Writing Smart Contracts
14 Security

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Supported by the Algorand Foundation

Elements of security

1. Mindset
2. Organizational
3. Physical

Your passphrase (2)

Irreversible transactions (!)

You may loose . . .

- Assets (tokens, NFTs)
- Voting rights / control over organization
- Identity, home . . .

Dangers

1. Loss (loose, forget, become incapacitated)
2. Theft (physical, cyber)
3. Robbery
4. Destruction (fire, water, . . .)

Considerations

- Cost vs. maximal damage
- Useful: mindset of data backup

Your passphrase (2)

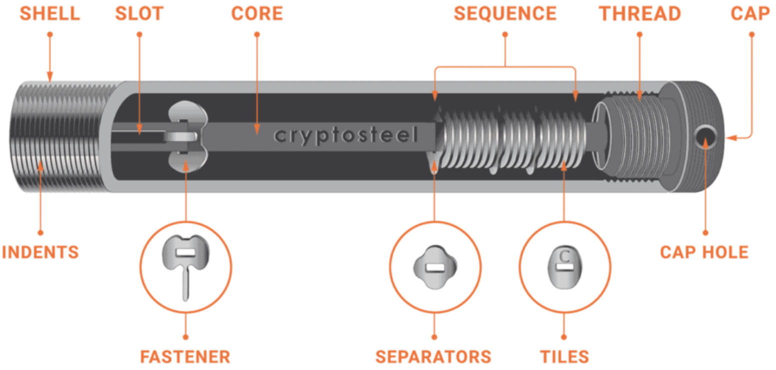
Don't

- Digital cop<u>ies</u> (backups, hacks, . . .)
- Especially in the cloud (no google docs, dropbox)
- Store credentials in code (Github)
- Leave credentials in old hardware (phone, SSD, laptop)

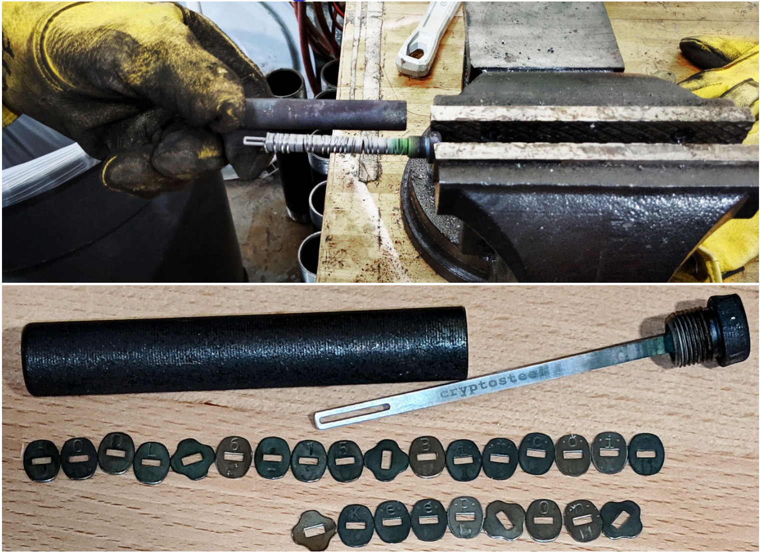
Do

- Store passphrase, not private key
- Keep small wallet online and large wallet offline ("cold")
- Physical storage of passphrase
  - Limited durability of paper storage (paper, ink, lamination)
  - Alternative materials (stone, metal), e.g. Cryptosteel
- Split passphrase in two
- Consider multisig
- Consider including passphrase in your will
- Regularly verify cold storage

Cryptosteel



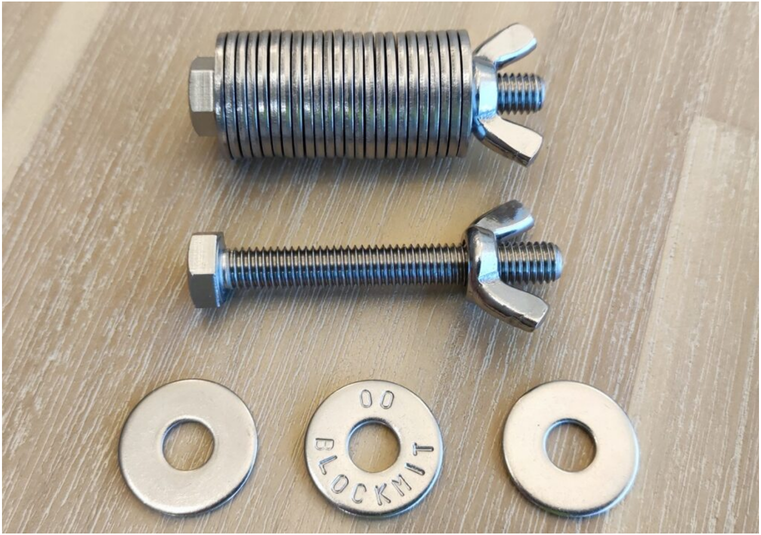
Cryptosteel after burning



Source:

https://medium.com/@cryptosteel/independent-heat-test-of-the-cryptosteel-capsule-e9de0c3ea534

Home-made cryptosteel



Source: https://blockmit.com/english/guides/diy/make-cold-wallet-washers/

Credentials in the code

Don't

- Store credentials in main code
  - Problem 1: loss/theft (Github etc)
  - Problem 2: updates

Do (depending on security requirements)

- Store in separate `.key` file, use `gitignore`
- Enter directly into code
- Use system variable (in the RAM)
- Connect to wallet app in browser
- Connect to phone wallet via QR code

  `https://algorand.github.io/walletconnect-example-dapp/`