



USING NAS[®] XC Q530 TO REDUCE THE FUSION TIME OF PVC COMPOUNDS

INEOS
STYROLUTION



1/18/2024

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NAS[®] is the trade name for the INEOS Styrolution brand of styrene methyl methacrylate copolymer (SMMA). NAS[®] is produced from styrene monomer and methyl methacrylate and offers the advantage of excellent processability, low moisture absorption, low residual stress, high rigidity, and excellent optical properties. In addition to these excellent properties, NAS[®] also makes an economical processing aid for use in reducing PVC fusion time with low compounding energy consumption.

NAS[®] XC Q530 is a specific grade of NAS[®], in powder form, that has been shown to be an excellent processing additive for PVC compounds. Used at typical loading levels of 1 to 4 phr, NAS[®] XC Q530 offers the following advantages over more popular acrylic processing aids:

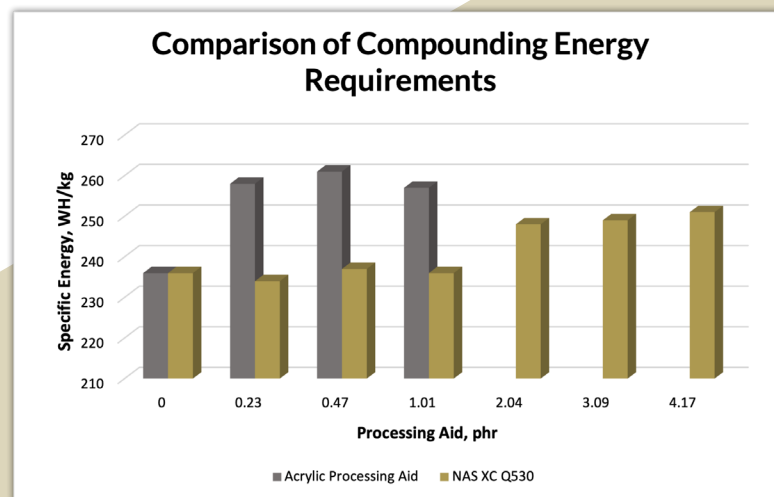
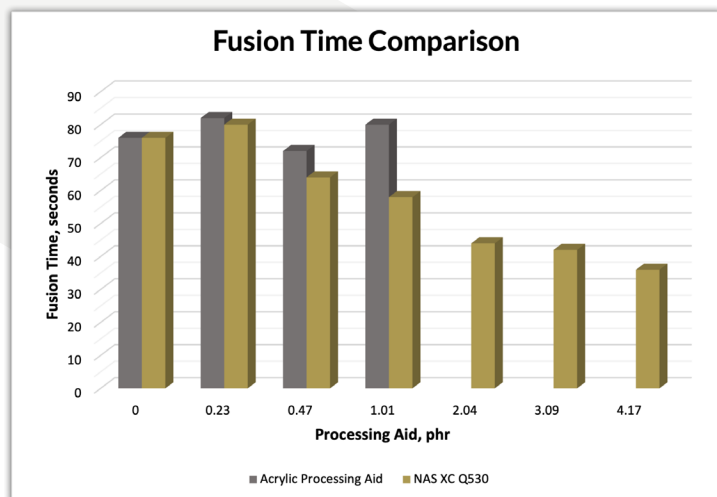
- Promotes faster fusion and increased production output.
- More homogeneous and elastic melt.
- Improved melt strength and elasticity.
- 300 mesh (600-micron) powder results in improved material handling, including easy pneumatic transfer and automatic weighing.

NAS[®] XC Q530 was tested against a popular acrylic processing aid per ASTM D2538-18 using a Brabender PlastiCorder Version 4.9.4. Test conditions were as follows:

- Mixer: Roller type 6 Elect
- Speed: 60 rpm
- Mixer Temperature: 165 °C
- Measuring Range: 50 Nm
- Test Time: 8 minutes
- Sample Mass: 65 grams
- Processing Aid Levels: 0, 0.23, 0.47, 1.01, 2.04, 3.09 and 4.17 phr



Test results show that fusion time drops sharply with increasing levels of NAS[®] XC Q530, and that specific energy also drops slightly.



The table below shows examples of the reduction in fusion time for several different PCV compound applications. NAS[®] XC Q530 can offer significant fusion time savings that can increase output while offering a more homogeneous melt and improved dispersion of ingredients.

COMPOUND	NAS LEVEL (phr)	FUSION TIME (minutes)	TEMPERATURE (°C)	ROTOR SPEED (rpm)
Rigid Pipe	0	4.2	190	90
Rigid Pipe	1	3.5	190	90
Rigid Pipe	2	2.8	190	90
Siding	0	3	170	50
Siding	1	2.3	170	50
Siding	2	1.9	170	50
Pipe Fitting - Molded	0.5	4.7	185	60
Pipe Fitting - Molded	1.5	3.3	185	60
Pipe Fitting - Molded	3	1.8	185	60
Clear Blow Molding	0	3	185	60
Clear Blow Molding	1	2.1	185	60
Clear Blow Molding	2	1.9	185	60

Typical properties for NAS[®] XC Q530 can be found in the table below.

PROPERTY	ISO TEST METHOD	UNITS	VALUE
Density	1183	g/cm ³	1.11
Melt Volume Rate, 220°C / 10 kg	D 1238	cm ³ / 10 min.	24
Water Absorption	62	%	0.17
Tensile Modulus	527-1	MPa	3400
Flexural Modulus	178	MPa	3200
Flexural Strength	178	MPa	101
Charpy Notched Impact Strength 23°C	179/1eA	kJ/m ²	1.4
Charpy Unnotched Impact Strength 23°C	179/1eA	kJ/m ²	20
Deflection Temp Under Load (1.8 MPa)	75-2/A	°C	99
Vicat Softening Temperature	306/B50	°C	98
Maximum Service Temperature	---	°C	260

NAS[®] XC Q530 can offer significant improvements compared to more common acrylic processing aids. These improvements can provide the PVC compounder with improved melt homogeneity, increased output, and overall improvements in the final compound quality.

For more information on NAS[®] XC Q530 please contact your local Entec Polymers account representative.