

INSOL-U-25[®] and STA-FORM 60[®]

Urea-Formaldehyde Concentrates

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Product Information

DESCRIPTION

INSOL-U-25[®] and STA-FORM 60[®] urea-formaldehyde concentrates (UFC) are clear, viscous liquids consisting of formaldehyde, urea, and a small amount of water. They provide some of the highest concentrations of formaldehyde commercially available in an easy-to-use form.

Benefits of INSOL-U-25 and STA-FORM 60 UFC include:

- Longer storage stability in contrast to conventional aqueous formaldehyde solutions.
- Can be stored at ambient temperatures.
- Convenient source of both urea and formaldehyde since active components are already in liquid form.
- Less storage space required since urea and formaldehyde are combined and do not require separate storage tanks.
- Reduced cycle times since part of the combination reaction between urea and formaldehyde has already occurred and only one material is metered to the process.

USES AND APPLICATIONS

INSOL-U-25 and STA-FORM 60 UFC can be used in many applications where urea and formaldehyde are required ingredients.

A major application for UFC is as a precursor in the manufacture of liquid and dry nitrogen-based lawn and shrub fertilizers.

Another major use for these products is in the preparation of urea-formaldehyde resins for wood product adhesives.

PRODUCT HANDLING

UFC contains formaldehyde which has a strong odor and at high levels can cause irritation of the eyes, skin, nose and throat. Do not get in eyes, on skin, or on clothing. Avoid prolonged or repeated skin contact. Wash thoroughly with soap and water after handling. Launder contaminated clothing before reuse. Discard contaminated shoes. Avoid prolonged or repeated breathing of vapor or mist. Keep containers closed when not in use. Use only in well ventilated areas.

Additional information on the safe handling of UFC is in the Material Safety Data Sheet available from Georgia-Pacific Chemicals.

SPECIFICATIONS

Type	urea-formaldehyde concentrate
Form supplied	liquid
Color, APHA	10 maximum
Formaldehyde, weight %	60.0 ± 0.5
Urea, weight %	25.0 ± 0.5
Active materials, weight %	85.0 ± 1.0
Viscosity, cps	240 - 600*
Specific gravity at 25°C	1.325 ± 0.005
Weight per gallon, lb	11.0 (average)
pH	7.0 - 8.5*
Specific heat at 45°C, cal/g	0.586
Electrical conductivity at 26°C, mho	32
Congealing point, °F	below -14
Boiling point, °F	212
Flash point, °F (Pensky-Martens Closed Cup)	176
Solubility in 100 grams UFC at 25°C	
water	miscible
methanol	miscible
ethanol	miscible
n-butanol	15 grams
urea	81 grams
Vapor pressure, mm Hg (Torr)	
at 25°C	10
at 39°C	31
at 49°C	50
at 62°C	100

* can be adjusted to meet specific needs.

TEMPERATURE REQUIREMENTS

INSOL-U-25[®] and STA-FORM 60[®] UFC remain stable unless subjected to temperature extremes. The viscosity of the

product increases with lower temperatures. At temperatures between -4°F and -22°F, these products become viscous and glass-like, but they will return to normal viscosity with warming. (See Figure 1) However, prolonged temperatures above 95°F also result in a rapid and permanent viscosity increase and are not recommended.

Therefore, the product should be maintained at temperatures between 77°F and 95°F during shipping, unloading and storage, although temperatures as low as -4°F can be tolerated without a permanent viscosity effect.

SHIPPING, UNLOADING AND TRANSFER

Georgia-Pacific ships INSOL-U-25® and STA-FORM 60® UFC in stainless steel tank trucks and in 20,000-gallon insulated resin-lined cars. They are shipped at a temperature between 77°F and 95°F.

Tank cars and tank trucks must be unloaded by pump. In accordance with OSHA regulations, unloading by air pressure is not permitted.

For truck unloading, the driver will hook up the transfer hoses to the truck and open the outlet valve. Plant personnel are responsible for making proper connections to the plant unloading line as well as the operation of all pumps and valves in the lines to the storage tank.

Since the viscosity of the product increases with lower temperatures, it is recommended that the concentrate be kept warm during transit for ease in unloading.

In climates where low temperatures are likely, transfer lines to storage should be insulated and heat-traced or steam-traced. This helps to maintain product flow during transfer and helps to prevent the lines from plugging.

Once the lines are warm, the heat source should be cut off so that the product is not overheated. High viscosities created from short periods of cooling can be reversed by warming with agitation to recommended temperatures.

STORAGE

The pH of UFC gradually drops when stored at room temperature (See Figure 2) and process adjustments may be necessary.

UFC should be stored in well-ventilated areas away from strong acids and oxidizing and alkaline materials.

Storage tanks of aluminum, resin-lined mild steel, or stainless steel are recommended. Since some contamination can occur with prolonged storage in aluminum or resin-

lined mild steel, storage tanks of stainless steel may be preferred.

UFC has been found generally to be less corrosive than aqueous formaldehyde solutions.

Indoor storage is recommended. Outdoor storage tanks should be shielded from the direct rays of the sun to maintain temperatures below 95°F.

If outside storage is necessary, or if low indoor temperatures are expected, insulated storage and some means of heating the tank, such as inside heating coils, should be considered. Hot water (127°F) is preferable to steam for heating.

Agitation inside the tank is also recommended to avoid hot spots and to maintain uniform viscosity.

Centrifugal pumps are recommended for UFC transfer. The pump horsepower required is generally twice that needed to transfer formaldehyde solutions with the same rate of flow. Mechanical pump seals are recommended.

INSOL-U-25 and STA-FORM 60 are stable for at least six months when stored under recommended conditions.

FIGURE 1.
Temperature Effect On Viscosity of UFC

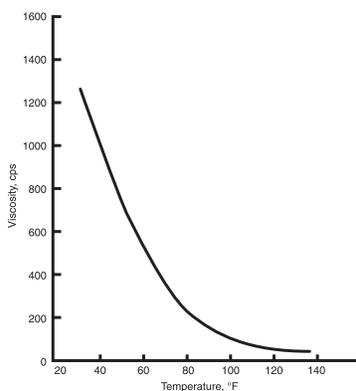


FIGURE 2.
pH changes of UFC

