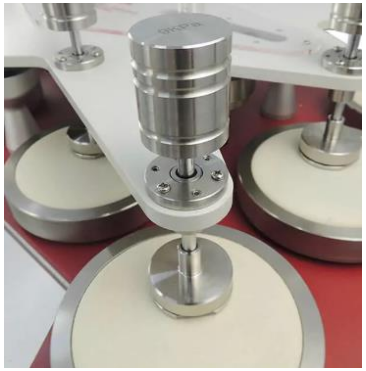
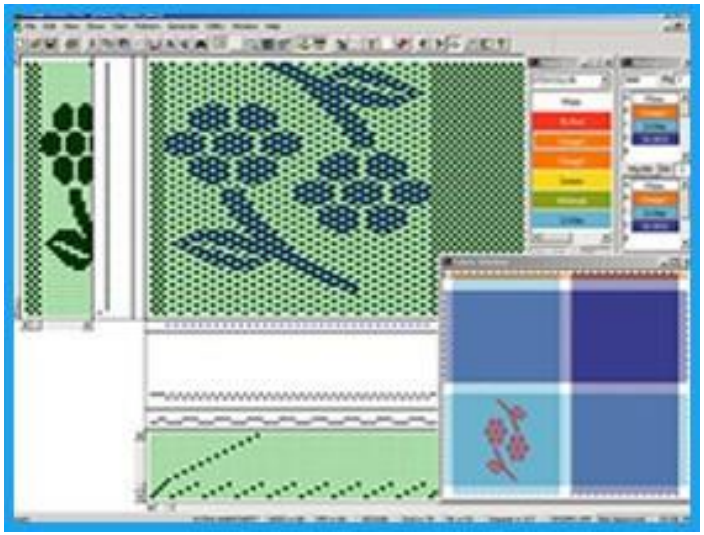
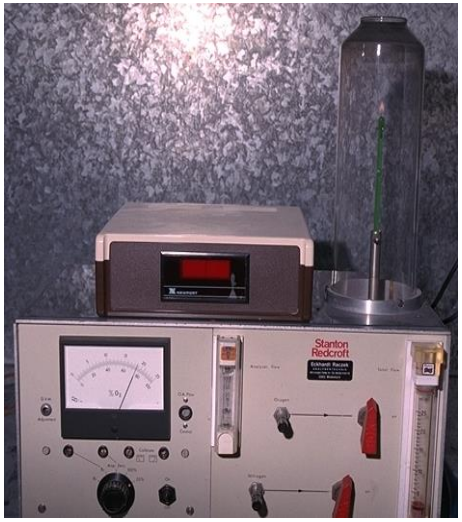
Durability

- Abrasion resistance
- Pilling
- Non-flammability



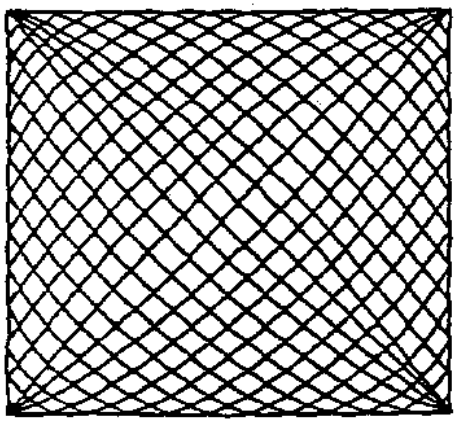


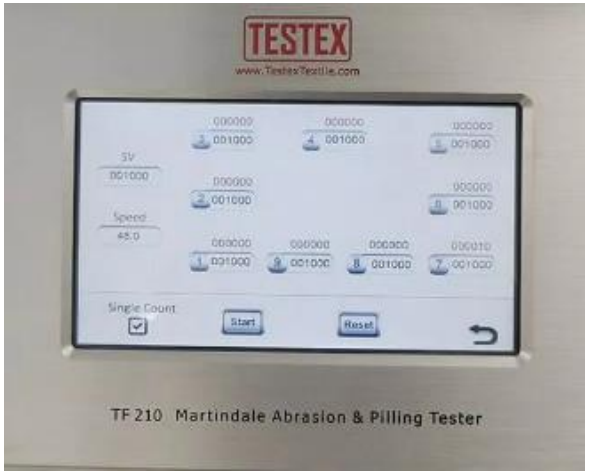


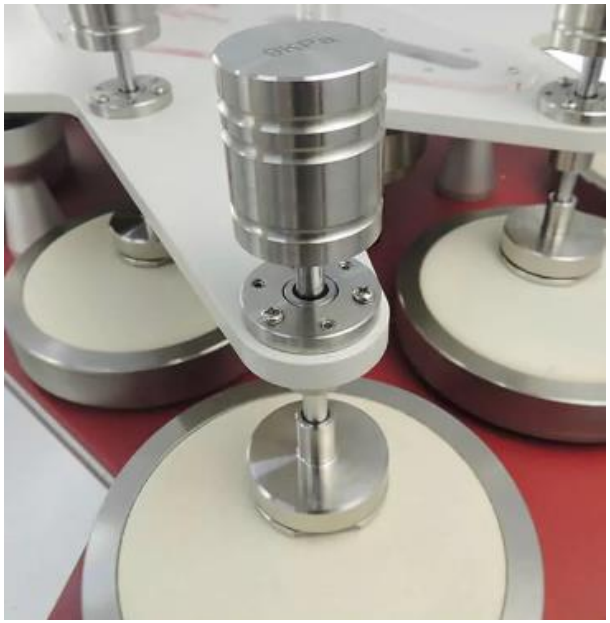
Abrasion resistance

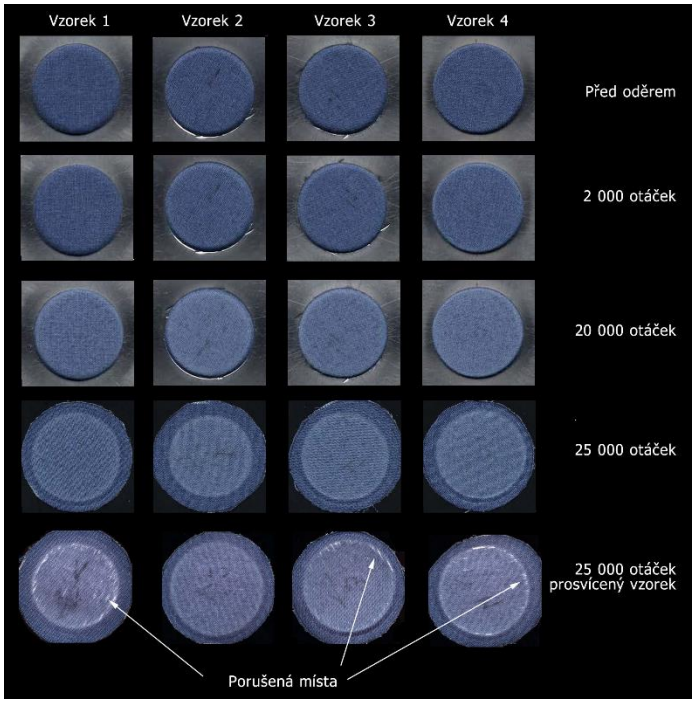
Martindale Abrasion Tester

- Circular specimen is abraded under controled pressure in controlled amout of abrasion rotation
- Abrading jaw moves according to Lissajous image
- Measurement standards
  - **ISO 12947-1:1998** Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 1: Martindale abrasion testing apparatus
  - **ISO 12947-2:2016** Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 2: Determination of specimen breakdown
  - **ISO 12947-3:1998** Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 3: Determination of mass loss
  - **ISO 12947-4:1998** Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 4: Assessment of appearance change



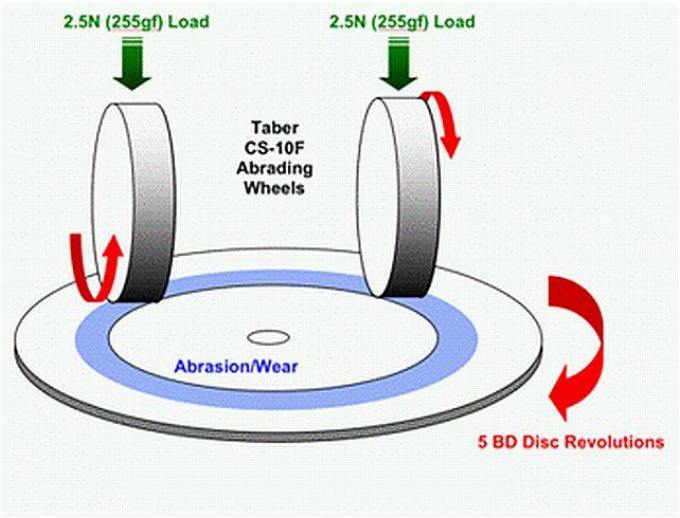

TESTEX
www.TestexTextile.com
Speed
45.0
Single Count
Start
Reset
TF 210 Martindale Abrasion & Pilling Tester

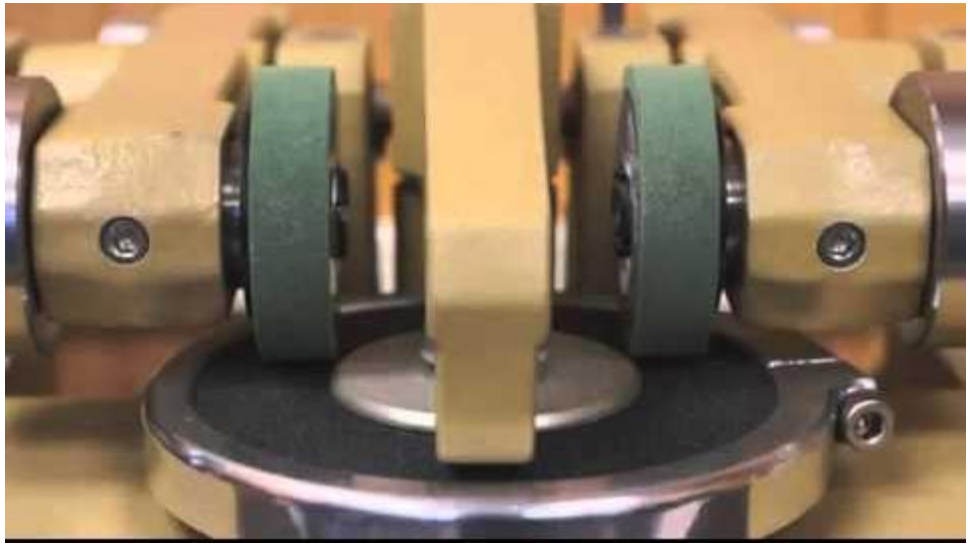



Vzorek 1
Vzorek 2
Vzorek 3
Vzorek 4
Před oděrem
2 000 otáček
20 000 otáček
25 000 otáček
25 000 otáček
prosvícený vzorek
Porušená místa

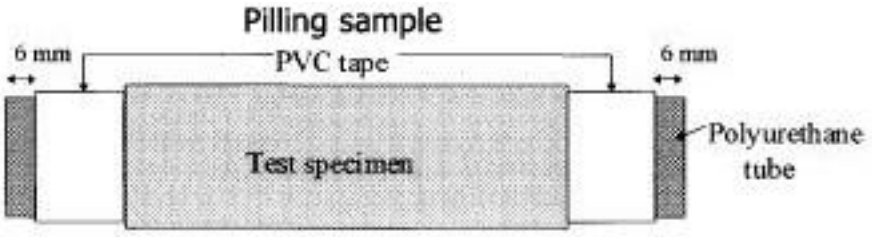

Crockmaster


TABER
5135 ABRASER


2.5N (255gf) Load
2.5N (255gf) Load
Taber
CS-10F
Abrading
Wheels
Abrasion/Wear
5 BD Disc Revolutions



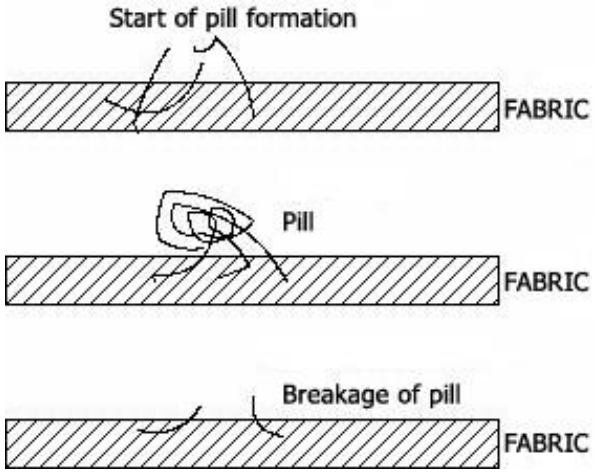
Pilling

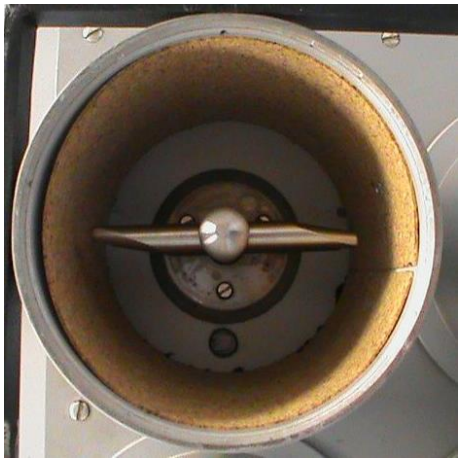


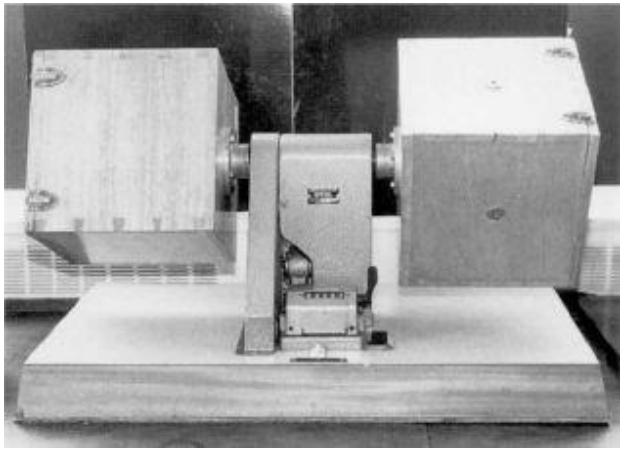
Testing methods

- Based on analysis of fabric inclination to pilling, fuzzing, and matting of textile fabrics using prescribed pilling tester. Measurement methods are applicable to most of woven and knitted fabrics, including napped fabrics (fleeces, inlay fabrics), etc.

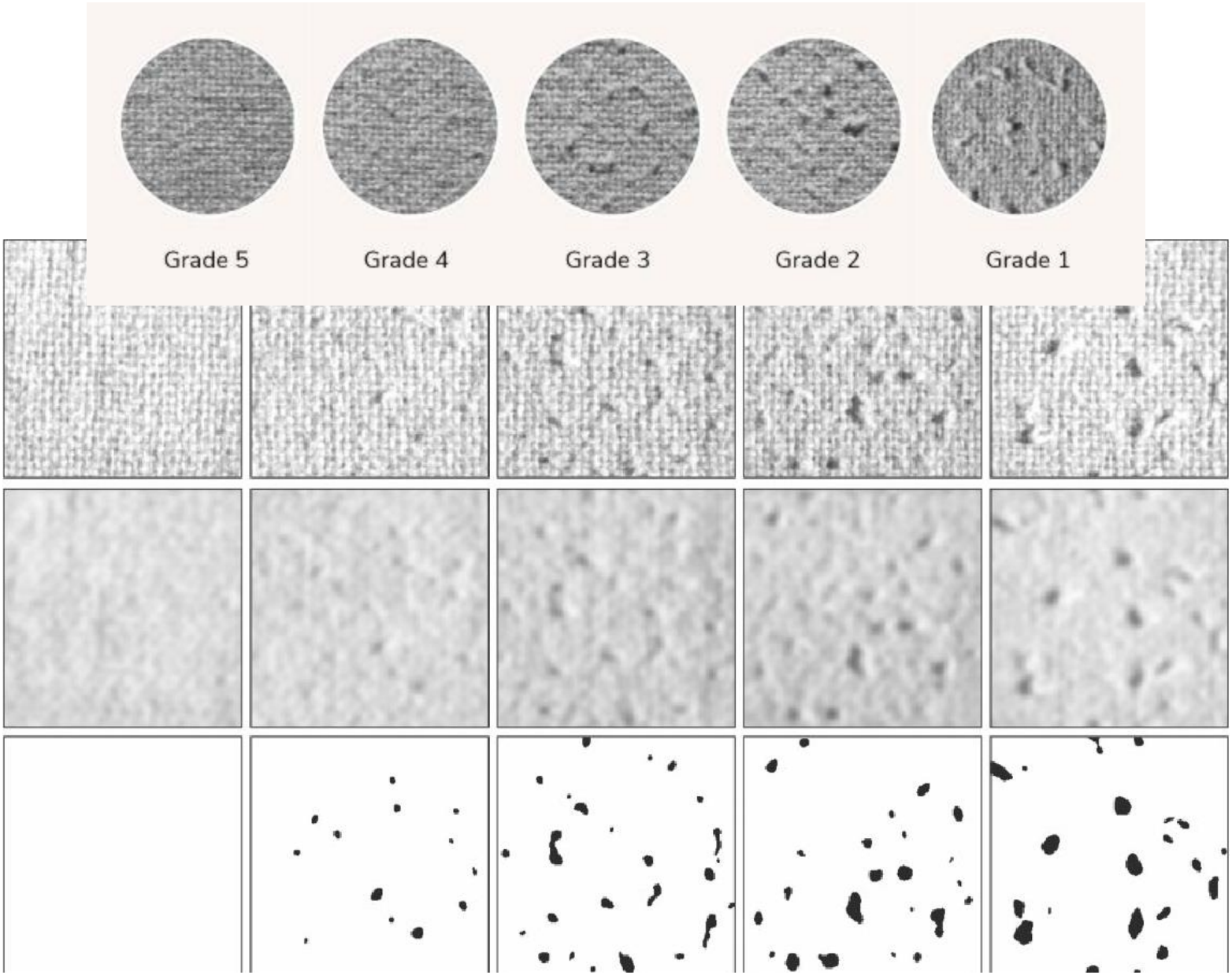
- **ISO 12945-1:2000** Textiles - Determination of fabric propensity to surface fuzzing and to pilling
  Part 1: Pilling box method
- **ISO 12945-2:2000** Textiles - Determination of fabric propensity to surface fuzzing and to pilling
  Part 2: Modified Martindale method
- **ISO 12945-3:2014** Textiles - Determination of the fabric propensity to surface pilling, fuzzing or matting
  Part 3: Random tumble pilling method
- **ISO/FDIS 12945-4** Textiles - Determination of fabric propensity to surface pilling, fuzzing or matting
  Part 4: Assessment of pilling, fuzzing or matting by visual analysis





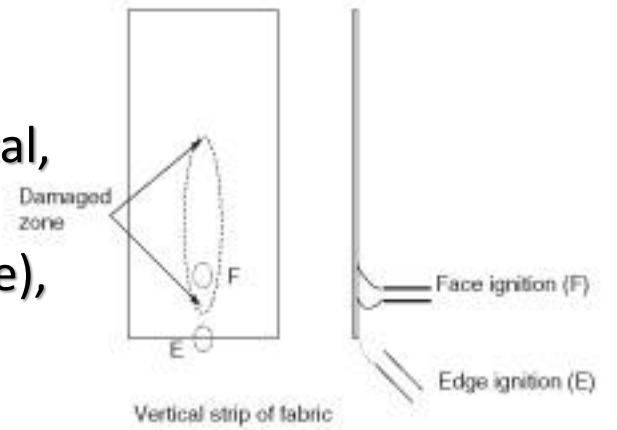



260g


Grade 5
Grade 4
Grade 3
Grade 2
Grade 1

Non-flammability test

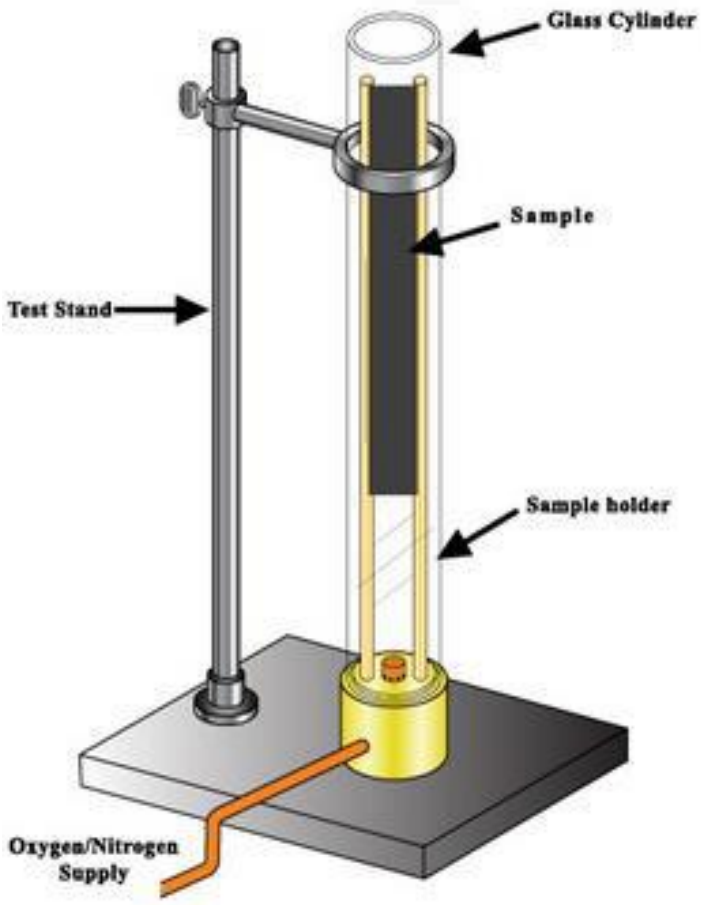
- Analysis of textile resistivity to open flame
  - Classification of flammability level (horizontal, vertical position),
    self-ignition (radiation heat source, cigarette),
    and limiting oxygen index (LOI)



- **ISO 4589-2:2017** *Plastics — Determination of burning behaviour by oxygen index*
  Part 2: Ambient-temperature test
  - methods for determining the minimum volume fraction of oxygen, in admixture with nitrogen, that will support combustion
  - vertical test specimens under specified test conditions
  - results are defined as oxygen index (LOI)

Flame resistivity

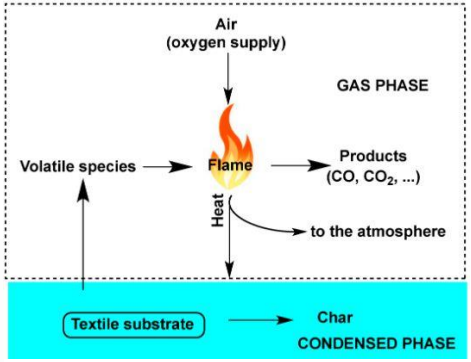
- Calculation of limiting oxygen index $$LOI = \frac{O_2}{O_2+N_2} \cdot 100\ [\%]$$

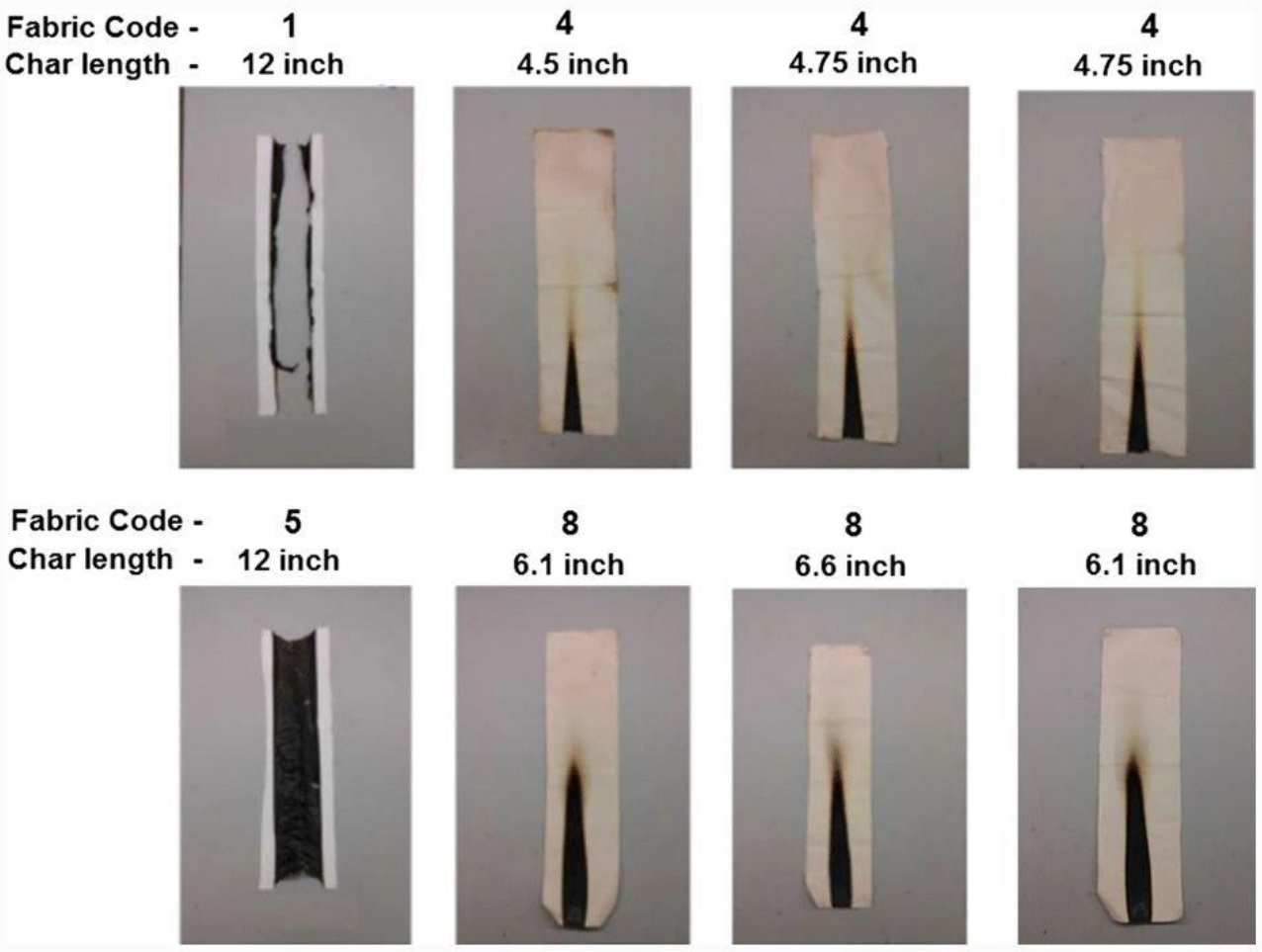


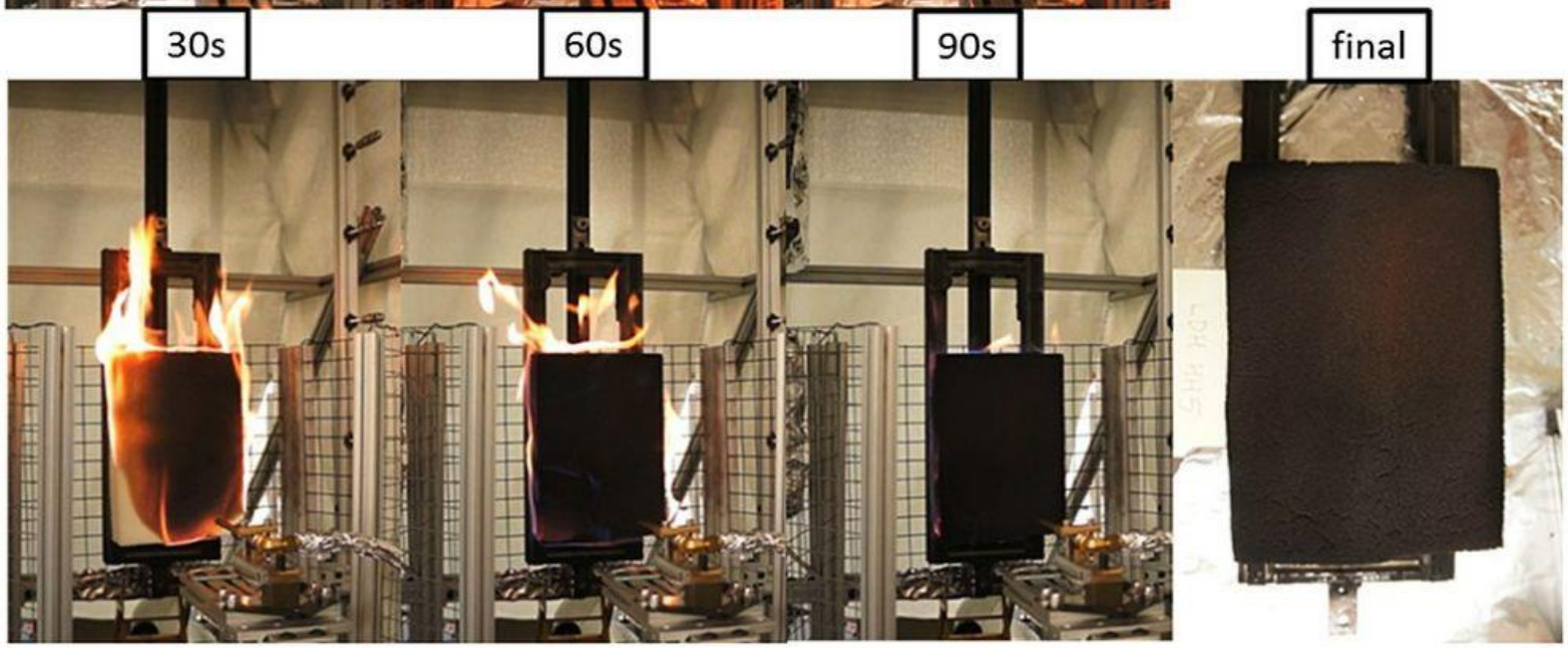
- O_2 - volume of oxygen
- N_2 - volume of nitrogen

Add-on%	13.8
After-flame time (sec)	0 [0]
After-glow time (sec)	0 [0]
Char length (cm)	10.3 [0.14]

FLAMMABILITY MEASURES IN COMMON TEXTILE FIBRES				
FIBRE:	Limiting Oxygen Index (%)	Heat of Combustion (Kcal/g)	Ignition temp (°C)	Melting temp (°C)
Wool	25.2	4.9	570-600	Does not melt






30s
60s
90s
final