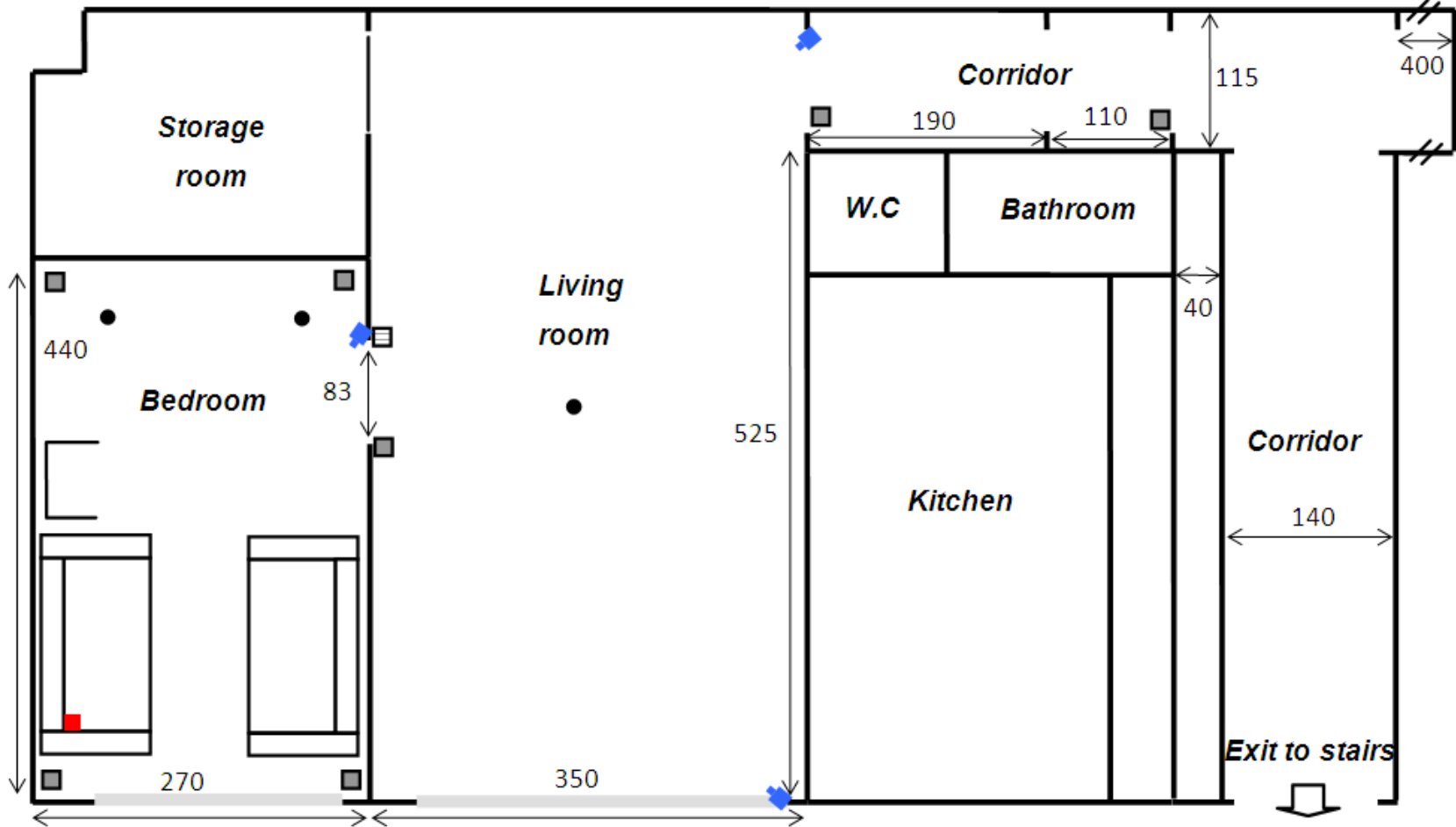


**RABOT 2012 – General set-up**



**Legend**

- Ignition
- Thermocouple Tree
- Heat flux gauge
- Velocity probe Tree
- ◆ Video camera

Multi-compartment set-up of the apartment showing the furniture layout (two sofas and one bookcase) and the fire-monitoring sensor locations for tests 1 and 3. Dimensions are given in cm.

Table 1. Details on the experimental set-up.

<i>Test N°</i>	<i>Fire room</i>	<i>Furniture</i>	<i>Ignition</i>
1 and 3	Bedroom	2 sofas + 1 bookcase	See scheme (p.1)
2 and 4	Storage room	1 sofa + 1 bookcase	In a corner of the sofa

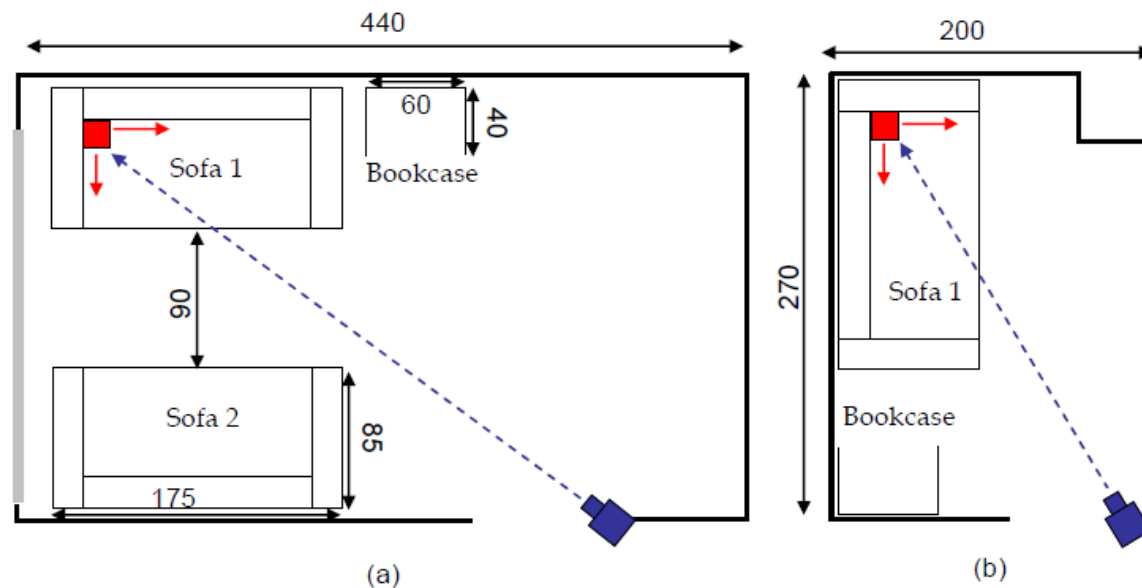
*Four large-scale fire tests have been conducted in an apartment in one of the ‘Rabot’ towers in the city of Ghent (Belgium) at the end of September 2012. The fire took place two times in a room with windows (TEST 1 and 3) and two times in a room without windows (TEST 2 and 4). Ventilation was present through single open doorways connecting the fire room to the living room and then to the corridor, connected to the staircase. The furniture consisted of one or two sofas and a bookcase filled with paper. The fire was ignited in the corner of a sofa by means of a lighter and six small wood cribs soaked in heptane.*

### **Apartment layout**

The apartment consists of a storage room, a bedroom, a living room, a W.C., a bathroom, a kitchen and a corridor (Fig. 1). Two rooms have been used as ‘fire’ rooms: the storage room (2.7m × 2.0 m × 2.5 m) and the bedroom (2.7 m × 4.4 m × 2.5 m). The entry to the kitchen has been sealed with a fire resistant panel for all four tests. The doors to the W.C. and bathroom were closed during all tests. The entrance to the apartment and the exit to the stairs were always completely open. In Tests 1 and 3, the bedroom was used as fire room. The door to the living room was open. The door of the storage room was closed for Test 1 and sealed with a fire resistant panel for Test 3 (because the door was damaged after the first test). In Tests 2 and 4, the fire room was the storage room. The door to the living room was open. The door of the bedroom was sealed with a fire resistant panel. The ceiling linings were composed of 2-cm thick gypsum plasterboard and a 30-cm thick concrete slab. The wall linings were composed of: (1) thin wall paper, (2) 2-cm thick gypsum plasterboard, (3) 3-cm thick fibre insulating board, and (4) a 30-cm brick layer. The floor covering in the rooms was vinyl layer on top of a 30-cm thick concrete slab.

## Fuel distribution and ignition

The fuel packages used in the experiments consisted of two types of furniture items: (1) identical sofas stuffed with polyurethane and covered with a fabric and (2) identical bookcases made of wood and filled with paper items of different densities (*e.g.* lightweight paper and magazines). In the living room (*i.e.* the fire room for Tests 1 and 3), 2 sofas were placed against the walls near the window and facing each other. The bookcase was placed near the firstly ignited sofa against the wall and facing the doorway. In the storage room (*i.e.* the fire room for Tests 2 and 4), one sofa was placed in the back corner against the wall. The bookcase was placed near the sofa as shown below. The fire was ignited using a lighter and six small wooden cribs soaked in heptane and placed in one corner of the first sofa. The positioning of the ignition allows monitoring the initial flame spread over the sofa using the video camera placed at the doorway during a substantial period. During this period, only the first sofa is burning. From the modelling perspective, the challenge is to predict this flame spread and the subsequent occurrence (or not) of secondary and tertiary ignition. If secondary (and/or tertiary) ignition occurs, it is also important to predict at what time this happens.



Sketch (top view) of fuel distribution in the fire room, ignition location and camera positioning at the doorway: (a) Living room (Tests 1 and 3) and (b) Storage room (Tests 2 and 4).