

Note

subject: Fire test StoreYour Key
date: 21 December 2022
reference: CD/PI//C 2119-2E-NO-001
from: P. Imminkhuizen BSc
to: StoreYourKey

1 Introduction

Various storage media, such as online or on paper, can be used to protect data (e.g. a master key/seed phrase). StoreYourKey supplies stainless steel plates which letters and numbers can be punched into. In this way, a master key/seed phrase can be stored securely. High temperatures can be involved in a house fire. These high temperatures can affect the readability of the punched letters and numbers.

On behalf of StoreYourKey, a test was performed to investigate the readability of punched letters and numbers in stainless steel plates after exposure to high temperatures. For this purpose, the stainless steel plates were heated in an oven, after which the degree of readability of the letters was assessed.

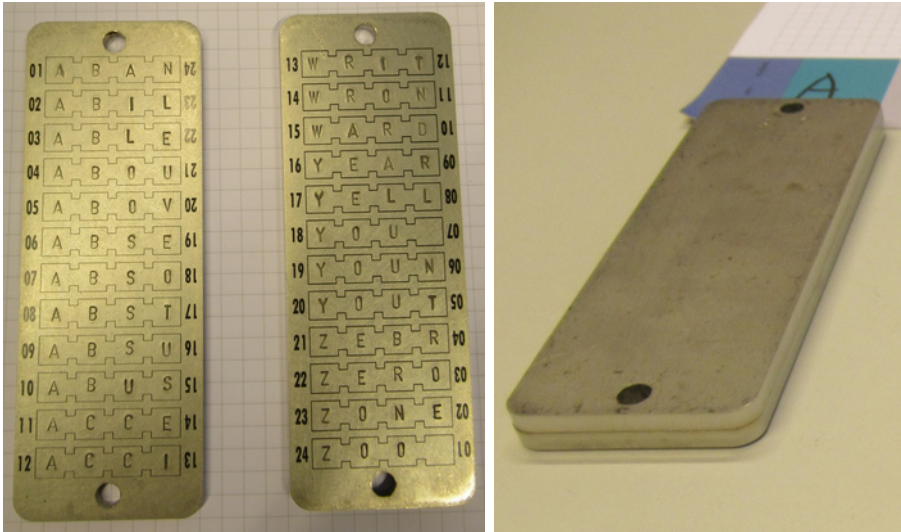
2 Test description

2.1 Samples

StoreYourKey uses stainless steel plates with a thickness of 4 mm. Using a hammer and an impact letter holder, the letters and numbers are punched into these stainless steel plates. The stainless steel plates are used in a set of two. Once the letters and numbers have been punched in, the two plates are attached to each other using stainless steel screws.

In consultation with the client, the two stainless steel plates were attached to each other with the letters facing to the inside. This method is prescribed as the correct method of fixing the stainless steel plates to each other by StoreYourKey. Figure 2.1 shows the tested samples. The letters in the stainless steel plates are punched in by the client.

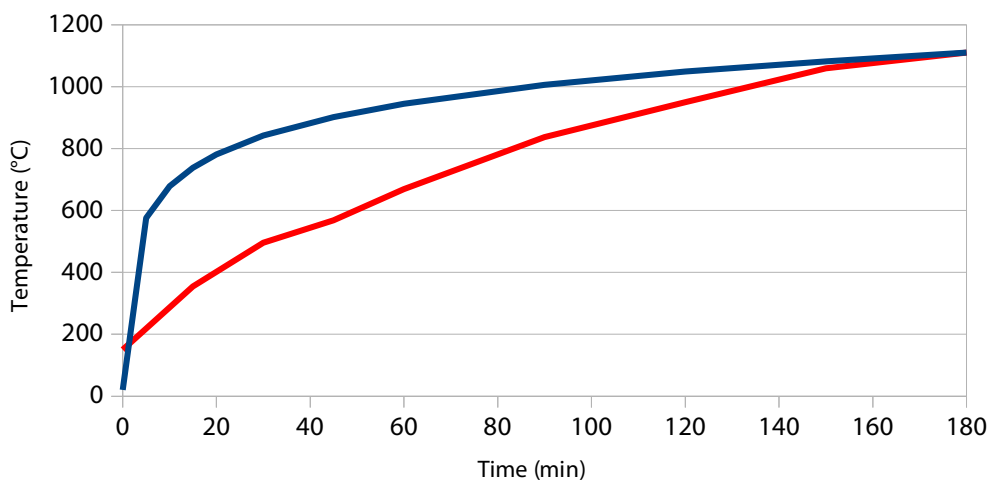
f2.1 Tested samples



2.2 Test setup

A ceramic oven type KMK 30-2 was used to simulate the temperatures of a house fire. When testing the fire resistance of a construction, the standard fire curve is used. This curve is defined in the standard EN 1363-1. The standard fire curve is shown in figure 2.2 by the blue line. During the test of StoreYourKey, this standard fire curve was followed as closely as possible. The temperature curve during the test is shown by the red line in figure 2.2.

f2.2 Temperature curve according to standard fire resistance curve (blue) and during test StoreYourKey (red)

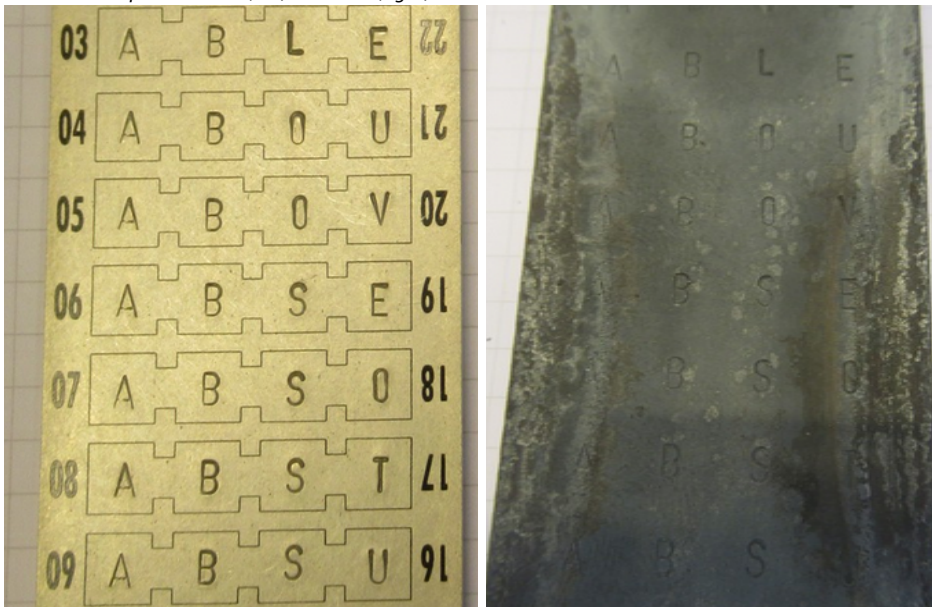


After 180 minutes, the oven was switched off, causing a temperature drop inside the oven. Forty-five minutes later (225 minutes after the start of the test), the oven door was left ajar. This caused the temperature to drop from about 780 °C to about 480 °C in 15 minutes. About 240 minutes after the start of the test, the samples were removed from the oven and cooled using water.

2.3 Observations

After cooling, the stainless steel plates were observed and photographed to assess the readability of the letters. Appendix 1 includes overview photos of the stainless steel plates before and after heating. Detailed photographs of the samples are shown below.

f2.3 Stainless steel plates before (left) and after (right) the test



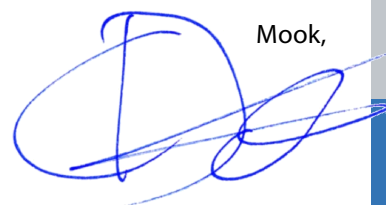
The photos show that the letters in the stainless steel plates are still readable after the test. The standard row numbering is no longer readable.

3 Conclusion

On behalf of StoreYourKey a test was performed to investigate the influence of a house fire on the readability of letters and numbers punched in stainless steel plates. For this purpose, the stainless steel plates were heated in a ceramic oven, following the standard fire curve as closely as possible.

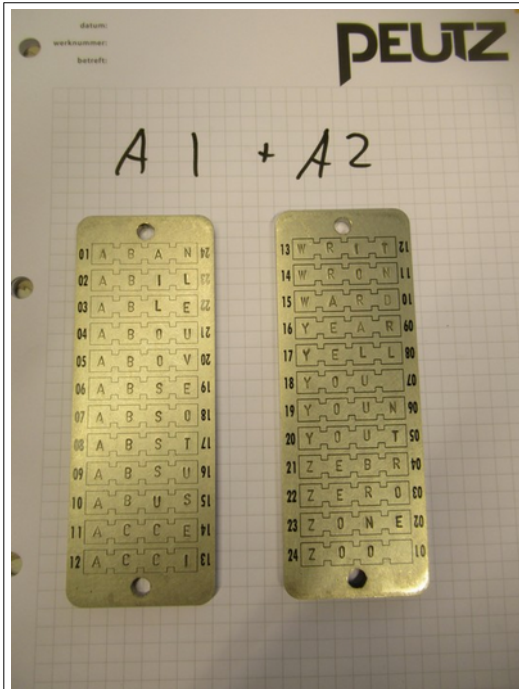
The results show that the punched letters are still readable after heating in the oven. The two stainless steel plates were attached to each other with the letters facing to the inside. This method of attachment is prescribed by StoreYourKey.

This note contains 3 pages and 1 appendix

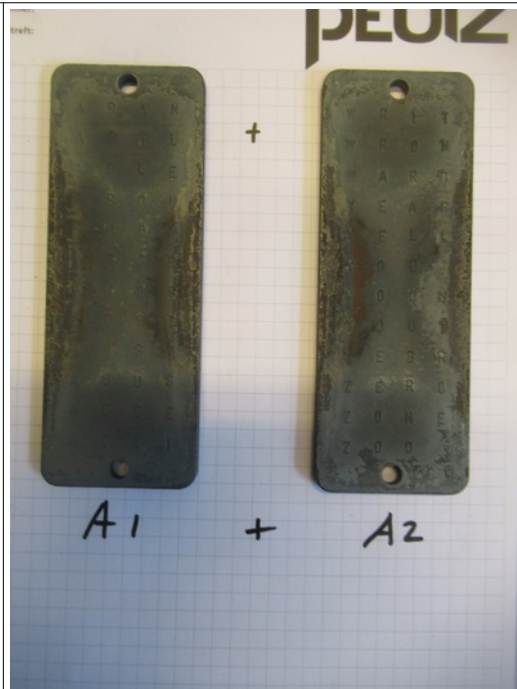
Mook,


Bijlage 1

Photographs



Stainless steel plates before test



Stainless steel plates after test



Stainless steel plates in oven before test



Stainless steel plates in oven after test