

Vazo™

Free Radical Initiators

Quick Product Review

Product Information

Description

Vazo™ free radical initiators are substituted azo compounds that thermally decompose to generate free radicals and nitrogen gas. The rate of decomposition is first-order and unaffected by contaminants such as metal ions. Chemours offers four solvent-soluble grades: Vazo™ 52, 64, 67, and 88 and three water-soluble grades: Vazo™ 56WSP, and 68WSP. The grade number is the Celsius temperature at which the half-life in solution is 10 hours. Vazo™ initiators are used in bulk, solution, suspension, and emulsion polymerizations. They can be used alone or in combination with other free radical initiators.

Commercial Uses

- Free radical polymerizations for resins and coatings
- Halogenations (chlorinated solvents and elastomers)
- Addition reactions (chlorine, hydrogen sulfide with olefins)
- Oxidations

Applications

Vazo™ free radical initiators are used to polymerize a variety of monomers. Some common acrylic and vinyl monomers are:

- vinyl chloride
- acrylonitrile
- acrylic acid
- acrylamide
- styrene
- ethylene
- vinyl acetate
- vinylidene chloride
- methyl methacrylate
- methyl acrylate
- unsaturated polyesters

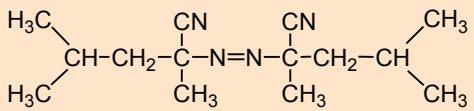
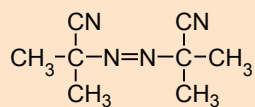
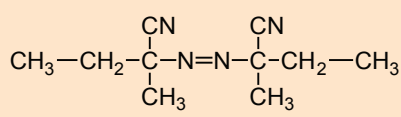
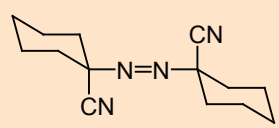
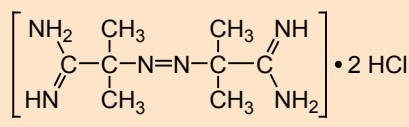
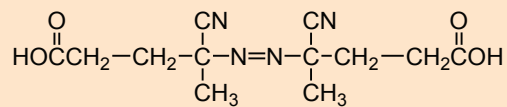
Some of the end-use markets for Vazo™ initiators are:

- automotive coatings
- industrial and specialty coatings
- acrylic sheets and composites
- chemical intermediates
- super-absorbent polymers
- water treatment chemicals
- adhesives and sealants
- graphic arts
- personal care
- detergents
- textiles
- pulp and paper uses
- pharmaceuticals

Advantages of Vazo™ Free Radical Initiators

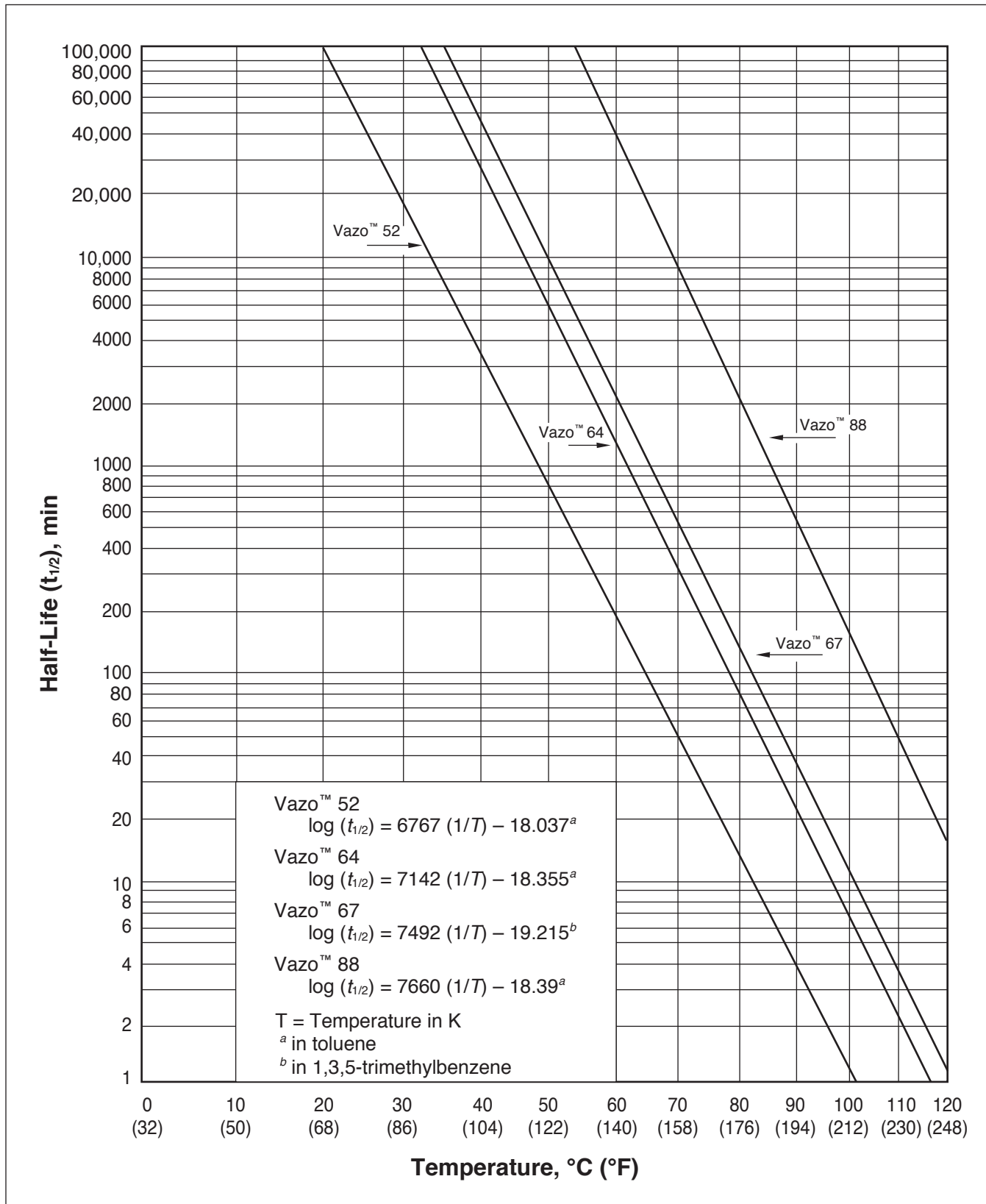
Because Vazo™ Free Radical Initiators...	They...
<ul style="list-style-type: none">▪ are more stable than peroxides	<ul style="list-style-type: none">▪ can be stored economically under milder conditions and are not shock-sensitive.
<ul style="list-style-type: none">▪ decompose with first-order kinetics and are not sensitive to metals, acids, or bases	<ul style="list-style-type: none">▪ enable highly efficient and predictable reactions under a wider range of processing conditions.
<ul style="list-style-type: none">▪ produce less energetic radicals than peroxides	<ul style="list-style-type: none">▪ improve product quality and yield by producing less branching, cross-linking, and chain decomposition.
<ul style="list-style-type: none">▪ have varying thermal activity	<ul style="list-style-type: none">▪ can be used over a wide range of process temperatures.
<ul style="list-style-type: none">▪ are very weak oxidizing agents	<ul style="list-style-type: none">▪ can be used to polymerize a wider range of monomers and do not affect pigments and dyes.
<ul style="list-style-type: none">▪ generate more viable free radicals per pound or kilogram than comparable peroxides and are not susceptible to radical-induced decomposition	<ul style="list-style-type: none">▪ are more cost-effective.

Chemical Structures and Properties of Vazo™ Grades

Grade	Chemical Name and Structure	Molecular Weight	CAS Number	SADT* (°C [°F])	Appearance	10-hr Half-Life Temperature (°C [°F])	Recommended Storage Temperature (°C [°F])
For Solvent Systems							
Vazo™ 52	2,2'-azobis(2,4-dimethylpentanenitrile) or 2,2'-azobis(2,4-dimethylvaleronitrile), AMVN, ADVN	248.37	4419-11-8	35 (95)	white noodles	52 (126)	10 (50)
							
Vazo™ 64	2,2'-azobis(2-methylpropanenitrile) or 2,2'-azobis(isobutyronitrile), AIBN	164.21	78-67-1	50 (122)	white noodles	64 (147)	24 (75)
							
Vazo™ 67	2,2'-azobis(2-methylbutanenitrile) or 2,2'-azobis(methylbutyronitrile), AMBN	192.26	13472-08-7	50 (122)	white noodles	67 (153)	24 (75)
							
Vazo™ 88	1,1'-azobis(cyclohexanecarbonitrile) or 1,1'-azobis(cyanocyclohexane), ACHN	244.33	2094-98-6	80 (176)	white noodles	88 (190)	24 (75)
							
For Aqueous Systems							
Vazo™ 56WSP	2,2'-azobis(2-amidinopropane) dihydrochloride 2,2'-azobis(2-methylpropionamidine) dihydrochloride, AAPH	271.24	2997-92-4	>75 (>167)	WSP—white or off-white powder	56 (133)	24 (75)
							
Vazo™ 68WSP	4,4'-azobis(4-cyanopentanoic acid) or 4,4'-azobis(4-cyanovaleric acid), ACVA	280.28	2638-94-0	55 (131)	white or off-white powder	68 (154)	24 (75)
							

*SADT = self-accelerating decomposition temperature

Figure 1. Thermal Decomposition of Vazo™ Free Radical Initiators



For more information, visit vazo.chemours.com

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