

Precision scales complement optical reflective read head encoder modules. Fine [nanometer] feature mask photolithography creates accurate and repeatable patterns for high resolution and accurate applications required in 3D-Metrology, calibration standards, and applications in laser, medical, and robotics.

The majority of linear scale applications work well with soda-lime glass with reflective chrome metal pattern on top and anti-reflective (AR) chrome backside. Common pitches range from 100µm to 20µm or as required for specific industry encoders. Process is capable producing 1µm track pattern (2µm period).

We have multiple coating options to optimize performance for the LED light source. For example, for red LED, our AR coating has typical reflectivity < 2% @630nm wavelength. Coatings for Blue, near-InfraRed, and InfraRed are available.

For applications requiring high accuracies over long lineal lengths or over wide temperature range, glass compositions with very low CTE are used.

Linear glass scale dimensions and tolerances

Glass Scale	Standard	Extended Length
Base Material	Soda-Lime Glass	
Length	Up to 160mm	>160 to 700mm
Length Tolerances	±0.1mm	±0.2mm
Width	As specified (3mm or 6mm are often used)	As Specified
Width Tolerances	±0.05mm	±0.1mm
Thickness Range	0.3 to 1.1	1.0 to 6.0mm
Thickness Tolerances	±0.05mm	±0.05mm
Pitch (total tolerance)	± 2.0µm	
Pitch (local tolerance)	±1.0 µm	

Chrome pattern specifications

Parameter	Reference	Minimum	Typical	Maximum	Unit
Pitch/ Period Accuracy	Local			±1	µm
	Total			±2	µm
Chrome reflective layer	Standard	50	54	60	%
	Augmented	60	65	70	%
	Enhanced (620-650 nm)	88	93	98	%
Chrome anti-reflective layer @ 620-650nm	AR		<2	5	%