



References:

UKRAINE

Volodymyr-Volynsky Sugar Plant, Tomashpil Sugar Mill, Chortkiv Sugar Plant, Savyntsi Sugar Mill, Gaisyn Sugar Plant

RUSSIA

Novokubansk Sugar Plant, Uspensk Sugar Plant, Balashov Sugar Factory, Elan-Kolenovskyy Sugar Factory, Izobilnenskyy Sugar Factory, Pereleshino Sugar Factory, Gribanovsky Sugar Factory, Zainsky Sugar Factory, Dobrinka Sugar Plant, Otradinsk Sugar Factory, Uvarovo Sugar Plant, Gryazi Sugar Plant, Argun Sugar Plant, Kamensky Sugar Plant

BELARUS

Skidel Sugar Factory

KAZAKHSTAN

Zhambylsky Sugar Plant

CZECH REPUBLIC

Vrdy Sugar Plant

LATVIA

Liepaja Sugar Plant

KYRGYZSTAN

Kaindy-Kant Sugar Plant

ALGERIA

Ouled Moussa, Sorasucre Spa Sidi Lakhdar, Spa Ram Sucre Mostaganem

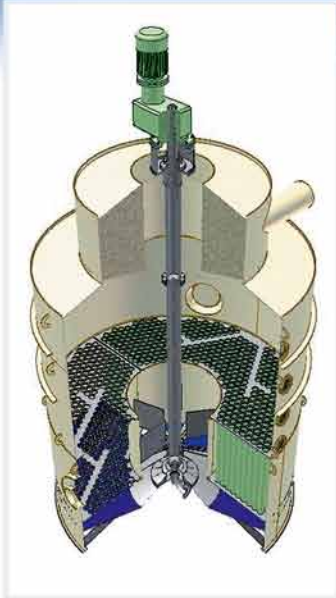


TECHINSERVICE™



SUGAR END SECTION

VACUUM PANS



Techinservice designs and manufactures a series of standard vacuum pans mod. TVA (for 15, 30, 40, 60, 75, 90, 110 and 130 tons of massecuite) equipped with mechanical stirrers. TVA-15 vacuum pans are mainly used for boiling seed magma, while TVA-30, TVA-40, TVA-60, TVA-75, TVA-90, TVA-110 and TVAa-130 pans are designed for A, B & C massecuite boiling. A concept of **Techinservice** lies in using batch vacuum pans for A-product and, if possible, continuous vacuum pans for boiling B & C-products.

These vacuum pans have a large heating surface, ensure production of more marketable sugar and contribute greatly to factory energy efficiency.

Advantages of TVA Vacuum Pans with Mechanical Stirrers Manufactured by Techinservice:

- Possibility to use low-pressure steam ($-0.1+0.35 \text{ kg/cm}^2$), boil syrups with the DS content $> 70\%$
- High crystal content in massecuite
- Cutting down the boiling time by $\sim 30\%$
- Possibility of continuous boiling thanks to the newly developed **Techinservice** vacuum pan mod. KONTI

TVA Vacuum Pan Specification

Model	Inside diameter, mm	Heating circulation tube diameter, mm	Heating surface area, m ²	Net volume, m ³	Massecuite output, t
TVA 15	2500	900	120	10.4	15
TVA 30	3000	1200	165	21	30
TVA 40/38	3800	1500	295	27.6	40
TVA 40-280	4000	1500	280	27.6	40
TVA 40-330	4000	1500	330	27.6	40
TVA 50-280	4000	1500	280	34.5	50
TVA 50-330	4000	1500	330	34.5	50
TVA 60-320	4500	1800	320	41.4	60
TVA 60-380	4500	1800	380	41.4	60
TVA 75-380	4930	2000	380	52	75
TVA 75-460	4930	2000	460	52	75
TVA 78-380	4500	1800	380	53.8	78
TVA 90	5500	2200	590	62	90
TVA 110	6000	2200	845	76	110
TVA 130	6000	2400	752	90	130



TVA Vacuum Pans

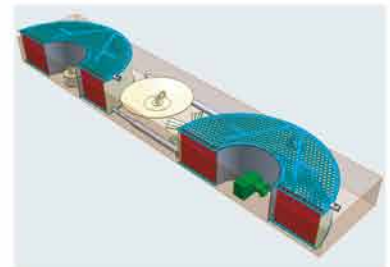


The TVA vacuum pan consists of four main parts: calandria, massecuite chamber, separator and stirrer. In addition, the pan is cut into horizontal and vertical planes into the following main units:

- support section with conical bottom – two parts;
- calandria – two parts;
- massecuite chamber (bottom) – two parts;
- massecuite chamber (top) – two parts;
- mechanical stirrer with inverse cone;
- separator.

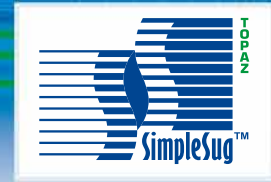
The distinctive feature of TVA vacuum pans is their modular design, which means that you can ship them by sea or road to any destination worldwide with no restrictions in size. In addition, it has advantages when installing pans at operating plants.

In order to achieve more cost-effective and efficient performance of the sugar end section, all vacuum pans are automated by installing **Topaz** automatic control system developed by **Techinservice**.



Main Operator's Room
at Sugar Plant

TOPAZ AUTOMATIC CONTROL SYSTEM FOR SUGAR END

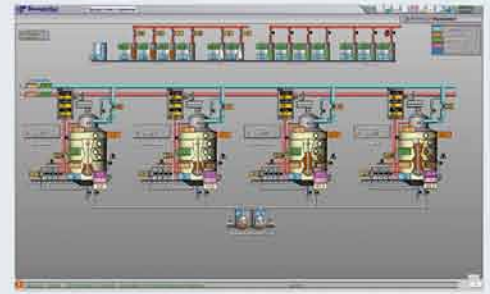
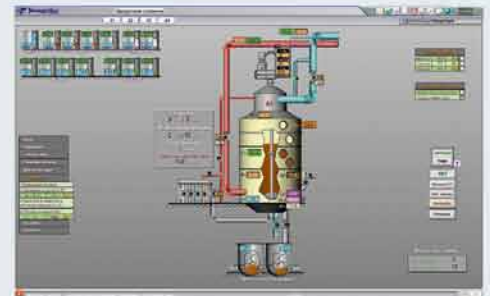
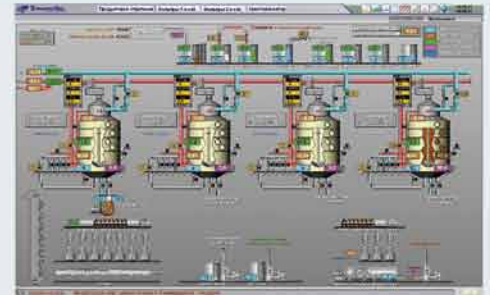


Fully automated and fault-free operation is guaranteed

Advantages & Features:

- Setting up main sugar grades: it is possible to adjust the boiling for a certain size of crystal depending on the current demand in the sugar market.
- Setting up the vacuum pan boiling time: the pan holds the preset time of crystallization, which allows controlling the purity of mother liquor of magma in efficient way.
- Auto-start function: it allows levelling peak loads of steam consumption, mostly effective when processing raw sugar and using exhaust steam.
- Automatic control of cooling crystallizers by keeping a balance between massecuite and cooling water temperatures, which ensures better crystallization effect and consequently higher sugar production output as well as better exhaustion of runoff syrups.
- Complete integrated control of sugar end auxiliary system performance:
 1. controlling the density of prepared remelts;
 2. keeping the set temperature of runoffs and molasses;
 3. operating batch and continuous centrifugals;
 4. pump control: frequency inverters are used to operate AC motors;
 5. pumps and actuators alarming; controlling deviation of process parameters from preset limit values;
 6. recording process parameters and data gathering and storage for the specified time period;
 7. remote control of system regulators by using the operator's panel or PC keyboard. Graphical mnemonic diagrams are the visual depiction of data about the technological process, equipment condition, operating modes and emergencies.

One of the main features of this control system is its high level of fail-safety, i. e. the control system continues functioning even after failure of some devices.



Sugar End Control System Mnemonic Diagrams

