DSR HARDWARE | ISO 22081:2021 - GENERAL TOLERANCE REFERENCE CHART

GPS quick reference for engineering drawings and CNC manufacturing

KEY POINT ISO 22081 has no predefined H/K/L classes and no universal numeric tolerance table.

1 STATUS & SCOPE

CURRENT | REPLACES ISO 2768-2

ISO 22081:2021 replaced ISO 2768-2:1989. It did not replace ISO 2768-1.

It covers general geometrical specifications and general linear/angular size specifications for integral features, including features of size.

Outside scope: derived features, integral lines, and dimensions other than linear/angular sizes.

2 ALLOWED SPECIFICATION FORMS

Category	Permitted form	What to remember
General geometry	Surface profile: tG | datum system	Surface profile is the geometrical characteristic; a datum system is required.
Linear size	+t1/-t2, +/-t, or ISO 286 designation	ISO 286 forms may be used (e.g. JS13/js13); other fundamental deviations are possible.
Angular size	+t1 deg/-t2 deg or +/-t deg	Used for angular sizes without an individual tolerance.
Tolerance value	Single or variable	Variable values may depend on feature dimensions and/or distance to the datum system (TEDs).

3 HOW IT APPEARS IN OR NEAR THE TITLE BLOCK

General tolerances ISO 22081

Linear sizes: +/- tL

Angular sizes: +/- tA deg

Place the general-tolerance declaration in or near the title block, or in the product-definition data set.

The selected values can be fixed values or variable values referenced through an unambiguous table or external document.

4 DATUM & VALUE RULES

DATUM SYSTEM

Required for the general geometrical specification. It must constrain the degrees of freedom needed to locate the profile tolerance zones.

NOT ALWAYS A-B-C

The datum system does not have to contain three datums and does not have to constrain all six degrees of freedom.

DATUM FEATURES

Datum features used in the general datum system are not controlled by the general geometrical specification; specify them individually as needed.

ISO 22081:2021 - APPLICABILITY RULES

What the general specifications apply to - and what they do not

5 GENERAL GEOMETRICAL SPECIFICATION - APPLICABILITY

The general surface-profile specification applies independently to each integral feature, EXCEPT:	Practical meaning
Feature has an individual or general size specification.	A feature of size controlled by a size specification is not also controlled by the general geometrical profile rule.
Feature (or its derived feature) has an individual geometrical specification.	The individual geometrical control is used for that feature instead of the general profile rule.
Feature is a datum feature used in the datum system of the general geometrical specification.	That datum feature is excluded from the general profile rule and should be individually specified as needed.
Feature is simplified and not represented in the CAD model (e.g. certain edges, fillets or screw threads).	The general geometrical specification does not automatically control these simplified/non-modelled features.

6 GENERAL SIZE SPECIFICATION - APPLICABILITY

1. A nominal linear or angular size is shown with no individual tolerance.
2. The nominal size is not a TED (theoretically exact dimension).
3. The nominal size is not an auxiliary dimension.
4. Alternatively, the feature of size is identified by a CAD attribute.

7 SCOPE REMINDERS FOR ENGINEERING DRAWINGS

INTEGRAL FEATURES

General specifications in ISO 22081 apply to integral features, including features of size.

SIZE TYPES

General size specifications cover linear sizes and angular sizes; other dimension types are outside this standard.

DO NOT OVER-GENERALIZE

Critical functional requirements still need explicit individual specifications when a general rule is insufficient.

ISO 22081:2021 - DRAWING TEMPLATES & VARIABLE VALUES

Practical title-block patterns without inventing default tolerance classes

8 TITLE-BLOCK TEMPLATES

A. FIXED VALUES

General tolerances ISO 22081

	tG	A	B	C

Linear sizes: +/- tL

Angular sizes: +/- tA deg

B. ISO 286 SIZE OPTION

General tolerances ISO 22081

	tG	A	B	C

Linear sizes: JS13/js13

Angular sizes: +/- tA deg

C. VARIABLE VALUES

General tolerances ISO 22081

	tG	A	B	C

Profile / linear / angular values:

See referenced tables or document

9 DESIGNER-DEFINED VARIABLE TOLERANCE TABLE TEMPLATE

ISO 22081 permits variable values, but the standard does not supply default numeric values. Define any variable scheme unambiguously.

Feature / condition	Range or rule	General profile tG	Linear size tL	Angular size tA	Reference / note
_____	_____	_____ mm	_____ mm	_____ deg	_____
_____	_____	_____ mm	_____ mm	_____ deg	_____
_____	_____	_____ mm	_____ mm	_____ deg	_____

10 WORKED CNC DRAWING EXAMPLE - ILLUSTRATIVE ONLY

General tolerances ISO 22081

	0.20	A	B	C

Linear: +/-0.10 mm

Angular: +/-0.5 deg

Critical fits, datum features and functional GD&T: individually specified as required.

EXAMPLE VALUES - NOT ISO DEFAULTS

0.20 mm, +/-0.10 mm and +/-0.5 deg are illustrative engineering choices only. ISO 22081 does not prescribe these values. Select actual tolerances from function, manufacturing capability, assembly and inspection needs.

11 ISO 2768-2:1989 VS. ISO 22081:2021

Topic	ISO 2768-2:1989	ISO 22081:2021
Status	Withdrawn	Current; confirmed by ISO in 2026
General geometrical classes	H / K / L	No predefined H/K/L classes
General geometrical control	Legacy table-based general geometrical tolerances	General geometrical specification uses surface profile with a datum system
Tolerance values	Taken from the legacy standard tables	Chosen by the designer; may be fixed or variable
Direct conversion	N/A	There is no universal K -> profile-value conversion

12 FINAL RELEASE CHECK

DO	State "General tolerances ISO 22081" in or near the title block.	DO NOT	Invent an "ISO 22081 H/K/L" tolerance class.
DO	Define a datum system when using a general geometrical specification.	DO NOT	Assume ISO 2768-K converts to one fixed surface-profile value.
DO	Individually tolerance critical fits, functional geometry and datum features as required.	DO NOT	Apply general size tolerance to TEDs or auxiliary dimensions.
DO	Make every referenced variable-value table or document unambiguous.	DO NOT	Use a general tolerance to hide an undefined functional requirement.

PRIMARY BASIS / SOURCES

ISO 22081:2021, Geometrical product specifications (GPS) - Geometrical tolerancing - General geometrical specifications and general size specifications, Edition 1 (2021-02). ISO confirms this edition remains current after its 2026 review.

Official ISO status page: https://www.iso.org/standard/72514.html

Related: ISO 8015, ISO 1101, ISO 5459, ISO 14405-1/-3, ISO 286-1/-2

Original engineering summary only; use the official ISO standard for contractual/compliance work.