

CANE SUGAR DECOLORIZATION BY **TULSION®** RESIN

Background

One of the largest sugar refineries in Thailand was using the acrylic microporous type strong base anion resin in the primary column and styrene type anion resin in the secondary column for decolorization of 60° Brix sugar melt. The plant was operated continuously in lead-lag operation, with columns fed with sugar melt having a color level of 600 ICUMSA.

Thermax proposed to replace both streams with styrene type resin, replacing the existing Acrylic-Acrylic configuration. of competitor.

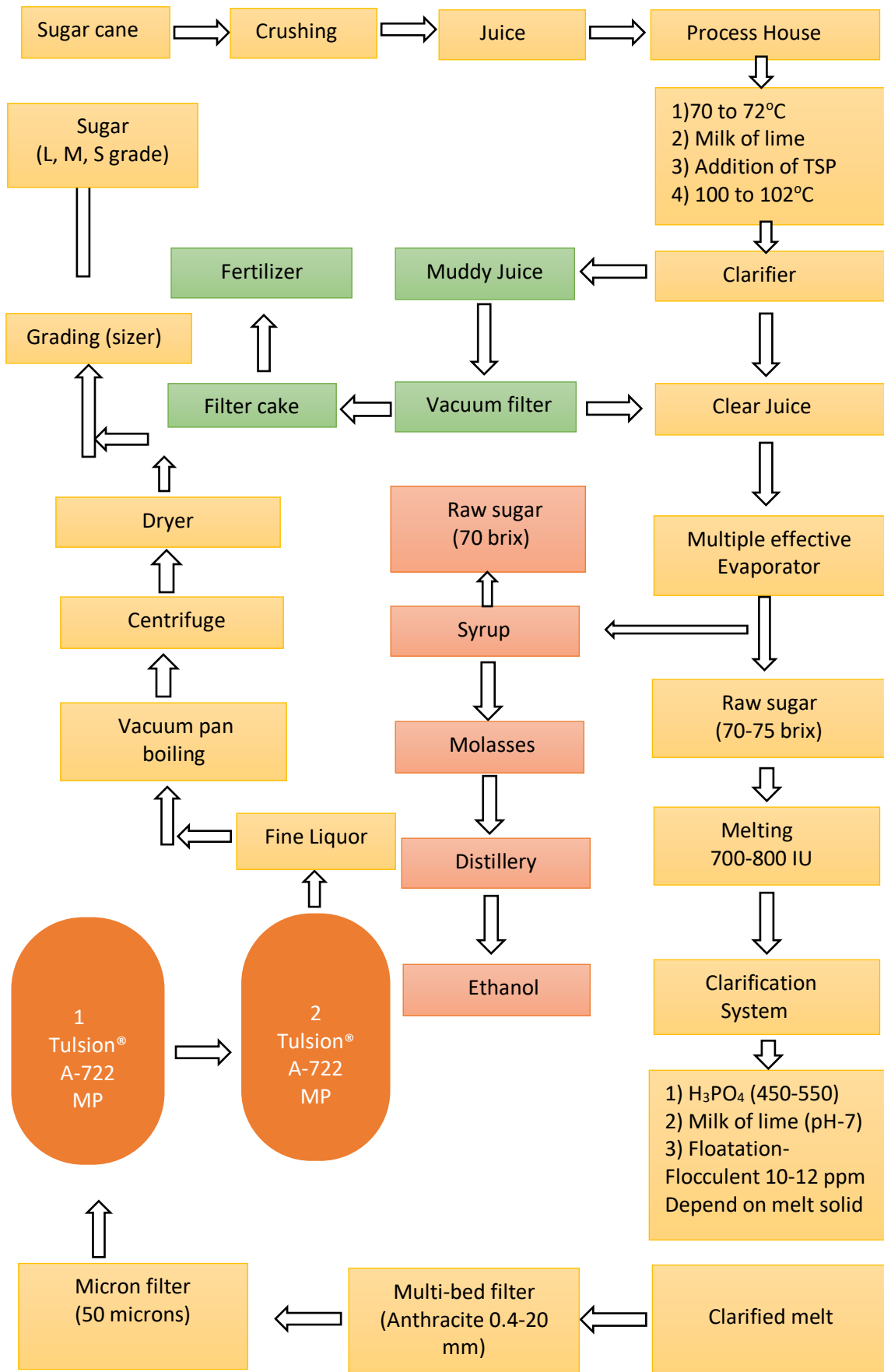
This change was going to give substantial saving on resin cost for the same or better-treated syrup volume of the desired color level @ < 150 ICUMSA.

Pilot trials were proposed and conducted at the site with continuous feed tapping taken from the sugar melt line. Results were encouraging and proved that **Tulsion®** resins are capable of delivering the refined sugar syrup of desired quality at par with the competition products. Based on the pilot trial results, customer replaced the entire quantity (f 20 m3)of the competitor's resin with Thermax **Tulsion® A-722 MP**.

Plant Details

Particulars	Unit	Primary column	Secondary column
Resin		Tulsion® A-722 MP	Tulsion® A-722 MP
Resin volume	Lit	10000	10000
Service flow	m ³ /hr	40	40
Vessel diameter	m	3	3
Vessel height	m	4	4
Area	m ²	7.1	7.1
Resin bed height	mm	1420	1420
Temperature	°C	65 to 70	65 to 70
Inlet color	IU	450-600	300
Color end point	IU	<300	<130
Service hours	hrs	18	20
Throughput	M ³	720	800
Backwash flow(@ 25°C)	m ³ /hr	40	40
Backwash time	Hrs.	1.5	1.5
Backwash end point	pol	0.00	0.00
Regenerant		NaCl + NaOH	NaCl + NaOH
Regenerant concentration	%	10 + 0.7	10 + 0.7
Regenerant quantity	kg	1400+105	1400+105
Regeneration time	Min.	60-80	60-80
Chemical soaking time	Min.	60	60
Slow rinse	BV	2	2
Fast rinse	BV	1	1

Refinery Process Diagram with Tulsion®



Feed & Treated syrup characteristics

Particulars	UOM	Feed Characteristics	Tulsion A-722 MP Styrenic + Styrenic	Competition Acrylic + Styrenic
pH		7 to 7.5	6.8 to 7.5	6.8 to 8.0
Brix	%	60-70	60-70	60-70
Color	ICUMSA	450 -600	< 150	< 150
Treated syrup volume	BV		80-85	80-85
Invert sugar	%	< 0.5	< 0.5	< 0.5

Color reduction observed from feed to the Secondary column outlet



Conclusion

Tulsion A-722 MP has delivered the quantity and quality of treated sugar syrup at par with the existing competition despite changing the treatment configuration of Acrylic-Styrenic to Styrenic -Styrenic macroporous strong base resin. The delighted customer continued with Thermax resins and replaced the other 2 streams with **Tulsion® A-722 MP**.