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*Bring trust into your projects*

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

MADE IN GERMANY

# Audit

**Security Assessment**

**11. January, 2022**

**For**



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Version	Date	Description
1.0	11. January 2022	<ul style="list-style-type: none"><li>• Layout project</li><li>• Automated- /Manual-Security Testing</li><li>• Summary</li></ul>

## **Network**

Binance Smart Chain (BEP20)

## **Website**

<https://www.8ballfi.com/>

## **Telegram**

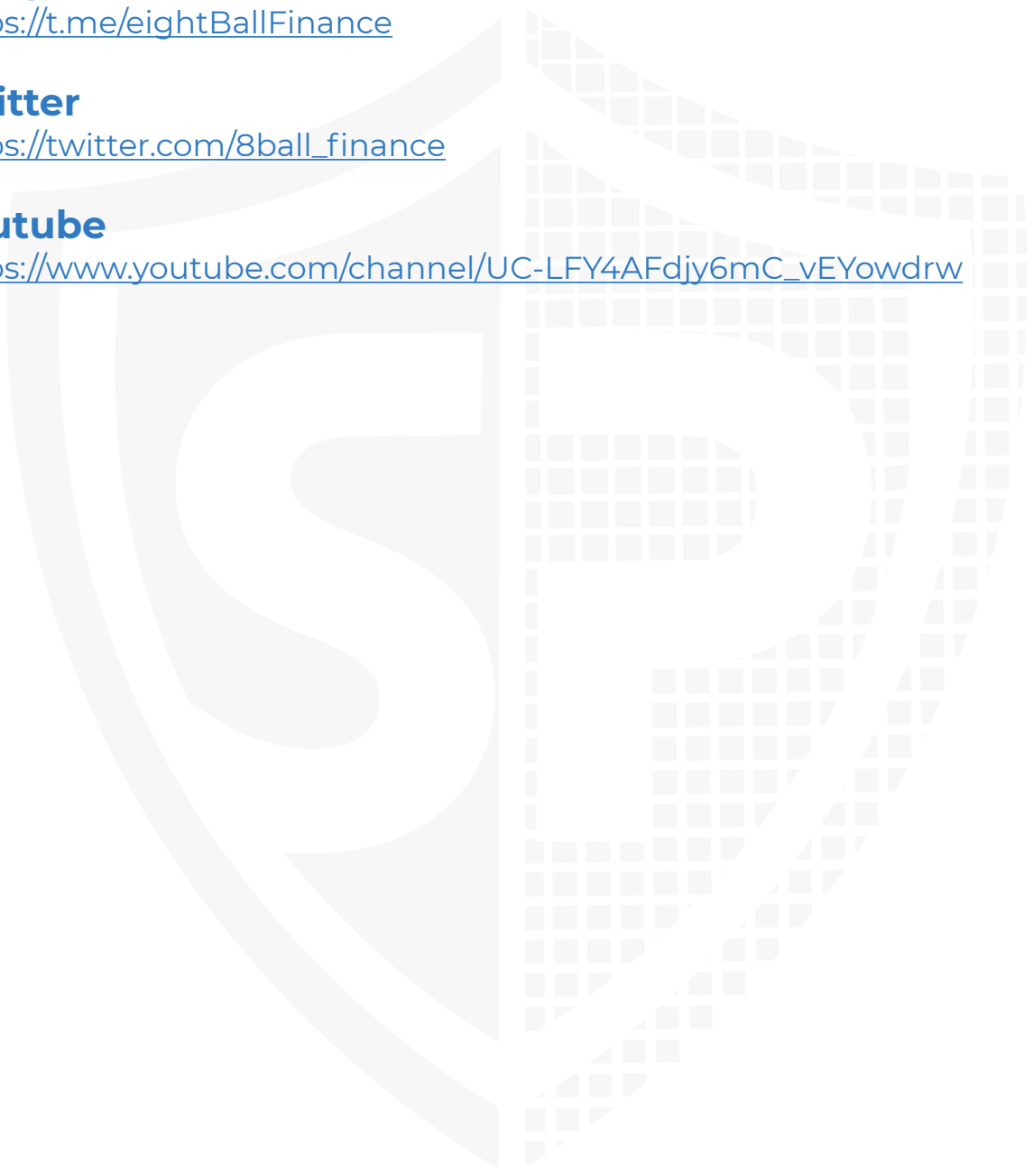
<https://t.me/eightBallFinance>

## **Twitter**

[https://twitter.com/8ball\\_finance](https://twitter.com/8ball_finance)

## **Youtube**

[https://www.youtube.com/channel/UC-LFY4AFdjy6mC\\_vEYowdrw](https://www.youtube.com/channel/UC-LFY4AFdjy6mC_vEYowdrw)



## Description

8BF is the governance token for 8Ball Finance ecosystem

## Project Engagement

During the 10th of January 2022, **8Ball 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



## Contract Link v1.0

- <https://bscscan.com/address/0x4882546b71b9dcb82f4064581c3352744af7f1e5#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:

```
{ } imports ... (5)  
  .//Ownable.sol  
  ./Context.sol  
  ./IBEP20.sol  
  ./SafeMath.sol  
  ./Address.sol  
{ } pragma ... (1)  
BEP20
```



## Tested Contract Files

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

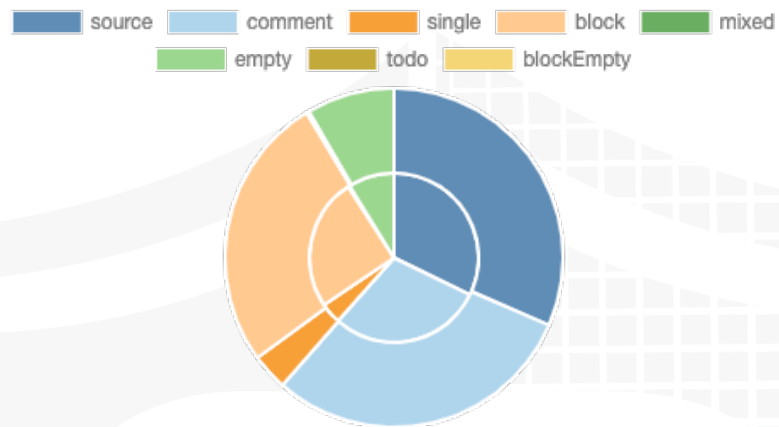
*A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.*

### v1.0

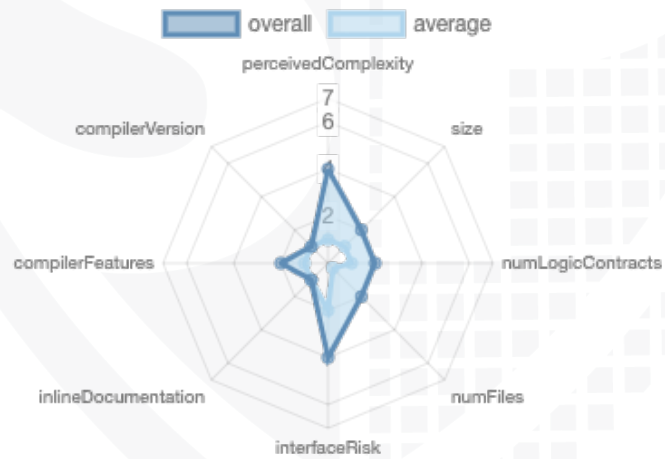
File Name	SHA-1 Hash
contracts/IBEP20.sol	e12b477c3a673533b9a57f0cb1e261feb659648a
contracts/BEP20.sol	9056cf40894755cd3f758b741bc58c43a41591fe
contracts/Context.sol	087642e7460910132a09facf3ed31439ca77b4fe
contracts/EightBallFinanceToken.sol	117458901a96e7c2239dbba9a51e3e27583570fe
contracts/Address.sol	044e91c6f67f68b5e9da4b71187ae9b09818d133
contracts/SafeMath.sol	d603a312feccf3aabb722526cd287f7a97f510d5
contracts/Ownable.sol	c8795dc7acf27267f86c4da8cc6df00a8939e7f0

# Metrics

## Source Lines v1.0



## Risk Level v1.0



## Capabilities

### Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	4	2	1	0

### 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	35	0

Version	External	Internal	Private	Pure	View
1.0	22	63	1	11	20

### State Variables

Version	Total	Public
1.0	18	9

### Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	^0.8.0			yes (3 asm blocks)	

Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/Create/Create2
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1.0				yes	yes	
-----	--	--	--	-----	-----	--



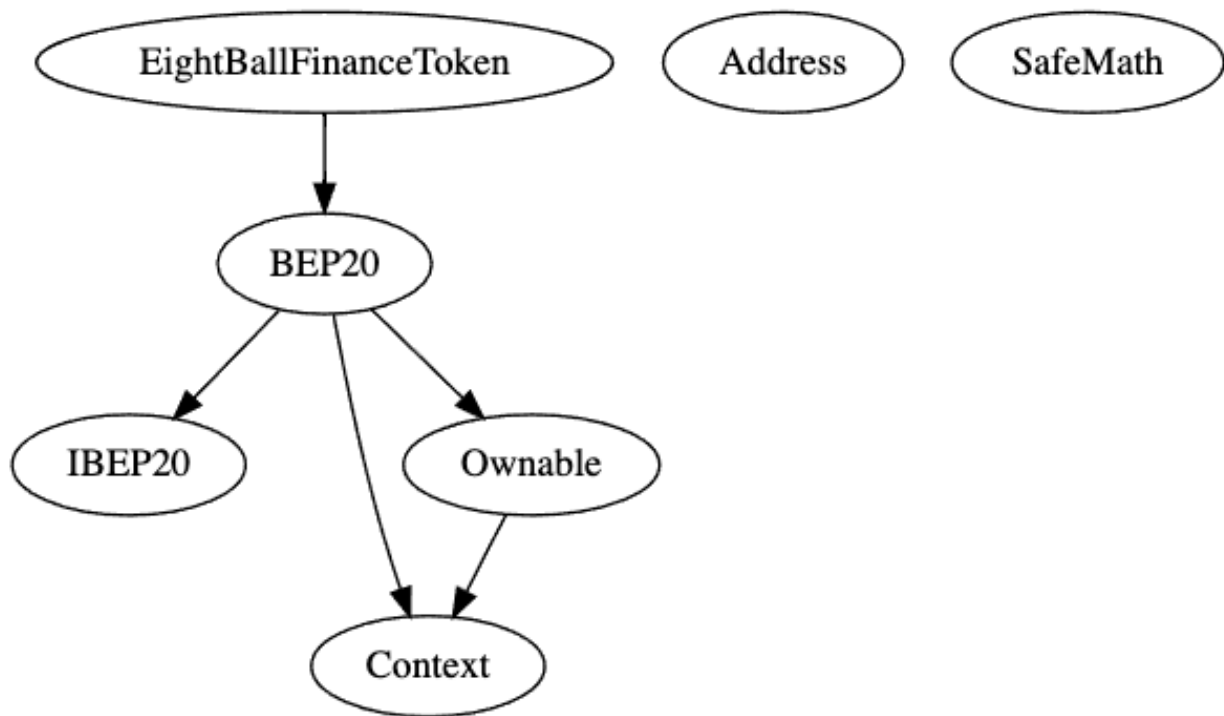
## Scope of Work

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)

## Inheritance Graph v1.0



## Verify Claims

### Correct implementation of Token standard

Tested	Verified
✓	✓

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

1. approve

2. claimRewards

3. decreaseAllowance

4. delegate

5. delegateBySig

6. increaseAllowance

7. mint

8. poolRewardsEmergencyWithdraw

9. renounceOwnership

10. setPoolRewardsWallet

11. setRewardsSignerWallet

12. transfer

13. transferFrom

14. transferOwnership

## Deployer cannot mint any new tokens

Name	Exist	Tested	Verified
Deployer cannot mint	✓	✓	✗

Max / Total Supply: 1.000.000.000

Comments:

### v1.0

- Deployer can mint token as long as total supply + minting amount is lower than max supply





## Deployer cannot burn or lock user funds

Name	Exist	Tested	Verified
Deployer cannot lock	✓	✓	✓
Deployer cannot burn	—	—	—



## Deployer cannot pause the contract

Name	Exist	Tested	Verified
Deployer cannot pause	—	—	—



## Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

### Legend

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

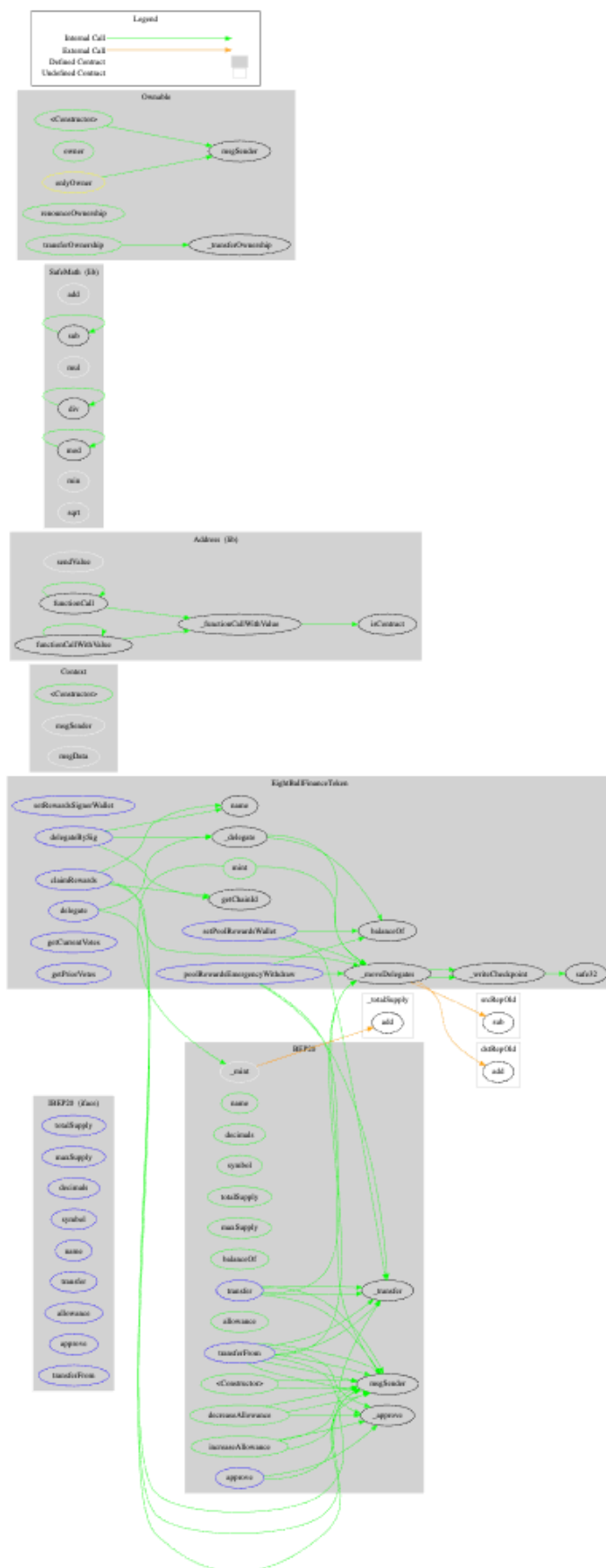
## Modifiers

- onlyOwner
  - Mint
  - setRewardsSignerWallet
  - setPoolRewardsWallet
  - poolRewardsEmergencyWithdraw

## Comments














- Deployer can set following state variables without any limitations
- Deployer can enable/disable following state variables
- Deployer can reset
  - \_rewardsSignerWallet
  - \_poolRewardsWallet
- Deployer can withdraw poolRewardsWallet balance to own balance

# CallGraph



# Source Units in Scope

## v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/IBEP20.sol	_____	1	93	34	16	63	19	_____
	contracts/BEP20.sol	1	_____	267	255	107	119	77	_____
	contracts/Context.sol	1	_____	28	28	11	14	1	_____
	contracts/EightBallFinanceToken.sol	1	_____	306	280	171	60	136	 
	contracts/Address.sol	1	_____	161	128	57	87	37	
	contracts/SafeMath.sol	1	_____	189	177	54	107	14	_____
	contracts/Ownable.sol	1	_____	68	68	30	28	24	_____
	<b>Totals</b>	<b>6</b>	<b>1</b>	<b>1112</b>	<b>970</b>	<b>446</b>	<b>478</b>	<b>308</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	All	Contract doesn't import npm packages from source (like OpenZeppelin etc.)	-	We recommend to import all packages from npm directly without flatten the contract. Functions could be modified or can be susceptible to vulnerabilities
#2	All	A floating pragma is set	3	The current pragma Solidity directive is „^0.8.0“.
#3	EightBallFinanceToken	Missing Zero Address Validation (missing-zero-check)	69, 64	Check that the address is not zero
#4	Main	State variable visibility is not set		It is best practice to set the visibility of state variables explicitly
#5	BEP20	Local variables shadowing	257, 110	Rename the local variables that shadow another component

#6	Ownable	Local functions shadowing	26	Rename the local variables that shadow another component
#7	BEP20	Tautology or contradiction	235	Fix the incorrect comparison by changing the value type or the comparison  _maxSupply cannot be lower than 0 because its type is a uint256

## Informational issues

Issue	File	Type	Line	Description
#1	EightBallFinanceToken	Comment	-	Keep continue to describe functions/variables if you already started

## Commented Code exist

There are some instances of code being commented out in the following files that should be removed:

File	Line	Comment
SafeMath	130	// assert(a == b * c + a % b); // There is no case in which this doesn't hold

## Recommendation

Remove the commented code, or address them properly.

## Audit Comments

**11. January 2022:**

- Read whole report for more information



## 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>	NOT 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>NOT 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 text is set against a dark blue background that includes a faint, stylized shield emblem. The shield has a grid-like pattern on its right side and a solid blue area on its left.

SolidProofed

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

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