BIO-BASED AND BISPHENOL-FREE EPOXY RESINS

DATASHEET SP-3430_C SP-3688_C SP-3661_C SP-3449_C SP-3645_C SP-3646_C

INTRODUCTION

SPECIFIC POLYMERS' range of epoxy resins redefines industry standards by **introducing advanced epoxy formulations** entirely **free from bisphenol derivatives**. Harnessing the unique characteristics of their core ingredients, our solutions offer the **essential properties to meet end-users' requirements**.

SP-3430_C, SP-3688_C & SP-3661_C: alternative to standard DGEBA

Leading our innovations, **SP-3430_C** and **SP-3661_C BP-free epoxy resins** represent ideal **alternatives** to standard **DGEBA**, providing comparable **viscosity profiles**, enhanced **reactivity**, and equivalent **performance** when combined with conventional hardeners. While **SP-3430_C** is derived from **depletable resources**, **SP-3688_C & SP-3661_C push the boundaries**, delivering **same performances** with an unparalleled **biobased carbon content** of **up to 72%**.

SP-3430_C and **biobased references SP-3688_C & SP-3661_C** are particularly suitable for **pultrusion** and **filament winding processes**.

SP-3449_C, SP-3645_C & SP-3646_C: alternative to low-viscosity DGEBA

To expand our portfolio and unlock new possibilities, **100% reactive low-viscosity epoxy formulations SP-3449_C, SP-3645_C & SP-3646_C** have been developed to fulfill the requirements of processes such as **infusion and RTM**.

All **free** from any trace of **bisphenol derivatives**, **SP-3645_C & SP-3646_C** are characterized by **biobased content of 32 and 61 %** respectively, allowing manufacturers to align with their sustainability strategies

KEY FEATURES

1. Bisphenol-free resins
2. Product grades available with biobased carbon content ranging from 0 to 72%
3. Orange viscous liquids at room temperature
4.
   - SP-3430_C, SP-3688_C and SP-3661_C : Comparable viscosity and performance to standard DGEBA resin
   - SP-3449_C, SP-3645_C & SP-3646_C : Comparable viscosity and performance to low-viscosity DGEBA resin formulations
5. Improved reactivity compared to standard DGEBA and low viscosity DGEBA

SPECIFIC POLYMERS

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TYPICAL DATA OF NEAT RESIN

Reference	Characteristic	Biobased carbon content (%)	Epoxy content (meq/g)	Epoxy Equivalent Weight (g/eq)	Viscosity at 25°C (mPa.s)	Application
SP-3430_C	BP-free alternative to unmodified standard DGEBA	0	7.3 – 8.2	118 - 139	4000 - 7000	General purpose application. Suitable for pultrusion and filament winding processes
SP-3688_C	BP-free and biobased alternative to unmodified standard DGEBA	42	7.3 – 8.2	118 - 139	4000 - 7000	
SP-3661_C	BP-free and biobased alternative to unmodified standard DGEBA	72	7.3 – 8.2	118 - 139	4000 - 7000	
SP-3449_C	Low viscosity BP-free epoxy resin	0	7.3 – 8.2	118 - 139	700-1200	Low viscosity versions suitable for infusion and RTM processes
SP-3646_C	Low viscosity BP-free and biobased epoxy resin	36	7.3 – 8.2	118 - 139	700-1200	
SP-3645_C	Improved biobased carbon content version of SP-3646_C	61	7.3 – 8.2	118 - 139	700-1200	

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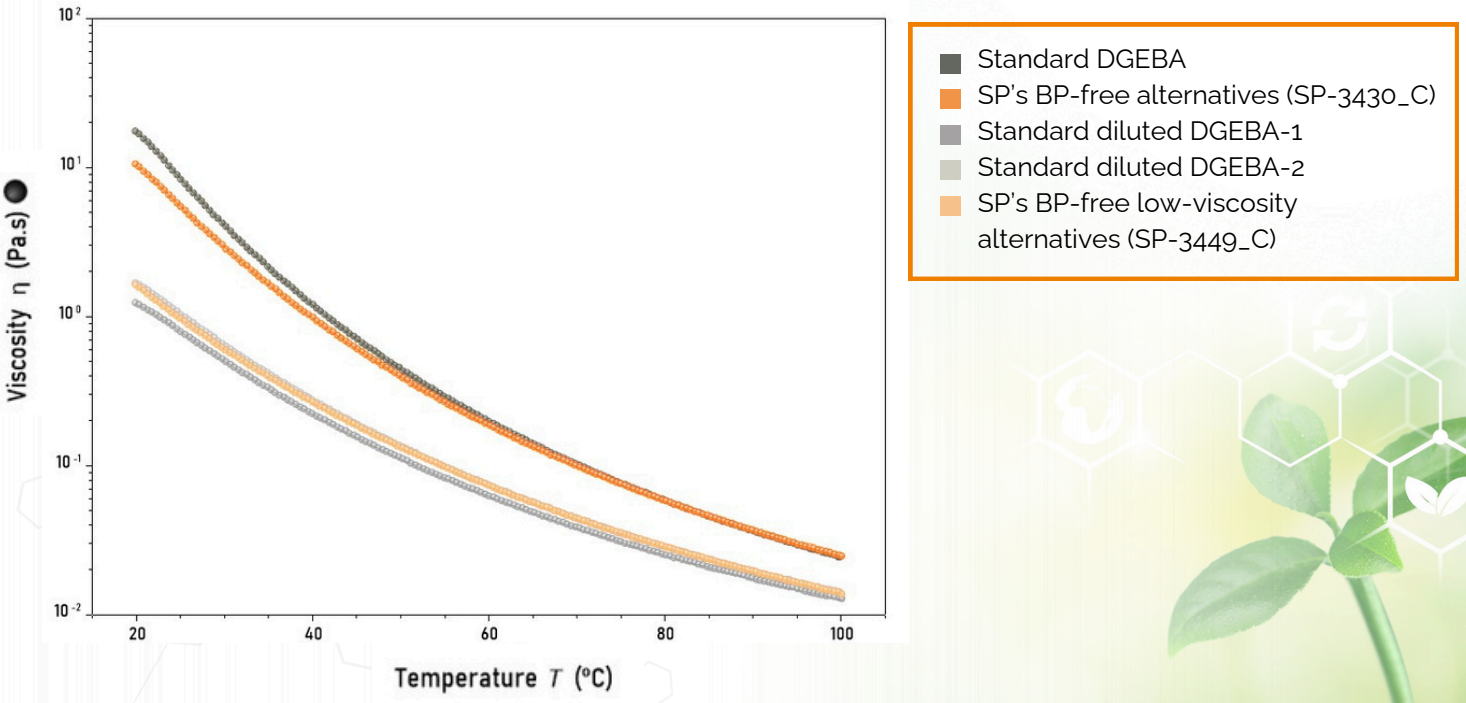
VISCOSITY PROFILES OF NEAT RESINS

Reference	Viscosity profiles of neat resins (mPa.s)					
	20 °C	25 °C	30 °C	40 °C	60 °C	80 °C
SP-3661_C, SP-3688_C or **SP-3430_C**	10500	5500	2950	990	185	60
SP-3449_C or **SP-3645_C** or **SP-3646_C**	1610	950	600	270	73	28

VISCOSITY PROFILE OF NEAT RESIN #3430 COMPARED TO PURE DGEBA



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SP-3430_C, SP-3688_C & SP-3661_C

Typical data obtained when cured with commercial aromatic hardener

Reference	With aromatic-type hardener		With cycloaliphatic-type hardener	
	SP-3430_C, SP-3688_C or SP-3661_C	DGEBA	SP-3430_C, SP-3688_C or SP-3661_C	DGEBA
Tonset (°C)*	135	157	55	80
Tpeak (°C)*	177	200	92	116
ΔH (J/g)*	410	300	511	423
Tg (°C)**	170	160	154	155

** First DSC heating ramp. ** Second DSC heating ramp*

SP-3449_C, SP-3645_C & SP-3646_C

Typical data obtained when cured resin with hardener suitable for infusion process

Reference	With infusion-type hardener	
	SP-3449_C or SP-3645_C or SP-3646_C	Low viscosity formulated DGEBA
Mix viscosity (mPa.s) at 25 °C	190	209
Mix viscosity (mPa.s) at 40 °C	163	150
Tonset (°C)*	81	93
Tpeak (°C)*	117	131
ΔH (J/g)*	554	432
Tg (°C)**	105	84

** First DSC heating ramp. ** Second DSC heating ramp*