

# readme.md for @maintainable.xyz/house- spec

The open specification for building maximally maintainable, healthy homes.

## What This Is

A complete, opinionated building specification for a Baufritz timber-frame house engineered around **clean-room-level indoor air quality, laboratory-grade water purity, self-hosted infrastructure, and lifetime maintainability**. Every system — air filtration, water treatment, heating, flooring, plumbing, datacenter — is designed so that components can be inspected, serviced, and replaced without destructive intervention.

## Specification Documents

Spec	Scope
<a href="#">01 — Air System</a>	H13 HEPA whole-house filtration, MVHR, steam humidification, duct design, pressure management
<a href="#">02 — Sensors &amp; Automation</a>	Per-room air quality sensors, KNX/Zigbee architecture, Home Assistant integration, demand-controlled ventilation
<a href="#">03 — Baufritz Coordination</a>	Technical room, duct routing, airtightness, radon protection, construction checkpoints
<a href="#">04 — Flooring &amp; Ceiling</a>	Lindner NORTEC Doppelboden raised floor, WOODline parquet, Plafotherm AirHybrid radiant ceiling
<a href="#">05 — Water System</a>	POE reverse osmosis, 316L stainless steel plumbing, ceiling-routed distribution, leak detection
<a href="#">06 — Home Datacenter</a>	Cellar, 4x 42U racks, closed-loop cooling, heat recovery, goods elevator, UPS, structured cabling

# Key Design Principles

- **Whole-house H13 HEPA** — 99.95% particle capture at 0.3 um, ISO Class 7-8 equivalent
- **Every air parameter controlled** — particulates, CO2, VOCs, humidity, temperature, pressure, radon
- **Heating via ceiling** (Plafotherm AirHybrid), not floor — fast response, furniture-independent, integrates MVHR supply air
- **Raised access floor** (Lindner NORTEC Doppelboden) — individually liftable 600x600 mm panels for full access to services underneath
- **Dry construction throughout** — no wet trades, ideal for Baufritz timber-frame
- **Whole-house POE reverse osmosis** — 95-99% TDS removal, remineralized, UV-sterilized, PFAS/microplastic-free
- **316L stainless steel plumbing** — food-grade, zero leaching, press-fit, routed accessibly under suspended ceiling
- **Home datacenter in cellar** — 4x 42U racks, 10 kW closed-loop cooling, N+1 redundancy, heat recovery heats the house in winter
- **Goods elevator** — 1000 kg capacity, cellar to ground floor, handles fully loaded server racks
- **Positive pressure** (+3-5 Pa) — unfiltered air never enters the building envelope

## PDF Build

The specs can be compiled into a single styled PDF with rendered Mermaid diagrams:

```
pnpm install
pnpm build
# Output: dist/house-spec.pdf
```

Requires Chromium (installed automatically via Puppeteer).

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