

# Source Units in Scope

## v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/LiquidityLocker.sol	1	————	155	150	105	27	78	
	contracts/interfaces/IFarm.sol	————	1	40	12	6	4	7	————
	contracts/interfaces/IFeeReceiver.sol	————	1	6	5	3	1	3	————
	contracts/interfaces/ILocker.sol	————	1	18	5	3	1	15	————
	contracts/interfaces/IPancakeswapFarm.sol	————	1	34	4	3	7	19	————
	contracts/interfaces/IReferral.sol	————	1	20	9	3	10	7	————
	contracts/interfaces/IPancakeRouter02.sol	————	1	50	6	4	————	16	
	contracts/interfaces/IPancakeRouter01.sol	————	1	160	4	3	————	48	
	contracts/interfaces/IVault.sol	————	1	75	6	3	9	51	————
	contracts/interfaces/IWBNB.sol	————	1	10	7	4	1	10	
	contracts/interfaces/IERC20.sol	————	1	86	26	21	54	13	
	contracts/helpers/AccessControl.sol	1	————	206	202	79	101	43	
	contracts/helpers/Context.sol	1	————	13	13	10	2	1	
	contracts/helpers/Ownable.sol	1	————	62	62	33	21	23	————
	contracts/helpers/Pausable.sol	1	————	80	80	29	41	14	
	contracts/helpers/ERC20.sol	1	————	345	305	113	161	81	————
	contracts/helpers/ReentrancyGuard.sol	1	————	45	45	15	22	5	————
	contracts/libraries/EnumerableSet.sol	1	————	321	274	98	141	34	
	contracts/libraries/Address.sol	1	————	248	180	93	110	47	
	contracts/libraries/SafeMath.sol	1	————	157	145	39	93	10	
	contracts/libraries/SafeERC20.sol	1	————	123	98	66	23	25	
	contracts/BeliToken.sol	1	————	199	199	161	22	130	————
	<b>Totals</b>	<b>12</b>	<b>10</b>	<b>2453</b>	<b>1837</b>	<b>894</b>	<b>851</b>	<b>680</b>	

## Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

# Audit Results

# AUDIT PASSED

## Critical issues

**No critical issues**

## High issues

**No high issues**

## Medium issues

**No medium issues**

## Low issues

Issue	File	Type	Line	Description
#1	BelToken	Missing Zero Address Validation (missing-zero-check)	127, 132, 142, 137	Check that the address is not zero

## Informational issues

**No informational issues**

## Audit Comments

We recommend you to use the special form of comments (NatSpec Format, Follow link for more information <https://docs.soliditylang.org/en/v0.5.10/natspec-format.html>) for your contracts to provide rich documentation for functions, return variables and more. This helps investors to make clear what that variables, functions etc. do.

### 29. January 2022:

- Read whole report for more information

### 01. February 2022:

- Issues were fixed by bell finance team
- Read whole report for more information

### 10. February 2022:

- Mainnet address has been provided from Beli Finance team

## SWC Attacks

ID	Title	Relationships	Status
<a href="#">SW C-1 36</a>	Unencrypted Private Data On-Chain	<a href="#">CWE-767: Access to Critical Private Variable via Public Method</a>	PASSED
<a href="#">SW C-1 35</a>	Code With No Effects	<a href="#">CWE-1164: Irrelevant Code</a>	PASSED
<a href="#">SW C-1 34</a>	Message call with hardcoded gas amount	<a href="#">CWE-655: Improper Initialization</a>	PASSED
<a href="#">SW C-1 33</a>	Hash Collisions With Multiple Variable Length Arguments	<a href="#">CWE-294: Authentication Bypass by Capture-replay</a>	PASSED
<a href="#">SW C-1 32</a>	Unexpected Ether balance	<a href="#">CWE-667: Improper Locking</a>	PASSED
<a href="#">SW C-1 31</a>	Presence of unused variables	<a href="#">CWE-1164: Irrelevant Code</a>	PASSED
<a href="#">SW C-1 30</a>	Right-To-Left-Override control character (U+202E)	<a href="#">CWE-451: User Interface (UI) Misrepresentation of Critical Information</a>	PASSED
<a href="#">SW C-1 29</a>	Typographical Error	<a href="#">CWE-480: Use of Incorrect Operator</a>	PASSED
<a href="#">SW C-1 28</a>	DoS With Block Gas Limit	<a href="#">CWE-400: Uncontrolled Resource Consumption</a>	PASSED



<a href="#">SW C-1 27</a>	Arbitrary Jump with Function Type Variable	<a href="#">CWE-695: Use of Low-Level Functionality</a>	<b>PASSED</b>
<a href="#">SW C-1 25</a>	Incorrect Inheritance Order	<a href="#">CWE-696: Incorrect Behavior Order</a>	<b>PASSED</b>
<a href="#">SW C-1 24</a>	Write to Arbitrary Storage Location	<a href="#">CWE-123: Write-what-where Condition</a>	<b>PASSED</b>
<a href="#">SW C-1 23</a>	Requirement Violation	<a href="#">CWE-573: Improper Following of Specification by Caller</a>	<b>PASSED</b>
<a href="#">SW C-1 22</a>	Lack of Proper Signature Verification	<a href="#">CWE-345: Insufficient Verification of Data Authenticity</a>	<b>PASSED</b>
<a href="#">SW C-1 21</a>	Missing Protection against Signature Replay Attacks	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	<b>PASSED</b>
<a href="#">SW C-1 20</a>	Weak Sources of Randomness from Chain Attributes	<a href="#">CWE-330: Use of Insufficiently Random Values</a>	<b>PASSED</b>
<a href="#">SW C-11 9</a>	Shadowing State Variables	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>
<a href="#">SW C-11 8</a>	Incorrect Constructor Name	<a href="#">CWE-665: Improper Initialization</a>	<b>PASSED</b>
<a href="#">SW C-11 7</a>	Signature Malleability	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	<b>PASSED</b>

<a href="#">SW C-11 6</a>	Timestamp Dependence	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	<b>PASSED</b>
<a href="#">SW C-11 5</a>	Authorization through tx.origin	<a href="#">CWE-477: Use of Obsolete Function</a>	<b>PASSED</b>
<a href="#">SW C-11 4</a>	Transaction Order Dependence	<a href="#">CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')</a>	<b>PASSED</b>
<a href="#">SW C-11 3</a>	DoS with Failed Call	<a href="#">CWE-703: Improper Check or Handling of Exceptional Conditions</a>	<b>PASSED</b>
<a href="#">SW C-11 2</a>	Delegatecall to Untrusted Callee	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	<b>PASSED</b>
<a href="#">SW C-11 1</a>	Use of Deprecated Solidity Functions	<a href="#">CWE-477: Use of Obsolete Function</a>	<b>PASSED</b>
<a href="#">SW C-11 0</a>	Assert Violation	<a href="#">CWE-670: Always-Incorrect Control Flow Implementation</a>	<b>PASSED</b>
<a href="#">SW C-1 09</a>	Uninitialized Storage Pointer	<a href="#">CWE-824: Access of Uninitialized Pointer</a>	<b>PASSED</b>
<a href="#">SW C-1 08</a>	State Variable Default Visibility	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>
<a href="#">SW C-1 07</a>	Reentrancy	<a href="#">CWE-841: Improper Enforcement of Behavioral Workflow</a>	<b>PASSED</b>
<a href="#">SW C-1 06</a>	Unprotected SELFDESTRUCT Instruction	<a href="#">CWE-284: Improper Access Control</a>	<b>PASSED</b>

<a href="#">SW</a> <a href="#">C-1</a> <a href="#">05</a>	Unprotected Ether Withdrawal	<a href="#">CWE-284: Improper Access Control</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">04</a>	Unchecked Call Return Value	<a href="#">CWE-252: Unchecked Return Value</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">03</a>	Floating Pragma	<a href="#">CWE-664: Improper Control of a Resource Through its Lifetime</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">02</a>	Outdated Compiler Version	<a href="#">CWE-937: Using Components with Known Vulnerabilities</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">01</a>	Integer Overflow and Underflow	<a href="#">CWE-682: Incorrect Calculation</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">00</a>	Function Default Visibility	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>

The logo features the word "SolidProofed" in a white, handwritten-style script. The "P" is particularly large and stylized, with a long horizontal stroke that extends to the left. The background is a solid blue color with a faint, large shield emblem. The shield has a grid-like pattern on its right side and a solid blue area on its left side.

SolidProofed

**Blockchain Security | Smart Contract Audits | KYC**

A small horizontal bar representing the German flag, with black, red, and gold stripes.

MADE IN GERMANY