

### Depth Gage Performance Evaluation Method

JIS B 7518 was revised and officially announced in 2018 as the Japanese Industrial Standard for the depth gage, and "Instrumental error" indicating the indication error of the depth gage has been changed to "Maximum Permissible Error (MPE) of indication".

The "Instrumental error" of the conventional JIS adopts acceptance criteria that the specification range (precision specification) equals acceptance range, and the OK/NG judgment does not include measurement uncertainty (Fig. 1). The "Maximum permissible error (MPE) of indication" of the new JIS employs the basic concept of the OK/NG judgment taking into account the uncertainty adopted in the ISO standard (ISO 14253-1).

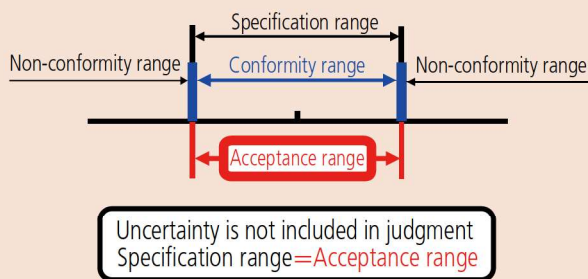
The verification of conformity and nonconformity to the specifications is clearly stipulated to use the internationally recognized acceptance criteria (simple acceptance) when the specification range equals the acceptance range, and it is accepted that the specification range equals the acceptance range if a given condition considering uncertainty is met.

The above said internationally recognized acceptance criterion is ISO/TR 14253-6: 2012 (Fig. 2).

The following describes the standard inspection method including the revised content of JIS 2018.

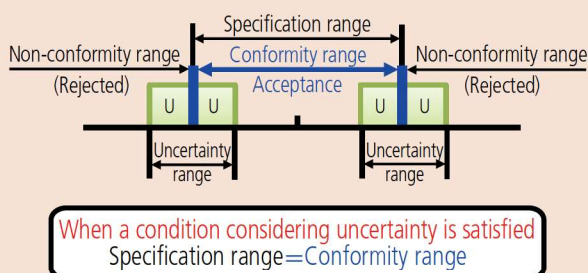
**Fig. 1 Conventional JIS** Instrumental error

JIS B 7518-1993



**Fig. 2 New JIS** Maximum permissible error (MPE)

JIS B 7518: 2018 (ISO/TR 14253-6: 2012)



### Maximum permissible error of partial measuring face contact $EM_{PE}$ [JIS B 7518: 2018]

The Maximum permissible error  $EM_{PE}$  of a depth gage is an indication error applied to depth measurement.

**Table 1** shows the Maximum permissible error  $EM_{PE}$  of the partial measuring face contact error.

$EM_{PE}$  for any desired height is obtained by measuring the height of two equal length gauge blocks, or equivalent, with a height gage on a precision surface plate (Fig. 3) and then subtracting the gauge block size from the measured size.

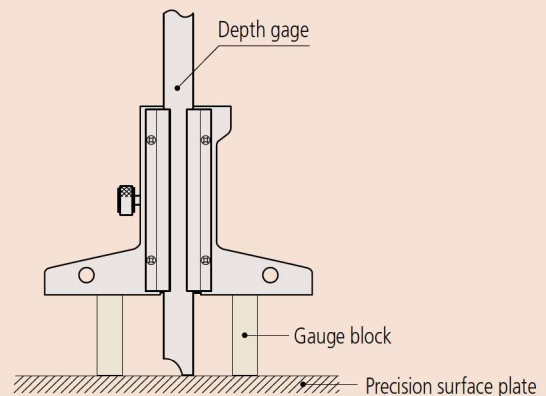
**Table 1: Maximum permissible error  $EM_{PE}$  of partial measuring face contact of a conventional depth gage**

Unit: mm

Measurement depth	Scale interval, graduation or resolution	
	0.05	0.02 or 0.01
50 or less	$\pm 0.05$	$\pm 0.02$
Over 50, 100 or less	$\pm 0.06$	$\pm 0.03$
Over 100, 200 or less	$\pm 0.07$	
Over 200, 300 or less	$\pm 0.08$	$\pm 0.04$
Over 300, 400 or less	$\pm 0.09$	
Over 400, 500 or less	$\pm 0.10$	$\pm 0.05$
Over 500, 600 or less	$\pm 0.11$	

Note:  $EM_{PE}$  includes the measurement error arising from straightness, flatness of the measuring surface and parallelism with the reference surface.

**Fig. 3: Determination of partial measuring face contact error**



The "Instrumental error" indicating the indication error of JIS has been changed to "Maximum permissible error (MPE) of indication" for the following models:

- **SERIES 571 ABSOLUTE Digimatic Depth Gage** described on page 06-6 to 06-7 (All models)
- **SERIES 527 Vernier Depth Gage** described on page 06-8 (All models)
- **SERIES 527, 571 Hook-end Type, Pin-end Type** described on page 06-9 to 06-11 (All models)
- **SERIES 571 Mini Depth Gage** described on page 06-12 (All models)