BRB

Silicone solutions for RTV-2 Formulators

Contents

- Vinyl Fluids & Vinyl Dimethicones
- Crosslinker & Modifier
- Vinyl Gum & Base Compound
- Vinyl Resins
- Additives - Inhibitor & Pt Catalyst
- Condensation Cure RTV
- VMS cleaning solvents

BRB's Value Proposition

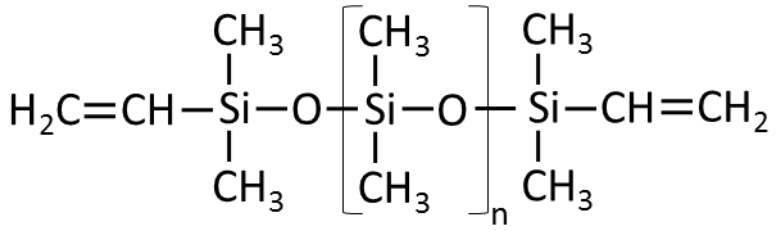
- BRB is an independent silicone intermediate supplier
- Quality Silicone intermediates at competitive pricing
- Quick customization to help customer shorten commercialization time.
- Global reach & supply chain
- High integrity, protection of customer's Intellectual Property
- Flexible MOQ to support customers' initial launch

What is RTV?

- RTV Silicone (Room-Temperature-Vulcanization) is a type of silicone rubber either one or two-component system curable to form a low modulus gels to a hard yet flexible elastomeric rubber.
- Main categories of cure reaction chemistry:
  1. Addition cure - catalysed using platinum
  2. Condensation cure – catalysed using tin salts

BRB Vinyl Fluids

- **BRB Vinyl Fluids** are Vinyl end-capped linear polydimethylsiloxanes with different viscosities.
- Features & Benefits
  - Used as the base polymer in most addition-cured RTV-2 formulations
  - Suitable for formulation of technical products
  - Complete range of viscosities
  - Low volatile content of 1.0 wt%
  - Customization upon request of vinyl groups in different constellation

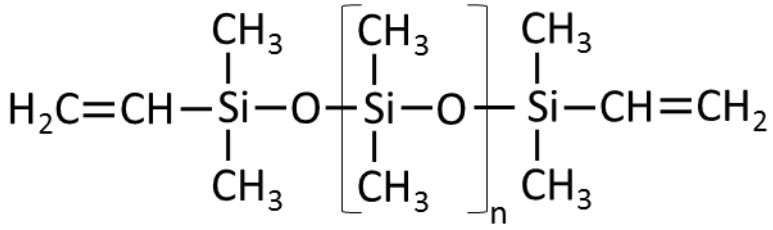


Vinyl fluid
(vinyl terminated)

Product name	Viscosity (cSt)	Vinyl content (mmol/g)
BRB Vinyl Fluid 20 cSt	20	1
BRB Vinyl Fluid 50 cSt	50	0.7
BRB Vinyl Fluid 100 cSt	100	0.33
BRB Vinyl Fluid 200 cSt	200	0.25
BRB Vinyl Fluid 1000 cSt	1000	0.12
BRB Vinyl Fluid 2000 cSt	2000	0.11
BRB Vinyl Fluid 5000 cSt	5000	0.08
BRB Vinyl Fluid 10.000 cSt	10000	0.05
BRB Vinyl Fluid 20.000 cSt	20000	0.04
BRB Vinyl Fluid 65.000 cSt	65000	0.03
BRB Vinyl Fluid 165.000 cSt	165000	0.02

BRB Vinyl Dimethicone

- **BRB Vinyl Dimethicones** are Vinyl end-capped linear polydimethylsiloxanes with different viscosities.
- **U**sed as base polymers for formulating dental silicones, electronic application, and products that require good optical clarity.
- Features & Benefits
  - Clear and colourless liquid
  - Complete range of viscosities
  - Very low volatile content of 0.5 wt%
  - Customization upon request of vinyl groups in different constellation

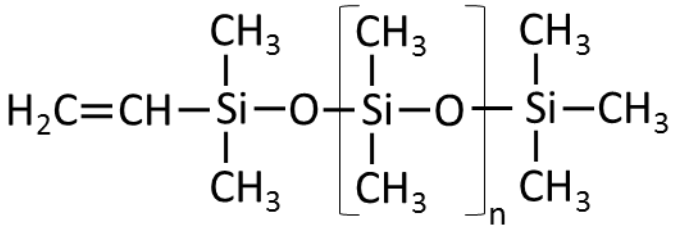


(vinyl terminated)

Product name	Viscosity (cSt)	Vinyl content (mmol/g)
BRB Vinyl Dimethicone 20 cSt	20	1.0
BRB Vinyl Dimethicone 50 cSt	50	0.80
BRB Vinyl Dimethicone 100 cSt	100	0.40
BRB Vinyl Dimethicone 200 cSt	200	0.26
BRB Vinyl Dimethicone 400 cSt	400	0.21
BRB Vinyl Dimethicone 1000 cSt	1000	0.12
BRB Vinyl Dimethicone 2000 cSt	2000	0.09
BRB Vinyl Dimethicone 10.000 cSt	10000	0.05
BRB Vinyl Dimethicone 20.000 cSt	20000	0.04
BRB Vinyl Dimethicone 65.000 cSt	65000	0.03

BRB Mono Vinyl Fluid

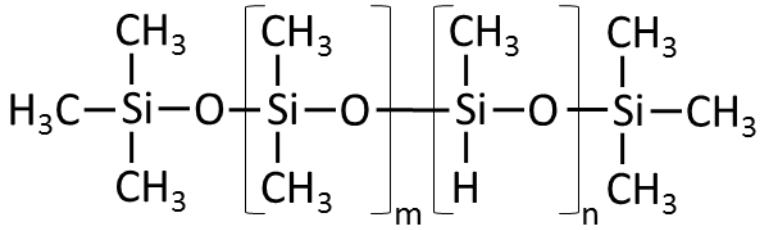
- BRB Mono Vinyl Fluid is a single side Vinyl end-capped linear polydimethylsiloxanes
- Features & Benefits
  - Single side vinyl terminated to achieve reduction in modulus & hardness
  - Can be used as a plasticizer to avoid migration effect
  - Low volatile @ 1% (wt)
  - Viscosity of 1000cSt
  - Low Vinyl Content of 0.06 mmol/g



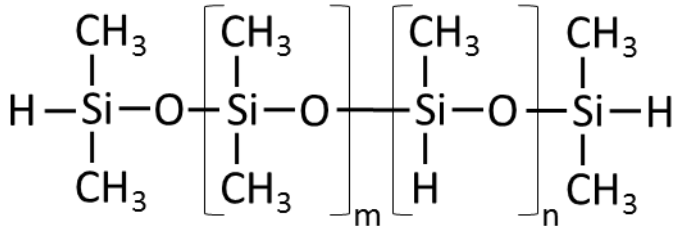
Mono Vinyl fluid
(vinyl terminated)

BRB Crosslinkers

- **BRB SiH Crosslinkers** are SiH-functional polydimethylsiloxanes with varying SiH content and viscosities
- Used as the crosslinker in addition-cured RTV-2 formulation
- Features & Benefits
  - Major influence on the mechanical properties of the elastomer
  - Cures with vinyl-functional components without by-product formation
  - Low volatile content available upon request
  - Low dosage required
  - Both pendant and terminal SiH available for higher reactivity. Pot life impact.
  - Customization of molecular structure available upon request



Crosslinker (pendant SiH)

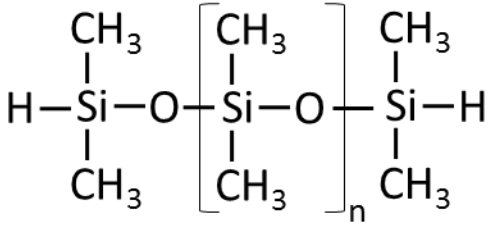


Crosslinker extender - 959H2.5
(SiH terminated & pendant SiH)

Product name	Type of SiH	Viscosity (cSt)	SiH content (mmol/g)
BRB Crosslinker 1592H7	Pendant	15	7.0
BRB Crosslinker 1595H7	Pendant	30	7.0
BRB Crosslinker 1596H0.9	Pendant	75	0.9
BRB Crosslinker 1598H2	Pendant	30	1.9
BRB Crosslinker 434H4	Pendant	50	4.0
BRB Crosslinker 959H2.5	Pendant & Endcapped	30	2.5

BRB Modifiers (Chain Extender)

- **BRB Modifiers** are SiH terminated polydimethylsiloxanes with varying SiH content and viscosities.
- Used for the formulation of addition-cured RTV-2
- Features & Benefits
  - Synergetic effect with BRB Crosslinkers on mechanical properties of elastomer
  - Cures with vinyl-functional components without by-product formation
  - Reduces crosslinking density thereby reduce elastomer hardness
  - Lowers viscosity of addition-cured RTV-2
  - Low dosage required
  - Low volatile content available upon request
  - Colourless



Modifier
(SiH terminated)

Product name	Type of SiH	Viscosity (cSt)	SiH content (mmol/g)
BRB Modifier 1439	End-capped	5	2.5
BRB Modifier 1449	End-capped	13	1.3

BRB Vinyl Gum

- **BRB GUM TG 22** is a Vinyl-functional Polydimethylsiloxane Gum
- Used as reinforcing and diluting fillers for silicones elastomers as well as to manufacture master-batches of pigments & process additives
- Features & Benefits
  - High Consistency
  - Low Volatile Content
  - Translucent
  - High level of filler/pigment acceptance
  - High storage stability

Product name	Molecular weight (10^4)	Volatile (wt%)	Vinyl content (mmol/g)
BRB Vinyl Gum TG 22	67	<3	0.03

BRB Vinyl-functional base compound

- BRB B300 & 1300 are a mixture of vinyl-group-containing silicones and reinforcing filler
- Used for formulating addition-cured two-component silicone rubber
- Features & Benefits
  - Improves the mechanical properties (tensile, elongation) of addition-cured silicone rubber
  - Eliminate handling of dry, dust forming filler during formulation process
  - Offered with a complete package of components for formulating addition-cured RTV-2.
  - Translucent colorless paste

Product name	Viscosity (cSt)	Density (g/cm3)	Vinyl content (mmol/g)
BRB B 300	300,000	1.10	0.09
BRB B 1300	1,300,000	1.13	0.11

BRB Vinyl Functional Resin

- Vinyl-functional resin dissolved in Vinyl fluid.
- As an additive for RTV-2 addition-cured formulations. Especially suitable to formulate clear elastomer in replacement of filler
- Features & Benefits
  - Increases hardness of elastomer when formulated into RTV-2
  - Improves mechanical properties of elastomer when formulated into RTV-2
  - Low dosage required
  - Good compatibility with other addition-cured RTV-2 components
  - Customization of resin and viscosity is available upon request
  - Translucent colorless liquid

Product name	Viscosity (cSt)	Reflective Index	Vinyl content (mmol/g)
BRB MQ 339	6500	1.41	0.22
BRB MQ 393	50000	1.41	0.20
BRB MQ 325	6500	1.41	0.26
BRB MQ 330	6500	1.41	0.30

BRB MP Vinyl Fluids

- BRB MP Vinyl Fluids are vinyl terminated dimethyl diphenyl polydimethylsiloxanes, varying in Phenyl content and viscosity.
- The Phenyl content changes the Refractive Index (RI) of the polymer significantly making it suitable for high optical clarity coating
- Features & Benefits
  - Enables formulations with high filler content that are highly transparent
  - Elastomers possess higher temperature stability than conventional PDMS systems
  - High refractive index
  - Vinyl terminated

Product name	Viscosity (cSt)	Phenyl content (mole%)	RI @25°C
BRB MPV 625	625	29.0	1.52
BRB MPV 2500	2500	42.0	1.54

Vinyl Additives - Inhibitors

- **BRB Inhibitors** are Vinyl-functional siloxanes used to increase the pot life of addition-cured RTV-2
- Features & Benefits
  - Increases pot life from minutes up to hours. For longer pot life (days), Ethynylcyclohexanol (ECH) is recommended.
  - Vinyl M2 (divinyl tetramethyl disiloxane) is highly volatile, which enables instant curing at elevated temperature
  - Vinyl D4 (tetravinyl tetramethyl cyclotetrasiloxane) is less volatile, which enables inhibited curing at elevated temperature
  - Low dosage required
  - Good compatibility with addition-cured RTV-2 components

Product name	Viscosity (cSt)	Density (g/cm^3)
BRB Vinyl M2 (CAS# - 2627-95-4)	1	0.81
BRB Vinyl D4 (CAS# - 2554-06-5)	4	0.98

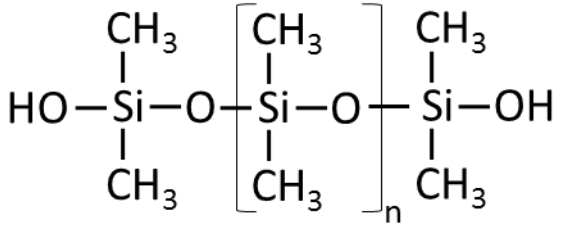
BRB Platinum (Pt) Catalyst

- **BRB Pt Cat** consists of Karstedt platinum catalyst in vinyl fluid
- Used for the formulation of addition-cured RTV-2.
- Features & Benefits
  - Available as 1 and 2 wt% Pt concentrations
  - Enables room temperature curing as well as accelerated curing at elevated temperature
  - Extremely low dosage required
  - Good compatibility with addition-cured RTV-2 components
  - Slightly yellow clear liquid

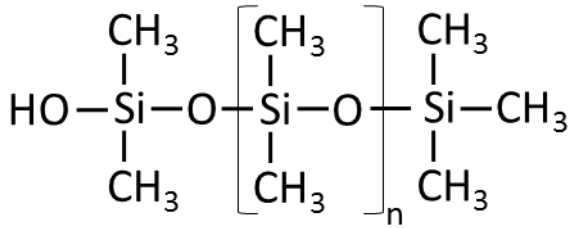
Product name	Pt content (wt%)
BRB Pt Cat 10000 Fast	1.0
BRB Pt Cat 20000 Fast	2.0

Condensation cure RTV-2

- Base polymer (BRB Flexosil OH Fluid)
  - Silanol endcapped polydimethylsiloxane viscosity range from 40cSt to 80,000 cSt
  - Mono Silanol endcapped polydimethylsiloxane, 20000cSt
- Crosslinker
  - BRB Silanil Si28 – Tetraethyl Orthosilicate with SiO2 @ 28%
  - Range of acetoxy, oxime and alkoxy silanes
- Tin Catalyst
  - BRB DBTDL – Dibutyltin dilaurate CAS# 77-58-7
  - BRB DBTDA – Dibutyltin diacetate CAS# 1067-33-0



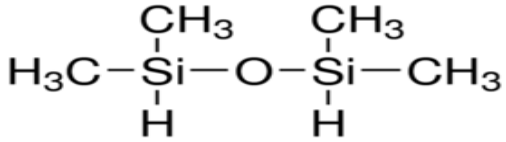
OH fluids
(OH terminated)



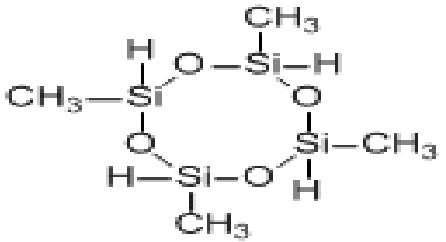
Mono OH fluid
(OH terminated)

Intermediates for Silicone Synthesis

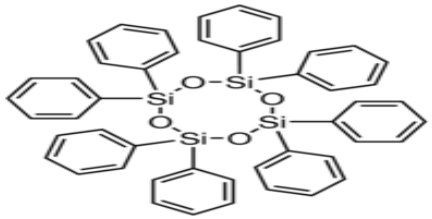
- **BRB 1,1,3,3 Tetramethyldisiloxane**
  - Primarily used as an intermediate in the preparation of silicon hydride end-capped siloxane polymers and other organo silicone
  - CAS number - 3277-26-7



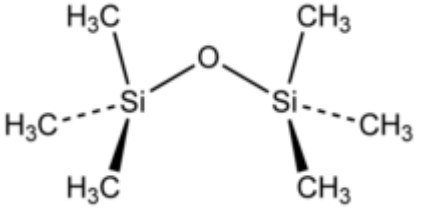
- **BRB D4H** (2,4,6,8 Tetramethylcyclotetrasiloxane)
  - Utilized widely to synthesize variety functional reactive silicone fluids and crosslinker for addition cure rubber
  - CAS number - 2370-88-9



- **BRB Phenyl D4** (Octaphenylcyclotetrasiloxane)
  - Also used widely to synthesize variety phenyl functional silicone fluids and phenyl crosslinker for vinyl addition silicone rubber
  - CAS number - 546-56-5



- **BRB Silicone Oil 0.65 cSt** (Hexamethyldisiloxane)
  - Various application one of which is an end blocker in the production of silicone polymer
  - CAS number – 107-46-0



BRB EL Fluids

- BRB EL Fluids are low molecular weight volatile methyl siloxane
- Ozone safe
- Volatile methyl siloxanes are VOC exempt in US and Canada
- Environmental friendly cleaning solvent, viscosity adjuster for conformal coating and removal of cured and uncured silicones.

BRB Product Name	BRB EL - 10	BRB EL - 20	BRB EL - 30
Chemical Name	Hexamethydisiloxane	Octamethyltrisiloxane	Decamethyltetrasiloxane
CAS No.	107-46-0	107-51-7	141-62-8
Viscosity (cSt)	0.65	1	1.5
Flash point, closed cup (°C)	-3	34	57
Drying rate similar to	Acetone	Isopropyl Alcohol	Water
Cleaning Applications			
Removal of silicones	Best	Best	Best
Dilution of conformal coating	Best	Best	Best
Mould release removal	Best	Best	Best
Printed circuit board	Best	Best	Best
Computer/mobile phone screen	Best	Best	Best
Plastic	Best	Best	Best


AMBITION / FLEXIBILITY / PASSION / INNOVATION
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flexible like a formulator
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