Q1 Core

What does the ozone layer do?

answer on the back →

A1

Absorbs harmful UV-B radiation from the sun

Q2 Core

What destroys stratospheric ozone?

answer on the back →

A2

Chlorine (from CFCs/HCFCs) and bromine (from halons)

Q3 Core

Reference ODP value and refrigerant?

answer on the back →

A3

1.0 — CFC-11

Q4 Core

ODP order: CFCs vs HCFCs vs HFCs?

answer on the back →

A4

CFCs (0.6–1.0) > HCFCs (0.01–0.1) > HFCs (0)

Q5 Core

Do HFCs deplete ozone?

answer on the back →

A5

No (no chlorine or bromine) — but they have high GWP

Q6 Core

What does ODP stand for?

answer on the back →

A6

Ozone Depletion Potential

Q7 Core

What does GWP stand for?

answer on the back →

A7

Global Warming Potential

Q8 Core

Which chemical besides chlorine depletes ozone?

answer on the back →

A8

Bromine (in halons)

Q9 Core

Classify R-12

answer on the back →

A9

CFC

Q10 Core

Classify R-11

answer on the back →

A10

CFC

Q11 Core

Classify R-502

answer on the back →

A11

Blend of R-22 (HCFC) + R-115 (CFC)

Q12 Core

Classify R-22

answer on the back →

A12

HCFC

Q13 Core

Classify R-123

answer on the back →

A13

HCFC

Q14 Core

Classify R-134a

answer on the back →

A14

HFC

Q15 Core

Classify R-410A

answer on the back →

A15

HFC blend

Q16 Core

Classify R-404A

answer on the back →

A16

HFC blend

Q17 Core

Classify R-407C

answer on the back →

A17

HFC blend (zeotropic)

Q18 Core

Which refrigerant class is phased out first?

answer on the back →

A18

CFCs (highest ODP), then HCFCs

Q19 Core

Which treaty controls ozone-depleting substances?

answer on the back →

A19

Montreal Protocol (1987)

Q20 Core

Which amendment adds HFCs to the phase-down?

answer on the back →

A20

Kigali Amendment (2016)

Q21 Core

When did U.S. CFC production end?

answer on the back →

A21

December 31, 1995

Q22 Core

R-22 phase-out rules?

answer on the back →

A22

Banned in new equipment Jan 1 2010; production/import ended Jan 1 2020

Q23 Core

Is venting refrigerant legal?

answer on the back →

A23

No — prohibited for ODS and substitutes, at service and at disposal

Q24 Core

Maximum Clean Air Act penalty for venting?

answer on the back →

A24

~$44,539 per day, per violation (indexed — check current)

Q25 Core

Can refrigerant be sold to anyone?

answer on the back →

A25

No — restricted to certified technicians

Q26 Core

Who must hold Section 608 certification?

answer on the back →

A26

Anyone who services, maintains, repairs, or disposes of equipment that could release refrigerant

Q27 Core

Do apprentices need certification?

answer on the back →

A27

No — if closely and continually supervised by a certified technician

Q28 Core

Which section covers motor vehicle A/C?

answer on the back →

A28

Section 609 (MVAC)

Q29 Core

Define 'recover'.

answer on the back →

A29

Remove refrigerant and store it — no processing

Q30 Core

Define 'recycle'.

answer on the back →

A30

Clean refrigerant for on-site reuse (oil, acid, moisture removed)

Q31 Core

Define 'reclaim'.

answer on the back →

A31

Reprocess to AHRI 700 purity at a facility — new-refrigerant quality

Q32 Core

What purity standard must reclaimed refrigerant meet?

answer on the back →

A32

AHRI Standard 700

Q33 Core

Which form of refrigerant equals 'new' quality?

answer on the back →

A33

Reclaimed (to AHRI 700)

Q34 Core

What two things must evacuation remove?

answer on the back →

A34

Air and moisture (dehydration)

Q35 Core

Why evacuate before recharging?

answer on the back →

A35

To remove moisture and noncondensables (prevents acid, ice, high head pressure)

Q36 Core

What is a noncondensable and its effect?

answer on the back →

A36

Air/nitrogen that won't condense — raises head pressure, wastes energy

Q37 Core

Deep-vacuum dehydration target (practice)?

answer on the back →

A37

Pull to ~500 microns and hold

Q38 Core

Which gas for pressure/leak testing?

answer on the back →

A38

Dry nitrogen, with a regulator and relief valve

Q39 Core

Why never use oxygen or compressed air?

answer on the back →

A39

Oxygen + oil can explode; air adds moisture

Q40 Core

Maximum fill on a recovery cylinder?

answer on the back →

A40

80% of capacity

Q41 Core

Recovery cylinder requirements?

answer on the back →

A41

DOT-approved, gray/yellow; never refill a disposable cylinder

Q42 Core

Can you refill a disposable cylinder?

answer on the back →

A42

No — never

Q43 Core

Gauge manifold color code?

answer on the back →

A43

Low side blue, high side red, center yellow (charging/vacuum)

Q44 Core

Safety hazards of refrigerant exposure?

answer on the back →

A44

Frostbite, asphyxiation (oxygen displacement), cardiac sensitization

Q45 Core

Refrigerant plus an open flame produces?

answer on the back →

A45

Phosgene (toxic)

Q46 Core

Why is refrigerant dangerous in low areas?

answer on the back →

A46

It is heavier than air and displaces oxygen

Q47 Core

PPE for refrigerant work?

answer on the back →

A47

Gloves and goggles; SCBA in extreme cases / well-ventilated area

Q48 Core

Define system-dependent recovery.

answer on the back →

A48

Uses the appliance's own compressor to move refrigerant

Q49 Core

Define self-contained recovery.

answer on the back →

A49

Recovery equipment that has its own compressor

Q50 Core

Factors that affect recovery speed?

answer on the back →

A50

Ambient temperature, equipment size/type, hose length and diameter, compressor health

Q51 Core

Can you mix different refrigerants in a cylinder?

answer on the back →

A51

No — never mix (prevents reclaiming)

Q52 Core

What is fractionation?

answer on the back →

A52

Blend parts leak/boil at different rates, changing composition

Q53 Core

How do you charge a blend?

answer on the back →

A53

As a liquid (prevents fractionation)

Q54 Core

Oils for CFC/HCFC vs HFC systems?

answer on the back →

A54

Mineral/alkylbenzene for CFC/HCFC; POE for HFC

Q55 Core

Is POE hygroscopic?

answer on the back →

A55

Yes — it absorbs moisture; keep sealed and work quickly

Q56 Core

Are there 'drop-in' replacements?

answer on the back →

A56

No

Q57 Core

Common leak-detection methods?

answer on the back →

A57

Electronic detector, UV dye, soap bubbles, ultrasonic

Q58 Core

Which appliances require owner refrigerant records?

answer on the back →

A58

Those with 50 lb or more of charge (kept 3 years)

Q59 Core

Leak-rate trigger: comfort cooling vs commercial refrigeration?

answer on the back →

A59

Comfort cooling 15%; commercial refrigeration 35% (annual)

Q60 Core

Leak repair timeline once the rate is exceeded?

answer on the back →

A60

Repair within 30 days; verify within 30 days

Q61 Core

Which law phases down HFC production?

answer on the back →

A61

The AIM Act (2020)

Q62 Core

What replaces R-410A?

answer on the back →

A62

Blends like R-32 and R-454B (A2L, lower GWP)

Q63 Core

What does A2L mean?

answer on the back →

A63

Mildly flammable refrigerant class — new handling/safety rules

Q64 Core

Four main parts of the refrigeration cycle?

answer on the back →

A64

Compressor, condenser, metering device, evaporator

Q65 Core

Where does refrigerant boil to vapor?

answer on the back →

A65

The evaporator (absorbs heat — low side)

Q66 Core

Where does refrigerant condense to liquid?

answer on the back →

A66

The condenser (rejects heat — high side)

Q67 Core

Job of the compressor?

answer on the back →

A67

Raises refrigerant pressure/temperature and moves it through the system

Q68 Core

Job of the metering device?

answer on the back →

A68

Drops pressure and controls flow into the evaporator

Q69 Core

Job of a filter-drier?

answer on the back →

A69

Removes moisture, acid, and particles

Q70 Core

What is a micron?

answer on the back →

A70

Unit of deep vacuum — 1/1000 of a millimeter of mercury

Q71 Core

1000 microns equals?

answer on the back →

A71

1 mm Hg

Q72 Core

What causes ice/acid in a system?

answer on the back →

A72

Moisture

Q73 Core

What happens to excess air in a system?

answer on the back →

A73

Raises head pressure; must be purged/recovered

Q74 Type I

Definition of a small appliance?

answer on the back →

A74

Contains 5 lb of refrigerant or less

Q75 Type I

Examples of small appliances?

answer on the back →

A75

Refrigerators, freezers, window/portable A/C, dehumidifiers, PTACs, vending machines

Q76 Type I

Small-appliance recovery: post-1993 equipment + working compressor?

answer on the back →

A76

Recover 90%

Q77 Type I

Small-appliance recovery: pre-1993 equipment OR dead compressor?

answer on the back →

A77

Recover 80%

Q78 Type I

Alternative to the 80%/90% recovery targets?

answer on the back →

A78

Evacuate to 4 inches Hg vacuum

Q79 Type I

Can a system-dependent (passive) device be used on small appliances?

answer on the back →

A79

Yes

Q80 Type I

Recovering with a passive device from a dead compressor — two methods?

answer on the back →

A80

Add heat + sharply tap the compressor; or use a vacuum pump with a non-pressurized container

Q81 Type I

Access valves needed to recover from a dead-compressor appliance?

answer on the back →

A81

Both high-side and low-side

Q82 Type I

Should you run the compressor with a passive recovery device?

answer on the back →

A82

Yes (if it works) — it moves the refrigerant

Q83 Type I

When do you remove solderless access fittings?

answer on the back →

A83

At the end of service

Q84 Type I

Common substitute for CFC-12 in small appliances?

answer on the back →

A84

R-134a

Q85 Type I

What should you never do with recovered refrigerant?

answer on the back →

A85

Vent it — recover, recycle, or reclaim instead

Q86 Type I

How do you identify refrigerant in a small appliance?

answer on the back →

A86

By pressure/temperature relationship and the nameplate

Q87 Type I

How do you detect noncondensables?

answer on the back →

A87

Abnormally high head pressure / temperature

Q88 Type I

Charge a small appliance how?

answer on the back →

A88

Per manufacturer — liquid or vapor

Q89 Type I

Can a small appliance's charge be recycled and reused?

answer on the back →

A89

Yes — recovered refrigerant can be recycled/reclaimed

Q90 Type II

Type II covers which appliances?

answer on the back →

A90

High-pressure and very-high-pressure appliances

Q91 Type II

Common Type II refrigerants?

answer on the back →

A91

R-22, R-410A, R-134a, R-404A, R-407C

Q92 Type II

Examples of very-high-pressure refrigerants?

answer on the back →

A92

R-13, R-503

Q93 Type II

Evacuation: high-pressure 200 lb or more, post-1993 equipment?

answer on the back →

A93

10 inches Hg vacuum

Q94 Type II

Evacuation: high-pressure under 200 lb, post-1993 equipment?

answer on the back →

A94

0 in Hg

Q95 Type II

Evacuation: medium-pressure 200 lb or more, post-1993 equipment?

answer on the back →

A95

15 inches Hg vacuum

Q96 Type II

Evacuation: high-pressure 200 lb+ or any medium, PRE-1993 equipment?

answer on the back →

A96

4 inches Hg vacuum

Q97 Type II

Evacuation: very-high-pressure or high-pressure under 200 lb, PRE-1993?

answer on the back →

A97

0 in Hg

Q98 Type II

The Nov 15 1993 date refers to?

answer on the back →

A98

The recovery/recycling equipment's manufacture date

Q99 Type II

The 200-lb split is based on?

answer on the back →

A99

The appliance's full charge — not the amount recovered

Q100 Type II

System-dependent recovery is allowed up to what charge (high-pressure)?

answer on the back →

A100

Less than 15 lb

Q101 Type II

R-410A lubricant?

answer on the back →

A101

POE (polyolester)

Q102 Type II

R-410A pressure vs R-22?

answer on the back →

A102

Higher pressure — needs compatible gauges, hoses, and recovery equipment

Q103 Type II

R-410A composition?

answer on the back →

A103

~50/50 R-32 / R-125 (near-azeotropic)

Q104 Type II

Does R-407C fractionate?

answer on the back →

A104

Yes (zeotropic) — charge as a liquid

Q105 Type II

What is nitrogen used for?

answer on the back →

A105

Pressure testing and purging moisture/air before brazing

Q106 Type II

Before a non-major repair (system not vented), evacuate to?

answer on the back →

A106

0 psig before opening

Q107 Type II

Must recovery equipment be certified?

answer on the back →

A107

Yes — third-party certified (e.g., UL/AHRI)

Q108 Type II

Should you use the system's own compressor to evacuate?

answer on the back →

A108

No — use a recovery machine

Q109 Type II

How do you leak-test a high-pressure system?

answer on the back →

A109

Pressurize with nitrogen; use electronic/soap/UV or ultrasonic detection

Q110 Type II

R-22 lubricant?

answer on the back →

A110

Mineral oil or alkylbenzene

Q111 Type II

What does high head pressure suggest?

answer on the back →

A111

Noncondensables, overcharge, or a dirty/blocked condenser

Q112 Type II

What does subcooling tell you?

answer on the back →

A112

Whether the condenser has the right liquid charge

Q113 Type II

What does superheat tell you?

answer on the back →

A113

Whether the evaporator is properly fed (correct charge/metering)

Q114 Type II

Always do what before opening a system?

answer on the back →

A114

Recover the refrigerant

Q115 Type II

Is R-410A a single refrigerant or blend?

answer on the back →

A115

A blend (R-32/R-125) — but behaves like one (near-azeotropic)

Q116 Type III

Type III covers which appliances?

answer on the back →

A116

Low-pressure appliances

Q117 Type III

Common low-pressure refrigerants?

answer on the back →

A117

R-11 and R-123

Q118 Type III

Equipment that uses low-pressure refrigerant?

answer on the back →

A118

Centrifugal chillers

Q119 Type III

Do low-pressure systems run under pressure or vacuum?

answer on the back →

A119

Vacuum

Q120 Type III

If a low-pressure system leaks, what happens?

answer on the back →

A120

Air and moisture are pulled IN

Q121 Type III

Evacuation level for low-pressure appliances?

answer on the back →

A121

25 mm Hg absolute

Q122 Type III

How do you raise pressure to recover or charge a chiller?

answer on the back →

A122

Add heat (and/or nitrogen) — never the compressor

Q123 Type III

Can you use the chiller's compressor to evacuate it?

answer on the back →

A123

No — use a separate recovery machine

Q124 Type III

Before opening a low-pressure system, do what?

answer on the back →

A124

Pressurize it to 0 psig (using heat/nitrogen)

Q125 Type III

What removes noncondensables from a chiller?

answer on the back →

A125

A purge unit

Q126 Type III

What do noncondensables do in a chiller?

answer on the back →

A126

Raise head pressure and hurt efficiency

Q127 Type III

What does moisture do in a chiller system?

answer on the back →

A127

Causes acid/corrosion and freeze-ups — use filter-driers and deep vacuum

Q128 Type III

R-11 boils at about?

answer on the back →

A128

~75°F at atmospheric pressure (so it is a vacuum at room temp)

Q129 Type III

R-123 boils at about?

answer on the back →

A129

~82°F at atmospheric pressure

Q130 Type III

How are low-pressure systems usually charged?

answer on the back →

A130

As a liquid, per manufacturer specs

Q131 Type III

What kind of gauges for low-pressure work?

answer on the back →

A131

Special low-pressure gauges (in Hg / psia)

Q132 Type III

What kind of recovery cylinders for low-pressure refrigerant?

answer on the back →

A132

Low-pressure/low-temperature rated, DOT-approved

Q133 Type III

Why add heat during low-pressure recovery?

answer on the back →

A133

It raises pressure so the refrigerant can be moved out

Q134 Type III

R-123 is used to replace?

answer on the back →

A134

R-11

Q135 Type III

Is R-123 an HCFC?

answer on the back →

A135

Yes

Q136 Type III

Is R-11 a CFC?

answer on the back →

A136

Yes

Q137 Type III

How do you leak-test a vacuum (low-pressure) system?

answer on the back →

A137

Pressurize with nitrogen, then electronic/soap detection

Q138 Type III

What is a purge unit for?

answer on the back →

A138

Removing air/noncondensables from a low-pressure chiller

Q139 Type III

What must be done with the water in a chiller barrel?

answer on the back →

A139

Drained/monitored — moisture harms the machine