Thermal Protective Performance Test (TPP)

• Measures how well a fabric/system provides a barrier to and insulation from heat/flame
• Test developed in 1970s by DuPont
• 50% radiant/50% convective heat source
• Heat source flux: 2 cal/cm²/sec (80 kW/m²)
• Measures heat energy required on outer surface of fabric/system to cause 2nd degree burns at the back of the fabric/system
KEVLAR®

Thermal Protection Performance Test

Computer

Thermal sensor

Sample

Convective Heat

Radiant Heat

24
DuPont Thermo-Man®

- 122 Sensors to record rise in temperature of mannequin’s epoxy-glass “skin”
- 12 propane gas burners
- Heat flux 2.0 cal/cm²/s (84 kW/m²)
- Exposure times up to 25 seconds
- Output information on:
  - % Second and third degree burns
  - Position of burns
  - Percentage total body burns
  - Time taken to body burn
  - % Chance of survival
PERFORM WHEN THE HEAT’S ON

THERMO-MAN®
Thermal Protection Evaluation System
Burn Injury Prediction

FR/Cotton 340 g/m²
Exposure time = 4.5 sec

- Unprotected
- 2nd degree burn = 2%
- 3rd degree burn = 91%
- No information

Total Burn Injury = 93%
THERMO-MAN™
Thermal Protection Evaluation System
Burn Injury Prediction

NOMEX® 265 g/m²
Long Underwear
Exposure time = 8.0 sec

Unprotected
2nd degree burn = 2%
3rd degree burn = 16%
No burn
No information

Total Burn Injury = 18%

PERFORM WHEN THE HEAT’S ON
Chance of survival from body burns

Source: American Burn Association (1991-1993 Study)