

Claims

- [Claim 1] A liquid chemical supply device capable of processing a gas, comprising:
first and second canisters connected, respectively, to a semiconductor manufacturing apparatus by way of first and second supply lines, to provide liquid chemicals stored therein to the semiconductor manufacturing apparatus; first and second push lines connected to the first and second canisters, respectively, and configured to discharge the chemicals into the first and second supply lines, by providing a push gas to the first and second canisters, respectively; and
a gas processing unit in fluid communication between the first supply line and the second push line, in order for the chemical in the first supply line containing a gas therein to be provided to and stored in the second canister through the second push line.
- [Claim 2] The liquid chemical supply device capable of processing a gas of claim 1, wherein the gas processing unit comprises:
a temporary storage tank configured to receive through one side thereof and accommodate therein the chemical discharged from the first supply line with a gas contained therein;
a first inlet pipe configured to selectively communicate between the one side of the temporary storage tank and the first supply line in accordance with operation of one or more control valves provided in the first inlet pipe; and
a first outlet pipe configured to selectively communicate between the other side of the temporary storage tank and the second push line in accordance with operation of one or more control valves provided in the first outlet pipe.
- [Claim 3] The liquid chemical supply device capable of processing a gas of claim 2, wherein the temporary storage tank is configured to receive through the one side thereof and accommodate therein the chemical discharged from the second supply line with a gas contained therein, in order for the chemical in the second supply line containing a gas therein to be provided to and stored in the first canister through the first push line, and
wherein the gas processing unit further comprises:
a second inlet pipe configured to selectively communicate between the one side of the temporary storage tank and the second supply line in accordance with operation of one or more control valves provided in the second inlet pipe; and
a second outlet pipe configured to selectively communicate between the other side of the temporary storage tank and the first push line in accordance with operation of one or more control valves provided in the second outlet pipe.

- [Claim 4] The liquid chemical supply device capable of processing a gas of claim 3, wherein the liquid chemical supply device provides the chemical in the first supply line containing a gas therein to the second canister to be stored therein through the second push line in accordance with operation of the one or more control valves in the first inlet pipe and the one or more control valves in the first outlet pipe, so as to remove the gas from the chemical that is ultimately supplied to the semiconductor manufacturing apparatus.
- [Claim 5] The liquid chemical supply device capable of processing a gas of claim 3, wherein the liquid chemical supply device provides the chemical in the second supply line containing a gas therein to the first canister to be stored therein through the first push line by control operation of the one or more control valves in the second inlet pipe and the one or more control valves in the second outlet pipe, so as to remove the gas from the chemical that is supplied to the semiconductor manufacturing apparatus.
- [Claim 6] The liquid chemical supply device capable of processing a gas of claim 3, wherein the liquid chemical supply device provides the chemical in the first supply line containing a gas therein to the first canister to be stored therein through the first push line by control operation of the one or more control valves in the first inlet pipe and the one or more control valves in the second outlet pipe, so as to remove the gas from the chemical that is supplied to the semiconductor manufacturing apparatus.
- [Claim 7] The liquid chemical supply device capable of processing a gas of claim 3, wherein the liquid chemical supply device provides the chemical in the second supply line containing a gas therein to the second canister to be stored therein through the second push line by control operation of the one or more control valves in the second inlet pipe and the one or more control valves that are in the first outlet pipe, so as to remove the gas from the chemical that is supplied to the semiconductor manufacturing apparatus.
- [Claim 8] The liquid chemical supply device capable of processing a gas of any of the preceding claims, wherein a vacuum pump configured to cause an interior of the gas processing unit to be in a negative pressure is further connected to the one side of the gas processing unit, so as to allow the chemical containing a gas therein to flow smoothly from the first and second supply lines to the gas processing unit.
- [Claim 9] The liquid chemical supply device capable of processing a gas of any of the preceding claims, wherein the first canister and the second canister are detachably connected to said liquid supply device for replacement of the first canister and the second canister with a full first canister and a full second

- canister.
- [Claim 10] The liquid supply device capable of processing a gas of claim 9, further wherein the full first canister and full second canister each comprise a diptube and the gas is an inert gas located in the diptube of the full first canister and full second canister.
- [Claim 11] The liquid supply device capable of processing a gas of any of the preceding claims further comprising a control unit.
- [Claim 12] The liquid supply device capable of processing a gas of any of the preceding claims further comprising a load cell located below the first canister and the second canister.
- [Claim 13] A system for supplying a liquid chemical comprising the liquid supply device of any of the preceding claims and one or more semiconductor manufacturing apparatuses.
- [Claim 14] The system of claim 11, wherein said one or more semiconductor manufacturing apparatuses are one or more CVD tools.
- [Claim 15] The system of claim 11 or 12, wherein said liquid chemical is selected from high purity TEOS, TiCl_4 , TMA, LTO520, TEMAZr, TEMAHf, HBO, 4MS, 3MS, TEB, or TEPO.
- [Claim 16] The method of processing a gas, comprising the steps of:
 providing the liquid chemical supply device or system of any of the preceding claims;
 flowing a push gas in said first push line to said first canister having said liquid chemical and said gas therein, and thereby flowing from said first canister said liquid chemical containing said gas to a first supply line;
 flowing said liquid chemical containing said gas from said first supply line to said gas processing unit;
 flowing said liquid chemical containing said gas from said gas processing unit through a second push line into said second canister; and
 storing said liquid chemical containing said gas in said second canister.
- [Claim 17] The method of claim 16, further comprising the step of supplying said one or more semiconductor apparatuses from said second canister while simultaneously performing the step of flowing said liquid chemical containing said gas from said gas treatment unit through said second push line into said second canister.
- [Claim 18] The method of claim 17, further comprising the step of temporarily blocking the flow of the push gas in the second push line while performing the step of flowing said liquid chemical containing said gas from said gas treatment unit through said second push line into said second canister.

- [Claim 19] The method of claim 18, further comprising the step of: switching the supply of the liquid chemical from the second canister to the first canister when the level in the second canister reaches a set value, by flowing push gas through the first push line and into the first canister.
- [Claim 20] The method of claim 19, further comprising the step of: flowing push gas into the second canister to flow liquid chemical present in the second canister through the gas processing unit and into the first canister while the first canister continues to supply the one or more semiconductor apparatuses until the second canister is exhausted.
- [Claim 21] The method of claim 20, further comprising the steps of: terminating the flow of the push gas to the second canister; flowing the push gas to the first canister; and replacing the exhausted second canister while continuing to flow push gas into the first canister to flow liquid chemical present in the first canister to the one or more semiconductor apparatuses.