



### ► DESCRIPTION

Injection unit with vacuum tank and programmed interface for high temperature mono-component and premixed multicomponent resins. The system consists of a tank and its peripherals, which can be installed in various positions around the injection tank.

The constituent parts are as follows:

- the injection tank and its options
- the electronic measurement apparatus (measurement of injected weights)
- the vacuum pump (degassing of the resins and/or the mould)
- the electronic data processor and supervision of the machine (direct management by the PC of the injection machine, if connected with a PLC. PLC is used for a complete automation of different process phases.)

### ► UNIT ELEMENTS

#### 1. The injection tank

- Each steel tank is mounted on three feet
- Material: stainless steel.

Name	Total tank volume	Approx. dimensions of each tank	Approx. weight of tanks	Load of one tank
SK1INJ1K10L	30l tank used with metallic tin 5l, 10l or 15l (filling max. resin 3l, 7l or 10 l)	Ø 300 mm, height 350 mm	80 kg	min. 0,5l. - max. 10l.
SK1INJ1K25L	50l tank to use with metallic tin 20 L or 30 l (filling max. resin 15l or 25l)	Ø 400 mm, height 400 mm	100 kg	min. 0.5 l. - max. 25l.
SK1INJ1K40L	60l with direct filling of max. 40l	Ø 400 mm, height 400 mm	100 kg	min. 0.5 l. - max. 40l.
SK1INJ1K50L	90 l tank with direct filling of max. 50l	Ø 400 mm, height 450 mm	140 kg	min. 0,5l. - max. 50l.
SK1INJ1K100L	2 tanks of 90 l with direct max. filling of total 100 l	Ø 400 mm, height 450 mm	2×140 kg	min. 0,5l. - max. 100l.



# TECHNICAL DATA SHEET

## SK11NJ1K Injection Unit

SK11NJ1K200L	4 tanks of 90 l with direct max. filling of total 100 l	Ø 400 mm, height 450 mm	4x140 kg	min. 0,5l. - max. 200l.
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Tank characteristics:

- Pressure: 10 bars (2 bars)
- Tested pressure: 15 bars (3 bars)
- Vacuum: up to 1 mbars.

The tank cover is closed by screw action and it is composed:

- a vacuum /pressure gauge
- a nitrogen connection with spherical valve
- an air/vacuum connection with 3 way valve for inversion
- an auxiliary connection for other functions
- two control points for temperature measurement
- two resin outlet connections
- a viewing window (diam. 80 mm).

### 2. Illumination of window

24V / 20watt illumination.

### 3. T/C K Temperature probe

Temperature probe with length 650 mm for direct measurement of resin temperature with display.

### 4. Electric agitation of resins

Electric motor, slow agitation, controllable speed, sealed unit, shaft and blade in steel, removable

### 5. Heating of container

Resin is placed in a tank for heating and degasation. For units with little volume it is possible to place resin in a tank or to use special metal containers (3l and 5l), which are installed inside the tank, for heating and degasation. In that case the volume heated in the tank can vary from 0.5 liters till possible effective volume. Attention: during degasation process resin volume is increasing, that is why the container of 5 l will have effective volume of 3, 5 l, and 90-l tank can be used for maximum of 50 l of resin.

### 6. Heated sole-plate



Plate for placement of peripheral equipment and tank shell.

### 7. Pneumatic tank-cover removal

Tank top cover may be opened using pneumatic system using air-pressure limiter. The cover is column-mounted and gives free access to the tank. Draining of the agitator is facilitated by an adjustable temporary stop device. Safety lock fitted for operator security

### 8. Electronic pressure measurement instrument

Electronic pressure measurement instrument in a tank. Connected to an optional data processor, 24V.

### 9. Mobile platform

The useful item incorporates the tank, control cubicle and accessories. Dimensions: 1500 x 750 mm

### 10. Pinching valve

Pneumatic pinching valve for opening and closing of supply line, as well as for speed regulating of resin stream is used for silicone tubes 7mm (ID) x 13mm (ED) in units with effective volume 5L - 50L. In units with effective volume 100L - 200L, the valve is used for opening and closing of supply line for silicone tubes 14mm (ID) x 20mm (ED). The valve is actuated by a pneumatic piston. Switch on/off is realized on control panel. The valve is heated.

### 11. Flexible heated connection between tank and mould

In order to avoid loss of heat, the flexible connection between the tank and the mould has isolated heating system and electric power supply. On a display the information about pre-set temperature of heated line and measured temperature is showed. The flexible connection is equipped with a disposable inner lining tube in silicone SK2RIM260-1 which can be changed after each application. Standard line length - 2,5 m.

Inner line diameter: 10 mm (in the model type 5l – 50l) and 21 mm (in the mode type 100l – 200l), 230V 50 Hz 375 W.

### 12. Electronic weighing device

- 230 V 50Hz,
- Maximum capacity: 150 kg,
- precision: 10 gr, digital display,
- 4\20mA signal for data recording, delivered with cables and connections
- Attached using 3 screws to tank

### 13. Vacuum pump



Capacity depending on packing up set: 16 or 25 m<sup>3</sup>/hour, maximum vacuum level 1mbars (no vacuum control).  
Vacuum gauge measurement and display for the gauge. Value in mbars.

### 14. Pirani gauge

Compact and durable vacuum gauge for vacuum level measurement – is a key point of the unit, as it is important to use measuring equipment resistant for volatile resins, and pollution resistant. The signal has a high quality and can be easily detected by control system PLC Schneider;

### 15. Full automated system, including PLC on 2 languages (Russian/English)

- heating the resin up to a set point
- degassing the resin during a certain time and with control of level of temperature
- injection of the resin with an applied pressure and up to a set point volume or duration
- compaction after injection with a pressure level (can be different from the injection pressure )

It is possible to memorize cycles in the PLC and this is possible with adjunction of a display. There is possibility of message during the process and the operator knows exactly the phasis in progress and set points for the phasis.

The PLC is a SCHNEIDER/TELEMECANIQUE system. Software is in 2 languages: English and Russian is included in price.

**16. Data processor** (can be added only with PLC) it is possible to work with PC if PLC is present.

Description: The system consists of a means of continuous measurement of the different parameters of the injection process

- Pressure conditions(Vacuum and pressurisation of the tank)
- Conditions and temperature(temperature of resin and mould)
- Weight injected into the mould (weighing scales)

These data are managed by an IBM compatible personal computer. XP / WIN 7. The machine is equipped with TACTILE colour monitor 17 inches. USB ports and integration are in control box.

- weight4/20 Ma signal
- vacuum level
- pressure levels in tank
- Pressure on mould (additional sensors not furnished 6 pressure 4/20 mamps).
- temperature of resin within the tank
- temperatures in the mould (4 T/C)



All incoming data are treated by the hard-disk loaded program, which can be set using the parameters in use by the operator. This provides the advantage of having available at all times a usable record of all parameters used in each application.

A software is included in the packages based on DASYPAB 12.0. The application records curves for the different inputs and reports with automatic printing of the reports after injection. Storage of the data of the parts (resin reference, batch numbers, tool references, operator's name).

All data are also automatically stored on Hard disk each second and a saving of ASCII file is on the disk. It is possible to work with EXCEL software.

Software is in Russian and English languages. The system also manages injection cycles of the injection pressure pot:

- name of the file;
- name of the part;
- reference resin and fabrics;
- name of saving files;
- injection flow or injection pressure selection;
- cycle data (pressure, flow , injected quantity, mould temperature for starting injection , resin temperature for starting injection, degassing duration, degassing resin temperature)

All production files are stored on the system and can be called back, renamed. The system stores automatically data s and it is possible to manage directly the machine by the PLC.

### **17. Installation works, customer training in Russian language**

Installation works and training are accomplished by qualified stuff of our company and an engineer of ISOJET. Start up and customer training is in Russian language.

### **18. Filling system (option)**

The system consists of device for resin preparation, filling of a tank, track, heating housing and heated filling line. (Option)

Equipment set is mounted on a track in a special box, which has two cells (thermo insulated blocks) for placing of original





containers with resin. Original containers heating is made by an electrical heater, specially designed for that purpose, in the form of a band, encircling container. For heating temperature control, and heating uniformity of resin in the original container, the set include a temperature sensor, plunged in the container with resin and electric mixer, placed on the container head. Resin constantly stirred is heated till the fixed temperature. Supply of heated resin in the tank is realized by creating of vacuum in infusion unit tank with a vacuum pump, which is included in the infusion unit set (the pump is not included in delivery).

Heated resin from original containers is transferred at infusion unit tank by a silicone tube, one end is placed in the container, and other is switched to the filling valve, placed on the head of a tank of injection unit.

Equipment control is made by control console of infusion unit, when hardware and software are totally integrated into PLC system.

Control system (basic), which can be connected to PC

Injection tank with heating system and degasation  
Used pressure from 6 to 10 Bars Upper tank head can be pneumatically opened



Vacuum system for resin degasation and /or vacuum creation in a tool

Photo 1: Basic configuration without PLC and PC.

Resin weighing device



Photo 2: Heating system

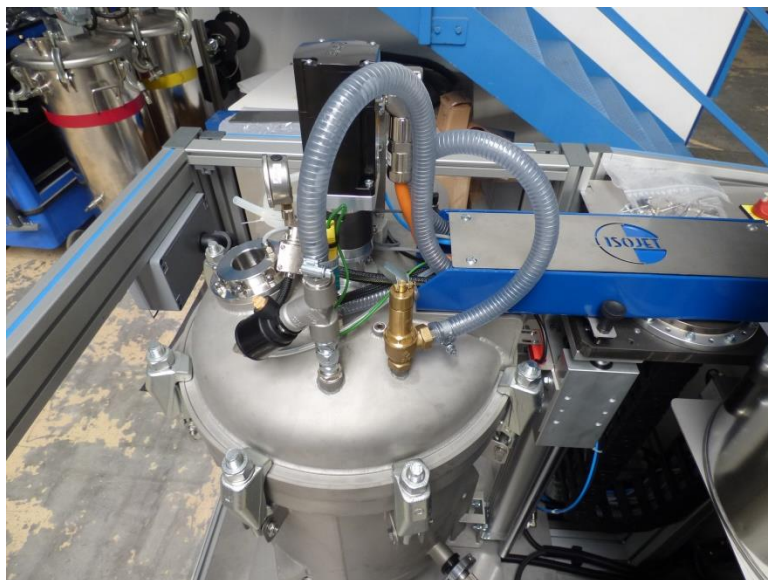


Photo 3: tank lid



Photo 4: tank

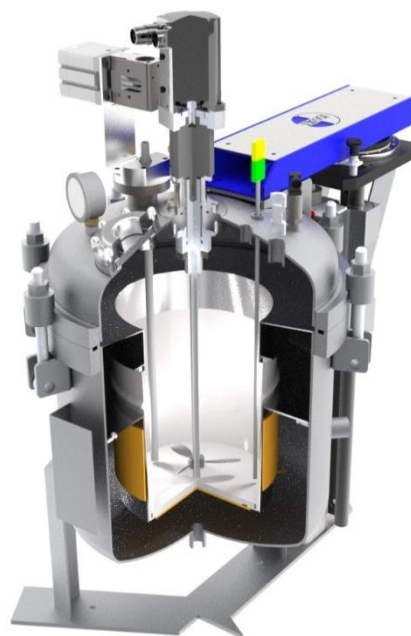


Photo 5: inside tank



# TECHNICAL DATA SHEET

## SK1INJ1K Injection Unit

### ▶ AUTOMATIC CYCLE REVIEW

ISO JET 10/23/2017 03:44:51 PM Com status

Recipe Mold Tank Param Alarms Resume Curves Data Language Logging Save Home X

#### Run data

Actual date: 10/23/2017  
Actual time: 03:44:51 PM

**Recipe error**  
Valid recipe

**Running error**  
You must complete Designation

Designation: \_\_\_\_\_  
Operator: \_\_\_\_\_  
Project: \_\_\_\_\_  
Serial number resin: \_\_\_\_\_  
Description: \_\_\_\_\_

#### Recipe detail

**SELECT RECIPE PRODUCTION**

##### SETPOINT TEMPERATURE

Tank belt: 50.0 °F  
Bottom of tank: 89.0 °F  
Tube: 52.0 °F  
Cover: 53.0 °F

##### SETPOINT MOLD

Test duration: 40 Sec  
Vacuum leak acceptable: 4.000 InHG  
Vacuum level target: 4.000 InHG  
Maximum test duration: 40 Sec

##### SETPOINT TANK

Temp. minimum for stirring: 58.0 °F  
Temp. minimum for degassing: 59.0 °F  
Temp. minimum for inject: 60.0 °F  
Stirring velocity: 61 rpm  
Vacuum level for count degassing: 0.200 InHG  
Degassing duration: 63 Sec

##### SETPOINT COMPACTION

Duration: 0 Sec  
Compaction pressure: 0.0 Psi

#### INJECTION PROFILE

	Flow	Pressure	Tank vacuum	Mold vacuum	Duration
STEP 1	200 gr/mn		1.500 InHG	1.000 InHG	1 Mn
STEP 2	250 gr/mn		2.000 InHG	0.800 InHG	2 Mn
STEP 3	300 gr/mn		3.000 InHG	0.500 InHG	3 Mn
STEP 4	300 gr/mn		4.000 InHG	0.400 InHG	1 Mn

Weight to inject calculation: 1.900 Kg

### ▶ INFORMATION PAGE FOR CREATING OF TECH. MAP

ISO JET 10/23/2017 03:47:08 PM Com status

Recipe Mold Tank Param Alarms Resume Curves Data Language Logging Save Home X

**Recipe name:** \_\_\_\_\_

# of actual step: 0

Flow of step: 0 gr/mn  
Pressure of step: \_\_\_\_\_  
Tank vacuum of step: 0.000 InHG  
Mold vacuum of step: 0.000 InHG  
Weight of step: \_\_\_\_\_  
Time of step: 0 Mn

Stirring: 61 rpm

%Opening: 0.0 %

Temp. tube: 70.9 °F

Pressure: -0.1 Psi / 29.920 InHG

Temp. cover: 71.1 °F

Maximum pressure: 145 Psi  
Maximum Temp.: 572 °F

Temp. tank: 69.6 °F

Temp. bottom tank: 69.9 °F

Resin temp: 71.1 °F

Vacuum: 2.847 InHG

Weight: 0.850 Kg

Mold pressure1: -6.3 Psi  
Mold pressure2: -6.3 Psi

Temp. mold 1: 1832.0 °F  
Temp. mold 2: 1832.0 °F  
Temp. mold 3: 1832.0 °F  
Temp. mold 4: 72.1 °F

Mold vacuum: 0.878 InHG / 0.110 InHG

**HEATING**

- Temp. resin ok for stirring
- Temp. resin ok for degassing
- Temp. resin ok for injection

**DEGASSING**

Waiting start

Remaining time degassing: 63 Sec

**INJECTION**

Waiting start

Flow: 0 gr/mn  
Injected weight: 0.000 Kg

**COMPACTION**

Remaining time compaction: 0 Sec

10/23/2017 - 03:44:36 PM The resin masse in tank is not OK please fill the tank  
10/23/2017 - 03:46:01 PM Low level resin tank

It remains responsibility of the user to verify that this product meet the requirement of the process applied.



► UNIT WITH CONTROL CONSOLE PLC



► **NOTE**

Please contact us for more detailed information as well as for system development according to your technical specification.

Standard warranty period: 12 months.