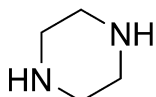


## Technical Data Sheet PIPERAZINE ANHYDROUS (PIP-ANH)

### General



MW: 86.1 gmol<sup>-1</sup>  
CAS No.: 110-85-0  
EINECS No.: 203-808-3  
IUPAC name: Piperazine

Piperazine (PIP; CAS 110-85-0) is a cyclic ethylene amine with two secondary amine groups. In its pure form, PIP has a freezing point of 106°C and a boiling

point of 147°C. Due to its narrow liquid range, commercial piperazine is often supplied as 68 % active content diluted with water (PIP 68%).

AkzoNobel supplies Piperazine 68 % and Piperazine 99 % – more commonly known as "anhydrous piperazine" or "piperazine flakes". Piperazine is commonly used as a raw material for several commercially available drugs. Other possible application fields include polyamides, gas sweetening and as an intermediate in PU catalysts.

### Sales Specification

| Characteristic | Unit  | Specification          | Methods of Analysis |
|----------------|-------|------------------------|---------------------|
| Appearance     | -     | white flakes           | 200                 |
| Piperazine     | w%    | Min99.7 (as waterfree) | 526                 |
| Water          | w%    | max 1.0                | 305                 |
| Color          | Hazen | max 50                 | 201                 |

Methods of Analysis are available upon request.

In case of dispute, the listed Method of Analysis will be used as reference methods.

### Physical and Chemical Properties

| Property                  | Value   | Property                               | Value                   |
|---------------------------|---|--|-------------------------|
| Form                      | flakes  | pH                                     | 12 at 15 % solution     |
| Colour                    | white   | Melting point/freezing point           | 106 °C at 1 013 hPa     |
| Odour                     | amine-like  | Boiling point/boiling range            | 147 °C at 1 013 hPa     |
| Flammability (solid, gas) | The substance or mixture is a flammable solid with the category 1 | Ignition temperature                   | 320 °C at 1 013 hPa     |
| Explosive properties      | Not explosive   | Vapour pressure                        | 0,4 hPa at 22,5 °C      |
| Oxidizing properties      | The substance or mixture is not classified as oxidizing           | Relative vapour density                | 3,0                     |
| Water solubility          | 150 g/l at 20 °C  | Density                                | 1 110 kg/m3 at 20 °C    |
|                           |   | Relative density                       | 1,1 at 20 °C            |
|                           |   | Partition coefficient: n-octanol/water | log Pow: -1,24 at 25 °C |
|                           |   | Viscosity, dynamic                     |                         |

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