CR Resin Formaldehyde Adsorption

Odour-substance comparison versus activated carbon

Source: odour tests by Royal Haskoning, Netherlands · summarised by CR-Products Int.

5/5	2/5	5/5	38 / 62
Formaldehyde rating · excellent	Activated carbon · moderate	Ammonia rating · excellent	Substances rated good or excellent

EXECUTIVE SUMMARY

Performance overview

In an odour-substance comparison by Royal Haskoning (Netherlands), pure CR Resin and activated carbon were rated for 62 odour-causing and hazardous gases on a five-point scale. For **formaldehyde**, CR Resin received the top rating, **excellent (5/5)**, against **moderate (2/5)** for activated carbon. Ammonia scored the same: excellent (5/5) for CR Resin, moderate (2/5) for carbon.

Together with NedLab report 127617/2011 for ammonia, this confirms the **Dual Action** of CR Resin: one granular medium that binds both ammonia and formaldehyde — the two indoor gases activated carbon holds worst.

RATING SCALE

How the substances were rated

1 ★☆☆☆☆	2 ★★☆☆☆	3 ★★★☆☆	4 ★★★★☆	5 ★★★★★
not	moderate	reasonable	good	excellent

* Resin not or barely regenerable for this substance: the gas stays bound.

RESULTS

Aldehydes, ammonia and amines: CR Resin against activated carbon

Substance	Activated carbon	CR Resin	Note
Formaldehyde	2 · moderate	5 · excellent *	Top rating; captured formaldehyde stays bound
Acetaldehyde	2 · moderate	4 · good	Aldehyde: oxidised, fruity odour
Acrolein	3 · reasonable	4 · good	Aldehyde from cooking and combustion
Ammonia	2 · moderate	5 · excellent	Confirmed by NedLab 127617/2011 (≈25× first hour)
Methylamine / dimethylamine	2 · moderate	4 · good	Fishy amine odours
Hydrogen sulphide (gas)	3 · reasonable	4 · good	Rotten-egg odour

WHAT IT MEANS FOR FILTER DESIGN

Where CR Resin belongs in a filter

- **Formaldehyde and ammonia:** CR Resin takes over the two polar gases activated carbon holds poorly — in one granular stage.
- **Keep the carbon for solvents:** in the same comparison activated carbon scores better on aromatic solvents and ketones (benzene, toluene, MEK). A blend of 10–15% CR Resin in the carbon bed covers both.
- **Permanent capture:** formaldehyde is marked * (resin not or barely regenerable): once bound it stays bound. Plan filter replacement rather than regeneration for formaldehyde duty.
- **Humid air:** CR Resin keeps working in humid conditions, where carbon loses capacity above about 60–70% RH.

OTHER GASES

Further substances rated good (4) or excellent (5) for CR Resin

Substance	CR	AC	Substance	CR	AC	Substance	CR	AC
Acrylonitrile	4	4	**Phenol**	4	?	**Hydrogen cyanide**	4	3
Allyl chloride	4	?	**Phosgene**	4	?	**Hydrogen fluoride**	4	2
Aniline	4	4	**Methanol**	4	?	**Hydrogen iodide**	4	3
Acetic acid	4	4	**Methyl chloride**	4	3	**Hydrogen selenide**	4	2
Bromine	4 *	?	**Methylene chloride**	4	4	**Hydrogen sulphide**	4	3
Chlorine	4 *	3	**Methyl mercaptan**	4	4	**Hydrochloric acid gas**	4	2
Dimethyl sulfide (1)	4	?	**Pyridine**	4	4	**Sulphur dichloride**	4	?
Dimethylformamide	4	?	**Styrene (with inhibitor)**	4	4	**Sulphur dioxide (humid)**	4	2
Dimethyl sulfide (2)	4	4	**Trichloroethanal**	4	?	**Hydrogen sulphide (from Na_2S)**	4	3
Ethanol (synthetic)	4	4	**Trichloroethylene**	4	?			
Ethyl mercaptan	4	3	**Hydrogen bromide**	4	2			

Green: CR Resin rated higher than activated carbon. Grey: equal rating. AC = activated carbon; ? = not tested for carbon.

EVIDENCE

Sources and limits

Ratings: odour-substance comparison of pure CR Resin (RE) and activated carbon (AC), tests by Royal Haskoning, Netherlands; full table of 62 substances: CR Resin vs Activated Carbon — Odour-Substance Comparison (crp-int.com/library). Ammonia: NedLab Analytical Report 127617/2011. Ratings are comparative and qualitative; performance in a specific filter is confirmed in a joint test with your current media (single-pass efficiency, breakthrough, pressure drop, humidity).

Free samples and a joint test on your filter: inquiries@crp-int.com · crp-int.com/oem.html