Advances in Fiber Technology for High-Performance Filtration

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and

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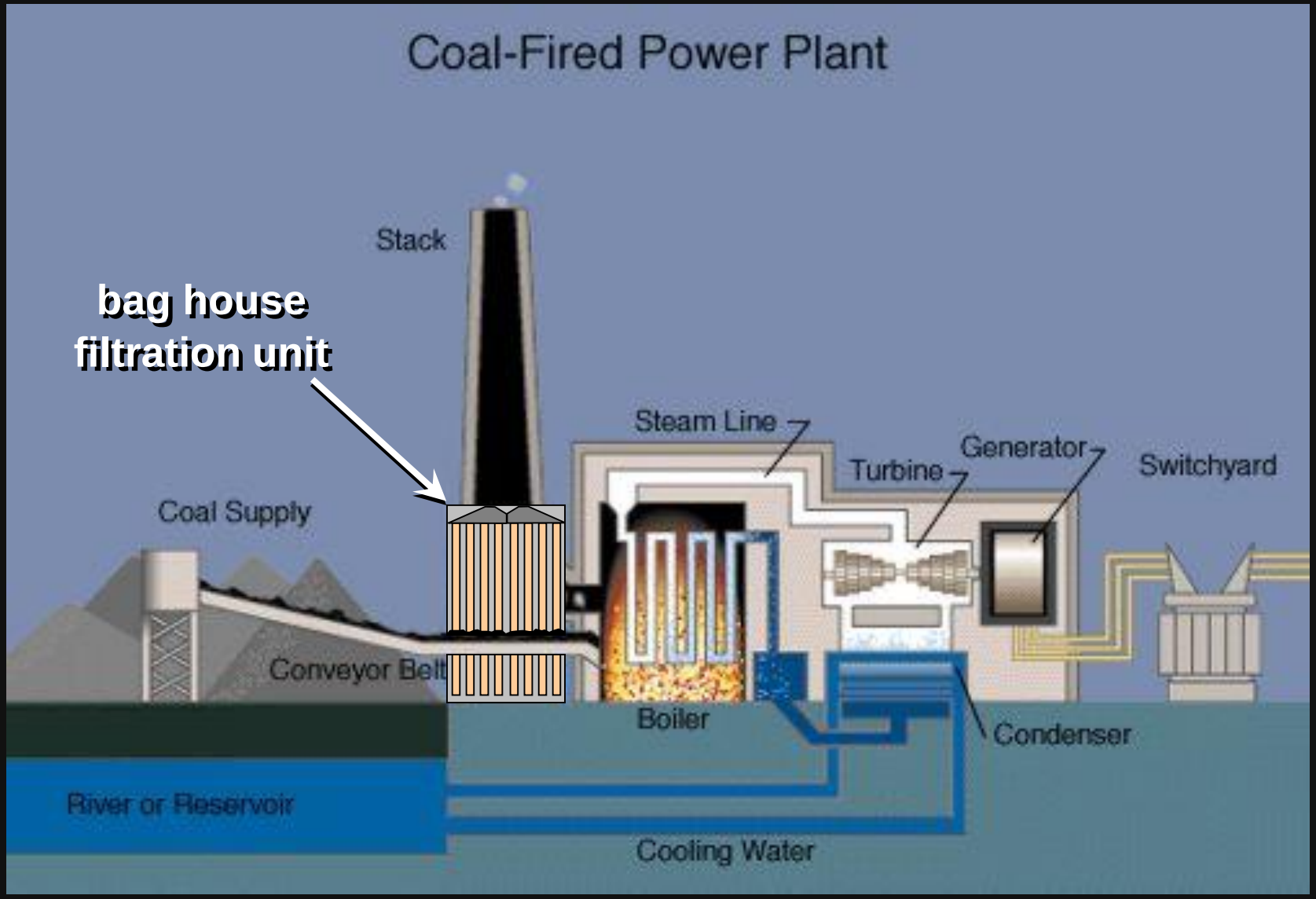
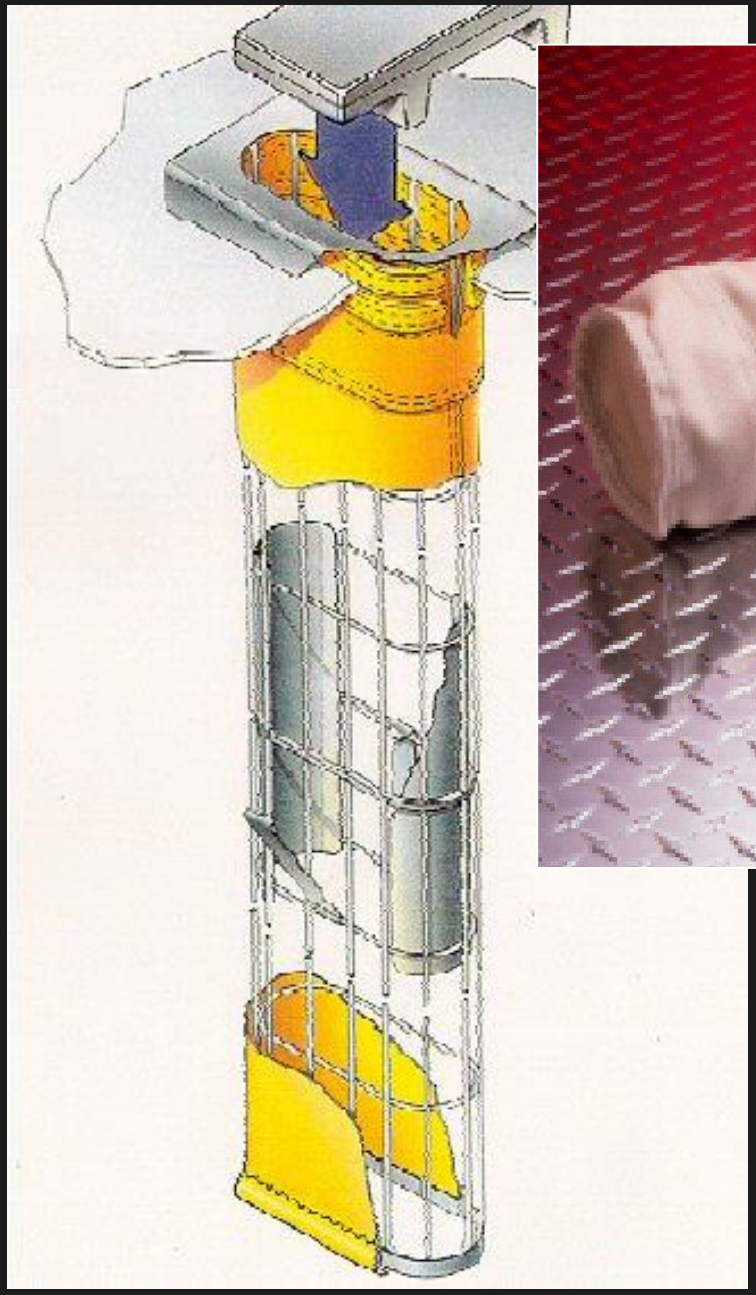
(yes, this is the first slide)

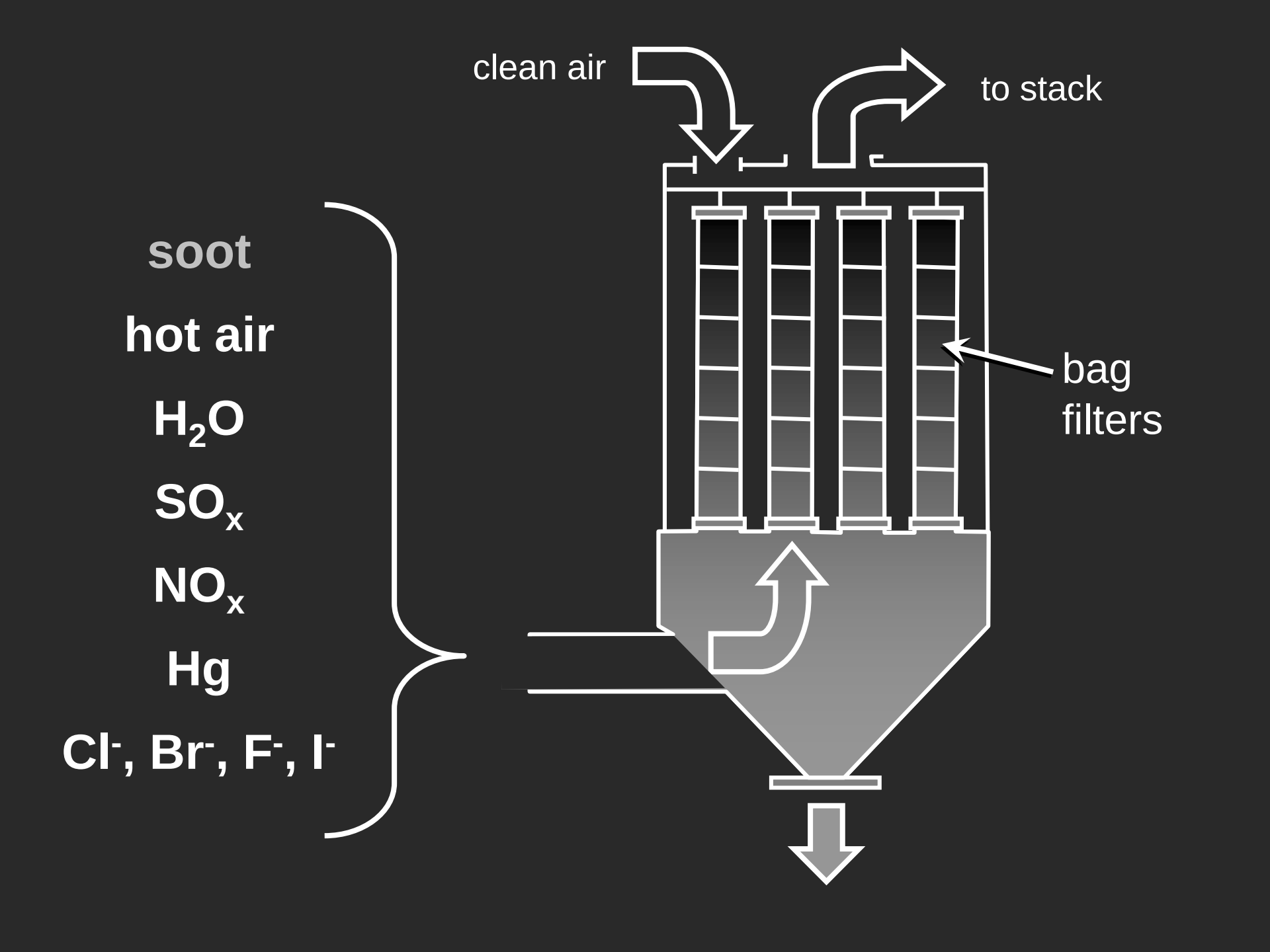


Courtesy: Tennessee Valley Authority



Courtesy: Midwesco Filter Company

Courtesy: Southern Company


clean air
to stack
soot
hot air
H_2O
SO_x
NO_x
Hg
Cl^-, Br^-, F^-, I^-
bag
filters

Typical Baghouse Fabric

needlepunched nonwoven – 16 oz./yd^2

tightly needled for strength and
to control permeability

optional scrim for dimensional stability

optional expanded PTFE laminate
to limit penetration

Typical Baghouse Fibers

fiber	chemical resistance	cost/lb
Teflon®	good resistance pH 1-14	very high
P84 ®	poor acid resistance	high
Kermel ®	poor acid resistance	high
Nomex ®	poor acid resistance	high
Glass	v. poor acid resistance	low

Problems:

cost/peformance (value)

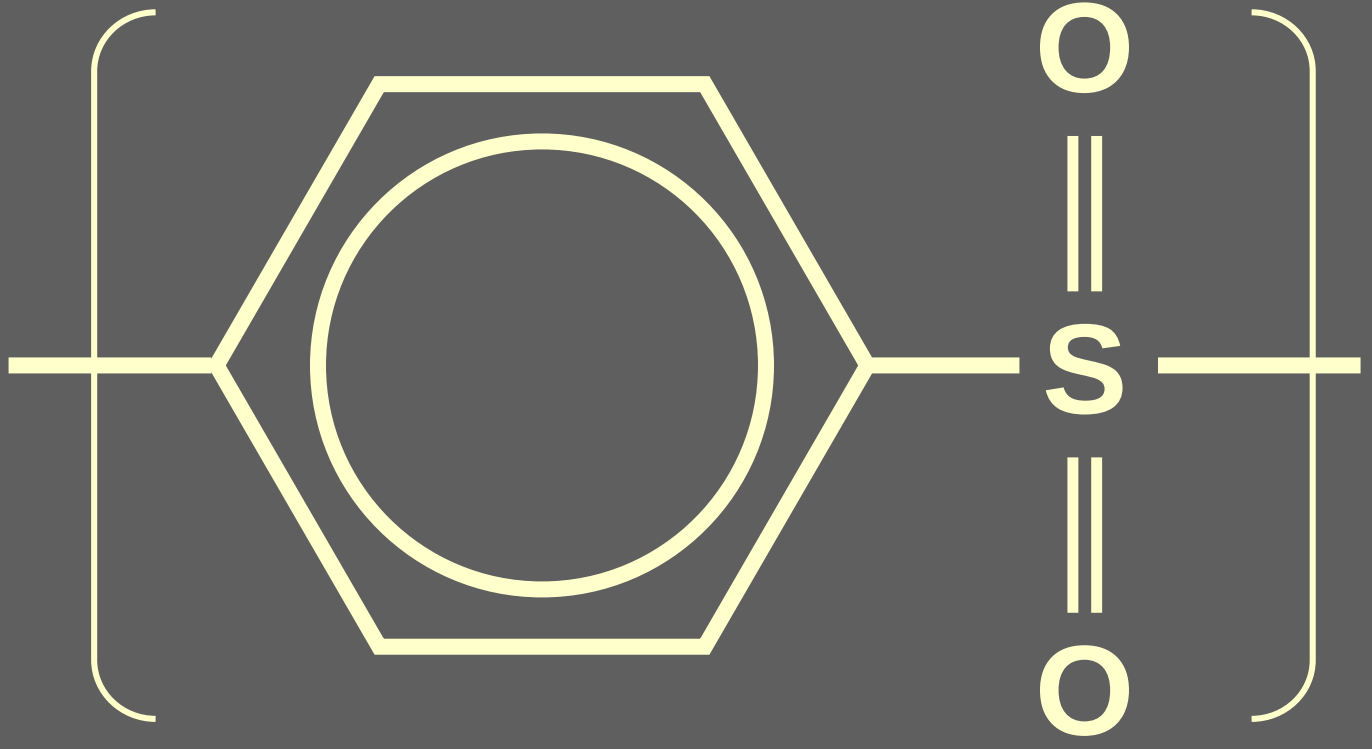
availability

filtration efficiency

Solution: PPS

(polyphenylene sulfide)

- √ **cost**
- √ ? **availability**
- ? **filtration efficiency**



Polyphenylene sulfide

PPS Properties

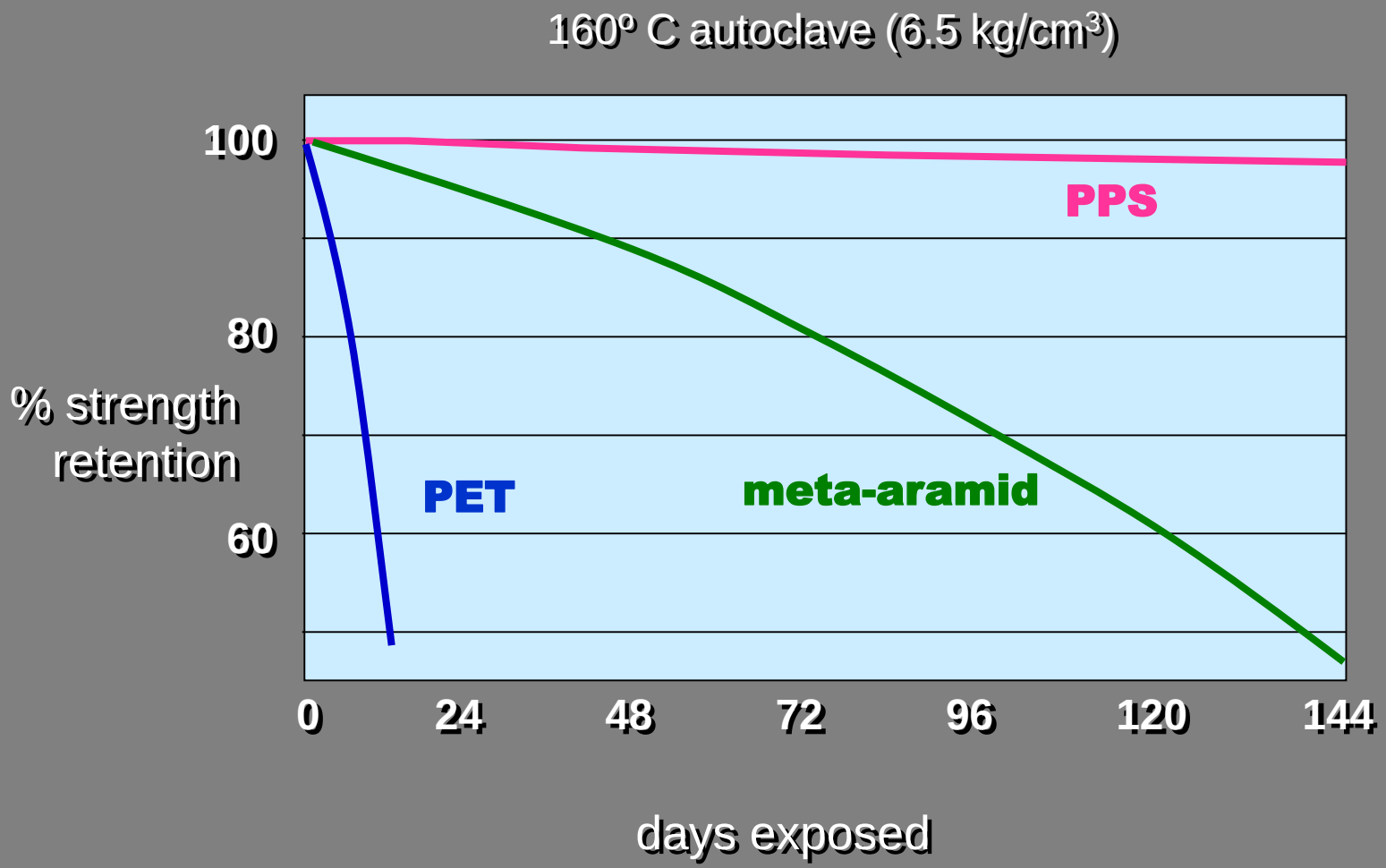
good tenacity

low shrinkage

flame resistance

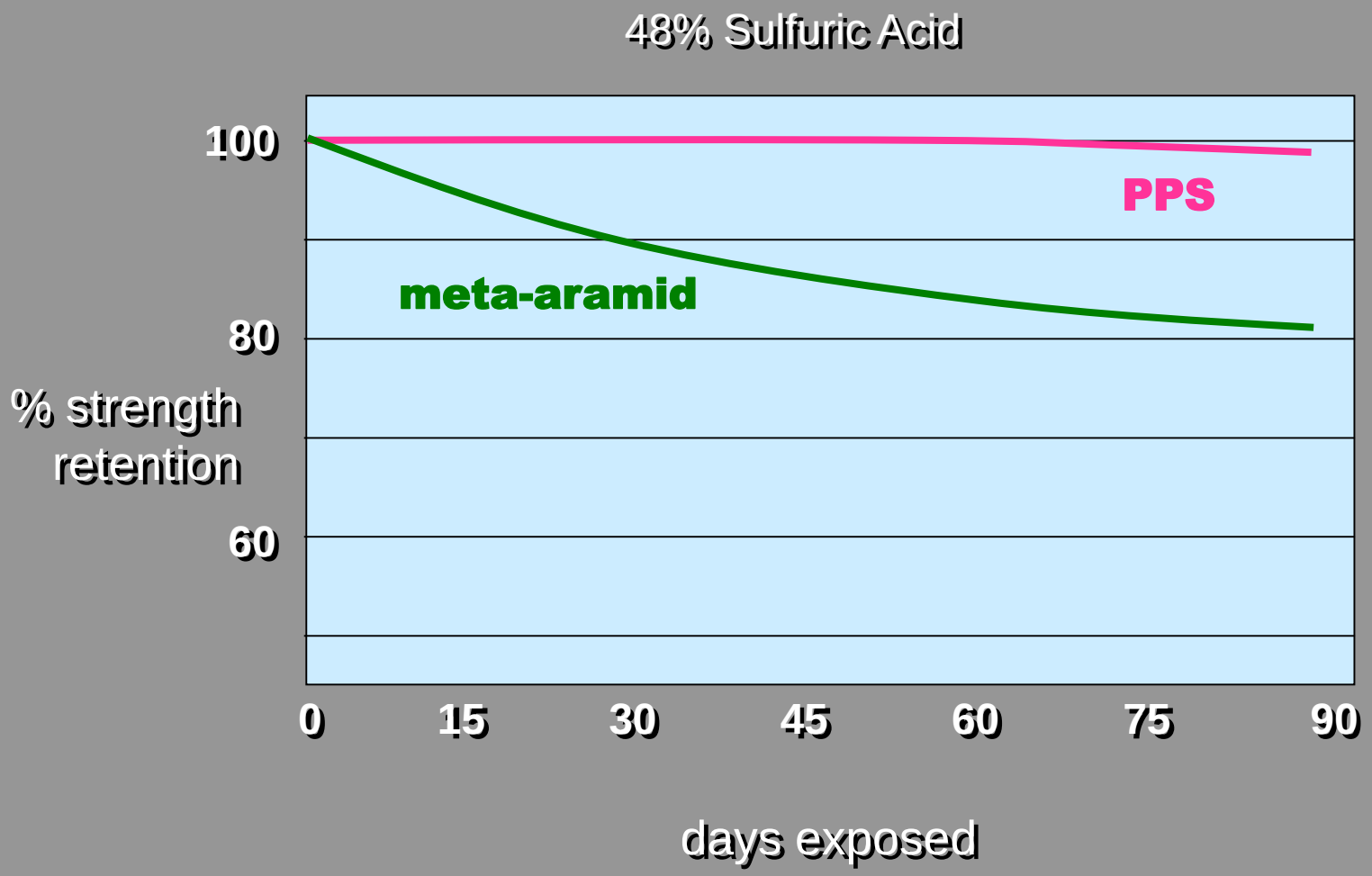
thermoplasticity

PPS Wet Heat Resistance



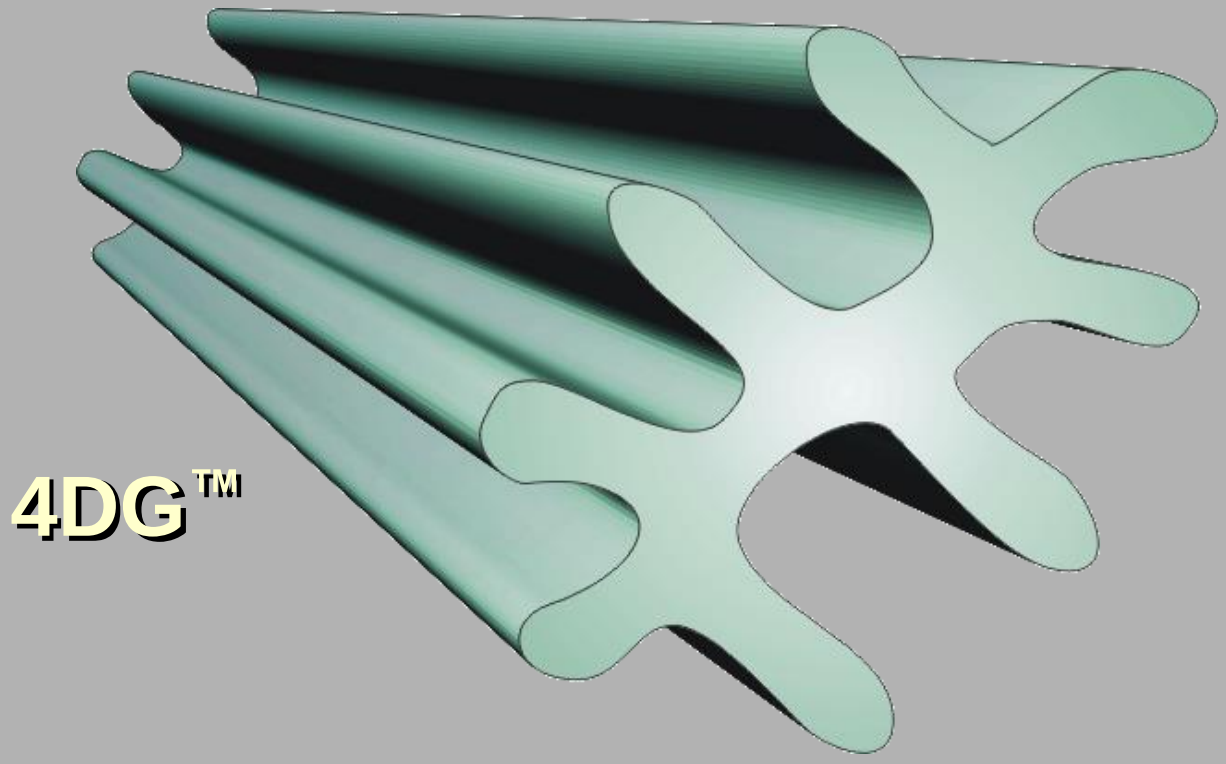
source: Ticona Engineering Polymers

PPS Chemical Resistance



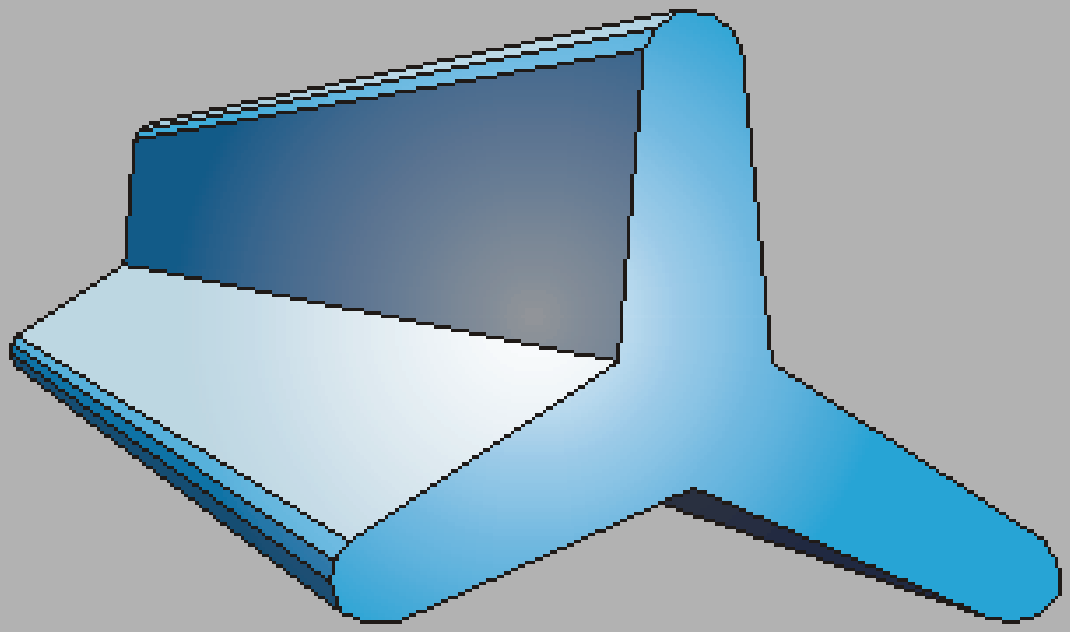
source: Ticona Engineering Polymers

Shaped Cross Sections

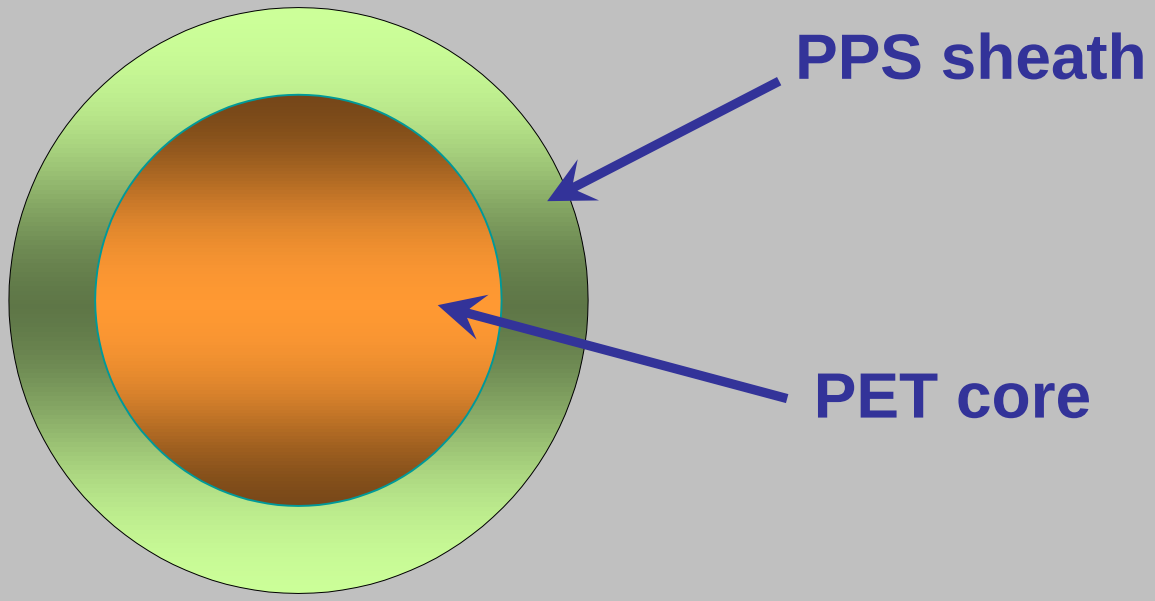


Shaped Cross Sections

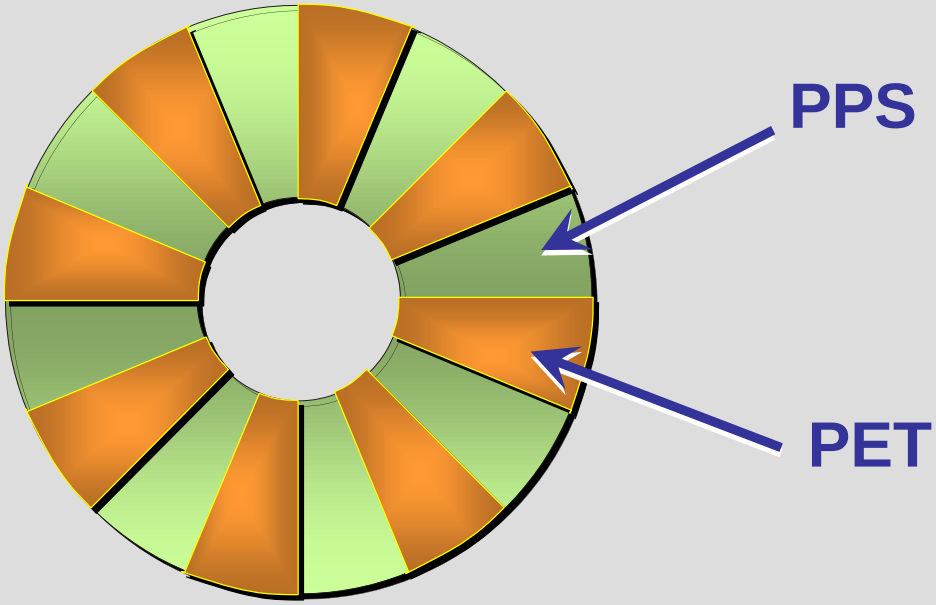
Shaped Cross Sections



Bicomponent Fibers



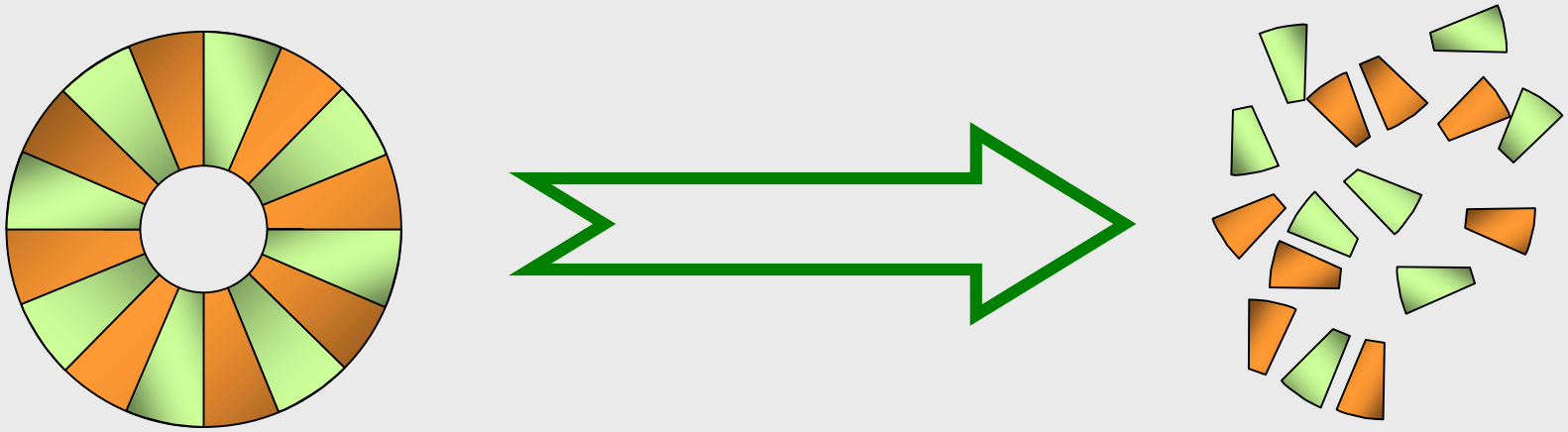
Bicomponent Fibers



Bicomponent Fibers

3 denier

0.19 denier



Solution: PPS

(polyphenylene sulfide)

- √ cost
- √ availability
- √ filtration efficiency
- √ healthy lungs