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Typical COD Regulatory Limits

(from a Chat GPT query)

A globally oriented overview of typical COD (Chemical Oxygen Demand) regulatory limits and what ranges are normally enforced for industrial effluent, stormwater/runoff, and publicly owned treatment works (POTW) discharge. Because COD is not regulated uniformly worldwide, the numbers below represent typical regulatory bands, common permitting practices, and standard industrial/commercial limits used by environmental agencies. **See item #4 for stormwater runoff (applicable to outside storage of pellet fuel).**

1. Municipal Wastewater (effluent discharge to surface waters)

Municipal plants must meet the strictest standards because the discharge goes directly to rivers.

Typical final effluent COD limits:

- **< 50 mg/L** — EU Urban Wastewater Directive (tight plants)
- **< 75 mg/L** — Common EU/UK high-quality treatment target
- **50–125 mg/L** — U.S. POTWs (COD is not federally regulated, but states often set these ranges)
- **< 100 mg/L** — Canada provincial guidelines (varies by province)
- **< 60–100 mg/L** — Japan WWTP effluent

Typical range: 50–125 mg/L for clean final effluent.
Anything above ~100–120 mg/L is rarely allowed for municipal direct discharge.

2. Industrial Wastewater (direct discharge to surface waters)

Direct dischargers face strict local permitting, usually case-by-case. Across OECD countries, permits most commonly set:

- **< 75–250 mg/L** for light industries (food & beverage, textiles, agri-processing)
- **< 150–300 mg/L** for biomass pellet plants with controlled runoff
- **< 250–500 mg/L** for heavy industries allowed higher organic load but with treatment
- **> 500 mg/L** is usually **not** acceptable without advanced treatment (DAF, biological, chemical oxidation)

Most common permit band: 100–250 mg/L COD.

3. Industrial Wastewater Discharged to POTWs (indirect discharge)

Industries sending water to municipal treatment plants face pre-treatment standards so they don't overload the plant.

Typical allowed COD concentrations:

- **< 500 mg/L** — common local limit in the U.S. and EU
- **500–1,000 mg/L** — sometimes allowed with surcharge
- **> 1,000 mg/L** — generally **not permitted**, unless the POTW explicitly accepts high-strength waste with special fees or pretreatment.

Typical indirect discharge limit: 250–500 mg/L, sometimes up to **1,000 mg/L** with fees.

4. Stormwater / Runoff (non-process water)

Very relevant to **biomass storage yards**, **wood chip piles**, **pellet storage**, and **coal yards**.

Stormwater COD limits vary widely; it is often regulated as a **"no visible pollution"** standard or as a numeric benchmark.

Typical numeric stormwater COD guidelines:

- **< 75 mg/L** — EU industrial stormwater
- **< 100 mg/L** — UK and Nordic nations
- **< 120 mg/L** — U.S. industrial stormwater "benchmark" value in many states
- **< 150 mg/L** — Often used for forestry product sites and pellet yards

5. Asia-Pacific (China, Vietnam, Korea, Indonesia)

Many APAC environmental ministries specify COD explicitly and use stricter standards for polluted rivers.

Typical limits:

- **China Class 1A discharge: COD < 50 mg/L** (very strict)
- **China Class 1B: COD < 60 mg/L**

- **China general industrial: COD < 100 mg/L**
- **Vietnam QCVN 40:2011/BTNMT:**
  - Column A (sensitive receiving waters): **< 75 mg/L**
  - Column B (normal waters): **< 150 mg/L**
- **South Korea: < 40–80 mg/L**

APAC limits for direct discharge are often stricter than U.S./EU.

Summary Table — Typical COD Limits

Category	Typical COD Limit (mg/L)	Notes
Municipal effluent to river	50–125	Most common across OECD
Industrial direct discharge	75–250	Higher if heavy industry
Indirect discharge to POTW	250–500 (sometimes 1,000)	Often surcharges above 500
Industrial stormwater	**75–150**	**Key issue for outdoor pellet storage**
China Class 1A	< 50	Among world's strictest
Vietnam (Column A/B)	75 / 150	Very relevant for pellet sites
Japan	60–100	Typical WWTP limits