

PRACTICAL LIGHTING KNOWLEDGE

Flicker & Stroboscopic

P_{st}^{LM} , SVM, and why a cheap driver can make moving machinery look frozen.

Why does the drill look stopped?

Because the light is pulsing in step with the rotation. You can't always see flicker directly, but it shows up on anything that moves.

DEFINITION · 1 OF 2

P_{st} LM

Visible flicker, **fixed gaze.**



The flicker you perceive directly. **Target ≤ 1.0** — at 1.0 it is just noticeable.

DEFINITION · 2 OF 2

SVM

Stroboscopic effect, **moving objects**.



Stroboscopic Visibility Measure. **SVM = 1** is just visible to a standard observer.

PERCENT FLICKER

$$\% \text{Flicker} = \frac{(\text{max} - \text{min})}{(\text{max} + \text{min})} \times 100$$

The depth of modulation in the light output. Lower percent flicker and higher frequency both reduce visible and stroboscopic effects.

One driver. Two risks.

Two independent metrics — keep both low.

FLICKER

P_{st}^{LM}

≤ 1.0

STROBOSCOPIC

SVM

≤ 1.0

DEPTH

% flicker

low

Flicker limits **to know.**

Common targets for good light quality (illustrative, per IEEE 1789 / EU).

P_{st}^{LM}

≤ 1.0

SVM (offices/industry)

≤ 1.0

SVM (sensitive tasks)

≤ 0.4

Modulation @ 100 Hz

low risk

Frequency

> 3 kHz



Judging flicker by eye.

If you can see it, it is already bad — but **invisible flicker still causes headaches** and the stroboscopic effect on machinery. Specify the metrics; don't rely on the eye.

NEXT TIME YOU SPEC A DRIVER

Ask for **flicker metrics.**

A good driver publishes P_{st}^{LM} and SVM. If the datasheet is silent, assume the worst.

- ✓ $P_{st}^{LM} \leq 1.0$
- ✓ $SVM \leq 1.0$ (≤ 0.4 sensitive)
- ✓ High-frequency, low-modulation driver

PRACTICAL LIGHTING KNOWLEDGE

Save this. Send it to a colleague.



NEXT EPISODE

Dimmer Compatibility

→ nlc.com.sa/academy