DUPONT

Suva®

alternative refrigerants

ART-9

Retrofit Guidelines for Suva HP80

Introduction

Suva HP80 is a commercially available three component mixture of HCFC-22, HFC-125, and HC-290 developed as an alternative refrigerant to replace R-502. Using the retrofit guidelines summarized below, most R-502 systems using positive displacement compressors (i.e., reciprocating, rotary, screw, and scroll) can be *easily* and *economically* retrofitted for use with Suva HP80. This allows the existing equipment to continue to operate safely and efficiently even after R-502 is no longer available.

Properties and Safety

Suva HP80 offers improved environmental properties versus R-502, with significantly lower ozone depletion potential (ODP) and global warming potential (GWP). (See *Table 1.*) Suva HP80 requires the same safe handling procedures as R-502. Like R-502, Suva HP80 is nonflammable and has a low degree of toxicity. Refer to DuPont Technical Bulletin P-HP (H-47122-1) for more detailed information on the properties, uses, storage, and handling of Suva HP80. Refer to the Material Safety Data Sheets (MSDS) for more safety information on the use of Suva HP80.

Selection of Refrigerant

Suva HP80 is the recommended alternative for most existing R-502 systems. With Suva HP80, comparable discharge temperatures and efficiency to R-502 are expected. Suva HP80 has improved capacity versus R-502, making it suitable for use in such applications as walk-in coolers/freezers, frozen food and dairy display cases, ice cream dispensers, and beverage vending machines.

Lubricants

Lubricant selection is based upon many factors including oil return to the compressor (oil miscibility), lubricity, and materials compatibility. Because of the different miscibility characteristics of Suva HP80 when compared to R-502, the lubricant must be changed when retrofitting.

Several types of lubricants have successfully been tested with Suva HP80. They include refrigerant grade alkylbenzene (AB) lubricants and refrigerant grade polyol esters (POE). Most equipment manufacturers have found AB lubricants to be the first choice for retrofit with Suva HP80; however, POEs will also work well in some equipment.

Before a retrofit is started, it is recommended that the compressor manufacturer be consulted for specific lubricant recommendations. Other sources of lubricant information are the DuPont Authorized Distributor, lubricant manufacturers, system manufacturers.

Table 1
Suva HP80 Physical Properties

Property	Units	Suva HP80	R-502
Boiling Pt (1 atm)	°C	-49.2	-45.4
	°F	-56.5	-49.8
Vapor Pressure, Sat'd Liquid at 25°C	kPa	1337	1162
	psia	194	169
Liquid Density at 25°C	kg/m³	1151	1217
	lb/ft³	71.9	75.9
Density, Sat'd Vapor at 25°C	kg/m³	69.2	66.7
	lb/ft³	4.32	4.16
Ozone Depletion Potential as compared to R-12	R-12 = 1	0.02	0.23
Halocarbon Global Warming Potential as compared to R-11	R-11 = 1	0.63	3.75
Capacity as compared to R-502*	R-502 = 100%	107%	100%
Energy Eff. as compared to R-502 (COP)*	R-502 = 100%	96%	100%

*Conditions: -40°F evaporator/130°F condenser/65°F suction temperature

Filter Drier

It is recommended that the filter drier be changed during the retrofit, as is routine practice following system maintenance. There are three types of filter driers commonly used in R-502 equipment:

- Solid core driers, in which the molecular sieve desiccant is dispersed within a solid core binder.
- Loose filled driers, which contain only the molecular sieve desiccant.
- Compacted bead driers, which also contain only the molecular sieve desiccant, but where the desiccant is compacted in the drier by mechanical pressure, usually a spring.

For solid core driers, consult the drier manufacturer for their recommended drier for use with the Suva HP blends. Some existing models of solid core driers, such as the Sporlan Catch All® or Alco ADK, are compatible with the Suva HP blends.

The XH-9 molecular sieve desiccant (manufactured by UOP) or equivalent (such as MS 594 from Grace) is recommended for use in loose filled driers with the Suva HP blends.

Compacted bead driers may use either the XH-9 or XH-6 desiccant or equivalent. Consult the drier manufacturer for their recommendation.

System Modification

The composition of Suva HP80 has been selected to provide the lowest possible discharge temperature while also providing comparable performance to R-502 in terms of both capacity and energy efficiency. As a result, minimal system modifications are anticipated when retrofitting R-502 systems with Suva HP80.

Retrofits of R-502 systems with other alternative refrigerants, such as HCFC-22 or HFC-125, may require more extensive system modifications (compressor replacement to multistage compressor, use of liquid injection, etc.). For some systems, this cost may be prohibitive. Suva HP80 provides the service contractor and equipment owner with a cost-effective way to retrofit an existing R-502 system.

It is important to note, however, that Suva HP80 was not designed for use in conjunction with other refrigerants or additives which have not been clearly specified by DuPont (i.e., topping off an existing R-502 charge with Suva HP80). Mixing refrigerants may have negative effects on system performance and lead to equipment damage.

Overview of Retrofit Process

Retrofit of an existing R-502 system with Suva HP80 can be accomplished using service practices and service equipment commonly used by trained mechanics or service contractors in the field.

The key steps involved in the retrofit are:

1. Recover R-502 charge from system.
2. Remove mineral oil from compressor and replace with selected lubricant.
3. Replace filter drier with new drier compatible with Suva HP80.
4. Charge system with Suva HP80.
5. Start system and adjust charge and/or controls to achieve desired operation.

For the majority of systems, the compressor lubricant change, a filter drier change, and, in systems with expansion valves, a possible adjustment to the superheat setting will be the only system modifications required in a retrofit to Suva HP80. For systems which are still under warranty, we recommend contacting the equipment or compressor manufacturers prior to performing the retrofit. Some equipment or compressor warranties may be impacted by a change from the refrigerant originally specified for the system or compressor.

Copeland Corporation approves the use of Suva HP80 and HP62 in existing equipment, provided the following conditions are met:

- Retrofitting systems that employ compressors manufactured prior to 1973 is not recommended.
- You must follow Copeland retrofit guidelines, and use only Copeland-approved lubricants and other parts.
- Pressure safety controls may have to be reset, due to the higher operating pressures of the alternatives.
- Pressure relief devices MUST be added to the compressor crankcase set at a maximum of 375 psig on Discus 3D and 4D and all other semi-hermetic (non-Discus) models.

WARNING: It is possible that excess pressure build-up on models indicated could result in the compressor exploding unless the pressure relief valve specified has been properly installed on the originally built Copeland Compressor.

Equipment and Supplies Needed for Retrofit

- Safety equipment (gloves, glasses)
- Manifold gauges
- Thermocouples to read line temperatures
- Vacuum pump
- Leak detection equipment
- Scale
- Recovery unit (RRU30 by Refrigerant Recovery Technologies, Inc. is recommended. See your local DuPont Authorized Distributor)
- Recovery cylinder
- Container for recovered lubricant
- Replacement lubricant
- Replacement refrigerant
- Replacement drier
- Labels indicating the refrigerant and lubricant charged to the system

Retrofit Procedure

Summarized below is a more detailed discussion of the recommended procedures for retrofitting a R-502 system with Suva HP80. Prior to the retrofit, review the Material Safety Data Sheets for safety information on the use of Suva HP80.

1. **Baseline Data with R-502.** For service contractors performing their initial retrofits with Suva HP80, it is recommended that system performance data be collected while R-502 remains in the system. This baseline of temperatures and pressures at various points in the system (evaporator, condenser, compressor suction and discharge, expansion device, etc.) at normal operating conditions will be useful when optimizing operation of the system with Suva HP80. A **System Data Sheet** is attached for recording this baseline data.

2. **Remove R-502 Charge.** R-502 should be removed from the system and collected in a recovery cylinder using a recovery device capable of pulling 10–15 in. Hg vacuum (50–67 kPa, 0.50–0.67 bar). If the recommended R-502 charge size for the system is not known, weigh the amount of refrigerant removed, as the initial quantity of Suva HP80 charged in the system will be determined from this figure.

3. **Drain Lubricant from Compressor.** In the cases where mineral oil is the existing oil, the oil will have to be drained from the compressor. This may require removing the compressor from the system, particularly with small hermetic compressors which have no oil drain. In this case, the lubricant can be drained from the suction line of the compressor. In most small systems, 90–95% of the lubricant can be removed from the compressor in this manner. Larger systems may require drainage from additional points in the system, particularly low spots around the evaporator, to remove the majority of the lubricant. In systems with an oil separator, any lubricant present in the separator should also be drained.

   In all cases, *measure* the amount of lubricant removed from the compressor. Consult the equipment manufacturer for their recommendation on allowable residual mineral oil in AB or POE. DuPont experience has been that a lubricant mixture of more than 80% AB or POE with mineral oil ensures good system performance. If poor system performance is noted upon start-up, an additional lubricant change may be required. Record on the attached **Retrofit Checklist** the amount of lubricant removed, as this will be needed in the next step.

4. **Charge Compressor with Chosen Lubricant.** Charge the compressor with the same volume of new lubricant as the volume of mineral oil removed in step 3. If system was found to be undercharged with mineral oil, charge to the manufacturer's specified level (i.e., sight glass) with the new lubricant. If no manufacturer's recommendation is given, use a lubricant with similar viscosity to that of the oil previously used in the system (150 SUS or 32 cSt is typical for R-502 systems). An AB lubricant, such as Zerol® 150, is recommended. Refrigerant grade POEs may also be used.

   Reinstall Compressor (if removed from system in step 3). Use normal service practices.

5. **Replace Filter Drier.** It is routine practice to replace the filter drier following system maintenance.

   The XH-9 molecular sieve desiccant (manufactured by UOP) or equivalent is recommended for use in loose fill driers with Suva HP80. For solid core driers, consult the drier manufacturer for their recommended drier in use with Suva HP80. Some existing solid core driers, such as those produced by Sporlan® and Alco®, can be used with Suva HP80.

6. **Reconnect System and Evacuate.** Use normal service practices. To remove air or other noncondensibles in the system, it is recommended that the system be evacuated to full vacuum (29.9 in. Hg/500 microns/ 0.14 kPa/0.0014 bar).

   Leak Check System. Use normal service practices. Reevacuate system following leak check.

7. **Charge System with Suva HP80.** Suva HP80 is a near-azeotropic mixture; therefore the vapor composition in the refrigerant cylinder is different from the liquid composition. To ensure that the proper refrigerant composition is charged in the system, it is important that **LIQUID ONLY** be removed from the charging cylinder. **Cylinders of Suva HP80 are equipped with dip tubes, allowing liquid to be removed from the cylinder when the cylinder is in the upright position.** ***The proper position is indicated by arrows on the cylinder and cylinder box.*** Once removed from the cylinder as a liquid, Suva HP80 can be changed to the high side of a system as a liquid or flashed to the low side of a running system using a throttling valve or liquid dispensing device to protect the compressor. Suva HP80 should be removed from a cylinder as a vapor only if all of the refrigerant in the cylinder is transferred to the system.

   The refrigeration system will require less weight of Suva HP80 than R-502. The optimum charge will vary depending on the operating conditions and system design. For most systems, the optimum charge will be 90–95% by weight of the original R-502 charge. It is recommended that the system be initially charged with about 80% by weight of the original R-502 charge (ex: if original R-502 charge was 10 ounces [284 grams], initially charge about 8 ounces [227 grams] of HP80).

   Add the initial charge to the high pressure side of the system. When the system and cylinder pressures equilibrate, load the remainder of the refrigerant to the suction line of the system. In this step, the compressor will be running. Some compressors may be damaged if liquid refrigerant enters the suction side of the compressor. Since liquid must be removed from the charging cylinder, it is important to charge the refrigerant slowly into the suction line to allow it to flash before it enters the system. A throttling valve may also be used to cause the refrigerant to flash.

8. **Adjust Charge.** Let conditions stabilize. If the system is undercharged, add additional Suva HP80 in small amounts (still removing *liquid* from the charging cylinder) until the system conditions reach the desired levels.

   See "How to Determine Suction Pressure, Superheat, and Subcool" at the end of this guideline for optimizing system performance.

   For low temperature evaporator applications (–40°F or –40°C), the suction pressure with Suva HP80 will be approximately 1 psi (6.89 kPa, 0.069 bar) higher than R-502. At medium temperature evaporator conditions (10°F or –12.2°C), the suction pressure with Suva HP80 will be approximately 7 psi (48.2 kPa, 0.482 bar) higher than R-502. At high evaporator temperatures (40°F or 4.4°C), the suction pressure with Suva HP80 will be approximately 10 psi (68.0 kPa, 0.680 bar) higher than R-502. Suva HP80 will have comparable discharge temperatures and the discharge pressure will be 30–45 psi (207–310 kPa, 2.07–3.10 bar) higher than that for R-502.

NOTE: Sight glasses in the liquid line can be used for charging in most systems.

However, it is best to charge your system by measuring the operating conditions (discharge and suction pressures, suction line temperature, compressor amps, super heat, etc.) first, before using the liquid line sight glass as a guide.

However, if the sight glass is close to the exit of the condenser or there is very little subcooling prior to the sight glass, bubbles may still be observed in the sight glass when the system is properly charged. Attempting to charge until the sight glass is clear may result in overcharging of refrigerant.

NOTE: Label Components and System. After retrofitting the system with Suva HP80, label the system components to identify the type of refrigerant (Suva HP80) and lubricant in the system, so that the proper refrigerant and lubricant will be used to service the equipment in the future. Identification labels are available from DuPont Authorized Distributors.

Summary

With the phaseout of CFCs, existing refrigeration equipment will need to be replaced with new equipment or retrofitted with alternative refrigerants. Using the procedures described previously, existing R-502 refrigeration systems can be retrofitted for use with Suva HP80, allowing them to continue in service for the remainder of their useful life.

Attached is a **Retrofit Checklist, System Data Sheet,** and pressure–temperature charts including an explanation of pressure/temperature relationships for Suva HP80 to assist you in the retrofit process.

Pressure/Temperature Relationship of Suva HP80

Temperature Glide

Temperature glide occurs in both an evaporator and a condenser. In an evaporator at constant pressure, the refrigerant blend begins to boil at one temperature and finishes boiling at a higher temperature. The difference in these boiling temperatures is called temperature glide. This also occurs in a condenser, except the temperature decreases as the refrigerant vapor condenses. Temperature glide will not affect system performance.

How to Read the Tables

Tables 2a and *2b* show the pressure/temperature relationship of Suva HP80 compared to R-502. Two temperatures are shown for Suva HP80 at a given pressure:

Saturated Liquid Temperature—in the condenser, this is the temperature where the last bit of vapor has just condensed (all liquid). Below this temperature, the refrigerant will be subcooled.

Saturated Vapor Temperature—in the evaporator, this is the temperature where the last drop of liquid has just boiled (all vapor). Above this temperature, the refrigerant will be superheated.

How to Determine Suction Pressure, Superheat, and Subcool

Suction Pressure

1. Determine the expected evaporator temperature using the R-502 column (baseline data).
2. Find the same expected evaporator temperature in the column "Sat. Vapor Temp." and note the corresponding pressure for this temperature. This is the suction pressure at which the system should operate.
   Note: For Suva HP80 the average coil temperature is approximately equal to the "Sat. Vapor Temp."

Superheat

Using the "Saturated Vapor Temperature" column for Suva HP80, the amount of vapor superheat is calculated in the same manner as for R-502.

Subcool

Using the "Saturated Liquid Temperature" column for Suva HP80, the amount of liquid subcool is calculated in the same manner as for R-502.

Table 2a
Pressure–Temperature Chart
Suva HP80 (psig/°F)

Pressure (psig)	R-502 Temp. (°F)	Suva HP80 Sat'd Liquid Temp. (°F)	Suva HP80 Sat'd Vapor Temp. (°F)
20*	-88	-94	-89
18*	-82	-88	-84
16*	-77	-83	-79
14*	-73	-79	-75
12*	-69	-75	-71
10*	-65	-71	-67
8*	-61	-68	-64
6*	-58	-65	-61
4*	-55	-62	-58
2*	-52	-59	-55
0	-50	-57	-53
2	-45	-52	-48
4	-40	-47	-44
6	-36	-43	-40
8	-32	-39	-36
10	-29	-36	-33
12	-25	-33	-29
14	-22	-29	-26
16	-19	-26	-23
18	-16	-24	-21
20	-13	-21	-18
22	-11	-18	-15
24	-8	-16	-13
26	-6	-14	-11
28	-3	-11	-8
30	-1	-9	-6
32	1	-7	-4
34	3	-5	-2
36	5	-3	-0
38	7	-1	2
40	9	1	4
42	11	3	6
44	13	5	7
46	15	6	9
48	16	8	11
50	18	10	12
52	20	11	14
54	21	13	15
56	23	14	17
58	24	16	18
60	26	17	20
62	27	19	21
64	29	20	23
66	30	22	24
68	32	23	25
70	33	24	27
72	34	26	28
74	36	27	29
76	37	28	31
78	38	30	32
80	40	31	33
82	41	32	34
84	42	33	35
86	43	34	37
88	45	36	38
90	46	37	39
92	47	38	40
94	48	39	41
96	49	40	42
98	50	41	43
100	51	42	44
102	53	43	45
104	54	44	46
106	55	45	47
108	56	46	48

*inches of mercury below one atmosphere

Pressure (psig)	R-502 Temp. (°F)	Suva HP80 Sat'd Liquid Temp. (°F)	Suva HP80 Sat'd Vapor Temp. (°F)
110	57	47	49
115	60	50	52
120	62	52	54
125	64	54	56
130	67	57	59
135	69	59	61
140	71	61	63
145	73	63	65
150	75	65	67
155	78	67	69
160	80	69	71
165	82	71	73
170	84	73	75
175	85	75	77
180	87	77	78
185	89	78	80
190	91	80	82
195	93	82	84
200	95	83	85
205	96	85	87
210	98	87	88
215	100	88	90
220	101	90	92
225	103	91	93
230	105	93	95
235	106	94	96
240	108	96	97
245	109	97	99
250	111	99	100
255	112	100	102
260	114	102	103
265	115	103	104
270	117	104	106
275	118	106	107
280	119	107	108
285	121	108	110
290	122	110	111
295	123	111	112
300	125	112	114
305	126	113	115
310	127	115	116
315	129	116	117
320	130	117	118
325	131	118	120
330	132	119	121
335	134	121	122
340	135	122	123
345	136	123	124
350	137	124	125
355	138	125	126
360	139	126	127
365	141	127	128
370	142	128	130
375	143	130	131
380	144	131	132
385	145	132	133
390	146	133	134
395	147	134	135
400	148	135	136
405	149	136	137
410	150	137	138
415	151	138	139
420	152	139	140
425	153	140	141
430	154	141	142
435	155	142	143
440	156	143	144
445	157	144	144

Table 2b
Pressure–Temperature Chart
Suva HP80 (kPa/°C)

Pressure (kPa)	R-502 Temp. (°C)	Suva HP80 Sat'd Liquid Temp. (°C)	Suva HP80 Sat'd Vapor Temp. (°C)
10	-85.5	-88.5	-85.5
20	-75.0	-78.5	-75.5
30	-68.5	-72.0	-69.5
40	-63.5	-67.0	-64.5
50	-59.5	-63.0	-60.5
60	-56.0	-59.5	-57.5
70	-53.0	-56.5	-54.5
80	-50.5	-54.0	-52.0
90	-48.0	-51.5	-49.5
100	-45.5	-49.5	-47.5
110	-43.5	-47.5	-45.5
120	-41.5	-45.5	-43.5
130	-40.0	-44.0	-42.0
140	-38.5	-42.0	-40.5
150	-36.5	-40.5	-39.0
160	-35.0	-39.0	-37.5
170	-33.5	-37.5	-36.0
180	-32.5	-36.5	-34.5
190	-31.0	-35.0	-33.5
200	-29.5	-34.0	-32.0
210	-28.5	-32.5	-31.0
220	-27.5	-31.5	-30.0
230	-26.0	-30.5	-28.5
240	-25.0	-29.5	-27.5
250	-24.0	-28.5	-26.5
260	-23.0	-27.0	-25.5
270	-22.0	-26.5	-24.5
280	-21.0	-25.5	-23.5
290	-20.0	-24.5	-23.0
300	-19.0	-23.5	-22.0
310	-18.5	-22.5	-21.0
320	-17.5	-22.0	-20.0
330	-16.5	-21.0	-19.5
340	-15.5	-20.0	-18.5
350	-15.0	-19.5	-18.0
360	-14.0	-18.5	-17.0
370	-13.5	-18.0	-16.5
380	-12.5	-17.0	-15.5
390	-12.0	-16.5	-15.0
400	-11.0	-15.5	-14.0
410	-10.5	-15.0	-13.5
420	-9.5	-14.0	-12.5
430	-9.0	-13.5	-12.0
440	-8.0	-13.0	-11.5
450	-7.5	-12.0	-10.5
460	-7.0	-11.5	-10.0
470	-6.0	-11.0	-9.5
480	-5.5	-10.0	-9.0
490	-5.0	-9.5	-8.0
500	-4.5	-9.0	-7.5
510	-3.5	-8.5	-7.0
520	-3.0	-8.0	-6.5
530	-2.5	-7.0	-6.0
540	-2.0	-6.5	-5.5
550	-1.5	-6.0	-5.0
560	-0.5	-5.5	-4.0
570	0.0	-5.0	-3.5
580	0.5	-4.5	-3.0
590	1.0	-4.0	-2.5
600	1.5	-3.5	-2.0
610	2.0	-3.0	-1.5
620	2.5	-2.5	-1.0
630	3.0	-2.0	-0.5
640	3.5	-1.5	0.0
650	4.0	-1.0	0.5
660	4.5	-0.5	1.0
670	5.0	0.0	1.5
680	5.5	0.5	2.0
690	6.0	1.0	2.5
700	6.5	1.5	3.0
710	7.0	2.0	3.5
720	7.5	2.5	3.5
730	8.0	3.0	4.0
740	8.5	3.5	4.5
750	9.0	4.0	5.0
760	9.5	4.5	5.5
770	10.0	4.5	6.0
780	10.5	5.0	6.5
790	11.0	5.5	7.0
800	11.0	6.0	7.0
810	11.5	6.5	7.5
820	12.0	7.0	8.0
830	12.5	7.5	8.5
840	13.0	7.5	9.0
850	13.5	8.0	9.0
860	14.0	8.5	9.5
870	14.0	9.0	10.0
880	14.5	9.5	10.5
890	15.0	9.5	11.0
900	15.5	10.0	11.0
950	17.5	12.0	13.0
1000	19.5	14.0	15.0
1050	21.0	15.5	16.5
1100	23.0	17.0	18.5
1150	24.5	19.0	20.0
1200	26.0	20.5	21.5
1250	28.0	22.0	23.0
1300	29.5	23.5	24.5
1350	31.0	25.0	26.0
1400	32.5	26.5	27.5
1450	34.0	28.0	28.5
1500	35.5	29.0	30.0
1550	36.5	30.5	31.5
1600	38.0	31.5	32.5
1650	39.5	33.0	34.0
1700	40.5	34.0	35.0
1750	42.0	35.5	36.0
1800	43.0	36.5	37.5
1850	44.5	37.5	38.5
1900	45.5	39.0	39.5
1950	46.5	40.0	40.5
2000	48.0	41.0	42.0
2050	49.0	42.0	43.0
2100	50.0	43.0	44.0
2150	51.0	44.0	45.0
2200	52.0	45.0	46.0
2250	53.0	46.0	47.0
2300	54.0	47.0	48.0
2350	55.0	48.0	49.0
2400	56.0	49.0	49.5
2450	57.0	50.0	50.5
2500	58.0	51.0	51.5
2550	59.0	52.0	52.5
2600	60.0	52.5	53.5
2650	61.0	53.5	54.0
2700	62.0	54.5	55.0
2750	62.5	55.5	56.0
2800	63.5	56.0	56.5
2850	64.5	57.0	57.5
2900	65.5	58.0	58.5
2950	66.0	58.5	59.0
3000	67.0	59.5	60.0
3050	68.0	60.0	60.5
3100	68.5	61.0	61.5
3150	69.5	61.5	62.0
3200	70.0	62.5	63.0

Checklist for Suva HP80 Retrofit

_____ 1. Establish baseline performance with R-502. (See data sheet for recommended data.)

_____ 2. Remove R-502 charge from system.
(Need 10–15 in. Hg vacuum [50–67 kPa, 0.49–0.67 bar] to remove charge.)
- Use recovery cylinder/*Do Not Vent to Atmosphere*
- Weigh amount removed (if possible): _____

_____ 3. Drain lubricant charge from compressor (unless alkylbenzene or polyol ester lubricant is already in compressor).
- Measure amount of lubricant removed and record. _____

_____ 4. Charge alkylbenzene or polyol ester lubricant.
- Recharge with amount equivalent to amount removed in *Step 3*.
- Reinstall compressor (if removed).

_____ 5. Replace filter drier with new drier approved for use with Suva HP80.
- Solid core driers: check with drier manufacturer for recommendation
- Loose fill driers: use XH-9 desiccant
- Compacted bead driers: use XH-9 or XH-6 desiccant

_____ 6. Reconnect system and evacuate with vacuum pump. (Evacuate to full vacuum [29.9 in. Hg/500 microns/0.14 kPa/0.0014 bar]).
- Leak check system. (Reevacuate system following leak check).

_____ 7. Charge system with Suva HP80.
- Remove ***Liquid Only*** from cylinder
- Initial charge 80% by weight of original R-502 charge
- Amount of refrigerant charged: _____

_____ 8. Adjust charge until desired operating conditions are achieved.
- Remove ***Liquid Only*** from cylinder
- If low in charge, add in increments of 2–3% of original R-502 charge
- Amount of refrigerant charged: _____

Total Refrigerant Charged (add 7 and 8) _____

- Label components and system for type of refrigerant (Suva HP80) and lubricant (alkylbenzene or polyol ester).

Retrofit is complete!!

System Data Sheet

Type of System/Location: _____

Equipment Mfg.: _____ Compressor Mfg.: _____

Model No.: _____ Model No.: _____

Serial No.: _____ Serial No.: _____

R-502 charge size: _____ Lubricant type: _____

_____ Charge size: _____

Drier Mfg.: _____ Drier type (check one):

Model No.: _____ Loose fill: _____

_____ Solid core: _____

Condenser cooling medium (air/water): _____

Expansion Device (check one): Capillary tube: _____

Expansion valve: _____

If Expansion valve:

Manufacturer: _____

Model No.: _____

Control/set point: _____

Location of sensor: _____

Other System Controls (ex.: head press control), Describe: _____

_____

(circle units used where applicable)

Date/Time				
Refrigerant				
Charge Size (lb, oz/grams)				
Ambient Temp. (°F/°C)				
Relative Humidity				
Compressor:				
Suction T (°F/°C)				
Suction P (psig, psia/kPa, bar)				
Discharge T (°F/°C)				
Discharge P (psig, psia/kPa, bar)				
Box/Fixture T (°F/°C)				
Evaporator:				
Refrigerant Inlet T (°F/°C)				
Refrigerant Outlet T (°F/°C)				
Coil Air/H_2O In T (°F/°C)				
Coil Air/H_2O Out T (°F/°C)				
Refrigerant T at Superht. Ctl. Pt. (°F/°C)				
Condenser:				
Refrigerant Inlet T (°F/°C)				
Refrigerant Outlet T (°F/°C)				
Coil Air/H_2O In T (°F/°C)				
Coil Air/H_2O Out T (°F/°C)				
Exp. Device Inlet T (°F/°C)				
Motor Amps				
Run/Cycle Time				

Comments: _____

_____