

KRAFTED SPIRIT

The Engine Room

Distillation, Clarification, Carbonation, Ice and the Equipment Behind a
Modern Bar Programme

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The room behind the room

There is a romantic idea of the bar that has nothing to do with machines: a skilled bartender, a few bottles, a shaker, and a feel for what a guest wants. It is a lovely picture and it is still, at its heart, true. But it leaves out the room behind the room.

The bars setting the pace at the top end of the market are quietly running equipment that would not look out of place in a laboratory or a small production kitchen — rotary evaporators, centrifuges, ultra-precise water baths, carbonation rigs, clear-ice machines — and the drinks that result are not achievable any other way.

"A bar can underspend, buying nothing and wondering why its drinks taste like everyone else's. Far more often, a bar overspends — seduced by a piece of equipment it saw in a viral video."

— PAUL WALKER

This book is about that hardware: what each piece does, what it is genuinely good for, and what it costs to own and run. It covers nineteen pieces of equipment, grouped into six families — from the most specialised distillation apparatus through to the humble pH meter that quietly underwrites everything else.

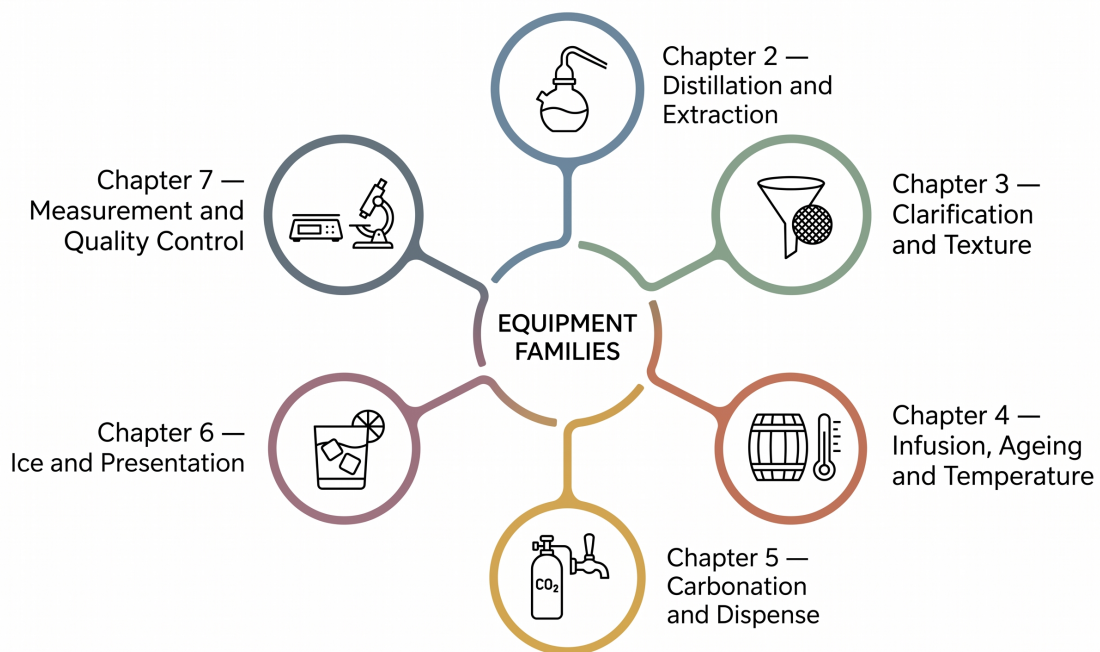
Every price is indicative, drawn from international suppliers in US dollars. If you are sourcing into the UAE, as most of my clients are, you must add freight, import duty and installation on top. The landed cost is the real cost, and any budget that ignores it is a budget that will be exceeded.



AN ELEGANT CONTEMPORARY HOTEL COCKTAIL BAR IN THE UAE AT GOLDEN HOUR — THE PREMIUM MARKET THIS BOOK SPEAKS TO.

The six equipment families

Each chapter in this book covers one family of equipment. The diagram below maps all six — their purpose, their relationship to one another, and where they sit in the broader programme.



Six families, nineteen machines. Every piece of equipment in this book belongs to one of these groups — each has a distinct purpose in the programme, and the strongest bars are built by choosing deliberately across all of them.

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CHAPTER ONE

The Case for the Right Kit

Equipment is the least romantic subject in bartending and one of the most consequential.

At the premium end of the market, the gap between a bar that owns the right machines and one that does not is no longer a matter of polish — it is a matter of what drinks are possible at all. A clarified milk punch with the clarity of glass, a botanical distillate that captures an aroma heat would have destroyed, a single block of clear ice that melts slowly enough to keep a spirit-forward drink honest to the last sip — none of these is achievable with a shaker and good intentions.

"The best kit buys three things: capability, consistency, and efficiency. A machine that delivers none of these for the drinks you actually sell is not an investment — it is an ornament."

Capability

Drinks and components that cannot be made any other way — genuine programme distinctiveness.

Consistency

A sous-vide infusion or a pH-checked acid is the same on a quiet Tuesday as on a heaving Friday.

Efficiency

A centrifuge clarifies in minutes what cheesecloth does in hours. At volume, speed is value.

The question is never whether a piece of equipment is impressive. It is whether it suits this menu, this venue, this volume and this price point. Buying kit because a competitor has it, or because it looked striking online, is the surest route to an expensive machine gathering dust in a corner.

The encouraging news is that almost all of this equipment is agnostic to what is in the glass. A centrifuge clarifies a non-alcoholic cordial as happily as an alcoholic infusion. A carbonation rig fizzes a shrub soda as readily as a spritz. The machine does not care whether there is alcohol in the liquid — and increasingly, your menu cannot afford to either.

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CHAPTER TWO

Distillation and Extraction

The most specialised and most expensive family — machines that transform rather than mix. They demand training, budget and, in the case of the still, a careful look at licensing.

Rotary Evaporator

A rotary evaporator running in a bar development space — glass flask rotating in a heated bath, clear distillate collecting in the receiving flask.

The rotary evaporator — universally shortened to "rotovap" — performs vacuum distillation: by lowering the pressure, it pulls volatile aromatics out of a liquid at temperatures well below alcohol's normal boiling point, often under forty degrees, so that delicate aromas survive intact. It is the machine behind crystal-clear botanical distillates, dealcoholised "ghost spirits" for non-alcoholic menus, and the capture of aromas that heat would obliterate.

In use, the operator loads the flask with an infused liquid, applies vacuum and gentle heat, rotates the flask to increase surface area, and collects the condensed distillate in a separate receiving flask. This is emphatically not a turn-it-on-and-walk-away device; it needs proper training to run safely and well.

INDICATIVE COST

\$4,000 – \$20,000+

Before freight and UAE import duty

ALCOHOLIC / NON-ALC

Both

Extracts flavour or strips alcohol equally

A full bar setup — the unit itself, a chiller and a vacuum pump — sits at the serious end of the investment scale. Its great virtue is versatility across the whole programme: the same machine extracts flavour from an alcoholic base and strips alcohol out for a non-alcoholic one, which for a bar serious about both sides of its list makes it, expensive as it is, one of the most genuinely useful machines it can own.

TRAINING NOTE

Requires genuine operator training. Budget for instruction alongside the machine — not after it arrives.



Copper Alembic Still

A gleaming small copper alembic pot still in a bar production space — warm metallic tones conveying craft distillation heritage. The still is a statement piece for a programme with the licence, the operator and the ambition to make its own spirits.

Distiller (Pot and Alembic Still)

A still performs traditional heat-based distillation, using heat rather than vacuum to produce or refine spirits, liqueurs and concentrated botanical distillates. Its place in a bar is in a house-made spirit programme — where licensing allows — or in producing flavour bases and hydrosols for use elsewhere on the menu.

The decisive issue here is not price but licensing. The rules governing distillation vary dramatically by market, and the UAE position in particular must be checked carefully before this is specified for a client. The still is a statement piece of equipment for a programme with the licence, the operator and the ambition to make its own spirits — and one to leave well alone otherwise.

Ultrasonic Homogeniser

The ultrasonic homogeniser uses high-frequency sound waves to emulsify, homogenise or accelerate extraction without applying heat. Its value lies in stable emulsions — binding oil into a syrup — in rapid infusion and extraction, and in smoothing the texture of dairy- or fat-based mixers.

It is the least familiar machine in this chapter and the one most likely to be bought for a specific textural problem — a stubborn emulsion, a mixer that will not stay smooth — rather than as a general-purpose tool. That is exactly how it should be approached: a targeted solution rather than a centrepiece.

STILL — INDICATIVE COST

\$500 – \$15,000+

Licensing check essential · UAE regulations apply

HOMOGENISER — INDICATIVE COST

\$1,000 – \$5,000

Targeted solution · both alcoholic and non-alc

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CHAPTER THREE

Clarification and Texture

Taking a liquid and making it clearer, cleaner or richer in texture. The results read instantly as craft to a guest.



A COMPACT BAR CENTRIFUGE — TUBES OF PERFECTLY CLARIFIED JUICE BESIDE THE DENSE PUCK OF SEPARATED SOLIDS.

CENTRIFUGE

The workhorse of the clarification programme

The centrifuge spins liquids or purées at high speed, separating solids, oils and clear liquid by density. It is the machine behind crystal-clear juices and cordials, clarified milk punches, and high-yield fat-washing. In use, the operator pre-treats the liquid, loads the rotor, spins for minutes, then decants the clarified layer off the compacted puck of solids.

For a bar that takes clarification seriously, the centrifuge is the workhorse: faster, higher-yielding and more consistent than every low-tech alternative. It clarifies alcoholic infusions and non-alcoholic juices and cordials equally well.

INDICATIVE COST

< \$1,000 – \$20,000+

WORKS ON

Alcoholic + Non-Alc

Fat-Washing Kit

Fat-washing infuses a spirit with a fat — butter, bacon, olive oil — for mouthfeel and flavour, then separates that fat back out, leaving the character behind without the grease. It builds savoury, rich cocktail bases: a brown-butter Old Fashioned, a bacon-washed bourbon.

The entry-level approach costs almost nothing — basic containers and filters. The upgrade path is the centrifuge, which speeds separation considerably. Fat-washing is the rare technique where the entry-level approach is genuinely viable.



Vacuum Chamber Sealer

The vacuum chamber sealer removes air and seals liquids or solids into pouches for infusion, marination or storage — enabling faster, oxidation-free infusions and neat portioning for service. The decisive distinction is between a proper commercial chamber sealer and the cheap external sealers that struggle badly with liquids. For a bar infusing and batching at any volume, the chamber sealer is the right tool. Less glamorous than a centrifuge, but one of those quietly essential machines a serious prep operation comes to rely on daily.

SEALER COST
\$300 – \$1,200

CAPTION
A commercial vacuum chamber sealer with its lid raised over a pouch of fruit and liquid mid-cycle.

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CHAPTER FOUR

Infusion, Ageing and Temperature

The broad middle of the kit list — the family that does the everyday work. Applying controlled heat, accelerating ageing, reaching extreme cold and capturing aromatic smoke.



AN IMMERSION CIRCULATOR CLAMPED TO A WATER BATH HOLDING SEALED JARS OF INFUSING SPIRITS AND SYRUPS — STEAM RISING GENTLY, CONVEYING CONTROLLED PRECISION.

SOUS-VIDE IMMERSION CIRCULATOR

The best-value piece of equipment in the book

The sous-vide immersion circulator provides precision water-bath heating for controlled, low-temperature infusions, syrups and batch work. Its core value is consistency: repeatable flavour infusions of herbs, fruit and spice without scorching, and reliable large-batch syrup or shrub production.

Commercial-grade circulators are among the most affordable serious machines — indicatively a few hundred dollars. It works identically on spirits and on non-alcoholic cordials and syrups. The immersion circulator is the machine most bars should point towards first: relatively cheap, easy to train on, and it turns infusion from a process that depends on a bartender's judgement into one that can be set to a temperature and a time and reproduced exactly.

FOR CONSISTENCY PER DOLLAR

little else in this book competes.

Liquid Nitrogen Dewar

A dramatic plume of cold white nitrogen vapour at the bar — moody, cinematic, spectacle handled with care. The cost that matters here is not the dewar but the discipline: liquid nitrogen requires staff training and proper ventilation, every time, with no shortcuts.

Rotational Ageing Device

The rotational ageing device — sometimes sold as a gyroscope or rapid-ageing unit — continuously rotates a vessel of spirit and wood, accelerating the contact that would otherwise take weeks in a static barrel. It trades a little romance for speed and repeatability, which for a busy commercial bar is usually the right trade.

Barrel Ageing Vessel

A small oak barrel imparts wood character and slow oxidative ageing the traditional way — for genuinely barrel-aged Manhattans, Negronis or house spirits. It cannot match the rotational device for speed or consistency, but it offers something the machine cannot: the genuine article and the story that comes with it.

Anti-Griddle

A flat surface chilled to around thirty degrees below zero, used to flash-freeze liquids into thin, brittle sheets for frozen garnishes, flavoured discs or moments of textural contrast on a finished drink. A specialist's tool, bought for a particular kind of visual flourish rather than everyday work.

Smoking Gun

The smoking gun generates cold smoke from wood chips for aroma infusion — behind tableside theatre, smoked garnishes and smoke-infused spirits. A handheld unit costs well under two hundred dollars, making it the great value proposition of this family: for the price of a single good bottle, it adds genuine theatre and a distinctive aromatic dimension.

ROT. AGEING

\$200–\$3k

BARREL

\$30–\$300

ANTI-GRIDDLE

\$500–\$1,500

SMOKING GUN

< \$200

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CHAPTER FIVE

Carbonation and Dispense

Machines that bridge craft and operation — putting bubbles in a drink and getting batched product to the glass at volume.



A BENCH CARBONATION SETUP — CO₂ CYLINDER, PRESSURE-RATED BOTTLES AND GAUGES, CONDENSATION ON THE CHILLED BOTTLES.

CARBONATION RIG

Force-carbonation for consistent, fine bubbles

A carbonation rig force-carbonates a finished liquid under pressure — behind carbonated cocktails, spritzes and batched fizzes. The operator chills the liquid close to freezing (cold liquid holds carbonation far better), loads it into a pressure-rated bottle or keg, charges with CO₂ at the correct pressure, agitates and rests before serving.

Carbonation is one of those capabilities that, once a bar has it, quietly expands the menu in both directions — equally effective on non-alcoholic sodas, shrubs and tonics as on alcoholic cocktails.

NITRO SYSTEM

A nitro system infuses a still liquid with nitrogen for a cascading pour and creamy texture — behind nitro cold-brew cocktails, stout-style serves, and non-alcoholic nitro coffee or tea. For many venues, the non-alcoholic application is the stronger commercial case: nitro coffee sells.



A POLISHED MULTI-TAP DRAFT TOWER — A BATCHED COCKTAIL BEING POURED, CONVEYING HIGH-VOLUME CONSISTENT SERVICE.

DRAFT SYSTEM

Infrastructure, not a benchtop — for high-volume venues

A draft system dispenses pre-batched cocktails, beer, wine or non-alcoholic serves from kegs through chilled lines to a tap. It speeds service during peak hours and cuts wastage compared with made-to-order. The same infrastructure pours batched cocktails, beer, wine or non-alcoholic mixers — a large part of its appeal.

The draft system is the clearest example of equipment bought for operational rather than craft reasons: it does not make a better drink — it makes the same good drink faster, more consistently and with less waste. For a small, slow room it is capital spent solving a problem it does not have.

INDICATIVE COST — PER LINE

~\$1,000 per line · multi-tap into five figures

Infrastructure investment · before freight and UAE import duty

CHAPTER SIX

Ice and Presentation

Ice is the most underrated ingredient in a cocktail and, at the top end, increasingly the most visible.



Clear Ice Machine

A single flawless clear ice cube in a crystal tumbler of amber spirit — light passing cleanly through bubble-free ice. At the top end of the market, that single block is one of the clearest signals a bar can send that it takes its craft seriously.

Clear Ice Machine

Uses directional freezing to produce dense, bubble-free, slow-melting blocks — a cold plate freezes water from the bottom up so impurities and bubbles are pushed out. The clear ice machine suits a spirit-forward programme trading on presentation and slow dilution. Where it fits, it transforms the look of a serve and slows dilution enough to keep a spirit honest to the last sip.

INDICATIVE COST

\$3,000 – \$15,000+

BEST SUITED TO

Spirit-forward, Old Fashioneds, Negronis

Ice Ball Press

Compresses a roughly cut block of ice into a clear, dense sphere using a heated metal press that melts and shapes the ice in moments. The natural companion to a clear ice programme — for a fraction of the cost of the machine, it adds theatre and a slower-melting format that guests have come to expect on a premium pour. Manual presses are indicatively from a modest sum up to a few hundred dollars.

Cream Whipper

Uses nitrous oxide chargers to aerate liquids into foams, airs or whipped textures — behind cocktail foams and toppers, flavoured airs, infused whipped creams. The practical, high-volume answer to foam technique: where a hand dry-shake or a surface-whisked air is slow and variable, the whipper produces a stable, pourable, consistent result fast enough for a busy service. Well under two hundred dollars, and one of the most useful texture tools a bar can own.

Measurement and Quality Control

PH METER — THE MOST QUIETLY IMPORTANT MACHINE IN THE BOOK

A pH meter measures acidity precisely, beyond what taste alone can reliably judge. Its value is twofold: dialling in sours, shrubs and clarified citrus to a consistent, repeatable acidity — and checking house-made syrups or ferments for food safety. It is unglamorous, it costs very little, and the best bars treat it as essential rather than optional.

The pH meter lets a bar standardise acidity to a number rather than a guess — the single biggest lever on the consistency of a sour. For the lowest outlay of anything in this book, it delivers the highest return in reliability. Any programme doing serious prep work should regard it as non-negotiable.

INDICATIVE COST

\$20 – \$300

A digital pH meter testing a cocktail batch — the display showing a reading on a clean prep bench.

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CHAPTER EIGHT

Specifying and Running the Kit

Owning a list of impressive machines is not the same as running a coherent equipment programme. This chapter is about the discipline that turns a wish list into a working operation.

Choosing what to buy

The first discipline is restraint. The right question for each candidate is not whether it is impressive but whether it suits the drinks you actually sell, at the volume you actually do, for the guests you actually serve. The bars that spend well are ruthless about the difference between equipment that will define their work and equipment that merely demonstrates ambition.

Costing it properly

The price in the catalogue is not the price you pay. Sourcing into the UAE adds freight, import duty and installation on top of every international figure. Beyond the landed price sit running costs — nitrogen supply, gas and glycol, consumables, servicing — and beyond those, the labour and training. Assessed by total cost of ownership against value returned, some apparently cheap machines reveal themselves as expensive to keep, and some apparently expensive ones turn out to cost very little per drink.

Training, safety and compliance

A capable machine in untrained hands is at best idle and at worst dangerous. A rotovap and a still require genuine operator training. A liquid nitrogen dewar demands full protective equipment and proper ventilation without exception. The right sequence is to confirm the safety and compliance position and budget for the training before the machine is bought, not after it has arrived.

Integrating the kit

Equipment does not work in isolation. A centrifuge amplifies the clarification and fat-washing done elsewhere on the bench. A vacuum chamber sealer feeds the sous-vide circulator. A pH meter underwrites the consistency of everything acidic that leaves the bench. Thinking about the kit as an integrated system turns a collection of machines into a programme.



The Build-Out

A bar development area being fitted out — stainless benches installed with equipment in place, cabling and plumbing in progress. The reality of a kit build-out: precise, considered and never as straightforward as the catalogue suggests.

"The machines are not the point. The drinks are."

But at the top of this market the drinks increasingly depend on the machines. A bar that buys the right kit, lands it honestly, trains its people properly and uses it well will deliver things its competitors cannot.

The machines that pay back fastest are the broadly useful, frequently used ones — the immersion circulator, the centrifuge, the pH meter, the smoking gun, the carbonation rig — that touch many drinks across both sides of the menu. The specialist pieces pay back only for programmes genuinely built around what they do.

Which of those two a programme becomes is decided not by the equipment, but by the discipline brought to choosing and running it.