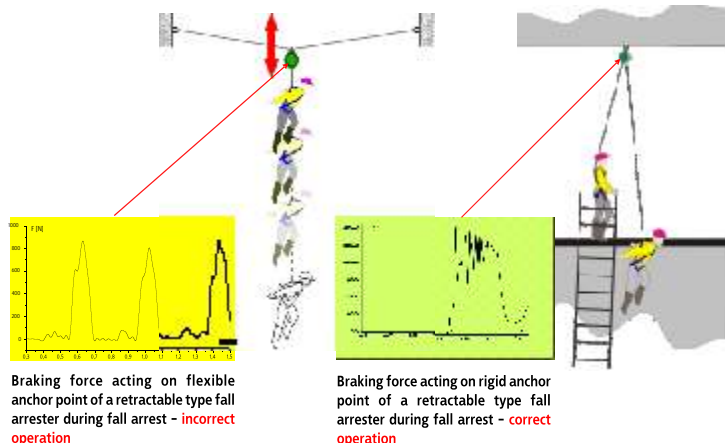


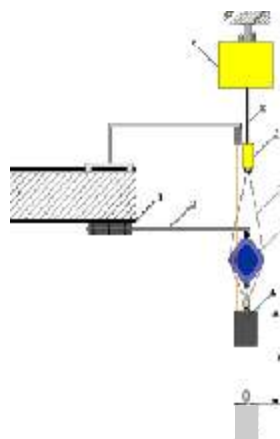
# IMPROVEMENT AND DEVELOPMENT OF PROTECTION PROPERTIES ASSESSMENT METHODS FOR PPE

## Test method for retractable type fall arresters

Protecting against falls from a height installed on a flexible anchor devices



**The idea of test method:** comparison of the performance of retractable type fall arrester attached to a rigid anchor point with the performance of the same device attached to the model of flexible anchor point



### Test equipment

- 1 rigid construction
- 2 model of the flexible anchor device (spring)
- 3 retractable type fall arrester
- 4 - test mass
- 5 - quick release device
- 6 - power winch for lifting and lowering test mass
- 7 flexible connector
- 8 laser extensometer

Requirement for retractable type fall arrester prepared for the use with flexible anchor devices

$$H_E \leq 1,25 \cdot H_{Rm}$$

where:  $H_{Rm}$  - mean value of fall arrest distance in case of the use of rigid anchor device  
 $H_E$  - value of fall arrest distance in case of the use of elastic anchor device

## Reference materials for test method of resistance to radiant heat penetration

### Requirements for reference materials:

- stability of structure
- reproducible test results
- durability during storage
- resistance to temperature
- easy identifiability, common availability, representation of particular protection level: for heat flux density 20 KW/m<sup>2</sup> (protective clothing for industrial workers exposed to thermal factors):  $10 \leq R_{HTI} 24 < 20s$ ,  $20 \leq R_{HTI} 24 < 50s$  for heat flux density 40 KW/m<sup>2</sup> (protective clothing for fire fighters):  $10 \leq R_{HTI} 24 < 18s$

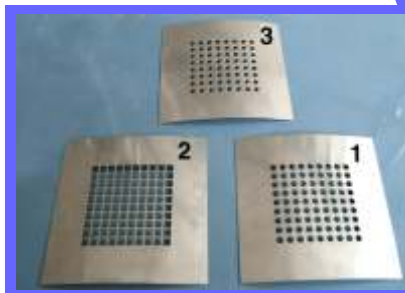


Figure - Steel plates proposed on reference materials:  
 plate 1 - 81 holes of 3,8 mm  
 plate 2 - 100 holes of 4x4 mm  
 plate 3 - 64 holes of 2,6 mm

### RESULTS

Selected reference materials for heat flux density 20 KW/m <sup>2</sup>		
Type of plate	Uncertainty of measurements [s]	Range of nominal values of heat transfer level [s]
81 holes of 3,8 mm diameter	± 0,75	20,4 - 21,9
100 holes of 4x4 mm	± 0,20	12,1 - 12,5
64 holes of 2,6 mm diameter	± 0,66	46,5 - 47,9
for heat flux density 40 KW/m <sup>2</sup>		
81 holes of 3,8 mm diameter	± 0,12	10,5 - 10,7
64 holes of ø 3,2 mm diameter	± 0,26	17,0 - 17,8

## Standard Filters

for Assessment of Repeatability of Test Stands  
 for Testing Penetration of Filtering Materials Against Solid and Liquid Aerosols  
 in accordance with EN 143:2000 and EN 143:2000/A1:2006

The special method of sealing steel tubes in the filters made of glass fibres was developed.

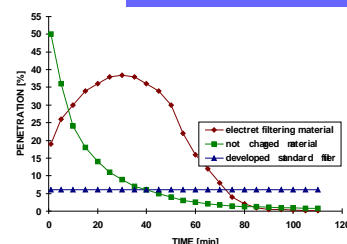
A special filtering material, that is characterised by filtration efficiency at the minimum level of 99,999 %, was used for the purpose of standard filters.



Steel tubes inside the standard filter

### Developed standard filters are characterised by:

- Constant penetration in time
- Unchanged filtering parameters after long time storage
- Resistance to thermal and mechanical factors
- Resistance to electrostatic charge of aerosol particles.
- Low flow resistance - 110 Pa
- Possibility of making filters of known aerosol penetration (0,1 50,0) % for different levels of filtration efficiency
- Possibility of firmly montage in universal sample holders with standard thread connector Rd 40 x 1/7"



Example of results of changes of penetration in time of sodium chloride standard aerosol through the electrets material and non charged filtering material and one of standard filters.

