KANE INTERNATIONAL CORPORATION

KANE - SHELLAC GUIDELINE FOR THE PREPARATION OF AQUEOUS DISPERSIONS

1. **Kane** Flaked Shellacs and Bleached Shellacs
2. Water-soluble special shellacs
3. General Procedure

1. Kane Flaked Shellac, Bleached Shellac

In addition to their solubility in pure low-molecular weight alcohols and other polar organic solvents, **Kane** Flaked Shellacs and Bleached Shellacs are soluble in basic aqueous media, i.e., in water or water/alcohol mixtures if an appropriate base (usually amine or alkali) is added.

Dewaxed shellac types yield clear dispersions at pH-values >6.9
Cloudy or milky dispersions are obtained with wax-containing types.

Bases compiled in the following table are commonly used for the preparation of aqueous shellac dispersions. The required quantities depend on the specific base and relate to the weighed quantity of shellac. Additionally the approximate maximum for the concentration of the respective shellac solutions are given. At higher concentrations than these the viscosities increase rapidly.

Bases for aqueous shellac dispersions

Base (amine/alkali)	Required amount [% by weight] approx.	Max. solids content of shellac solution [%] approx.
Borax - 10 H2O	22	33
Sodium hydroxide	5	33
Potassium hydroxide	7	33
Sodium carbonate	7	33
Potassium carbonate	7	33
Ammonia/Water (25%)	11	25
Morpholine	10	27
2-Amino-2-methyl-1-propanol	10	27
Diethanolamine	12	27
Triethanolamine	18	27

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2. Water-Soluble Special Shellacs

The water-soluble shellacs (**63 series**) are directly soluble in water or aqueous solvent systems without any further additive. However, if the degree of water hardness is very high, a water softening agent should be incorporated.

The dissolving procedure corresponds to the general one given in item 3 **without** adding a base, however. Especially in case of fine-powdered product **Kane 63HE-N** vigorous stirring after its addition to the cold/cool solvent (water; water/organic solvent) is essential in order to achieve complete and homogeneous wetting of all shellac particles. Otherwise, formation of lumps may occur which will dissolve very slowly afterwards. The pH value has to be controlled if a mixture of water with an organic solvent (e.g. alcohol) is used.

3. General Procedure for Aqueous Dissolution of Shellac

Mix Shellac with cold/cool water or aqueous solvent system in a vessel with a stirrer and heating facility. Add the necessary amount of amine or alkali (flaked or bleached shellacs only!). Stir and heat mixture to 50 - 60 degrees C (**63 HYDRAM** max. 40 degrees C!). Switch off heater when temperature has been reached and continue stirring until shellac is completely dissolved. It is advisable to keep the vessel covered during cooling period in order to avoid film formation on the surface of the dispersion.

The pH value should be adjusted to approx. 6.9 - 7.3 (not necessary in case of water-soluble special shellacs if no other solvent but water is used.)

Some bases, especially borax, cause swelling of the shellac at the beginning of the dissolution process. If the concentration is high it could be necessary to stop the stirrer during this short period.

It is possible to dissolve shellac at low temperatures (25 degrees C), as well, but this will prolong the swelling time and the time until it is completely dissolved (3 to 12 hours depending on the kind of base which is used).