

# RESEARCH

Polycyclic Aromatic Hydrocarbon (PAH) are a dangerous class of chemicals that firefighters are exposed to during live fire, overhaul and surface exposure / tranfer. There are 16 common PAH, many of which are categorised as carcinogenic.





Polycyclic Aromatic Hydrocarbon (PAH)	% Reduction in PAH
Naphthalene	97.8%
Acenaphthylene	96.9%
2-Bromonaphthalene	97.8%
Acenaphthene	98.6%
Fluorene	99.4%
Phenanthrene	99.2%
Anthracene	99.3%
Fluoranthene	96.0%
Pyrene	95.5%
Benzo(a)anthracene	86.8%
Chyrsene	86.5%
Benzo(b)fluoranthene	80.2%
Benzo(a)pyrene	87.0%
Indeno(1,2,3-cd)pyrene	80.0%
Dibenz(a,h)anthracene	82.5%
Benzo(g,h,i)perylene	80.9%
Total of all PAHs	88.4%

\*The use of Smoke Soap has removed between 80% and 99.4% of individual PAH's from the cloth.

For more research, head to smokesoap.com.au

**'PROTECTION AFTER THE FIRE'** 

AT SMOKE SOAP, WE ARE PASSIONATE FIREFIGHTERS BASED IN VICTORIA, AUSTRALIA WHO HAVE DEDICATED OUR CAREERS TO PROTECTING OUR COMMUNITY. FUELLED BY OUR FRONT LINE EXPERIENCE, WE EMBARKED ON A MISSION TO CREATE A REVOLUTIONARY DECONTAMINATION SOAP TO ADDRESS A CRITICAL NEED: PREVENTING THE ABSORPTION OF HARMFUL CHEMICALS THROUGH THE SKIN.

OUR JOURNEY BEGAN WITH A PERSONAL INSIGHT. AFTER LONG SHIFTS BATTLING FIRES, I WOULD ALWAYS NOTICE THE LINGERING SMELL OF SOOT ON MY HAIR AND SKIN, DESPITE OUR RIGOROUS CLEANING ROUTINES. THIS REVELATION INSPIRED US TO DEVELOP A SOAP THAT NOT ONLY REMOVES THESE STUBBORN CONTAMINANTS BUT ALSO ELIMINATES THEIR ODOUR IN A SINGLE WASH.

THROUGH METICULOUS RESEARCH AND DEVELOPMENT, WE CRAFTED A UNIQUE FORMULA THAT COMBINES EFFECTIVENESS WITH GENTLENESS, ENSURING THOROUGH CLEANSING WITHOUT COMPROMISING SKIN HEALTH. EACH BATCH OF SMOKE SOAP IS CRAFTED WITH CARE, USING ONLY THE HIGHEST QUALITY INGREDIENTS TO DELIVER A PRODUCT THAT MEETS THE DEMANDING STANDARDS OF OUR FELLOW FIREFIGHTERS AND ANYONE EXPOSED TO HAZARDOUS ENVIRONMENTS.

DRIVEN BY OUR FIRSTHAND EXPERIENCE AND COMMITMENT TO INNOVATION, SMOKE SOAP REPRESENTS OUR DEDICATION TO PROVIDING A SOLUTION THAT ENHANCES PERSONAL SAFETY AND WELL-BEING. JOIN US IN OUR MISSION TO PROTECT THOSE WHO PROTECT OTHERS, ONE WASH AT A TIME.

# STAY CLEAN, STAY SAFE WITH SMOKE SOAP

# **Polycyclic Aromatic Hydrocarbons (PAHs):**

# What Firefighters Need to Know

# What Are PAHs?

Polycyclic aromatic hydrocarbons (PAHs) are a group of chemicals formed during the incomplete burning of carboncontaining materials like fuels and organic matter. They are commonly found in smoke and soot.

# Why Are PAHs a Concern?

PAHs are known for their potential health risks, including cancer. They can be present in both smoke from fires and diesel exhaust, posing a significant risk to firefighters.

# How Firefighters Are Exposed

- 1. **Through Smoke and Soot**: When fighting fires, firefighters come into contact with smoke and soot that contain PAHs. These chemicals can settle on the skin and gear.
- 2. **Skin Absorption**: PAHs can penetrate the skin's outer layer, thanks to their ability to dissolve in fats and oils. Once absorbed, they enter the bloodstream and can pose health risks.
- 3. **Diesel Exhaust**: Firefighting vehicles and equipment that use diesel engines release exhaust containing PAHs, adding another source of exposure.

### Protecting Against PAH Exposure

- Use Proper Gear: Wear well-maintained protective clothing and gloves to reduce direct contact with PAHs.
- **Clean and Decontaminate**: After exposure, thoroughly clean and decontaminate equipment and gear to remove PAHs.
- **Practice Good Hygiene**: Wash your skin and any exposed areas with soap and water to eliminate residual PAHs.

By understanding how PAHs affect health and implementing these protective measures, firefighters can better safeguard their well-being while performing their crucial duties.

- I. Benzo[a]pyrene
- 2. Naphthalene
- 3. Phenanthrene
- 4. Chrysene
- 5. Fluoranthene
- 6. Pyrene
- 7. Anthracene
- 8. Benz[a]anthracene
- 9. Benzo[b]fluoranthene
- 10. Benzo[k]fluoranthene

These PAHs can be present in smoke, soot, and diesel exhaust, contributing to health risks.

#### Firefighters may be exposed to a range of (PAHs), including:

# **Activated Charcoal**

Activated charcoal is a form of carbon that has been processed to create a highly porous material with an extensive surface area. This activation process typically involves heating carbon-rich materials, such as coconut shells or wood, in the presence of a gas that creates small, low-volume pores.







d]pyrene Benzo[g,h,i]perylene

Dibenz[a,h]anthracene

#### Natural Source

While the activation process is industrial, the starting materials are natural, making it a popular choice for those seeking more natural health products.

#### How it works

Activated charcoal carries a net negative charge so it attracts heavy metals and other toxins. it's tiny pours and immense surface area make it extremely **adsorbent** to take toxins with it.

# Absorption V ADSORPtion

#### What is Absorption?

Absorption is a process where one substance, such as a liquid or gas, is taken into another. This occurs at both the molecular and atomic levels, as the atoms and molecules of the two substances must interact and combine. For a substance to be absorbed, it typically needs to either dissolve or diffuse into the other.

#### What is Adsorption?

In contrast, adsorption involves the accumulation of one substance on the surface of another, rather than it being taken in. This process is characterised by adherence, where one substance simply clings to the surface of another without dissolving or diffusing.

#### Activated Charcoal and Adsorption

Activated charcoal utilizes the process of adsorption, making it highly effective for detoxification. Impurities or toxins adhere to the surface of the charcoal.

Due to its remarkably large surface area, activated charcoal can attract a vast number of impurities, enhancing their removal from the body. In fact, just one teaspoon of activated charcoal has more surface area than an entire football field!

Moreover, activated carbon has a negatively charged pore structure, which enables it to attract positively charged substances, such as impurities and gas-forming compounds. Once these substances adhere to its surface, they are not absorbed by the body.

# **SMOKE SOAP HAS AN**

# 88%

# **REDUCTION IN OVERALL PAH**



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