



COMPRESSED AIR RESIN DRYER (CARD)

DATA SHEETS

FarragTech offers 4 series of Compressed Air Resin Dryer (CARD) to dry hygroscopic plastic resins.

Many standard accessories and complete systems are available:

- Installation flanges, shut-off slides, magnet boxes, floor stands, suction boxes and remote control boxes
- Material handling equipment including venturi loaders, single self-contained vacuum loaders, proportional loaders, dust separators and central vacuum loading systems (see *Material Handling*)
- Compressed air units including oil separators and refrigeration dryers
- Heatless regenerated compressed air dryers for dew point < -90 °F
- Heat recovery from the air compressor to heat the resin in the dryer

All standard 4 dryer series feature:

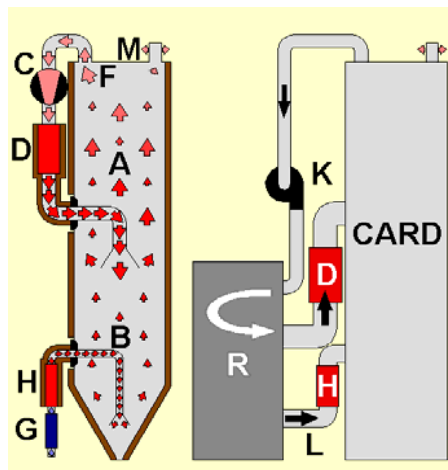
- Life time guarantee for performance and drying results
- 3 year full warranty including parts and labor
- Lowest operation cost with compressed air cost included
- Very simple operation
- Virtually no maintenance requirements
- Mirror stainless steel drying hoppers
- Insulated hoppers for operating temperature up to 400 °F
- Stainless steel housing with temperature resistant sight glasses
- Removable air distributors with external disconnecting access
- Switch cabinet and wiring according to CE standards

The sophisticated and economical *CARD L-Series* is available in 10 standard sizes to cover material flow rates up to 2500 lb/h with hopper volumes from 66 to 925 gal.

It preheats the resin in the upper part of the hopper {A} by the closed secondary air circuit before it dries it in the lower part {B} by the open process air circuit.

The secondary air is sucked at the top of the hopper {F} by the blower {C} and heated in the electric heater {D} before it is returned to the hopper.

Pre-dried compressed air is supplied to the process air control valve group, which decompresses the air and controls the air flow rate before it is heated in the electric heater {H} and distributed at the bottom of the hopper.



The dry process air rises upwards removing the moisture from the resin before it is exhausted through the dust filter {M} on top of the hopper.

Standard compressed air at a pressure of 100 psi and a pressure dew point of 40 °F reaches a dew point of -10 °F as soon as the air is decompressed to atmospheric air pressure at sea level, which is very suitable for drying hygroscopic resins (See *Resin Drying Background*).

The integrated micro processor controller measures the difference between the temperature at the bottom and the top of the hopper and regulates the air flow rates to match the material throughput thus saving energy and insuring perfect drying results. The controller automatically turns the sleep mode on if dry material is not required in the plant after the set drying time elapses. The drying temperature is dropped down, the process air flow is reduced to minimum and the secondary air circuit is switched off.

The *CARD L-Series* makes use of heat recovered from the air compressor {R} to reduce or eliminate the electrical heating demand from the heaters {D} and {H}.

FarragTech offers optional heat recovery systems with single and central dryers to preheat the secondary air stream {K} and the process air stream {L}. Depending on the compressor type and the air pressure range, pre-heating to temperatures between 180 °F and 360 °F can be reached in heat recovery systems.

The *CARD L-Series* was designed with a lot of attention paid to all details after many years of experience in manufacturing compressed air resin dryers. The slim and tall design insures perfect material and air flow through the hopper. The resin close to the walls of the hopper is perfectly heated to the desired drying temperature as well as the resin at the center of the hopper due to the efficient high temperature insulation around the entire hopper and the well designed air distributors.



CARD L-Series system description and features:

- The *CARD L-Series* is designed for floor standing applications beside the processing machine with the smallest footprint including floor stand and suction box or on mezzanine and gravity feed above the machine
- The hoppers are designed for possible side-by-side installation in different sizes to form very compact central drying systems in plant rooms
- Every hopper is an independent dryer with an integrated switch cabinet, control unit, process and secondary air circuits
- Dryers can be added, moved or removed from a central system at any time. The remote compressed air unit transforms the individual dryers to a central drying system
- All hoppers are equipped with appliances and control outputs to adapt and operate 2 self-contained vacuum loaders or venturi loaders for loading and unloading the hopper
- Every hopper includes 2 service doors for easy cleaning access and 2 sight glasses

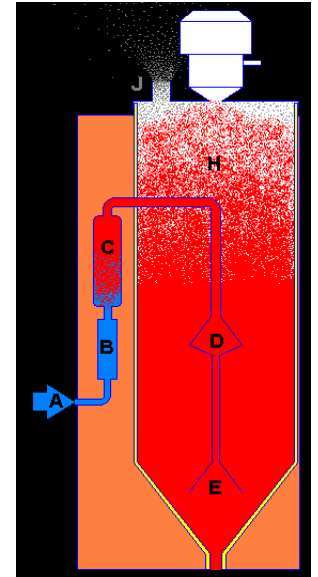
The standard *CARD L-Series* is controlled by the easy to use (*FIT*) Farrag Intelligent Terminal featuring:

- Full graphic display
- Pre-programmed drying data menu for all common resins
- Free-programmable menu for special resins or alloys
- Standard continuous operation mode with temperature input
- Continuous and batch drying modes
- Automatic modulating energy control based on actual material throughput
- Controls for loading and unloading units included
- Automatic sleep mode at low temperature to avoid material degradation and over-drying with input from the processing machine or integrated loaders
- Electrical power and compressed air consumption display and data bank for energy consumption with analyses
- Free-programmable timer by date or repeated weekly function for automatic loading and drying start
- Fault analyses and alarm output for the included strobe light and the acoustical buzzer
- Software available in several languages
- Data input/output interface
- Optional interface and software for remote control through the processing machine controller available for several machine types
- Optional dew point display and alarm
- CE compliant

The simple and economical *CARD S-Series* is available in 6 standard sizes to cover material flow rates up to 120 lb/h with hopper volumes from 2.6-42.2 gal. The standard *CARD S-Series* is equipped with *FIT* and it has the same advantages of the larger *L-Series*.

This small dryer series uses compressed air for heating and drying in one open circuit and they are still more economical to operate when compared with desiccant dryers.

A small amount of pre-dried compressed air {A} is branched from the central compressed air system in the moulding plant and supplied to the dryer. The air is decompressed and regulated through a group of valves {B}, heated in electric heater {C} and released inside the drying hopper {H} through the air distributor. The air distributor releases the heated air through outlets {D} and {E} in different levels inside the drying hopper insuring that the residence time of the resin at maximum temperature is sufficient to heat the pellets all the way through to the center. The process air is then exhausted through the filter {J} on top of the hopper.





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The compressed air flow rate is variable and based on the resin flow rate and the hopper is of a slim and tall design to avoid funnel flow.

The *CARD S-Series* does not lose drying efficiency over time and the drying results are guaranteed for life as long as standard pre-dried compressed air is provided.

With no moving parts, no wear and tear, the units are virtually maintenance free.

The *CARD S-Series* is designed with a lot of attention paid to details. The compact size and the small footprint design allows for two different installation types; direct installation on machine extruders with gravity feed or floor standing installations on mobile frames with suction boxes to unload the dried resin.

All hoppers are also equipped with appliances and control outputs to adapt 2 self-contained vacuum loader or venturi loaders. Because of limited space on top, only compact venturi loaders can be applied for loading material to the smallest dryer of this series (*CARD 10 S*).

The smaller sizes (10 S, 20 S and 40 S) are equipped with a hinged lid for easy cleaning access from the top and 2 sight glasses on either hopper side. The larger sizes (70 S, 110 S and 160 S) are equipped with one service door on the side of the hopper, a hinged lid and 3 sight glasses.

All hoppers are equipped with a handle on each hopper side to allow for a safe grip when moving dryers on the floor or sliding dryers on extruder flanges.

Lockable robust, casters are installed under the mobile frames to insure operation safety in floor standing installations. Crane lifting holes are available on both dryer sides. For safety reasons it is not recommended to move or lift the dryers with material in their hoppers.

The low cost *CARD E-Series* is also available in 6 standard sizes to cover material flow rates up to 120 lb/h with hopper volumes from 2.6-42.2 gal. The same hoppers and most components of the *S-Series* are used in the *E-Series* with basic controls.

The *CARD E-Series* is designed to be comparable with the standard operation functions offered in small size desiccant dryers.

A simple temperature controller is used in this series to control the process air flow as set by the operator. The air flow rate is factory set to the value required for maximum material flow rate in each size.

The energy cost (including compressed air cost) is lower than the energy cost when operating comparable desiccant drier sizes but the maintenance-free operation and the long life time of the *CARD E-Series* makes it more economical and desirable.

The hopper lids of the low cost series are designed to adapt loaders with integrated or external controls. No appliances to operate or control material loaders are included in this dryer series. Because of limited space on top, only compact venturi loaders can be applied for loading material to the smallest dryer of this series (*CARD 10 E*). *CARD E-Series* is also applicable in both installation types; on the extruder or floor standing (see *CARD S-Series*).



The *CARD G-Series* is the smallest resin dryer series on the market. It is designed for direct installation on extruders of micro injection molding machines. The *G-Series* is available in 3 sizes with hopper volumes of 0.4, 0.8 and 1.6 gal.

This series is designed with venturi loaders integrated in hopper lids and loader controls integrated in the switch boxes. With basic temperature control the *CARD G-Series* is very similar to the *E-Series*.

Hinged lids and one temperature resistant sight glass are standard in the *G-Series*.

A simple and compact sliding flange is one of the very few accessories available for the series.





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MATERIAL THROUGHPUTS AND TECHNICAL DATA

Material throughputs are based on material supplier's recommendation and a bulk density of 40 lb/ft³ (50 lb/ft³ for PET)

	Moisture(%)		Temp. (°F)	Time (h)	G-Series			E-Series / S-Series						L-Series									
	Initial	Resid.			1	3	6	10	20	40	70	110	160	250	450	600	850	1200	1650	2000	2500	3000	3500
ABS	0.45	0.05	180	2	1.1	2.2	4.2	7.0	14.0	28	49	77.0	112	175	315	420	595	840	1150	1400	1750	2100	2450
CA	0.7	0.1	180	2	1.1	2.2	4.2	7.0	14.0	28	49	77.0	112	175	315	420	595	840	1150	1400	1750	2100	2450
CAB	0.7	0.1	170	2	1.1	2.2	4.2	7.0	14.0	28	49	77.0	112	175	315	420	595	840	1150	1400	1750	2100	2450
CP	1.0	0.1	170	2	0.7	1.4	2.6	4.4	8.8	18	31	48.4	70	110	195	260	370	520	720	880	1100	1320	1540
PA 6	0.5	0.02	170	4	0.5	1.0	2.1	3.5	7.0	14	25	38.5	56	85	150	200	295	400	560	680	850	1020	1190
PA 6.6	0.5	0.2	180	4	0.5	1.0	2.1	3.5	7.0	14	25	38.5	56	85	150	200	295	400	560	680	850	1020	1190
PA 12	0.7	0.02	180-250	4	0.5	1.0	2.1	3.5	7.0	14	25	38.5	56	85	150	200	285	400	560	680	850	1020	1190
PBTP	0.25	0.015	290	2.5	0.9	1.8	3.4	5.7	11.4	23	40	62.7	91	140	250	335	475	670	920	1120	1400	1680	1960
PC	0.16	0.01	250	2	1.1	2.2	4.2	7.0	14.0	28	49	77.0	112	175	315	420	595	840	1150	1400	1750	2100	2450
PE	0.2	0.05	190	1.5	0.7	1.4	2.6	4.4	8.8	18	31	48.4	70	110	198	260	370	520	720	880	1100	1320	1540
PES	0.43	0.02	305	2.5	0.9	1.8	3.4	5.7	11.4	23	40	62.7	91	140	250	335	475	670	920	1120	1400	1680	1960
PET	0.25	0.003	360	4	0.7	1.4	2.6	4.4	8.8	18	31	48.4	70	110	195	260	370	520	720	880	1100	1320	1540
PET G	0.6	0.015	165	6	0.4	0.8	1.5	2.5	5.0	10	18	27.5	40	61	110	145	205	290	400	480	600	720	840
PI	0.32	0.05	250	2.5	0.8	1.6	3.2	5.3	10.6	21	37	58.3	85	130	230	310	440	620	850	1040	1300	1560	1820
PMMA	0.4	0.02	180	2.5	0.8	1.6	3.2	5.3	10.6	21	37	58.3	85	130	230	310	440	620	850	1040	1300	1560	1820
POM	0.25	0.05	215	2.5	0.8	1.6	3.2	5.3	10.6	21	37	58.3	85	130	230	310	440	620	850	1040	1300	1560	1820
PP	0.2	0.05	195	1.5	0.7	1.4	2.6	4.4	8.8	18	31	48.4	70	110	195	260	370	520	720	880	1100	1320	1540
PPS	0.2	0.005	305	2	0.9	1.8	3.7	6.2	12.4	25	43	68.2	99	150	270	360	510	720	990	1200	1500	1800	2100
PS	0.1	0.02	180	1.5	1.0	2.0	4.0	6.6	13.2	26	46	72.6	106	165	295	395	560	790	1080	1320	1650	1980	2310
PSU	0.1	0.02	250	1.5	1.0	2.0	4.0	6.6	13.2	26	46	72.6	106	165	295	395	560	790	1080	1320	1650	1980	2310
PUR	0.9	0.01	195	2.5	0.9	1.8	3.4	5.7	11.4	23	40	62.7	91	140	250	335	475	670	920	1120	1400	1680	1960
SAN	0.3	0.05	180	2	1.0	2.0	4.0	6.6	13.2	26	46	72.6	106	165	295	395	560	790	1080	1320	1650	1980	2310
SB	0.6	0.02	180	1.5	1.0	2.0	4.0	6.6	13.2	26	46	72.6	106	165	295	395	560	790	1080	1320	1650	1980	2310
CARD TECHNICAL DATA					1	3	6	10	20	40	70	110	160	250	450	600	850	1200	1650	2000	2500	3000	3500
Max. Compressed air consumption (cfm)					0.3	0.6	1.2	2.4	4.2	7.8	13.2	22.2	31.2	11.5	19.5	25.5	36	50	69	84	105	126	147
Min. Compressed air consumption (cfm)					0.3	0.6	1.2	1.2*	1.2*	2.4*	2.4*	4.2*	4.2*	11.5	19.5	25.5	36	50	69	84	105	126	147
Width (inch)					10.1	10.9	12	12.8	14.3	16.1	18.0	19.6	21.3	25.2	25.2	32.3	32.3	40.9	40.9	53.1	53.1	59.4	59.4
Depth (inch)					4.4	5.2	6.3	7.6	9.1	10.9	12.9	10.6	16.3	25.2	25.2	32.3	32.3	40.9	40.9	53.1	53.1	59.4	59.4
Height w/o filter, strobe or blower (inch)					13.3	15.3	19.6	18.7	24.8	32.5	38.9	47.4	53.6	72.4	91.7	97.3	112.3	130.3	140.9	145.3	157.3	166.9	182.6
Width with floor standing frame (inch)					-	-	-	-	24.8	24.8	24.8	24.8	24.8	25.2	25.2	32.3	32.3	40.9	40.9	53.1	53.1	59.4	59.4
Depth with floor standing frame (inch)					-	-	-	-	24.4	24.4	24.4	24.4	24.4	25.2	25.2	32.3	32.3	40.9	40.9	53.1	53.1	59.4	59.4
Height with floor standing (inch)					-	-	-	-	50	57.7	64.1	72.6	78.8	86.1	105.4	111.1	126.1	146.1	156.6	161.0	173.0	182.6	198.4
Installed Power (kW)					0.2	0.2	0.2	1.0	1.0	1.0	3.0	3.0	3.0	8.5	8.6	16.5	16.5	31	31	49	49	67	67
power consumption at 180 °F (kW)					0.01	0.2	0.04	0.07	0.13	0.26	0.5	0.75	1.15	2.4	4.3	5.7	8	11	16	19	24	28	33
power consumption at 250 °F (kW)					0.02	0.04	0.08	0.12	0.23	0.45	0.85	1.23	1.82	3.5	6.3	8.4	11.8	17	23	28	35	42	49
power consumption at 360 °F (kW)					0.03	0.06	0.11	0.18	0.35	0.69	1.31	1.93	2.88	4.6	8.1	11	15.6	22	30	37	46	55	64
Max. current at 400 V, 50 Hz (A)								12	12	12	20	20	20	13	13	24	24	45	45	70	70	97	97
Power supply (V, Phases, Hz)					230 / 1 / 50-60								400 / 3 / 50 or 480 / 3 / 60										

* Not applicable for CARD E-Series. The air flow in the E-Series is constant (Minimum air flow = maximum air flow)
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