

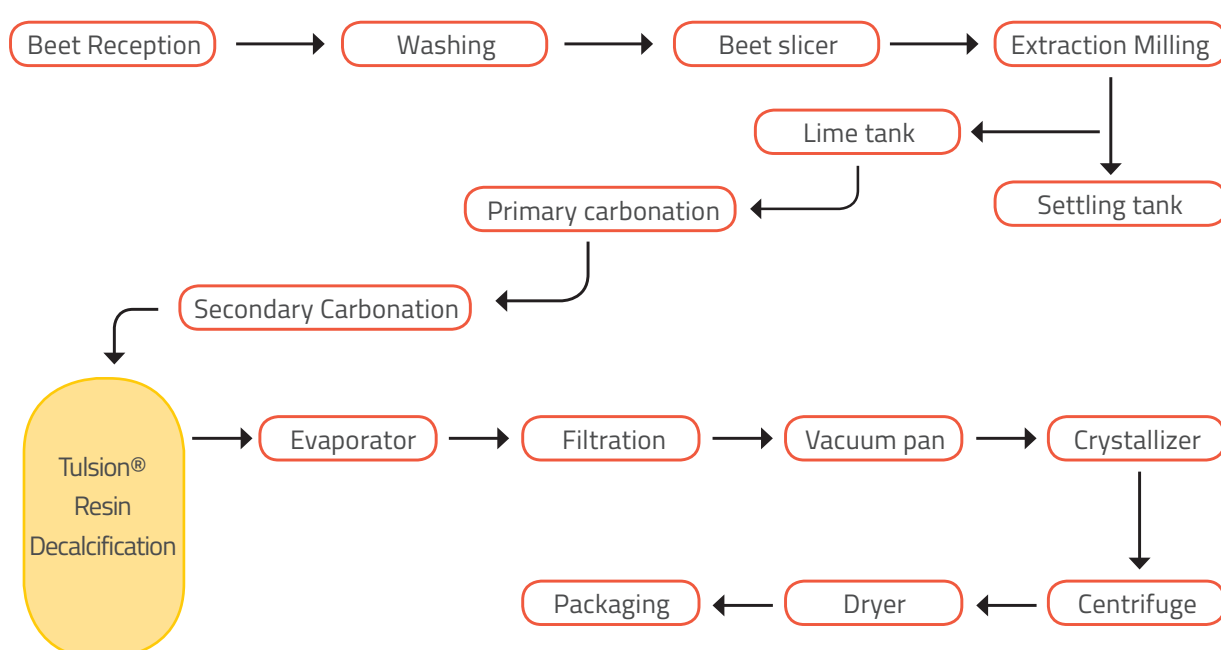
## Beet Sugar Decalcification Using Tulsion® Ion Exchange Resins

### Objective

Demand for sugar is increasing day by day due to higher consumption worldwide which is a major ingredient in food & beverage industry. To meet the potential demand of sugar variety, different manufacturing processes are developed to extract it from different sources. Sugar is obtained from various sources like sugar cane, beet, cassava roots etc. wherein beet is the second largest source of sugar after cane. During carbonation process, juice contains a higher amount of calcium which causes problems like high turbidity, loss of sugar, larger mass of molasses, and scale formation in evaporators. To prevent these issues, Tulsion® resin is employed which can effectively remove calcium & other alkaline earth metals from the juice.



### Beet Sugar Manufacturing Process & Refining



### Resin Mechanism

Divalent (Ca or Mg) ions having high affinity than monovalent ions towards Tulsion decalcification resin consist of sulphonic acid group. Calcium ion replaces with sodium ion in sulphonic group. This reaction is reversible on increasing monovalent ion concentration.



### Customer Plant Details

Particulars	Unit	Softener
Resin name		Tulsion®T-4213 MP Na FG
Resin volume	lit	9000
Resin bed depth	mm	1463
Vessel diameter	m	2.8
Operating temperature	°C	90
Syrup flow rate	M <sup>3</sup> /hr	100
Throughput/output	M <sup>3</sup>	1000
Regenerant		NaOH+ Soft juice
Regeneration level	g/l	50
Regenerant quantity	Kg (100%)	450
Regenerant concentration	%	4
Regeneration time	minutes	30
Regeneration temperature	°C	<40
Slow rinse		With soft juice
Slow rinse volume	BV	2

### Parameters

Particulars	Unit	Feed Analysis	Resin Outlet Analysis
Calcium	mg as Ca/L	200 - 340	≤50
Brix	%	16	16
Polarization	%	9.4	9.38
Color	ICUMSA	215	210
pH		8	8

### Thermax Solution

Thermax Tulsion®T-4213 MP Na FG is the most suitable product for softening process specific to the beet sugar syrup offering many advantages as per customers' requirements. One of our customers from Europe is highly satisfied with our service and has been buying this particular product for past 15 years continuously.

### Advantages

- Syrup turbidity reduction
- High sugar yield
- Less evaporator scaling
- Reduced maintenance & operation cost
- Easy filtration
- Lower water consumption

