ASIANLOOP CUSTODY CALCULATOR – USER MANUAL (v2)

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1. ABOUT THIS CALCULATOR

The Asianloop Custody Calculator is a supporting engineering tool for custody transfer, proving, audit checks, and training. It provides quick calculations for **Corrected Volume (Vcorr)**, **Mass**, **Energy** for liquids, and standardized volume for dry gas using real-gas compressibility (Z). The tool supports three Z sources: **Manual Z**, **Papay approximation**, and **AGA8-Detail** when composition data is provided.

2. HOW TO USE THIS CALCULATOR

2.1 Liquids

Inputs: V, unit, T, Tref, CTL via α or manual, optional ρ and HHV. Outputs: Vcorr, Mass, Energy.

2.2 Dry Gas

Inputs: Qline, P, T, base conditions, Z source, optional density/SG and GCV. Outputs: Qstd, optional mass and energy. Z upgrades to AGA8-Detail if composition is provided.

3. STANDARDS & REFERENCES

Liquids: API MPMS 11.1; ISO 5167-1/2; OIML R117-1. Custody Transfer: API MPMS 21.2. Gas: AGA 3 (orifice), AGA 7 (turbine), AGA 9 (ultrasonic), AGA 8 (compressibility). Wet/Multiphase: API MPMS 22.2; ISO/TR 11583.

4. WORKED EXAMPLES

Example 1: Liquid Volume Correction — 1000 bbl at 28°C → Vcorr 990.9 bbl; mass and energy if density and HHV given.

Example 2: Dry Gas Standardization with Composition — Qline 5000 m³/h at 60 bar, 30°C; composition provided. Browser Papay → server AGA8-Detail → Qstd upgraded.

Example 3: Manual Z — dataset Z=0.920 entered directly for contractual use.

5. LIMITATIONS & BEST PRACTICES

- Liquids: α-CTL approximate; prefer API 11.1 tables. - Gas: Papay approximate; prefer Manual Z or AGA8-Detail. - Wet gas: correlations are indicative only; use multiphase metering if possible. - Always record CTL/Z source, calibration, and standard base conditions.

6. DISCLAIMER & COPYRIGHT

This tool is provided as-is for educational and engineering support. Asianloop Sdn Bhd makes no warranty for contractual or legal acceptance of results. Official custody transfer requires certified systems per API, ISO, OIML, and AGA standards.