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## Data in Brief

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## Data Article

## Data on temperature-time curves measured at chimney-roof penetration



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## ABSTRACT

Data on temperature-time curves measured at chimney-roof penetration are reported here. The tests were performed in different configurations in order to reproduce all the possible conditions in which a chimney may operate. To do this, a chimney was installed in a corner test structure and in an axi-symmetric test structure, and in three roofs of different thickness, thermal resistance, and layers position. The space between chimney and roof was left open, sealed with metal sheets, sealed with insulating panels, and filled of insulating material respectively.

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## Specifications Table

Subject area	<i>Engineering</i>
More specific subject area	<i>Fire safety</i>
Type of data	<i>Graphs and tables.</i>
How data was acquired	<i>Temperatures were measured with thermocouples of K type and a data acquisition system.</i>
Data format	<i>Raw data.</i>
Experimental factors	<i>The experimental factors are: position of the chimney in the roof, roof thickness, roof thermal resistance, roof layers position, clearance sealing mode.</i>

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Experimental features	Exhaust gas was fed into a chimney at a constant temperature, and roof temperature in the vicinity of the chimney was measured.
Data source location	ANFUS laboratory of Brescia (Italy)
Data accessibility	Data are available with this article

## Value of the data

- Data can be used to assess the variables affecting heat transfer at chimney roof penetration.
- Data can be used to define a new chimney certification procedure.
- Temperature-time curves can be used to define methods for estimating steady temperatures at chimney-roof penetration.
- Data can be used as benchmark when testing devices for limiting the temperature at chimney-roof penetration.

## 1. Data

Data presented in this paper support for previous works [1–13] on heat transfer at chimney-roof penetration. The data (Figs. 1–24 and Supplementary tables) are the temperature-time curves measured at chimney-roof penetration on varying the test structure used to test chimneys (1); the characteristics of the roof (2); the way of sealing the clearance between chimney and roof (3). Temperatures are also reported in the form of tables.

## 2. Experimental design, materials, and methods

In the experimental campaign extensively described in [1–5], a chimney of 200 mm in diameter was installed in a corner test structure (C) and in an axi-symmetric test structure (A) respectively. The test structures described in [1,4] are both made of an interchangeable roof. The three roofs (R1, R2, R3) installed in the experimental tests are described in [1]. As illustrated in [1–5], the clearance between chimney and roof was left open (*op*), sealed at the top and at the bottom with metal sheets (*ms*), sealed at the top and at the bottom with insulating panels (*ad*), and filled of insulating materials (*fi*) respectively.

In the tests, hot gas at a predetermined temperature (calculated as the average of the temperatures  $T_{gas2}$  and  $T_{gas3}$  measured in the vicinity of the roof) was fed into the chimney until the achievement of the test final condition. The test final condition is defined as an increase in the flammable materials temperature lower than 2 °C in 30 minutes, or after 8 hours; however, some tests were stopped before the achievement of the test final condition. Flammable material temperatures, ambient temperature ( $T_{env}$ ) and exhaust gas temperatures ( $T_{gas2}$  and  $T_{gas3}$ ) were measured according to the schemes

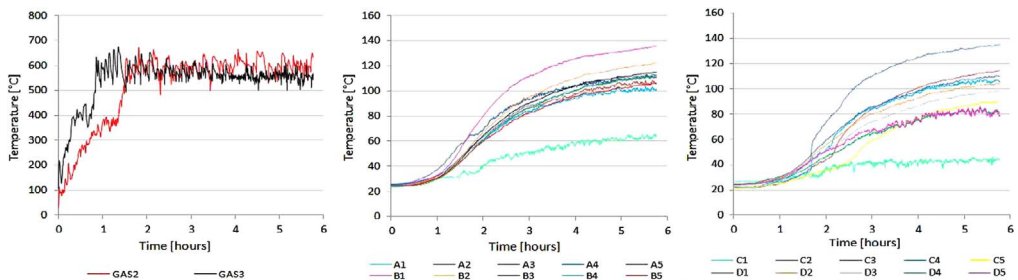


Fig. 1. Temperature-time curves measured in the C-R1op test.

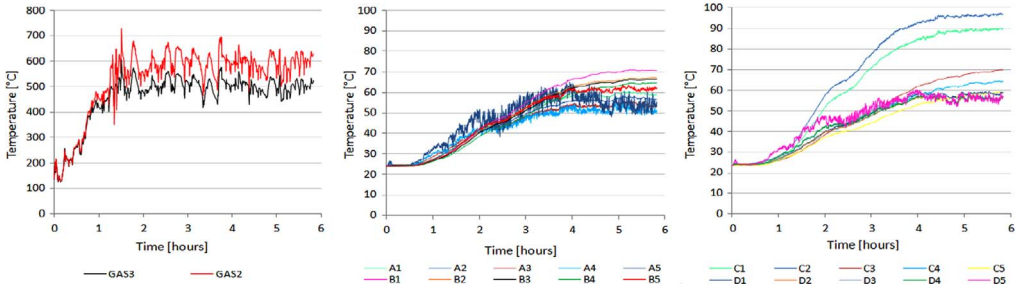


Fig. 2. Temperature-time curves measured in the C-R1ms test.

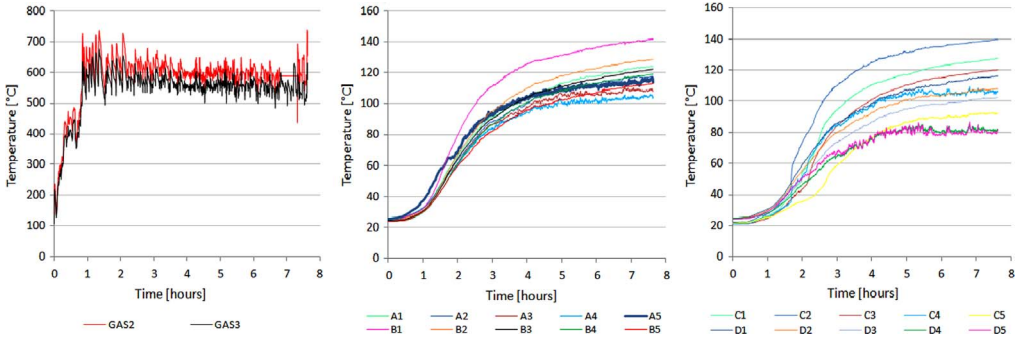


Fig. 3. Temperature-time curves measured in the C-R1ad test.

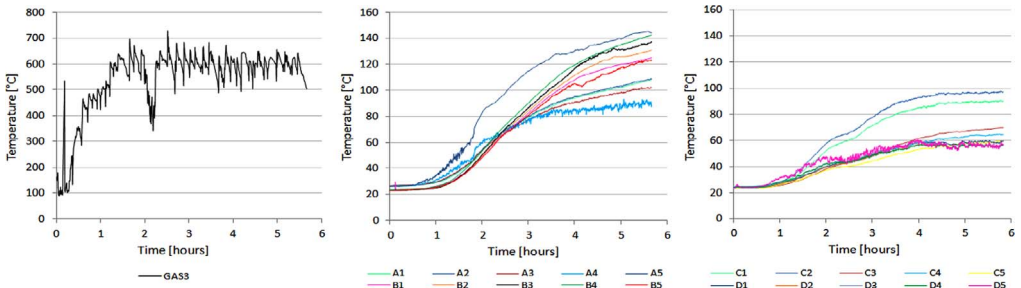


Fig. 4. Temperature-time curves measured in the C-R1fi test.

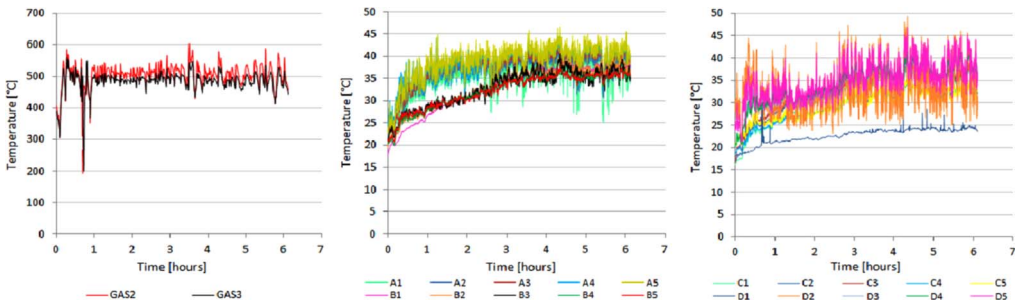


Fig. 5. Temperature-time curves measured in the C-R2op test.

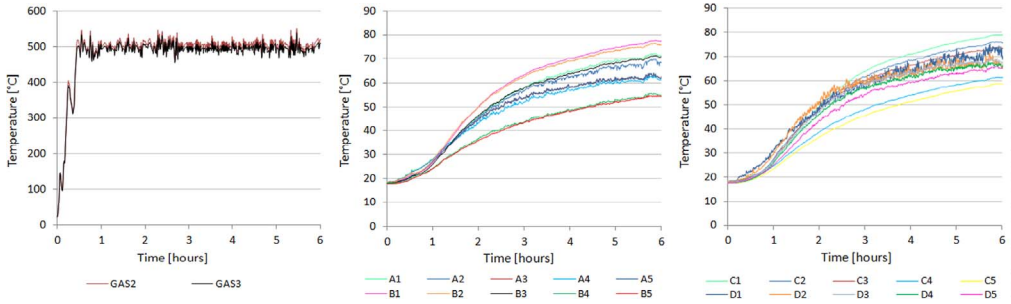


Fig. 6. Temperature-time curves measured in the C-R2ms test.

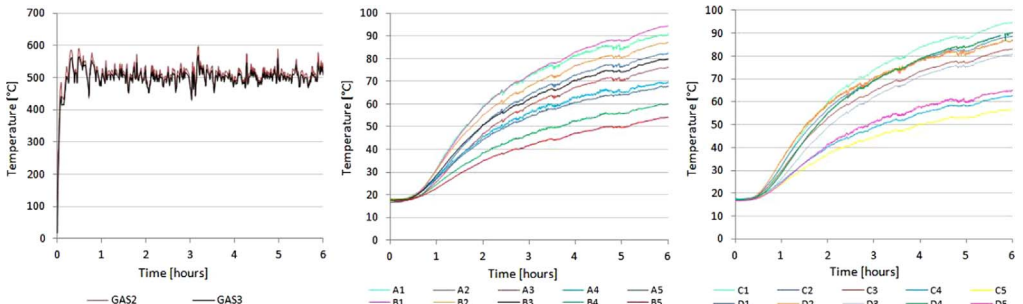


Fig. 7. Temperature-time curves measured in the C-R2ad test.

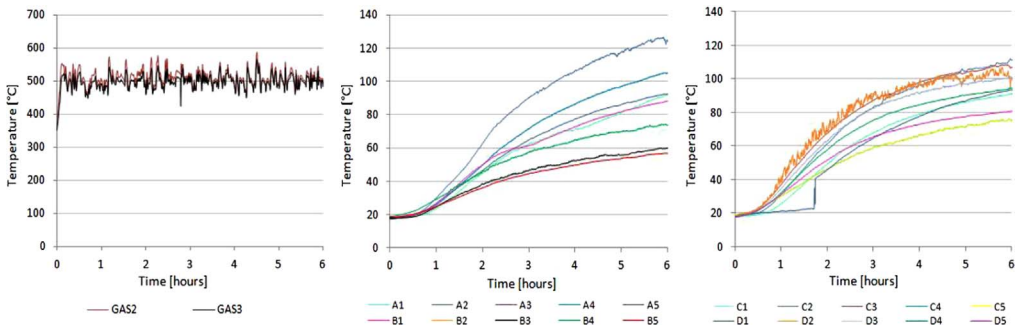


Fig. 8. Temperature-time curves measured in the C-R2fi test.

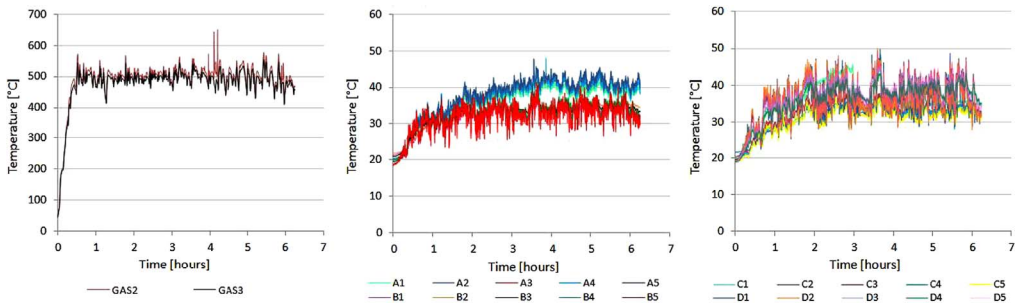


Fig. 9. Temperature-time curves measured in the C-R3op test.

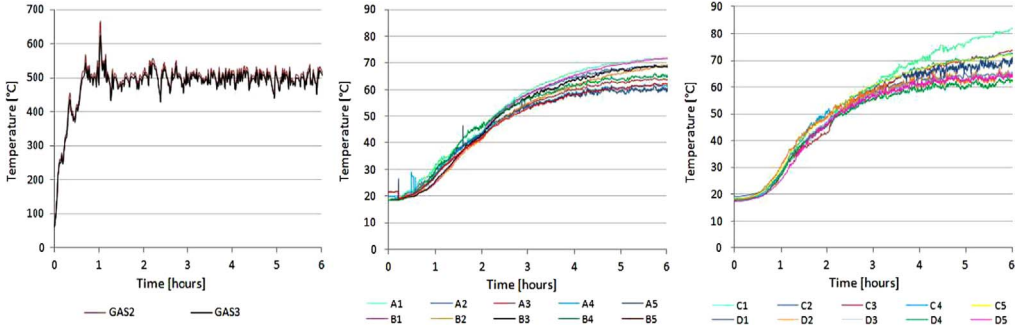


Fig. 10. Temperature-time curves measured in the C-R3ms test.

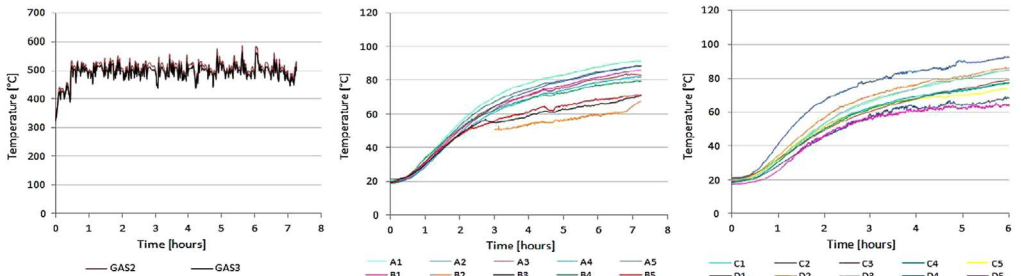


Fig. 11. Temperature-time curves measured in the C-R3ad test.

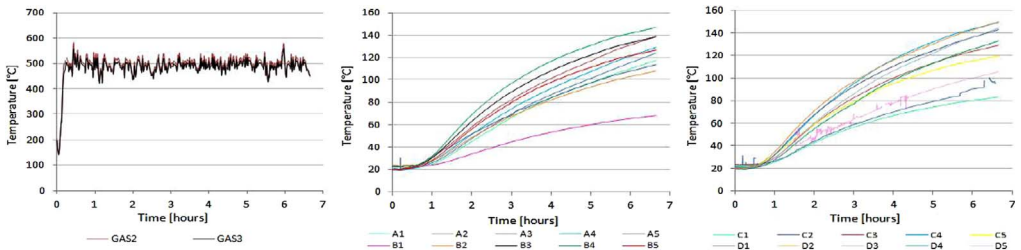


Fig. 12. Temperature-time curves measured in the C-R3fi test.

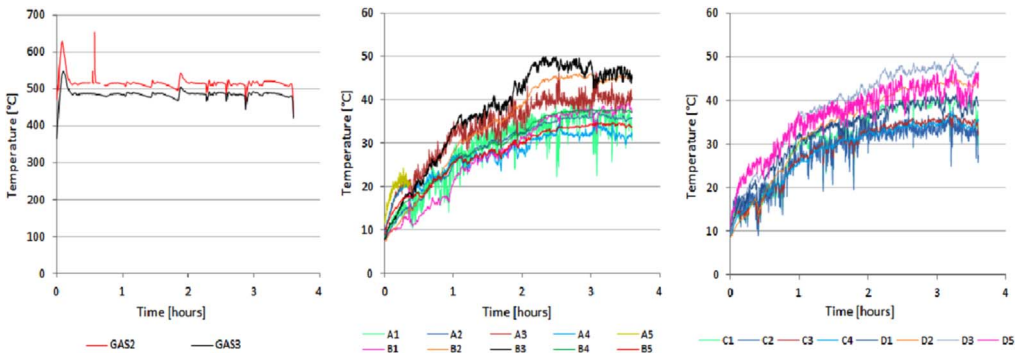


Fig. 13. Temperature-time curves measured in the A-R10p test.

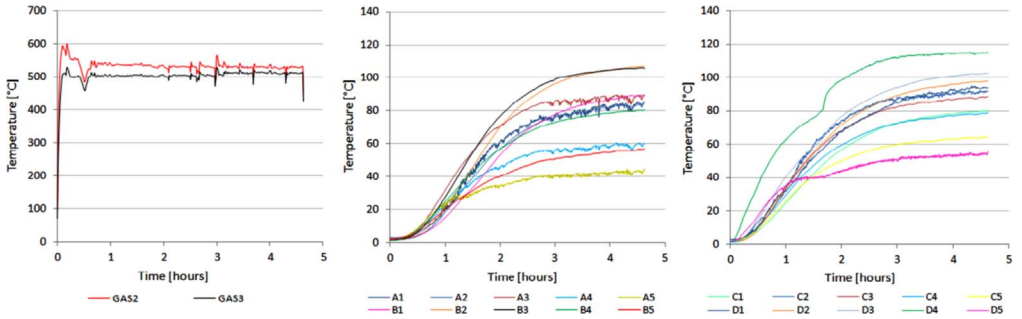


Fig. 14. Temperature-time curves measured in the A-R1ms test.

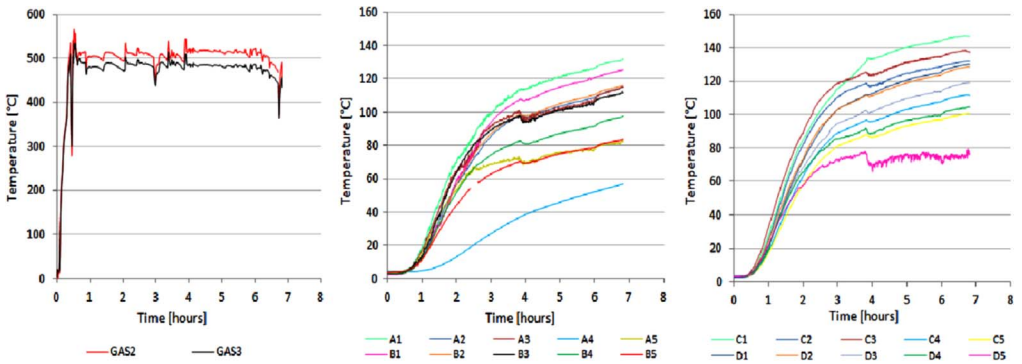


Fig. 15. Temperature-time curves measured in the A-R1ad test.

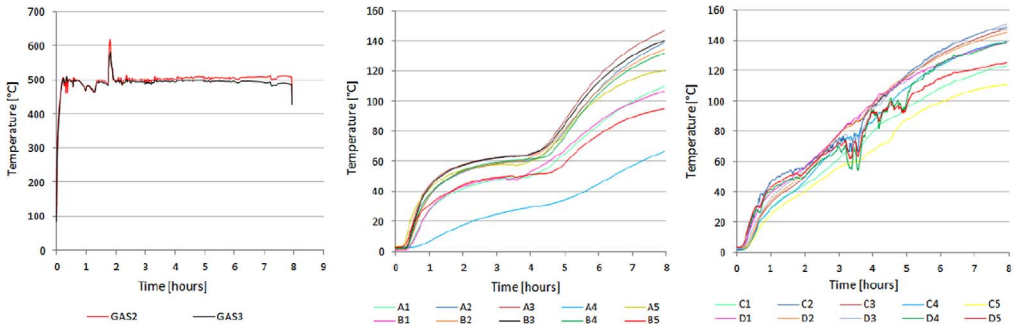


Fig. 16. Temperature-time curves measured in the A-R1fi test.

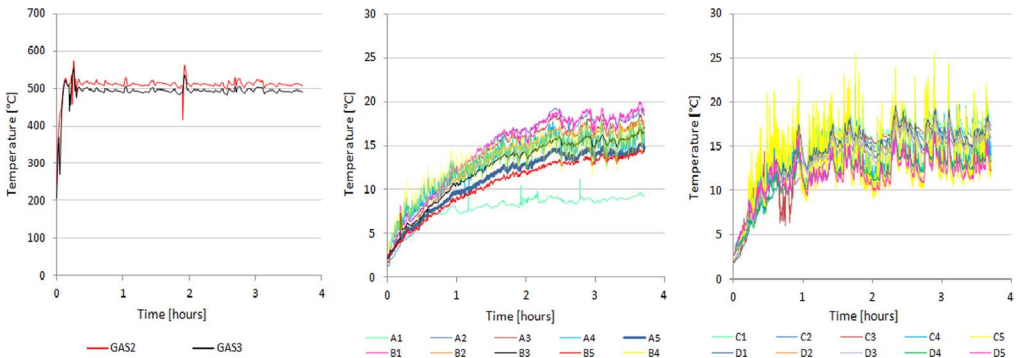


Fig. 17. Temperature-time curves measured in the A-R2op test.

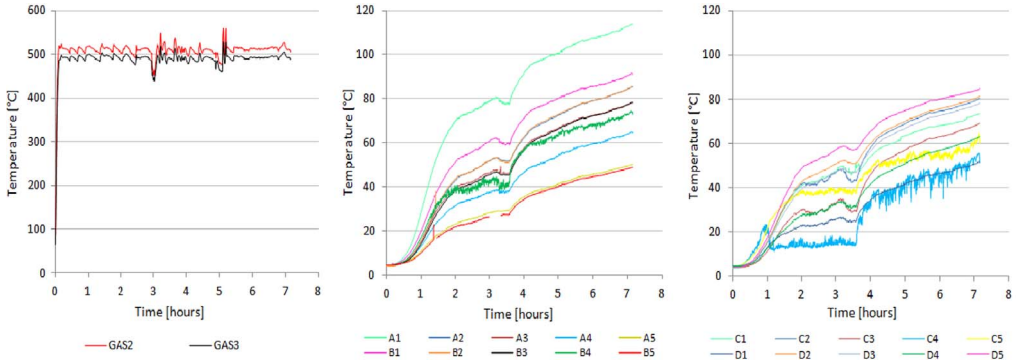


Fig. 18. Temperature-time curves measured in the A-R2ms test.

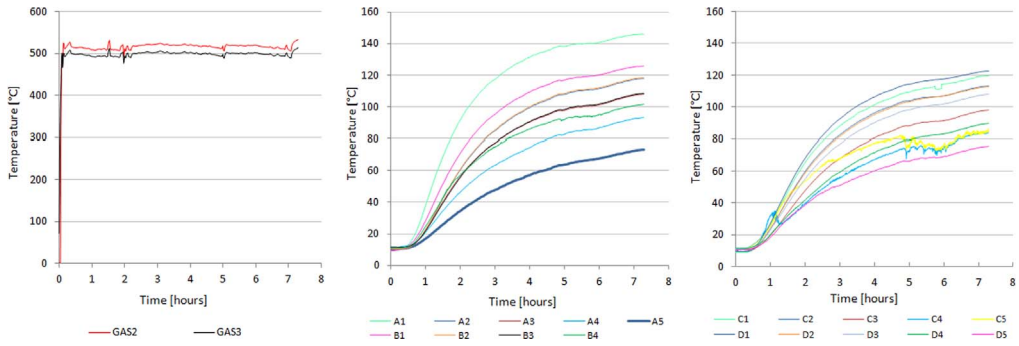


Fig. 19. Temperature-time curves measured in the A-R2ad test.

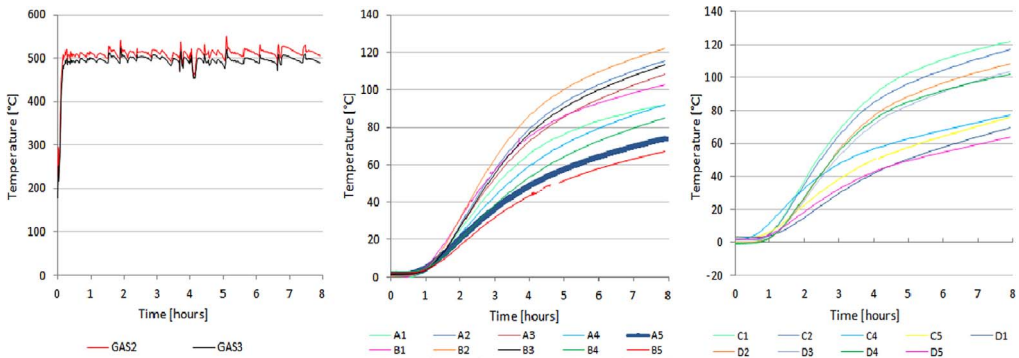


Fig. 20. Temperature-time curves measured in the A-R2fi test.

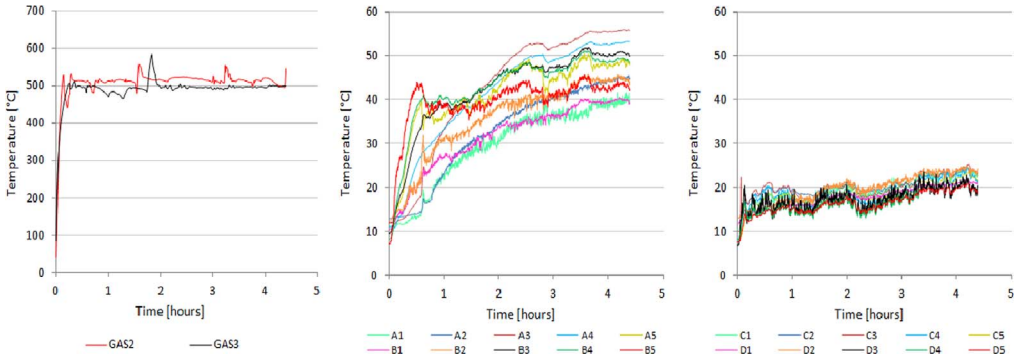


Fig. 21. Temperature-time curves measured in the A-R3op test.

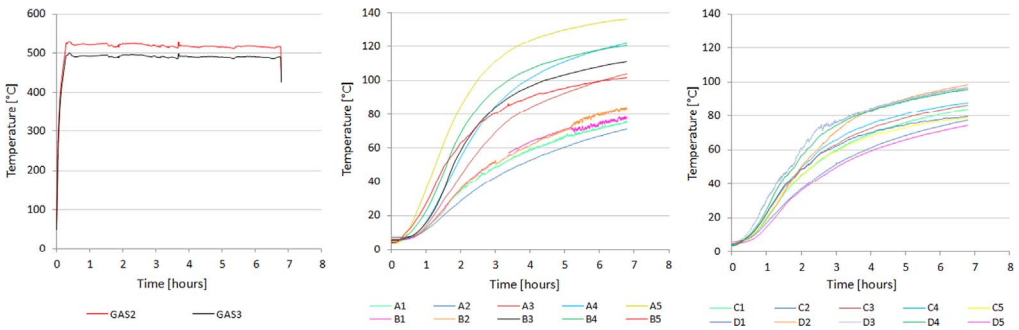


Fig. 22. Temperature-time curves measured in the A-R3ms test.

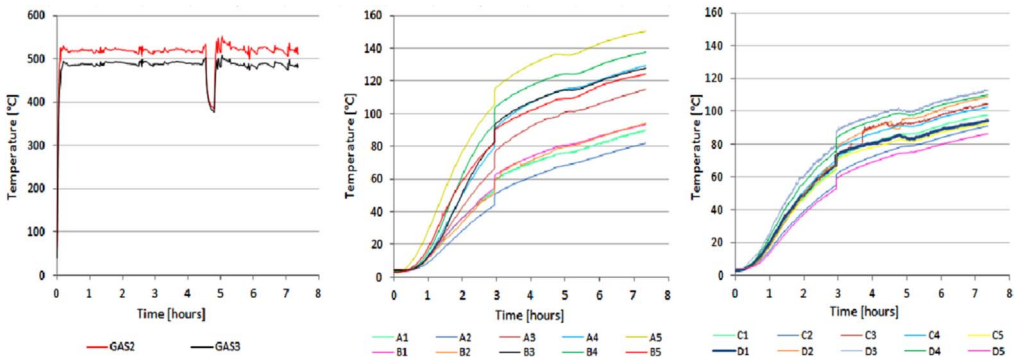


Fig. 23. Temperature-time curves measured in the A-R3ad test.

reported in [1,4], and they were measured every 10 seconds by thermocouples of K type connected to a data acquisition system.

In the following, an acronym identifies each test: the first letter refers to the test structure, the following two characters identify the roof installed in the test structure, and the final two characters



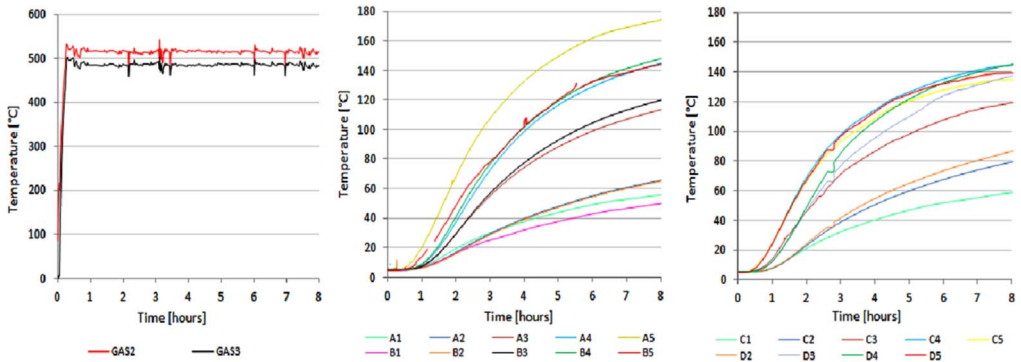


Fig. 24. Temperature-time curves measured in the A-R3fi test.

identify the clearance sealing mode. Thermocouples installed in the clearance are identified by a letter followed by a number according to the schemes reported in [1,4].

## Acknowledgments

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## Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at <https://doi.org/10.1016/j.dib.2018.08.017>.

## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at <https://doi.org/10.1016/j.dib.2018.08.017>.

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