



## Product Data Sheet Flame Retardants

Additives

**Exolit® AP 428**

Edition Date June 07, 2018 Edition Number

**Ammonium Polyphosphate****Product Description**

Exolit AP 428 is a fine-particle ammonium polyphosphate produced by a special method. The product is largely insoluble in water and completely insoluble in organic solvents. It is colourless, non-hygroscopic and non-flammable. Exolit AP 428 differs from most other commercial products in the following ways: - greatly reduced solubility in water - lower viscosity in aqueous suspensions - lower viscosity in PU polyol suspensions.

**Benefits****Specifications**

Characteristics	Unit	Target value	DS <sup>1)</sup>	TD <sup>2)</sup>	Test method
<b>Chemical Formula</b>		[NH <sub>4</sub> PO <sub>3</sub> ] <sub>n</sub> n > 1000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Phosphorus</b>	% (w/w)	31 - 32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Photometry after oxidizing dissolution; (11/17)
<b>Water / Moisture</b>	% (w/w)	max. 0.25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Thermogravimetry at 130 °C; (11/03)
<b>Nitrogen</b>	% (w/w)	14 - 15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Elemental analysis; (11/07)
<b>Viscosity</b>	mPa*s	max. 100	<input type="checkbox"/>	<input checked="" type="checkbox"/>	at 25 °C in 10 % aqueous suspension
<b>pH Value</b>		6 - 8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Potentiometry in 10 % aqueous suspension; (11/12)
<b>Solubility in Water</b>	% (w/w)	max. 0.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gravimetry after filtration of a 10 % aqueous suspension at 25 °C; (11/41)
<b>Acid Number</b>	mg KOH/g	max. 1.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Titration using alkali in 10 % aqueous suspension; (11/11)
<b>Decomposition Temperature</b>	°C	> 275	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Initial evolution of ammonia
<b>Average Particle Size (D50)</b>	µm	approx. 20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Particle Size Distribution</b>	% (w/w)		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Air jet sieving; (11/02)
	> 100 µm	max. 0.2 (DS)			
	< 10 µm	≤ 17 % (TD)			Laser diffraction
<b>Weight Loss</b>	% (w/w)		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	350 °C	approx. 5			
	450 °C	approx. 10			
	550 °C	approx. 20			

<sup>1)</sup> Delivery specification: The product is monitored on a regular basis to ensure that it adheres to the specified values. Test methods: Clariant method numbers 11/xx in brackets.

<sup>2)</sup> Technical data: The technical data are used solely to describe the product and are not subject to regular monitoring.

**Applications****Intumescent coatings**

On account of its low water solubility, Exolit AP 428 is particularly suitable as an acid donor for intumescent coatings. Other essential components of intumescent systems include a binder, a carbon donor and a blowing agent. On exposure to flame, intumescent coatings form a carbonaceous foam which effectively shields the underlying material from temperature increases. Steel structures coated with intumescent paints can meet the requirements of fire resistance classes specified in EN, BS, ASTM, UL, Chinese Standards and others. The application of Exolit AP 428 based intumescent coatings on wood or plastics enables these materials to qualify for Building Material Class B (EN 13501-1). Exolit AP 428 imparts a good flame-retardant effect to adhesives and sealants when it is incorporated into the base formulation at the rate of 10 - 20 %.

**Polyurethane foams**

Exolit AP 428 is a suitable non-halogenated flame retardant for polyurethane foams. If handling of Exolit AP 428 as a solid is not possible we recommend the dosage of the flame retardant by preparing an Exolit AP 428/polyol-suspension. Because of the low acid number of Exolit AP 428, it is also possible to incorporate this flame retardant in an Exolit AP 428/isocyanate suspension. To prevent the solids from settling, the Exolit AP 428 suspensions should be stirred or circulated by pump. The stirrers commonly found in service tanks are adequate for this purpose.

**Other applications**

Exolit AP 428 has an excellent flame-retardant effect in cellulose-containing materials such as paper and wood products. With chipboard products, a B-classification according to EN 13501-1 can be achieved by adding 15 - 20 % Exolit AP 428. Because of its high heat stability, Exolit AP 428 is an essential component in intumescent formulations for thermoplastics, particularly polypropylene, for which the classification UL 94 V-0 is specified for applications in the electrical sector. Casting resins based on epoxy resins or unsaturated polyester resins achieve the classification UL 94 V-0 with Exolit AP 428.

## Packaging and Handling

### Delivery form

White powder

### Storage

Minimum shelf life is 12 months from the date of shipping when stored according to the said conditions.

### Packaging

Exolit AP 428 is supplied in 25 kg paper bags and in 500 kg and optionally double-stacked 500 kg shrink-wrapped big-bags/super-sacks. For regulatory details such as the classification and labeling as dangerous substances or goods please refer to our corresponding Material Safety Data Sheet.

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