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Hidden Treasures!!
Rhodia Cigarette Filter Colloquium 1st - 5th June 2008

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Cigarette Filters – Current Market Trends

As Dr. Mike Taylor's presentation outlined there are a number of current market trends:

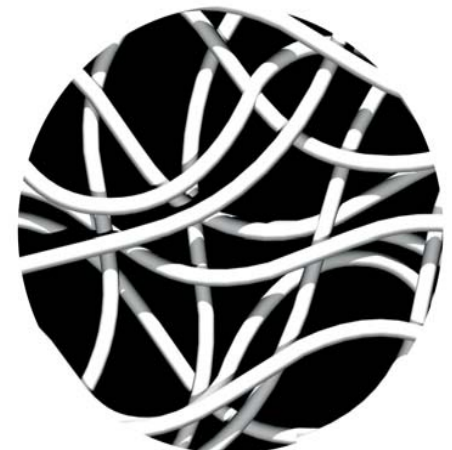
- Trend 1: Global trends will continue to be a reduction of the yields of all compounds in smoke
 - Trend 2: Filters will continue to play a major role in product development and marketing
 - Trend 3: Filters will continue to get longer and lower in circumference
 - Trend 4: The trend in increased use of flavours will continue
 - Trend 5: For the foreseeable future acetate and carbon will continue to be the major components of cigarette filters
-
- Having identified these trends we have been through Filtrona's extensive Development Sample library (>40 years) to see the type of product that may be the filter of the future
 - The following slides show examples of those products which have been identified as 'hidden treasures' and could therefore be stars of the future when considering the trends outlined above
 - Some of these are currently in production, some have only been made in the Development area
 - The drivers for each of the following product types is indicated in the bottom corner of the slide

Random Oriented Acetate

- Plasticised tow cut into staple fibre then reformed using Non-Wrapped Acetate type process
- Lower tow weight for spec PD (10-15% depending on spec)
- Can choose most economic tow for required Filament Denier
- Same Tar Retention % as equivalent Wrapped Acetate
- In theory can add other fibres and additives – e.g. wood pulp



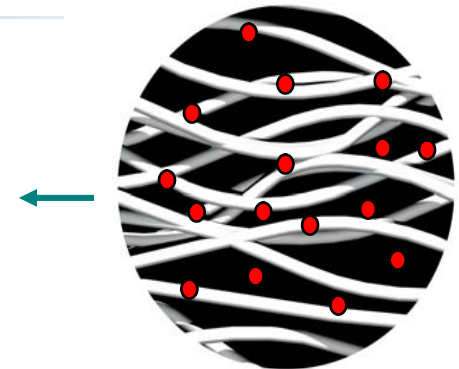
Tow fibre format in
Monoacetate



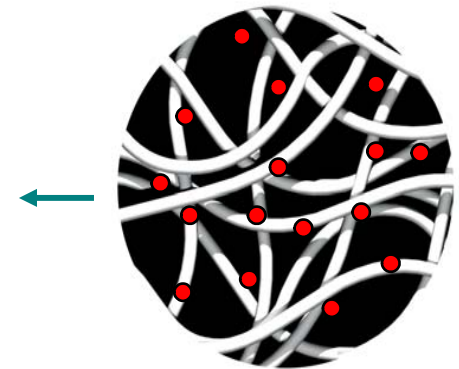
Tow fibre format in
ROA

Randomised fibres

- The randomised acetate fibre structure in ROA makes it more difficult for air to pass through the filter, thus the Pressure Drop for the filter increases
- To bring the Pressure Drop down to acetate specification, tow weight is reduced, and thus cost goes down.
- Compared to WA at same parameters tow saving normally between 10-15%. Higher for super Slims – up to 40% saving.
- If same filament denier tow is used then TR will be about the same as the equivalent WA.



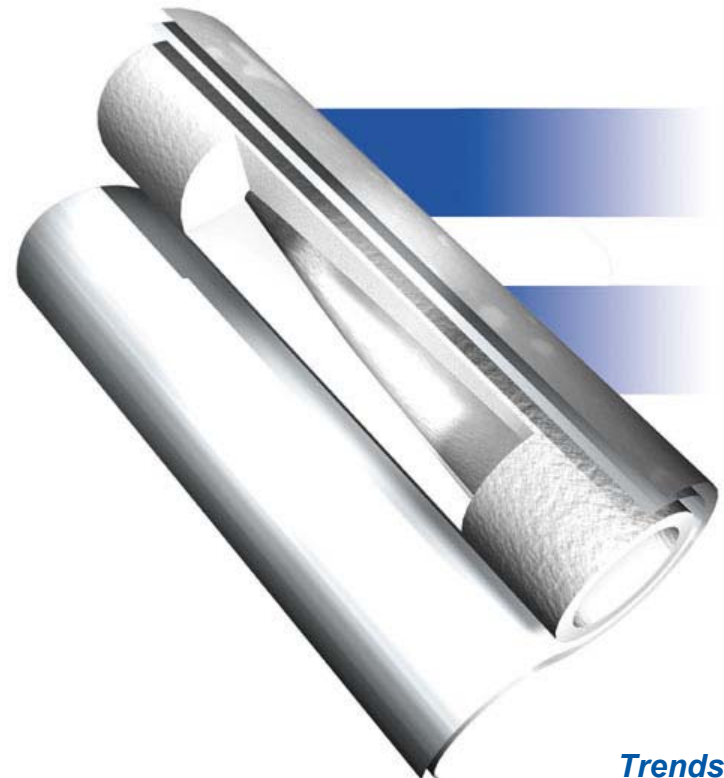
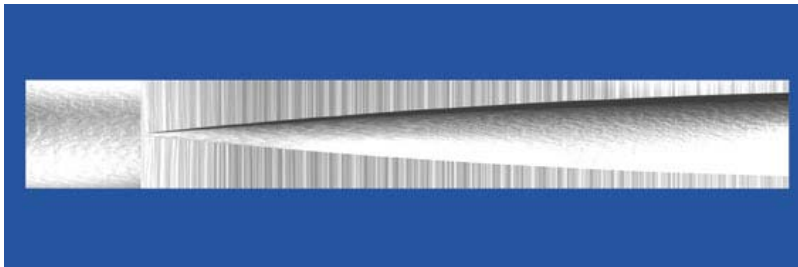
Linear Mono-Acetate



Random Orientation Acetate

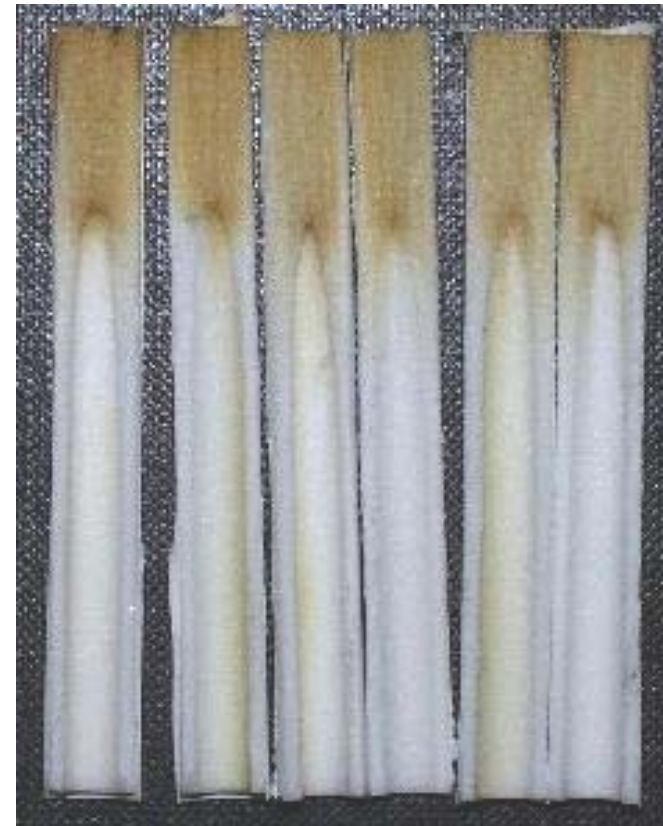
Shaped Acetate Filter - Long Bore

- Mono filter construction
- Shaped end appearance with a symmetrical design
- Bore depth minimum 10 mm
- Cellulose acetate filter material



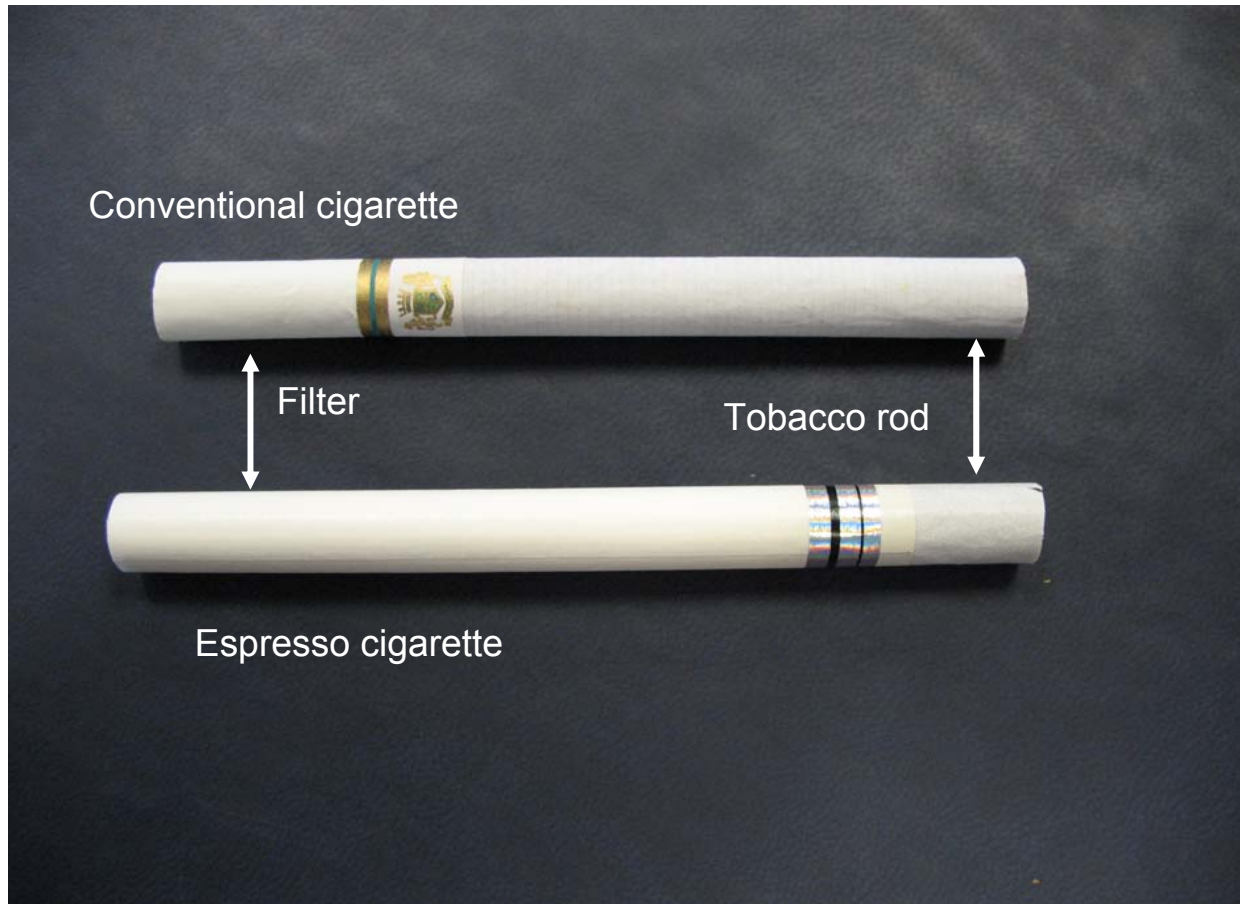
Shaped Acetate Filter

- Wide range of retention possibilities
- Comparable tar retention than CA at acceptable DR
- Applicable for a wide range of tar deliveries
- Unique product appearance offering exclusive brand identity
- 'Clean' end appearance



The 'Espresso' concept

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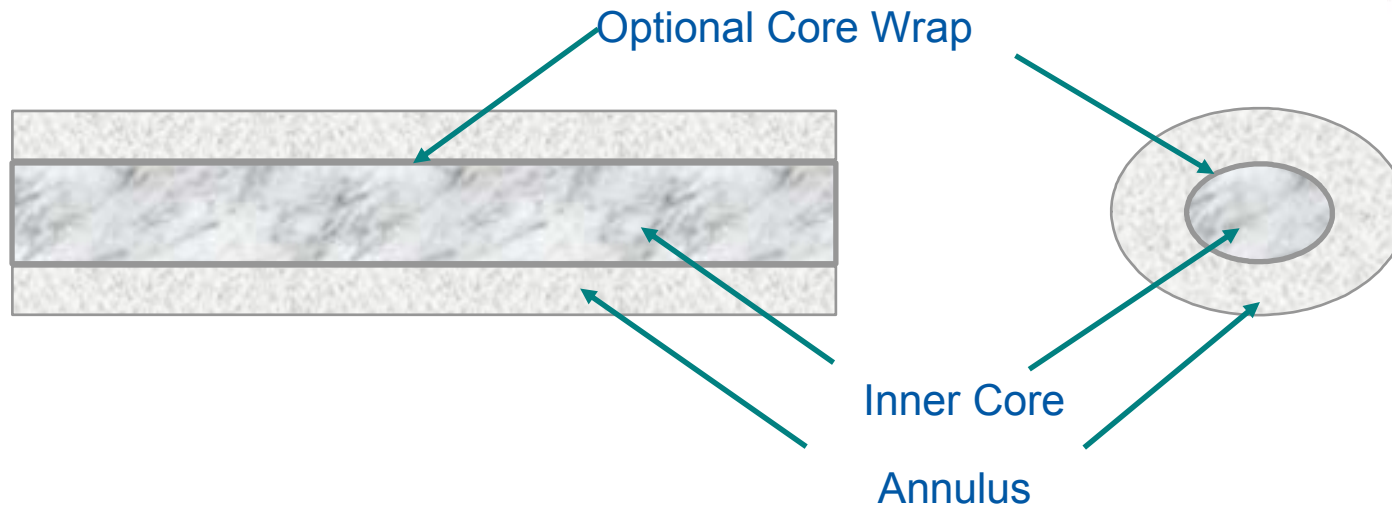


Oval Monoacetate Filter

- Mono filter construction
- Flexible cellulose acetate design capability
- Oval profile suitable for Decouflé oval cigarette making machine
- Plugwrap either standard or porous

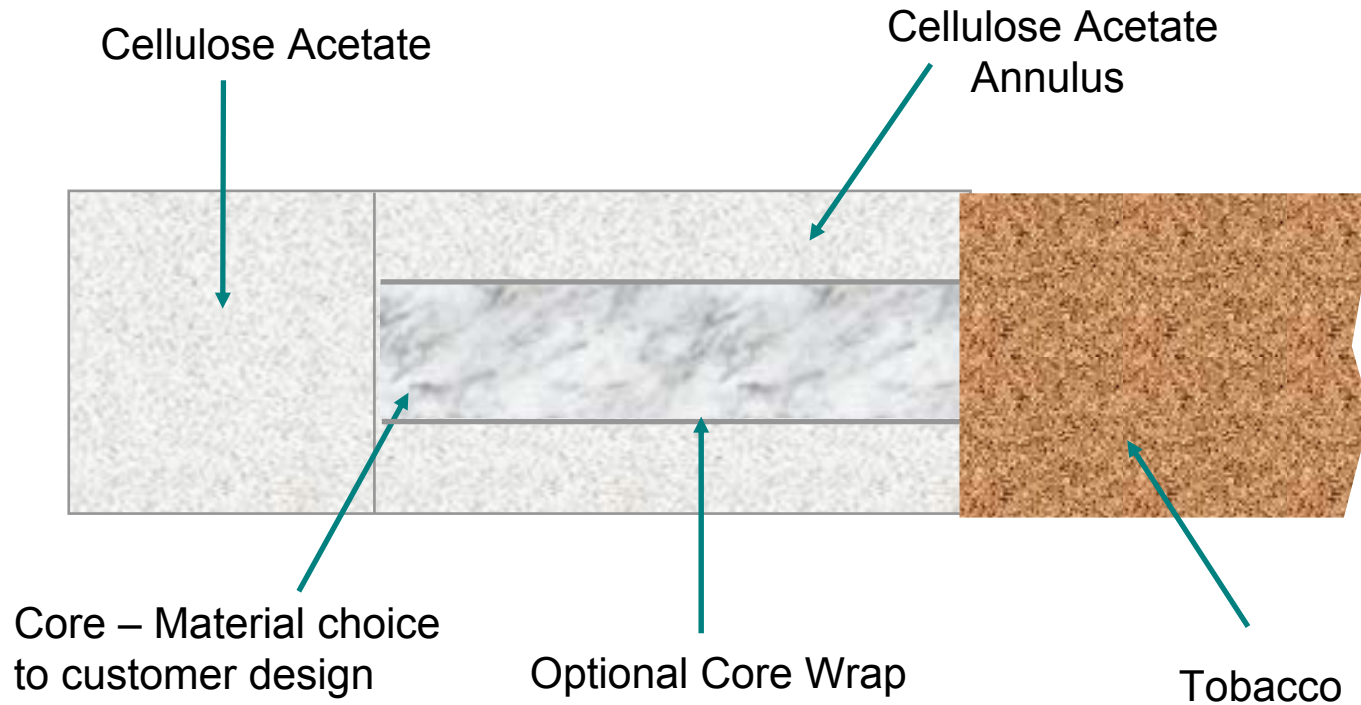


Mono Coaxial Core Filter Design



- Coaxial construction
- Mono filter with multiple materials
- Inner core of any filtration medium
- Annulus typically made with cellulose acetate
- Optional but non essential core wrap
- Can be incorporated into a dual filter design

Dual Coaxial Core Filter Design



Coaxial Core Filter

- Increased retention capability over monoacetate if paper core is used
- Normal acetate or special end appearance possible
- Suitable for ultra low tar cigarettes
- Potential multiple flow paths
- Low CO designs at conventional cigarette draw resistance

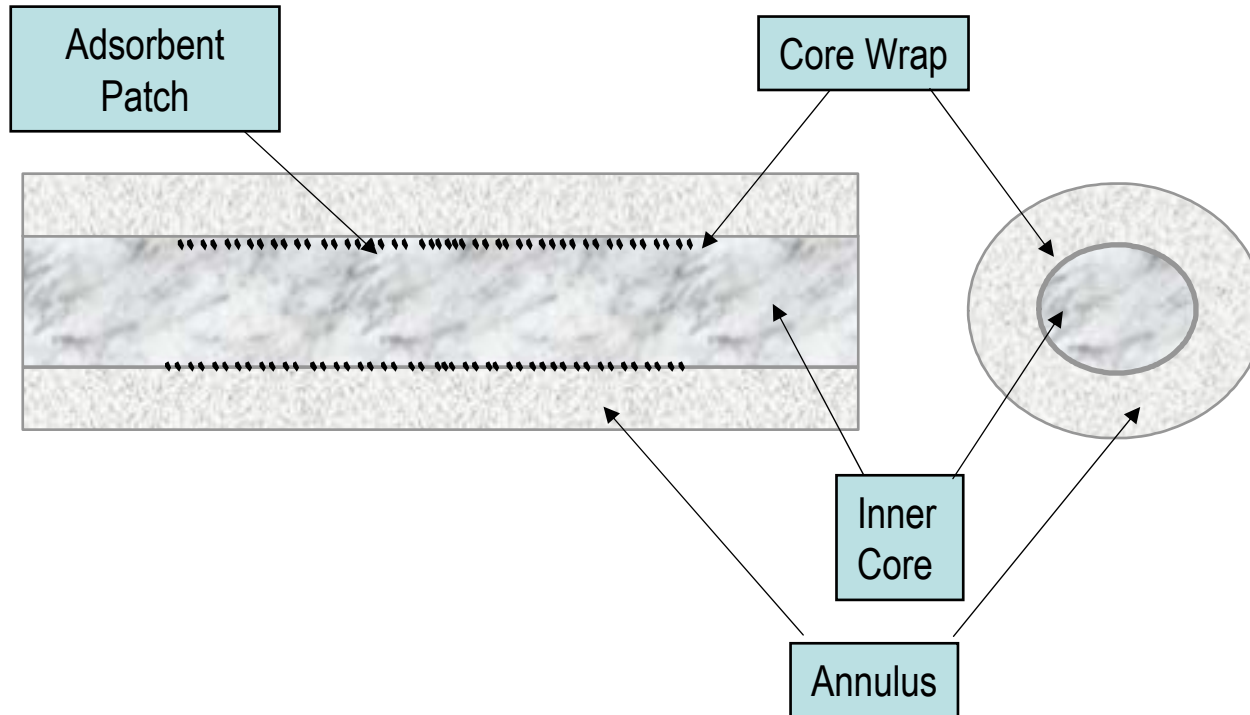


Complex Coaxial Core Filters

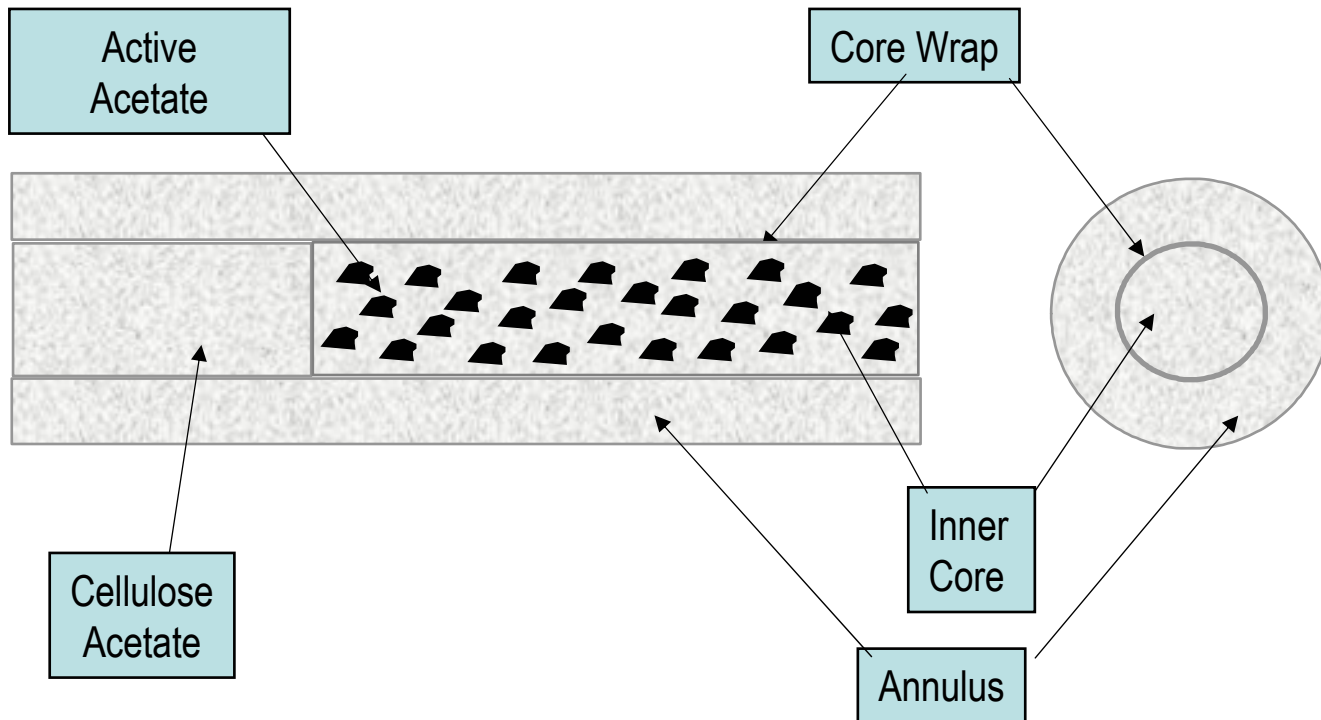
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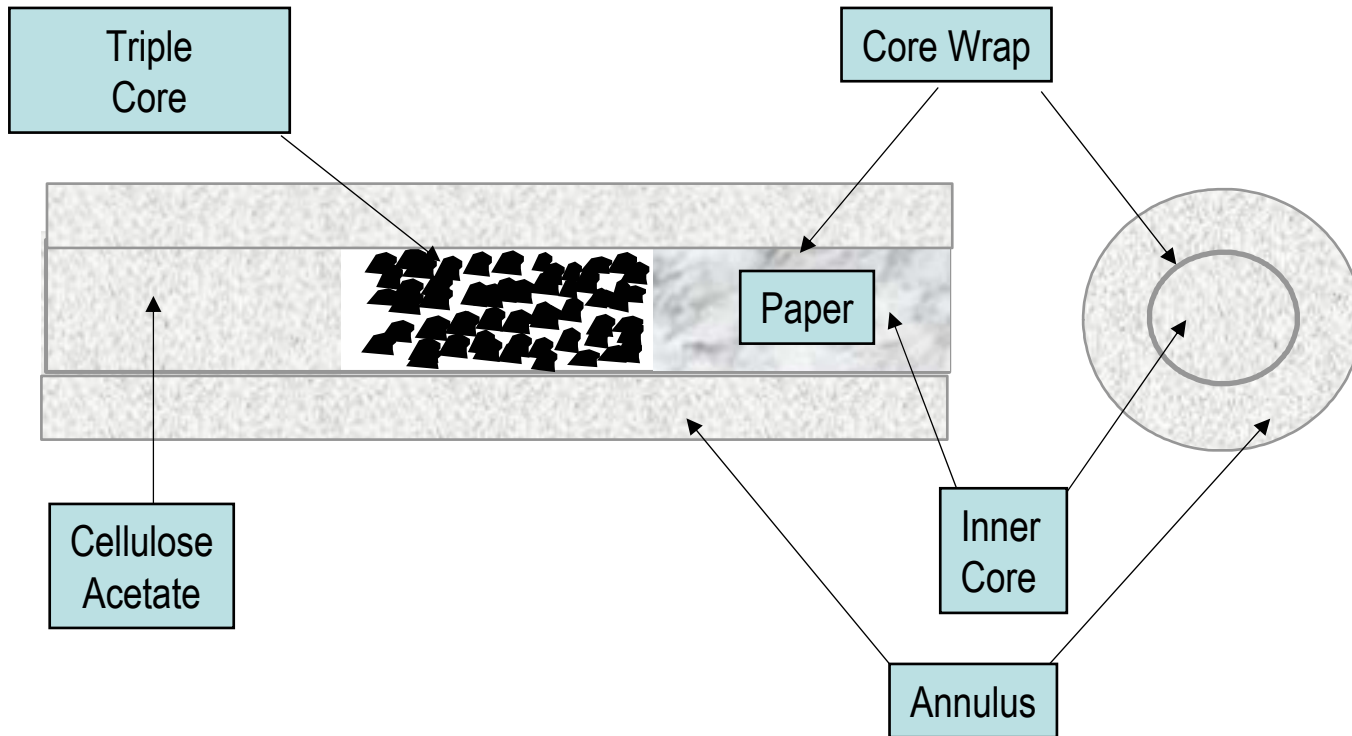
Coaxial Core Filter with Active Patch



Coaxial Core Filter with Dual Core Construction



Coaxial Core Filter with Triple Core Construction



Multiple Segment Filters

- Up to five 'solid' segments in the filter tip
- Gives great filter design flexibility:
 - Potential vehicle for Hoffmann Analyte reduction
 - High Vapour Phase Activity
 - High filter retention

Quintuple Filter - High Vapour Phase Retention

- Five filter components in one product
- Two separate cavities
- Three other filter components
- Minimum filter length 24mm -preferably 30mm



ACT (Adsorbent Coated Thread)

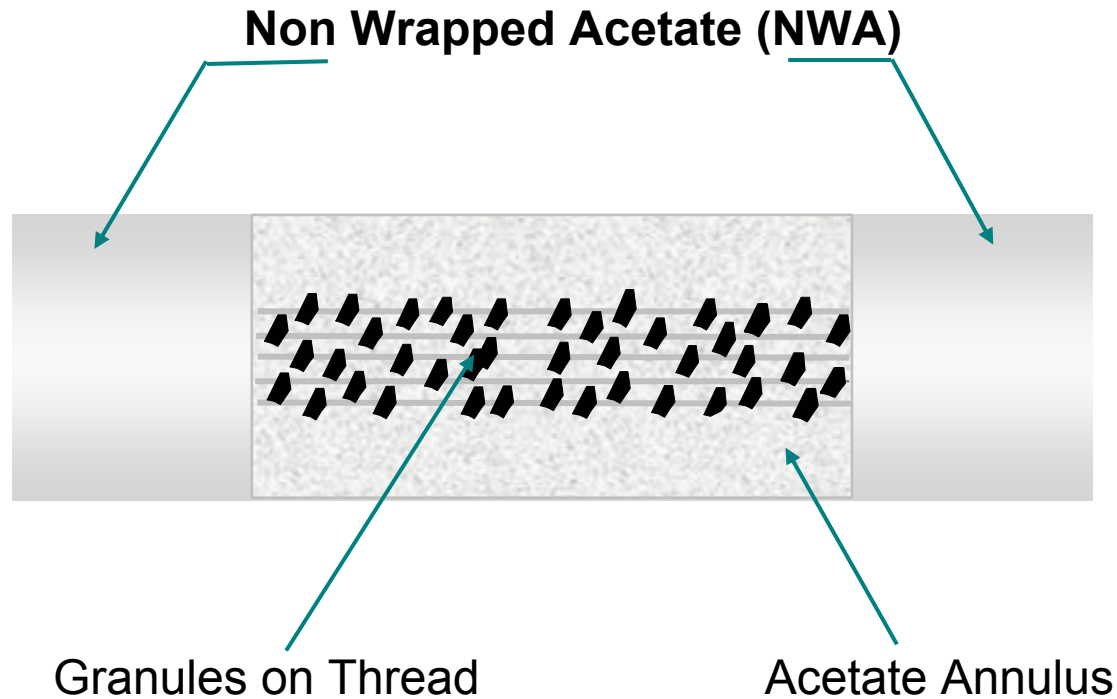
- Carbon is stuck to CA yarn



- **ACT 1** (with CA annulus – approx 8mgs/mm) **ACT 2** (all carbon – approx 18mgs/mm)

- Coaxial Core and Superslim Slim versions possible
- Other granular additives possible

Filter Construction



- Superior carbon loading per millimetre compared with conventional filters.
- Carbon loading in the range of 5 ~ 18mg/mm can be achieved.
- High retention capability

High Retention Vapour Phase Active (HRVPA)

- Paper segment coated with an activated carbon material
- Increased tar and nicotine retention
- The activated carbon results in a reduction of vapour phase and semi-volatile components in mainstream smoke for a given tar delivery, without increased levels of ventilation
- Paper segment degrades faster than comparable CA segment
- Potentially lower cost



Filter Materials – others investigated by Filtrona

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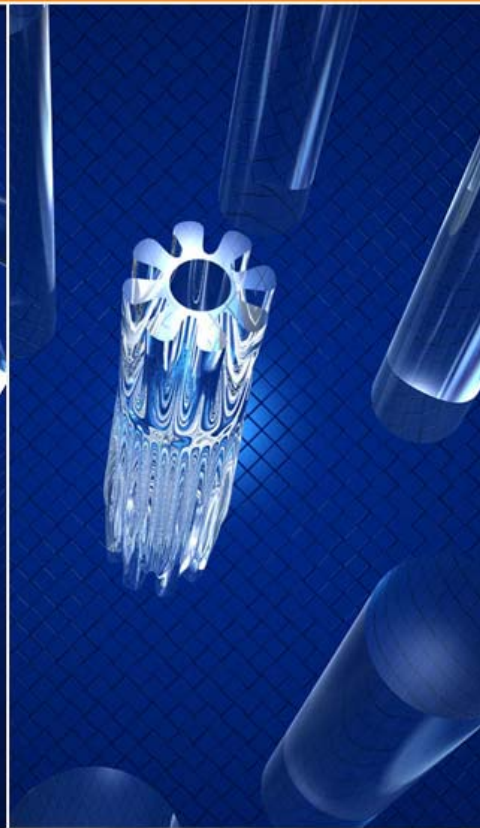
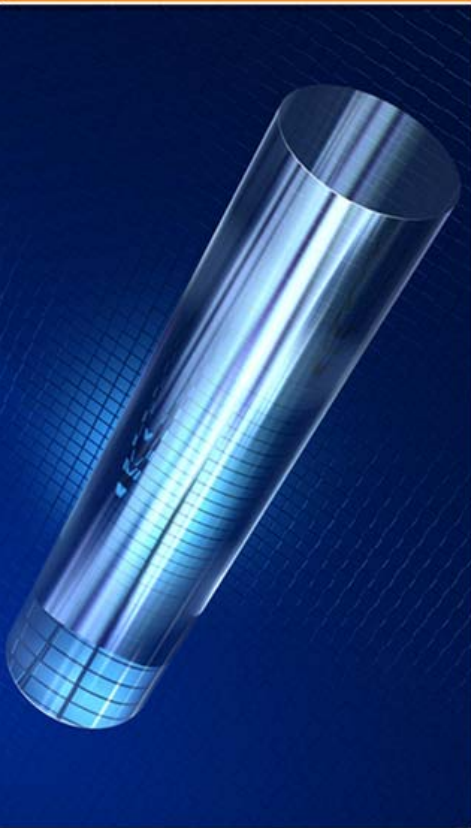
Glass Fibre	Gold	<u>Flavours</u>	<u>Flavours</u> (cont)
PEAT	Silver granules	Menthol	Asian Pear
Staple Fibre on Yarn	Fluorescent dyes (turmeric)	Coffee	Strawberry
Carded Sliver Filter	Grains - oatmeal	Banana	Cherry
Fibrex	- semolina	Spearmint	Rum Vanilla
Polypropylene	- millet	Mandarin	Chocolate
Nylon	- linseed	Peppermint	Coconut
Flocked filter	SAP (super absorbent polymer)	Lemon	Clove/Kretrek
EPF – Bi Component melt spun	Cloves	Orange	Peach
Crest – wood pulp + lyocell	Mint	Apple	Liquorice
Chitosan		Cappuccino	Lime
Space dust (from Siberia)		Apple/Cinnamon	Whiskey
Cellophane (as fill)		Cinnamon	Brandy
Algenic acid		Lime/Cola	Cognac
Vitamin C		Citrus Orange	Lavender
Silica gel		Sweet Orange	Fruity
		Ice Lemon	Cardamin (curry)
		Tropical	Plus various tobacco type flavours

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