

Abstract

Tobacco Heated Products (THPs) are quickly growing as part of the tobacco market. These products fall into the Heat not Burn category, which requires some differences in the filters utilized. THPs do not require much actual filtration, since the tobacco is not combusted like in a traditional cigarette. The filters are mainly present to help cool the vapor before it reaches the consumer's mouth. With this different requirement, many producers are looking for low pressure drop options, such as hollow acetate tubes. With this being said, Innovation is not limited in this sector, with many customers exploring options with flavors, capsules, shapes, alternate filtering media, and many others.

Background

Heat not burn products offer a way to deliver a tobacco like experience to a consumer without the need to burn or combust the tobacco, making them potentially reduced risk products. Instead the tobacco is heated to generate a smoke-like aerosol which can be inhaled.

There are 3 broad product types:

1. Device with cigarette like consumable
2. Cigarette like rod with built in heat source
3. Device which generates vapor and draws it through a tobacco pod

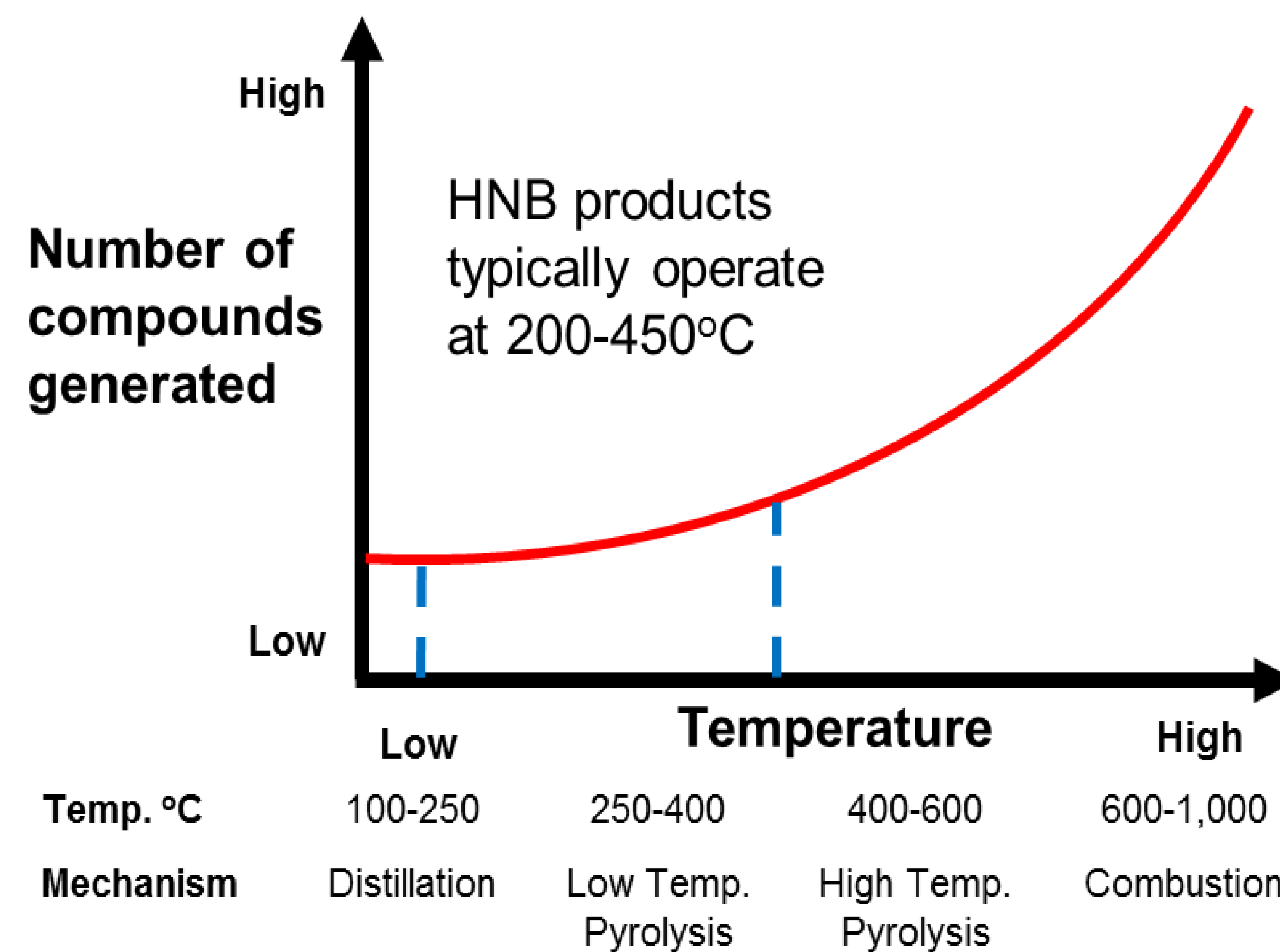


Figure 1. Temperature versus Compounds Generated.



- Requirement**
 - Structural strength to insert into device
 - Cooling of vapour to form aerosol
 - Low filtration efficiency
- Materials Selection**
 - New materials such as PLA or paper tubes introduced
 - Survivability of heating is another concern
- Technical Evaluation**
 - Limited experience – rely more on testing
 - More scope for design of experiment approach
- Product Specification**
 - THP specifications are different to regular cigarette filters
 - Will have different Q. Plan

Figure 2. New Requirements for Filter Design.

Design Considerations

- Heating style may limit filter design
- Customer equipment
 - Unique product parameters may require specialized manufacturing capabilities
 - Availability of online laser
- Reduction of vapor temperature through filtration/ventilation
 - New materials to adsorb heat
 - Ventilation to mix smoke with outside air
- Maximization of flavor in the vapor
 - Filtration kept to a minimum by selecting the right filtration components
 - Minimizing ventilation to maximize consumer experience
 - Typical filter tip pressure drops are in region of 35 mmWg
- Addition of flavors and additives to enhance customer experience
 - Introducing capsule filter segments
 - Introducing activated charcoal to design
- Filtration considerations
 - To date filters have 3-4 segments
 - Are there simpler solutions?
 - Segment configurations vary greatly from combustibles
 - Filter lengths add complexity to manufacturing

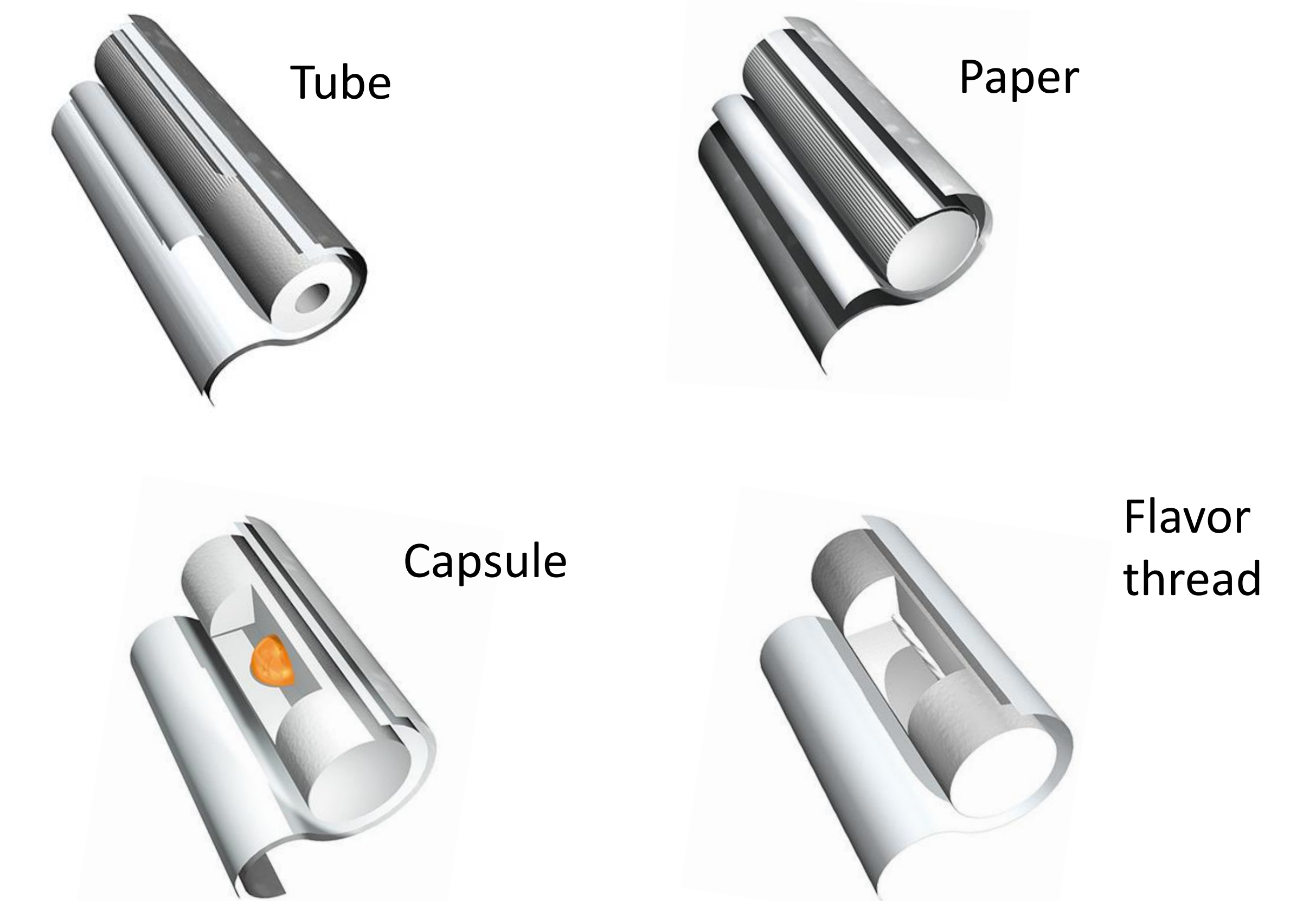


Figure 3. Various Filter Designs.

Conclusions

- THPs have been in development for a long time and are now here to stay
- The role of a filter in THPs is critical to the functionality of the product and smoking experience
- The role of the filter in THPs is very different from that of a combustible cigarette
- Careful consideration must be given to the materials, configuration, and interaction with the system in order to design the desired THP filter
- Biodegradability will need to be considered in the future

Contact

Amanda Periman
Essentra Filter Products
303 Gallimore Dairy Road, Greensboro, NC, USA
amandaperiman@essentra.com
336-478-3124

References

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