

One ruler (BS.1770), two regional rules (EBU R128, ATSC A/85) - the numbers and the order.

How BS.1770 measures (the ruler)

1. K-weight - filter the signal to hear the way a human ear hears.
2. Square - turn the waveform into energy (power).
3. Gate - drop blocks below -70 LUFS, then below -10 LU of the average.
4. Integrate - average what survives = the integrated loudness (LUFS).

Separate branch: oversample x4 to find the true peak, reported in dBTP.

The three documents (2026)

ATTRIBUTE	BS.1770-5	EBU R128	ATSC A/85
Role	measures	EU target	US target
Target	none	-23 LUFS	-24 LKFS
Unit	LKFS/LUFS	LUFS	LKFS
Dialogue	gating only	whole prog.	Anchor (dialog)
True peak	defines dBTP	-1 dBTP	-2 dBTP rec.
Legal force	none	convention	law (CALM Act)

Get the order right

- Normalize integrated loudness to the target FIRST (one gain move on the whole programme).
- THEN check the true peak; apply a true-peak limiter only if it exceeds the ceiling.
- Re-measure loudness after heavy limiting - it can nudge the integrated value.
- LUFS = an average; dBTP = a maximum. They are different tests - satisfy both.
- 23 LUFS is the broadcast target, not a universal one - streaming runs louder (~-14).

Worked example (EBU R128 spec)

Meter reads -20.4 LUFS, -0.3 dBTP. Target -23 LUFS: gain = -23 - (-20.4) = -2.6 dB.

New true peak = -0.3 + (-2.6) = -2.9 dBTP -> below -1 dBTP. Pass: -23 LUFS, -2.9 dBTP.