



SOLIDProof
Bring trust into your projects

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

MADE IN GERMANY

Grays Currency Audit

**Security Assessment
09. March, 2023**

For



SolidProof_io



@solidproof_io

Disclaimer	3
Description	5
Project Engagement	5
Logo	5
Contract Link	5
Methodology	7
Used Code from other Frameworks/Smart Contracts (direct imports)	8
Tested Contract Files	9
Source Lines	10
Risk Level	10
Capabilities	11
Inheritance Graph	12
CallGraph	13
Scope of Work/Verify Claims	14
Modifiers and public functions	24
Source Units in Scope	26
Critical issues	27
High issues	27
Medium issues	27
Low issues	27
Informational issues	27
Audit Comments	28
SWC Attacks	29

Disclaimer

SolidProof.io reports are not, nor should be considered, an “endorsement” or “disapproval” of any particular project or team. These reports are not, nor should be considered, an indication of the economics or value of any “product” or “asset” created by any team. SolidProof.io do not cover testing or auditing the integration with external contract or services (such as Unicrypt, Uniswap, PancakeSwap etc’...)

SolidProof.io Audits do not provide any warranty or guarantee regarding the absolute bug- free nature of the technology analyzed, nor do they provide any indication of the technology proprietors. SolidProof Audits should not be used in any way to make decisions around investment or involvement with any particular project. These reports in no way provide investment advice, nor should be leveraged as investment advice of any sort.

SolidProof.io Reports represent an extensive auditing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology. Blockchain technology and cryptographic assets present a high level of ongoing risk. SolidProof’s position is that each company and individual are responsible for their own due diligence and continuous security. SolidProof in no way claims any guarantee of security or functionality of the technology we agree to analyze.

Version	Date	Description
1.0	29. January 2023	<ul style="list-style-type: none">• Layout project• Automated- /Manual-Security Testing• Summary
1.1	8. March 2023	<ul style="list-style-type: none">• Audit

Network

Ethereum

Website

<https://stalwart-bublanina-88c064.netlify.app/>

Telegram

<https://t.co/j8pWvlxZeU>

Twitter

<https://twitter.com/TGCERC20>



Description

The Grays have been watching and waiting, and they have finally awarded us the currency of the universe, The Grays Currency. (TGC). TGC is a renounced, immutable, deflationary ERC-20 Cryptocurrency designed to provide holders and stakers with rewards to generate passive income. When staked you also will be able to participate in a DAO. (Proposal/ Voting will be geared towards but not limited to future marketing and branding of TGC.

Project Engagement

During the Date of 29 January 2023, **Grays Currency 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

- Token: <https://goerli.etherscan.io/address/0x4DEbbeCf94C55A277BDdc7C05a6353e96A24510C#code>
- Staking: <https://goerli.etherscan.io/address/0x308e61958cb246a9ff4d898d2673d8b7cbaed177#code>
- Governance: <https://goerli.etherscan.io/address/0x00f92a894694fbe6551387796bb874cdb7674104#code>

v1.1

- Token: <https://goerli.etherscan.io/address/0x5B84097bA70EAF1E664F34a409973cA7612524BB#code>
- Staking: <https://goerli.etherscan.io/address/0x84A64678173111C7306C7E8D3E6275134E87C2Db#code>
- Governance: <https://goerli.etherscan.io/address/0xF5ab352E72cc0c2C0B71Eb424A9c48Bf2F1eFe70#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)
Critical	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.
High	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.
Medium	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.
Low	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.
Informational	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:

Dependency / Import Path	Count
@openzeppelin/contracts/access/Ownable.sol	1
@openzeppelin/contracts/token/ERC20/ERC20.sol	1
@openzeppelin/contracts/token/ERC20/utils/SafeERC20.sol	2
@openzeppelin/contracts/utils/math/SafeMath.sol	1

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/ Governance.sol	f0d220c2cd050ed7a1324119d4ec640d675ee e0a
contracts/ TGCStaking.sol	fec6c2d9a60e2ea7d7f2ba00a940eea02fb57 1ad
contracts/TGC.sol	240beeb003a1ec5faa82f5c9c12a999d0db84 799

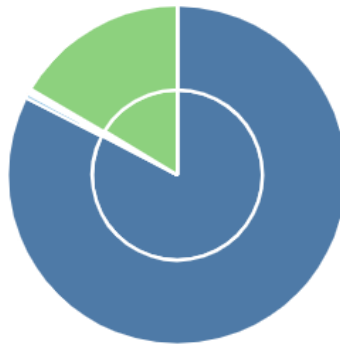
v1.1

File Name	SHA-1 Hash
contracts/ Governance.sol	c37649a110b1fff406ec781b0d91000cfa2f2e3 1
contracts/ TGCStaking.sol	77b2fc03993c4184a7515b7b96e8684564ec2 4dc
contracts/TGC.sol	bc1b16c5c6a1c06050acb757610227978694 7903

Metrics

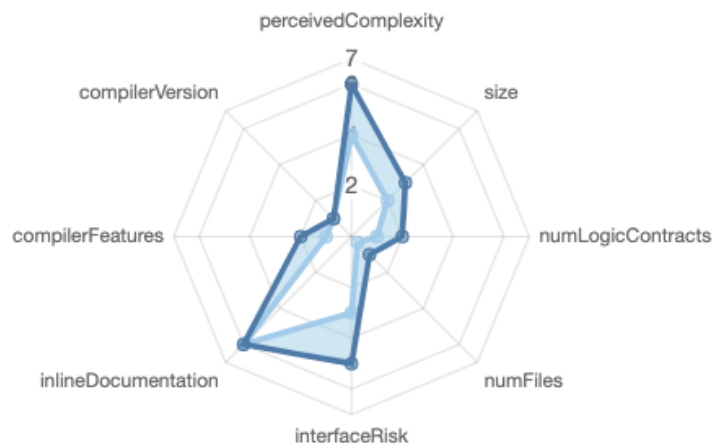
Source Lines v1.1

source comment single block mixed
empty todo blockEmpty



Risk Level v1.1

overall average



Capabilities

Components

 Contracts	 Libraries	 Interfaces	 Abstract
4	0	6	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.





 Public	 Payable
62	1

External	Internal	Private	Pure	View
44	82	30	4	21

StateVariables

Total	 Public
67	56

Capabilities

Solidity Versions observed	 Experimental Features	 Can Receive Funds	 Uses Assembly	 Has Destroyable Contracts
0.8.2		yes		

 Transfers ETH	 Low-Level Calls	 DelegateCall	 Uses Hash Functions	 ECRecover	 New/Create/Create2
yes					yes → NewContract:LiquidityProvider

 TryCatch	 Unchecked

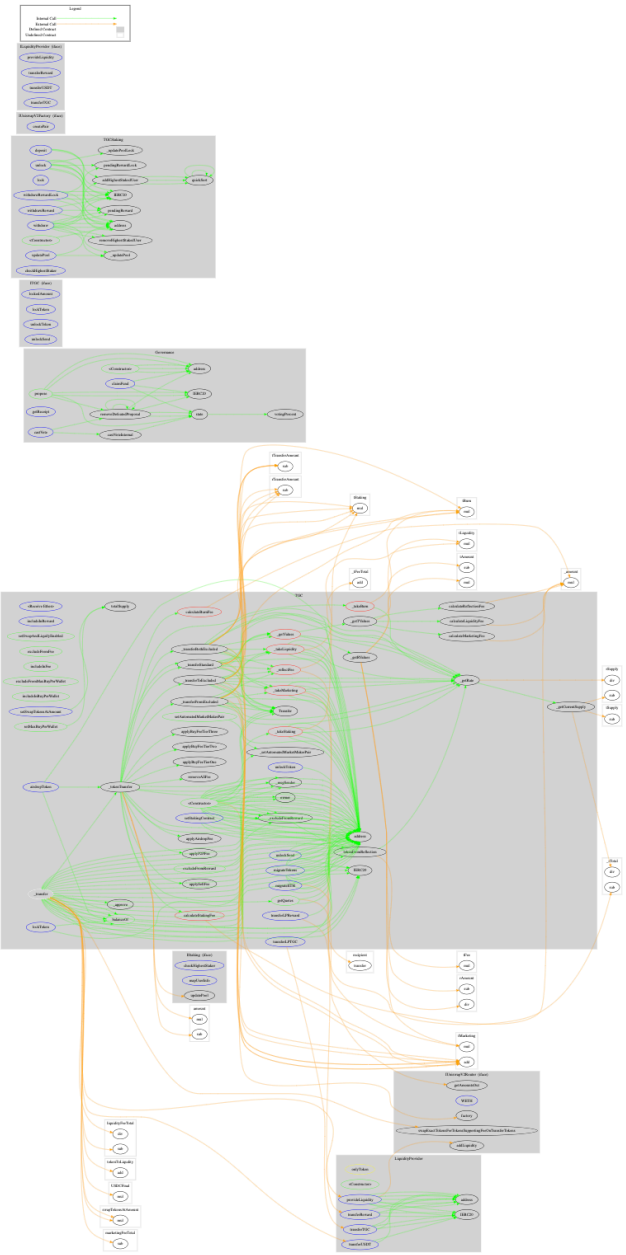
Inheritance Graph

v1.1



CallGraph

v1.1



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. Is contract an upgradeable
2. Correct implementation of Token standard
3. Deployer cannot mint any new tokens
4. Deployer cannot burn or lock user funds
5. Deployer cannot pause the contract
6. Deployer cannot set fees
7. Deployer cannot blacklist/antisnipe addresses
8. Overall checkup (Smart Contract Security)

Is contract an upgradeable

Name	
Is contract an upgradeable?	No



Correct implementation of Token standard

ERC20				
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 v1.1

1. deposit (0xb6b55f25)

2. lock (0x1338736f)

3. unlock (0x5d36598f)

4. updatePool (0x51eb05a6)

5. withdraw (0x2e1a7d4d)

6. withdrawReward (0xc885bc58)

7. withdrawRewardLock (0xb1fa319a)

1. castVote (0x2c0a3f89)

2. claimFund (0x31c7364f)

3. propose (0xd4f6b5ec)

4. removeDefeatedProposal (0x41a5b0d6)

1. airdropToken (0x57afa4c7)

2. approve (0x095ea7b3)

3. decreaseAllowance (0xa457c2d7)

4. excludeFromFee (0x437823ec)

5. excludeFromMaxBuyPerWallet (0xe87055ef)

6. excludeFromReward (0x52390c02)

7. includeInBuyPerWallet (0x83bc98d9)

8. includeInFee (0xea2f0b37)

9. includeInReward (0x3685d419)

10. increaseAllowance (0x39509351)

11. lockToken (0xcec1460b)

12. migrateETH (0x74da7cd8)

13. migrateTokens (0x957537f9)

14. renounceOwnership (0x715018a6)

15. setAutomatedMarketMakerPair (0x9a7a23d6)

16. setMaxBuyPerWallet (0x5214f6e1)

17. setStakingContract (0x9dd373b9)

18. setSwapAndLiquifyEnabled (0xc49b9a80)

19. setSwapTokensAtAmount (0xaf4f3b2)

20. transfer (0xa9059cbb)

21. transferFrom (0x23b872dd)

22. transferLPReward (0x14d1034c)

23. transferLPTGC (0x1b7c68e8)

24. transferOwnership (0xf2fde38b)

25. unlockSend (0x82f2a18a)

26. unlockToken (0x7326afe0)

Deployer cannot mint any new tokens

Name	Exist	Tested	Status
Deployer cannot mint	—	—	—
Max / Total Supply	N/A		



Deployer cannot burn or lock user funds

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

Comments:

v1.0

- Owner can lock user funds by
 - The owner is able to lock the TGC token by setting the max buy per wallet amount to 0
- Tokens
 - will be burned automatically when the user will unlock their tokens from the staking contract, and the burn amount will be decided according to the locking period.

Deployer cannot pause the contract

Name	Exist	Tested	Status
Deployer cannot pause	—	—	—



Deployer cannot set fees

Name	Exist	Tested	Status
Deployer cannot set fees over 25%	✓	✓	✓
Deployer cannot set fees to nearly 100% or to 100%	✓	✓	✓

Comments:

v1.0

- The owner cannot set the unlock fee as it is constant in the staking contract

Deployer can blacklist/antisnipe addresses

Name	Exist	Tested	Status
Deployer cannot blacklist/antisnipe addresses	—	—	—



Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

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

Modifiers and public functions

v1.1

TGCStaking.sol

```
deposit
lock
unlock
withdrawReward
withdrawRewardLock
withdraw
updatePool
```

Governance.sol

```
◆ propose
◆ removeDefeatedProposal
◆ castVote
◆ claimFund
```

TGC.sol

```
◆ excludeFromReward
Ⓜ onlyOwner
◆ includeInReward
Ⓜ onlyOwner
◆ setSwapAndLiquifyEnabled
Ⓜ onlyOwner
◆ setAutomatedMarketMakerPair
Ⓜ onlyOwner
◆ excludeFromFee
Ⓜ onlyOwner
◆ includeInFee
Ⓜ onlyOwner
◆ excludeFromMaxBuyPerWallet
Ⓜ onlyOwner
◆ includeInBuyPerWallet
Ⓜ onlyOwner
◆ setStakingContract
Ⓜ onlyOwner
◆ setSwapTokensAtAmount
Ⓜ onlyOwner
◆ setMaxBuyPerWallet
Ⓜ onlyOwner
◆ lockToken
◆ unlockToken
◆ unlockSend
◆ airdropToken
◆ migrateTokens
◆ migrateETH
◆ transferLPReward
◆ transferLPTGC
```


Ownership Privileges:

- Deployer can set following state variables
 - TGC
 - swapTokensAtAmount (not more than the total supply but can be really small number including zero)
 - maxBuyPerWallet (can be zero)
- Deployer can enable/disable following state variables
 - TGC
 - _isExcludedFromReward
 - _excluded
 - swapAndLiquifyEnabled
 - _automatedMarketMakerPairs
 - _isExcludedFromFee
 - _isExcludedFromMaxBuyPerWallet
 - _isExcludedFromMaxBuyPerWallet
- Deployer can set following addresses
 - TGC
 - stakingContract (but only once)
 -
- Existing Modifiers
 - TGC
 - onlyOwner
- TGC
 - Marketing Wallet is able to
 - transfer the USDC tokens (that are holding by the liquidityProvider) to the any address
 - Transfer the contract native token balance to an arbitrary address with the migrateETH balance
 - Transfer any tokens to an arbitrary address that the contract holds

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

Source Units in Scope

v1.1

File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score
contracts/Governance.sol	1	1	185	181	151	1	89
contracts/TGCStaking.sol	1	1	473	467	412	1	202
contracts/TGC.sol	2	4	812	793	650	1	644
Totals	4	6	1470	1441	1213	3	935

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalised lines of the source unit (e.g. normalises functions spanning multiple lines)
nSLOC	normalised 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

Critical issues

No critical issues

High issues

No high issues

Medium issues

Issue	File	Type	Line	Description
#1	TGC.sol	Owner can drain tokens	778	<p>The marketing wallet is able to transfer any tokens from the contract's balance including the native ones. Just only if the contract itself holds some tokens.</p> <p>The liquidity will be added to the contract address. The owner is able to drain out the liquidity balance and the marketing balance.</p>

Low issues

Issue	File	Type	Line	Description
#1	TGC.sol	marketingFee/liquidityFee	—	If marketing-/liquidityfee are 0 the transfer will be reverted in L556/L561 because the contract will lead in an underflow which will be reverted automatically by pragma version above 0.8.x
#2	TGC.sol	Missing Zero Address validation	252-281	Check that the passed address is not zero

Informational issues

Issue	File	Type	Line	Description
-------	------	------	------	-------------

#1	All	NatSpec documentation missing	-	If you started to comment your code, also comment all other functions, variables etc.
----	-----	-------------------------------	---	---

Audit Comments

We recommend you to use the special form of comments (NatSpec Format, Follow link for more information <https://docs.soliditylang.org/en/latest/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.

09. March 2023:

- There is still an owner (Owner still has not renounced ownership)
- Read whole report and modifiers section for more information

SWC Attacks

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

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

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

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

*Solid
Proofed*

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


MADE IN GERMANY