



## Hydrazine Solution Terminology

### Terminology

*Hydrazine hydrate* terminology came into use when hydrazine first became commercially available, and was based on the fact that a monohydrate ( $N_2H_4 \cdot H_2O$ ) is formed through hydrogen bonding when hydrazine and water are mixed. The extent to which the monohydrate exists in aqueous solutions has not been clearly established.

In designating solution strength using hydrazine hydrate terminology it is assumed that all of the hydrazine is present as the hydrate. Since the monohydrate ( $N_2H_4 \cdot H_2O$ ) has a molecular weight of 50, and the contained hydrazine a weight of 32, pure monohydrate would contain 32/50 or 64%  $N_2H_4$ . Thus 100% hydrazine hydrate has been used interchangeably with 64%  $N_2H_4$  solution. Since the dual terminology results in the use of different percentages to express one solution concentration, some people have been confused.

### How to Avoid Terminology Confusion

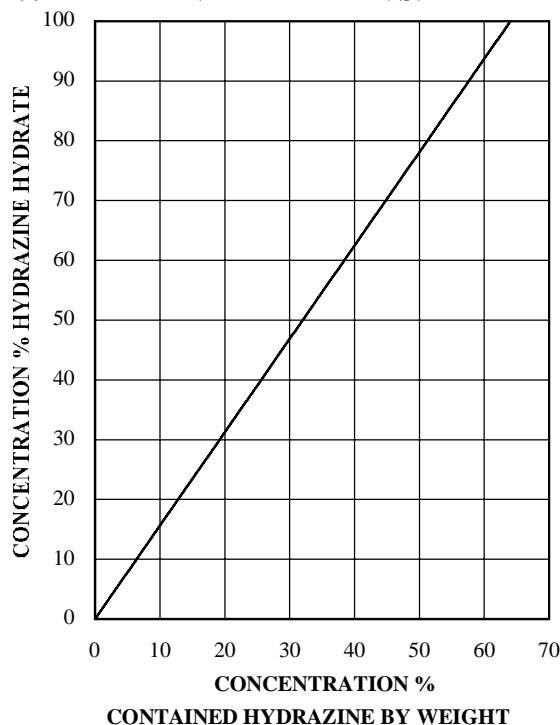
In some cases, confusion resulted because the word "hydrate" had been inadvertently omitted or considered to be synonymous with the word "solution". For example, a reference to a 54% hydrazine solution should be expressed either as "percent contained hydrazine by weight" or as "percent hydrazine hydrate". Otherwise, it could refer to either 54% or 35% contained hydrazine depending upon whether concentration was expressed on actual hydrazine basis or on a hydrazine hydrate basis. Users should ascertain which terminology applies when reference to hydrazine solution concentrations is involved. To prevent the confusion caused by "dual" terminology, literature and package labels express hydrazine content in terms of contained hydrazine (%  $N_2H_4$ ).

### How to Convert One Terminology to Another

Users of hydrazine solutions can easily convert from one terminology to another by referring to the conversion chart on this page. To convert from percent hydrazine hydrate to percent contained hydrazine, pick the applicable concentration expressed as percent hydrazine hydrate at the left of the chart, follow this concentration line to the intersection with the plotted diagonal and read the corresponding concentration in terms of contained

hydrazine by weight from the bottom of the chart. By reversing this procedure, concentrations of contained

**CONVERSION CHART**  
**% HYDRAZINE HYDRATE VS. HYDRAZINE**



Hydrazine by weight can also be changed to concentrations expressed in terms of hydrazine hydrate.

Conversion from one base terminology to another can also be done without the graph. Solutions expressed in terms of percent hydrazine hydrate must be multiplied by the factor 0.64 to find the actual hydrazine content. Thus, a 50% hydrazine hydrate solution contains  $50 \times 0.64$  or 32%  $N_2H_4$ . To convert from percent contained hydrazine to percent hydrazine hydrate, divide %  $N_2H_4$  by 0.64. For example, a solution designated as 48%  $N_2H_4$  is equivalent to one designated as 75% hydrazine hydrate.

### Weight vs. Volume

Hydrazine solutions are generally sold on a weight basis, but some users are also interested in volume measurement. Converting from one measure to the other involves a simple calculation if the specific gravity is known. One multiplies

# Performance Chemicals Hydrazine

the specific gravity of the hydrazine solution times the weight of a gallon of pure water at the same temperature, 25°C being the usual reference. A gallon of pure water weighs 8.312 pounds at this temperature.<sup>a</sup>

Product	Specific Gravity	Pounds/Gallon
Scavox ® 35%	1.019	8.470
51.2%	1.028	8.545
54.4%	1.031	8.570
64.0%	1.032	8.578

<sup>a</sup> "CRC Handbook of Chemistry and Physics", CRC Publishing, 1990, page F2.

## Technical Service

For answers to your questions about Arch Chemicals hydrazine solutions call, Arch Chemicals Hydrazine Technical Service, 960 I-10 Service Rd., Westlake, LA 70669 at (337) 430-4686.

Or visit our web site [www.hydrazone.com](http://www.hydrazone.com)

## Sales

To place an order for delivery in the U.S. or internationally, or for further information call (800)-654-6018.

For further information on storage and handling, see Arch Chemicals Product Brochure "Storage and Handling of Aqueous Hydrazine Solutions".

Please refer to the Material Safety Data Sheet (MSDS) for complete information on Storage and Handling, Toxicological Properties, Personal Protection, First Aid, Spill and Leak Procedures, and Waste Disposal. To order an MSDS, call MSDS Control at 1-800-511-MSDS. Before using or handling this product, the MSDS should be thoroughly reviewed.

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## Sales Headquarters

Arch Chemicals, Inc.  
960 I-10 Service Rd., Westlake, LA 70669

Phone: (337) 430-4023

Arch Chemicals, Inc. 960 I-10 Service Rd., Westlake, LA 70669

Arch Chemicals, Inc.