

TECHNICAL BRIEFING

Introduction to

API 6A

Specification for Wellhead and Christmas Tree Equipment

A structured guide to product specification levels, ratings, materials and qualification, prepared by Rapid Global engineering.

What this briefing covers

- 01** Where API 6A comes from, and what it covers
 - 02** Product Specification Levels, PSL 1 through 4
 - 03** Ratings: rated working pressure and temperature class
 - 04** Materials, sour service and qualification testing
 - 05** Wellhead and christmas tree equipment, explained
 - 06** Markings, ordering and how we help
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01 — ORIGINS & SCOPE

A specification with 60+ years behind it

API Specification 6A was first published by the American Petroleum Institute in the early 1960s, building on API's earlier well-control valve standards from 1939. It has since been revised through 21 editions, with the current 21st edition published in 2018.

Since roughly the mid-1990s, API 6A has been progressively harmonised with the international standard ISO 10423, so equipment built to one is recognised against the other on projects worldwide.

1939

API's earliest well-control valve standardisation work begins

Early 1960s

API 6A is first published as its own specification

Mid-1990s

Harmonisation with ISO 10423 begins

2018

21st edition published — current edition today

01 — ORIGINS & SCOPE

What API 6A covers

API 6A, aligned internationally with ISO 10423, sets out the design, materials, testing, inspection, marking and documentation requirements for wellhead and christmas tree equipment used across drilling, completion, workover and production of oil and gas wells.

Wellhead housings

Casing heads, casing spools, tubing heads and tubing head adapters

Trees and flow control

Christmas trees, crosses, tees, gate and check valves, chokes and actuators

Connections

Wellhead connectors and fittings that join equipment while holding pressure

01 — ORIGINS & SCOPE

The API Monogram

Manufacturers licensed under the API Monogram Program may apply the API mark to equipment built to Spec 6A, under a quality management system that API itself audits. For a purchaser, the mark is a signal — not a substitute for specifying the equipment correctly.

What the monogram confirms

The product was manufactured under an audited quality system, to the design, material and testing requirements of the specification edition it references.

What the purchaser still defines

The PSL, performance requirement level, material class, temperature class and rated working pressure needed for the specific well and site.

02 — PRODUCT SPECIFICATION LEVELS

PSL 1 through PSL 4

The Product Specification Level sets how much design verification, material testing, inspection and documentation a piece of equipment must carry. Requirements build up from PSL 1 to PSL 4 — the level does not change the equipment's pressure rating.

PSL 1

Baseline requirements: dimensional, material and functional testing at the essential level.

PSL 2

Adds further material testing and documentation on top of PSL 1.

PSL 3

Increases inspection, non-destructive examination and traceability further still.

PSL 4

The most stringent level: full testing, documentation and traceability for critical, high-consequence service.

03 — RATINGS

Rated working pressure

Equipment is built to one of six standard pressure classes, in pounds per square inch (psi). Test pressures and hold times for a given rating are set out in API 6A's own qualification tables.



HPHT wells (typically above 15,000 psi and/or 350°F) call for additional design and qualification attention beyond the standard classes.

03 — RATINGS

Temperature classes

Class	Range (°F)	Range (°C)	Typical service
K	-75 to 180	-60 to 82	Arctic, extreme cold ambient
L	-50 to 180	-46 to 82	Cold ambient
N	-50 to 140	-46 to 60	Cold ambient, lower operating temperature
P	-20 to 180	-29 to 82	Temperate ambient
S	0 to 140	-18 to 60	Warm ambient
T	0 to 180	-18 to 82	Warm ambient, higher operating temperature
U	0 to 250	-18 to 121	High operating temperature
V	35 to 250	2 to 121	High ambient and operating temperature

04 — MATERIALS

Material classes, AA to HH

A two-letter code sets the material requirement for pressure-containing parts (first letter) and pressure-controlling parts (second letter), and whether the equipment is qualified for general or sour service under NACE MR0175 / ISO 15156.

Class	Service	Materials (containing / controlling)
AA	General	Carbon / low-alloy steel, both parts
BB	General	Carbon / low-alloy steel — stainless steel
CC	General	Stainless steel, both parts
DD	Sour	Sour-qualified carbon / low-alloy steel, both parts
EE	Sour	Sour-qualified carbon / low-alloy steel — sour-qualified stainless steel
FF	Sour	Sour-qualified stainless steel, both parts
HH	Sour	Corrosion-resistant alloy, both parts

04 — MATERIALS & QUALIFICATION

Performance requirements and testing

PR1**Design validation**

The baseline route: verification by design calculation or finite element analysis, confirming the design meets the specification's requirements.

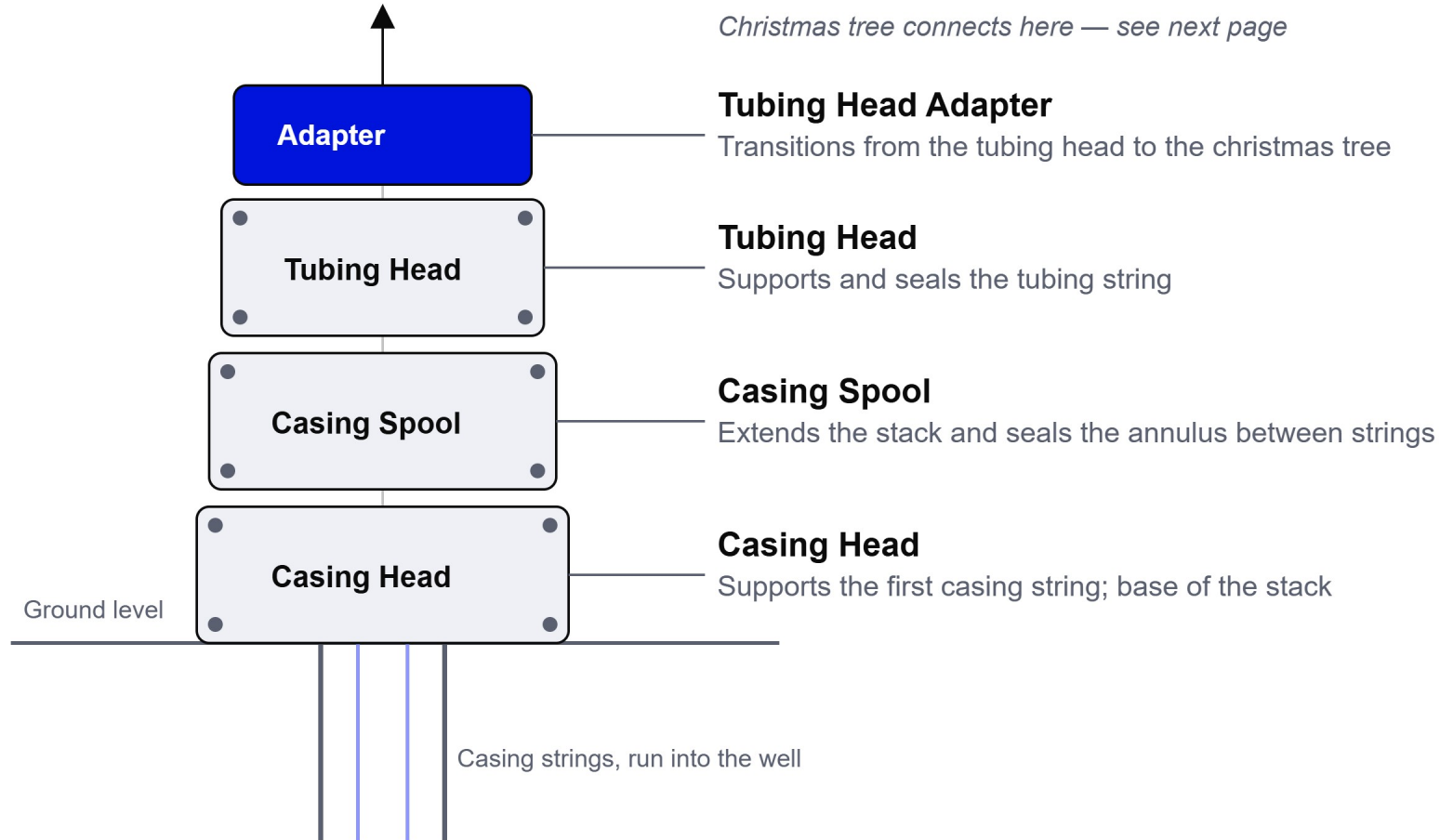
PR2**Qualification testing**

Adds physical performance qualification testing of a representative product, following the standard's own Annex F requirements — referenced for valves as API 6AV1.

Exact test pressures, cycles and hold times are set out in API 6A's own qualification tables and are confirmed against the current edition for each specific product before test planning begins.

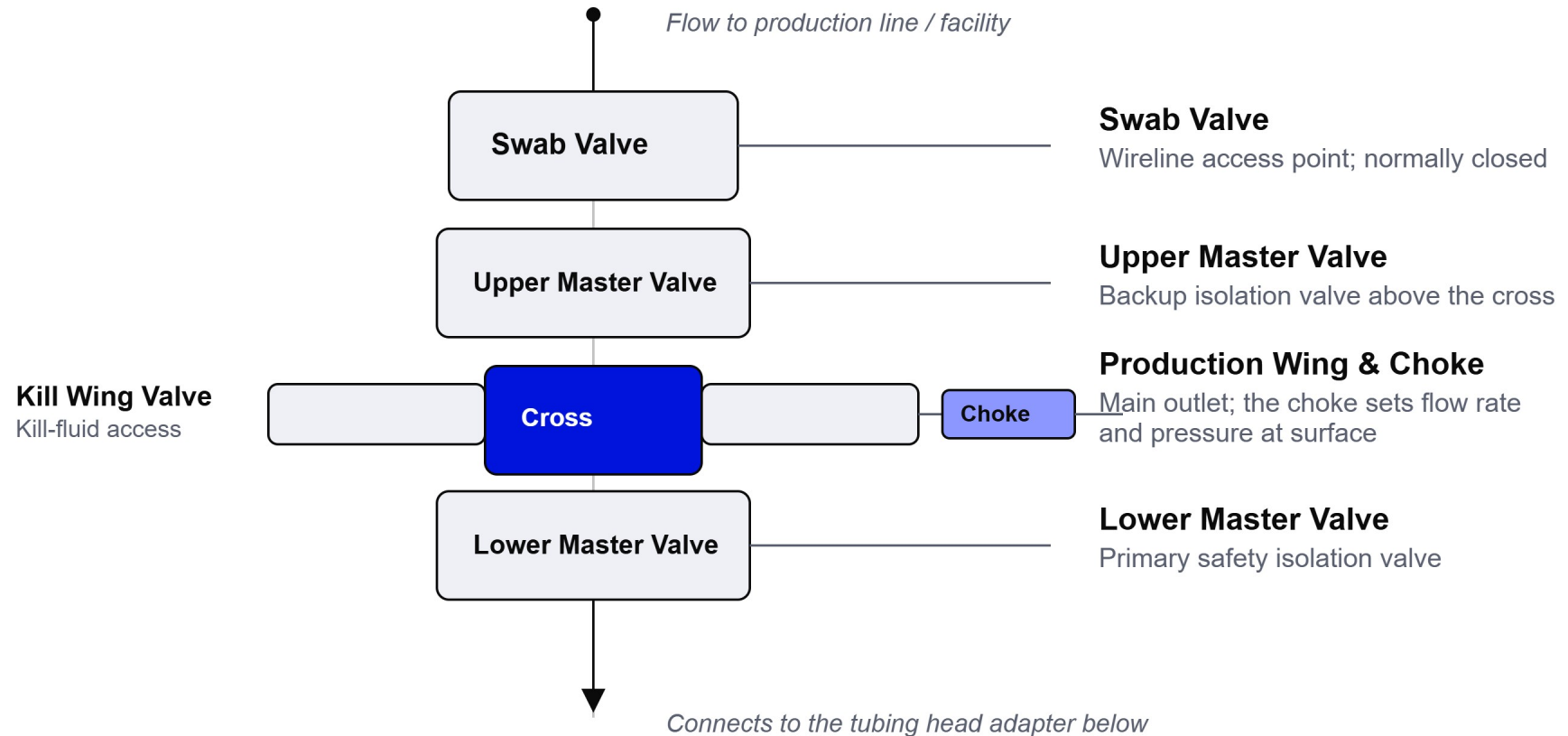
05 — EQUIPMENT

Anatomy of a wellhead stack



05 — EQUIPMENT

Anatomy of a christmas tree



05 — EQUIPMENT

Core equipment covered

Casing head & spool

Support and seal each casing string, forming the base of the wellhead stack

Tubing head & adapter

Supports the tubing string and transitions from casing head to tree

Christmas tree, crosses & tees

Houses the valves and fittings that control flow from the producing well

Gate & check valves

Isolate or direct flow, opening and closing against full working pressure

Chokes

Control flow rate and pressure drop at surface

Wellhead connectors

Join sections of equipment while holding a reliable pressure seal

05 — EQUIPMENT

Markings & traceability

Every item of API 6A equipment carries a permanent mark so it can be identified and traced throughout its service life. The full marking requirements sit within the standard itself; the essentials are:

Manufacturer's name or mark, and the API Monogram where licensed	Temperature class
Nominal size and rated working pressure	Product Specification Level
Material class	Unique serial number

05 — EQUIPMENT

What we confirm before we specify

Before any equipment can be correctly specified against API 6A, these parameters need to be set from the well and site conditions:

Rated working pressure

One of the six standard psi classes

Temperature class

Set by site ambient and service temperature

Material class

General or sour service, per NACE MR0175 / ISO 15156

PSL and PR level

Matched to the consequence of failure for this equipment

End and outlet connections

Type, size and orientation needed for the stack

Trim & bore size

Sized to the tubing, casing and flow requirements

WHY RAPID GLOBAL

Where we support this work

Specification support

Helping confirm the right PSL, PR level, material class and temperature class for a given well

Connection & seal design

Threaded and metal-to-metal connections used across wellhead and tree assemblies

Material & sour-service assessment

Checking material selection against NACE MR0175 / ISO 15156 requirements

FEA verification

Simulation-based evidence to support PR1 design qualification before build

TALK TO US

Let's talk about your next wellhead package

Whichever part of the specification you need help with — connections, seals, materials or qualification — our engineers are ready to take it on.



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