# UNICELL-TS

- p-Toluenesulfonylsemicarbazide
- Foaming agent for high temperature process

## Description

**UNICELL-TS**, the trade name of p-Toluenesulfonylsemicarbazide, evolves gas at the relatively higher decomposition temperatures than foaming agents.
The high decomposition temperature of **UNICELL-TS** gives less risk of premature decomposition in compounding stage where high temperatures are required. **UNICELL-TS** is recommended to use in ABS, rigid PVC, polyamide, HDPE, Polysulfone and other polymers requiring high processing temperature.

## Properties of UNICELL-TS

| Item | Specification |
|---|---|
| Chemical Name | p-Toluenesulfonylsemicarbazide |
| Appearance | Fine White Powder |
| Decomposition Temperature (℃) | 228~232 |
| Gas Volume (ml/g, at 25℃) | 115~155 |
| Average Particle Size(㎛) | 4.0~4.6 |
| Moisture Content (%) | 0.5 max. |
| Chemical Formula | $CH_3-\phi-SO_2-NH-NH-CO-NH_2$ |
| Specific Gravity (at 25℃) | 1.44 |
| Molecular Weight | 299.25 |
| Solubility (g sample/100ml solvent, at 20℃) | Soluble in Water : 0.49<br>Toluene : 0.35<br>Alcohol : 5.10<br>DMSO : fairly soluable |
| CAS No. | 10396 - 10 - 8 |

## Decomposition of UNICELL-TS

When **UNICELL-TS** decomposes, nitrogen and carbon dioxide are evolved.

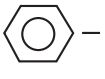
$$R-SO_2-NH-NH-CO-NH_2 \longrightarrow R-SO_2-N=N-CO-NH_2 + H_2O$$

$$R-SO_2-N=N-CO-NH_2 + H_2O \longrightarrow R-SO_2-N=N-COOH + NH_3$$

$$R-SO_2-N=N-COOH \longrightarrow R-SOH + N_2 + CO_2$$

$$R-SOH + NH_3 \longrightarrow R-S-S-R + R-SO_3-NH_4 + 2H_2O$$

$$3NH_3 + 2CO_2 + H_2O \longrightarrow (NH_4)HCO_3 + H_2NCOO-NH_4$$

※ R : $CH_3-$ 

Several compounds have been found to activate the decomposition of **UNICELL-TS**. Because of this activation, **UNICELL-TS** is applicable to low processing temperature plastics. General activators are; **UNIPASTE** series, zinc oxide, zinc stearate, calcium stearate, lead stearate and zinc chloride.