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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

DRAFT

CALENDULA *

UPOV Code(s):

CALEN

Calendula L.

GUIDELINES

FOR THE CONDUCT OF TESTS

FOR DISTINCTNESS, UNIFORMITY AND STABILITY

prepared by experts from Japan
to be considered by the
Technical Committee
at its fifty-fifth session, to be held in Geneva,
from 2019-10-28 to 2019-10-29

Disclaimer: this document does not represent UPOV policies or guidance

Alternative names:*

Botanical name	*English*	*French*	*German*	*Spanish*
Calendula L.	Calendula	Calendula	Ringelblume	Caléndula, Mercadela

The purpose of these guidelines ("Test Guidelines") is to elaborate the principles contained in the General Introduction (document TG/1/3), and its associated TGP documents, into detailed practical guidance for the harmonized examination of distinctness, uniformity and stability (DUS) and, in particular, to identify appropriate characteristics for the examination of DUS and production of harmonized variety descriptions.

ASSOCIATED DOCUMENTS

These Test Guidelines should be read in conjunction with the General Introduction and its associated TGP documents.

* These names were correct at the time of the introduction of these Test Guidelines but may be revised or updated. [Readers are advised to consult the UPOV Code, which can be found on the UPOV Website (www.upov.int), for the latest information.]

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1. Subject of these Test Guidelines

These Test Guidelines apply to all varieties of *Calendula* L..

2. Material Required

2.1 The competent authorities decide on the quantity and quality of the plant material required for testing the variety and when and where it is to be delivered. Applicants submitting material from a State other than that in which the testing takes place must ensure that all customs formalities and phytosanitary requirements are complied with.

2.2 The material is to be supplied in the form of seeds or rooted cuttings.

2.3 The minimum quantity of plant material, to be supplied by the applicant, should be:

seed-propagated varieties: sufficient seeds to produce 30 plants
vegetatively propagated varieties: 15 rooted cuttings

In the case of seed, the seed should meet the minimum requirements for germination, species and analytical purity, health and moisture content, specified by the competent authority. In cases where the seed is to be stored, the germination capacity should be as high as possible and should, be stated by the applicant.

2.4 The plant material supplied should be visibly healthy, not lacking in vigor, nor affected by any important pest or disease.

2.5 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If it has been treated, full details of the treatment must be given.

3. Method of Examination

3.1 Number of Growing Cycles

The minimum duration of tests should normally be a single growing cycle.

3.2 Testing Place

Tests are normally conducted at one place. In the case of tests conducted at more than one place, guidance is provided in TGP/9 “Examining Distinctness”.

3.3 Conditions for Conducting the Examination

3.3.1 The tests should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics of the variety and for the conduct of the examination.

3.3.2 Because daylight varies, color determinations made against a color chart should be made either in a suitable cabinet providing artificial daylight or in the middle of the day in a room without direct sunlight. The spectral distribution of the illuminant for artificial daylight should conform with the CIE Standard of Preferred Daylight D 6500 and should fall within the tolerances set out in the British Standard 950, Part I. These determinations should be made with the plant part placed against a white background. The color chart and version used should be specified in the variety description.

3.4 Test Design

3.4.1 In the case of seed-propagated varieties, each test should be designed to result in a total of at least 30 plants.

3.4.2 In the case of vegetatively propagated varieties, each test should be designed to result in a total of at least 15 plants.

3.5 Additional Tests

Additional tests, for examining relevant characteristics, may be established.

4. Assessment of Distinctness, Uniformity and Stability

4.1 Distinctness

4.1.1 General Recommendations

It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding distinctness. However, the following points are provided for elaboration or emphasis in these Test Guidelines.

4.1.2 Consistent Differences

The differences observed between varieties may be so clear that more than one growing cycle is not necessary. In addition, in some circumstances, the influence of the environment is not such that more than a single growing cycle is required to provide assurance that the differences observed between varieties are sufficiently consistent. One means of ensuring that a difference in a characteristic, observed in a growing trial, is sufficiently consistent is to examine the characteristic in at least two independent growing cycles.

4.1.3 Clear Differences

Determining whether a difference between two varieties is clear depends on many factors, and should consider, in particular, the type of expression of the characteristic being examined, i.e. whether it is expressed in a qualitative, quantitative, or pseudo-qualitative manner. Therefore, it is important that users of these Test Guidelines are familiar with the recommendations contained in the General Introduction prior to making decisions regarding distinctness.

4.1.4 Number of Plants or Parts of Plants to be Examined

In the case of seed-propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 20 plants or parts taken from each of 20 plants and any other observation made on all plants in the test, disregarding any off-type plants.

In the case of vegetatively propagated varieties, unless otherwise indicated, for the purposes of distinctness, all observations on single plants should be made on 10 plants or parts taken from each of 10 plants and any other observation made on all plants in the test, disregarding any off-type plants.

4.1.5 Method of Observation

The recommended method of observing the characteristic for the purposes of distinctness is indicated by the following key in the Table of Characteristics (see document TGP/9 “Examining Distinctness”, Section 4 “Observation of characteristics”):

MG: single measurement of a group of plants or parts of plants
MS: measurement of a number of individual plants or parts of plants
VG: visual assessment by a single observation of a group of plants or parts of plants
VS: visual assessment by observation of individual plants or parts of plants

Type of observation: visual (V) or measurement (M)

“Visual” observation (V) is an observation made on the basis of the expert’s judgment. For the purposes of this document, “visual” observation refers to the sensory observations of the experts and, therefore, also includes smell, taste and touch. Visual observation includes observations where the expert uses reference points (e.g. diagrams, example varieties, side-by-side comparison) or non-linear charts (e.g. color charts). Measurement (M) is an objective observation against a calibrated, linear scale e.g. using a ruler, weighing scales, colorimeter, dates, counts, etc.

Type of record: for a group of plants (G) or for single, individual plants (S)

For the purposes of distinctness, observations may be recorded as a single record for a group of plants or parts of plants (G), or may be recorded as records for a number of single, individual plants or parts of plants (S). In most cases, “G” provides a single record per variety and it is not possible or necessary to apply statistical methods in a plant-by-plant analysis for the assessment of distinctness.

In cases where more than one method of observing the characteristic is indicated in the Table of Characteristics (e.g. VG/MG), guidance on selecting an appropriate method is provided in document TGP/9, Section 4.2.

4.2 Uniformity

4.2.1 It is of particular importance for users of these Test Guidelines to consult the General Introduction prior to making decisions regarding uniformity. However, the following points are provided for elaboration or emphasis in these Test Guidelines:

4.2.2 These Test Guidelines have been developed for the examination of cross-pollinated seed-propagated and vegetatively propagated varieties. For varieties with other types of propagation the recommandation in the General Introduction and document TGP/13 "Guidance for new types and species". Section 4.5 Testing Uniformity should be followed.

4.2.3 The assessment of uniformity for cross-pollinated should be according to the recommendations for cross-pollinated varieties in the General Introduction.

4.2.4 For the assessment of uniformity of vegetatively propagated varieties, a population standard of 1% and an acceptance probability of at least 95% should be applied. In the case of a sample size of 15 plants, 1 off-type is allowed.

4.3 Stability

4.3.1 In practice, it is not usual to perform tests of stability that produce results as certain as those of the testing of distinctness and uniformity. However, experience has demonstrated that, for many types of variety, when a variety has been shown to be uniform, it can also be considered to be stable.

4.3.2 Where appropriate, or in cases of doubt, stability may be further examined by testing a new seed or plant stock to ensure that it exhibits the same characteristics as those shown by the initial material supplied.

5. Grouping of Varieties and Organization of the Growing Trial

5.1 The selection of varieties of common knowledge to be grown in the trial with the candidate varieties and the way in which these varieties are divided into groups to facilitate the assessment of distinctness are aided by the use of grouping characteristics.

5.2 Grouping characteristics are those in which the documented states of expression, even where produced at different locations, can be used, either individually or in combination with other such characteristics: (a) to select varieties of common knowledge that can be excluded from the growing trial used for examination of distinctness; and (b) to organize the growing trial so that similar varieties are grouped together.

5.3 The following have been agreed as useful grouping characteristics:

(a) Plant: growth habit (characteristic 1)
(b) Flower head: type (characteristic 14)
(c) Ray floret: main color of upper side (characteristic 23) with the following groups:
Gr. 1: white
Gr. 2: light yellow
Gr. 3: medium and dark yellow
Gr. 4: yellow orange
Gr. 5: orange
Gr. 6: orange red
(d) Disc: type (characteristic 33)
(e) Disc: main color (characteristic 35)

5.4 Guidance for the use of grouping characteristics, in the process of examining distinctness, is provided through the General Introduction and document TGP/9 “Examining Distinctness”.

6. Introduction to the Table of Characteristics

6.1 Categories of Characteristics

6.1.1 Standard Test Guidelines Characteristics

Standard Test Guidelines characteristics are those which are approved by UPOV for examination of DUS and from which members of the Union can select those suitable for their particular circumstances.

6.1.2 Asterisked Characteristics

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

6.2 States of Expression and Corresponding Notes

6.2.1 States of expression are given for each characteristic to define the characteristic and to harmonize descriptions. Each state of expression is allocated a corresponding numerical note for ease of recording of data and for the production and exchange of the description.

6.2.2 In the case of qualitative and pseudo-qualitative characteristics (see Chapter 6.3), all relevant states of expression are presented in the characteristic. However, in the case of quantitative characteristics with 5 or more states, an abbreviated scale may be used to minimize the size of the Table of Characteristics. For example, in the case of a quantitative characteristic with 9 states, the presentation of states of expression in the Test Guidelines may be abbreviated as follows:

State	*Note*
small	3
medium	5
large	7

However, it should be noted that all of the following 9 states of expression exist to describe varieties and should be used as appropriate:

State	*Note*
very small	1
very small to small	2
small	3
small to medium	4
medium	5
medium to large	6
large	7
large to very large	8
very large	9

6.2.3 Further explanation of the presentation of states of expression and notes is provided in document TGP/7 “Development of Test Guidelines”.

6.3 Types of Expression

An explanation of the types of expression of characteristics (qualitative, quantitative and pseudo-qualitative) is provided in the General Introduction.

6.4 Example Varieties

Where appropriate, example varieties are provided to clarify the states of expression of each characteristic.

6.5 Legend

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1 2	**3 4**	**5 6**	**7**			
	Name of characteristics in English	**Nom du caractère en français**	**Name des Merkmals auf Deutsch**	**Nombre del carácter en español**		
	states of expression	types d'expression	Ausprägungsstufen	tipos de expresión		

1 Characteristic number

2 (*) Asterisked characteristic – see Chapter 6.1.2

3 Type of expression
QL Qualitative characteristic – see Chapter 6.3
QN Quantitative characteristic – see Chapter 6.3
PQ Pseudo-qualitative characteristic – see Chapter 6.3

4 Method of observation (and type of plot, if applicable)
MG, MS, VG, VS – see Chapter 4.1.5

5 (+) See Explanations on the Table of Characteristics in Chapter 8.2

6 (a)-(e) See Explanations on the Table of Characteristics in Chapter 8.1

7 Not applicable

7. Table of Characteristics/Tableau des caractères/Merkmalstabelle/Tabla de caracteres

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
1.	**(*)**	**QN VG**	**(+)**				
		Plant: growth habit	**Plante : port**	**Pflanze: Wuchsform**	**Planta: hábito de crecimiento**		
		upright	dressé	aufrecht	erguido	Princess Golden	1
		semi-upright	demi-dressé	halbaufrecht	semierguido	Orange Gem	2
		horizontal	horizontal	waagerecht	horizontal	Winter Sun	3
2.	**(*)**	**QN MS/VG**	**(+)**				
		Plant: height	**Plante : hauteur**	**Pflanze: Höhe**	**Planta: altura**		
		short	courte	niedrig	baja	Orange Gem	3
		medium	moyenne	mittel	media	Sunset Buff	5
		tall	haute	hoch	alta	Princess Golden	7
3.	**(*)**	**QN MG/MS/VG**	**(+)**				
		Plant: width	**Plante : largeur**	**Pflanze: Breite**	**Planta: anchura**		
		narrow	étroite	schmal	estrecha	Alice Orange	3
		medium	moyenne	mittel	media	Orange Gem	5
		broad	large	breit	ancha	Princess Golden	7
4.		**QN MG/MS/VG**	**(+)**				
		Primary lateral shoot: length	**Pousse latérale primaire : longueur**	**Stengel: Internodienlänge**	**Tallo lateral primario: longitud**		
		short	courte	kurz	corto	Orange Gem	3
		medium	moyenne	mittel	medio	Sunset Buff	5
		long	longue	lang	largo	Princess Golden	7
5.		**QN MS/VG**	**(+)**				
		Primary lateral shoot: length of internode	**Pousse latérale primaire : longueur de l'entrenœud**	**Primärer Seitentrieb: Länge der Internodie**	**Tallo lateral primario: longitud del entrenudo**		
		very short	très court	sehr kurz	muy corto	Alice Orange	1
		short	court	kurz	corto	Orange Gem	2
		medium	moyenne	mittel	medio		3
		long	long	lang	largo	Princess Golden	4
		very long	très long	sehr lang	muy largo		5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
6.	**(*)**	**QN MG/MS/VG**	**(+) (a)**				
		Leaf: length	**Feuille : longueur**	**Blatt: Länge**	**Hoja: longitud**		
		short	courte	kurz	corta	Fuyushirazu	3
		medium	moyenne	mittel	media	Alice Orange	5
		long	longue	lang	larga	Orange Gem	7
7.	**(*)**	**QN MG/MS/VG**	**(+) (a)**				
		Leaf: width	**Feuille : largeur**	**Blatt: Breite**	**Hoja: anchura**		
		narrow	étroite	schmal	estrecha	Fuyushirazu	3
		medium	moyenne	mittel	media	Alice Orange	5
		broad	large	breit	ancha	Orange Gem	7
8.	**(*)**	**PQ VG**	**(+) (a)**				
		Leaf: shape	**Feuille : forme**	**Blatt: Form**	**Hoja: forma**		
		oblong	oblongue	rechteckig	oblonga	Alice Orange	1
		oblanceolate	oblancéolée	verkehrt lanzettlich	oblanceolada	Sunset Buff	2
		spatulate	spatulée	spatelförmig	espatulada	Princess Golden	3
9.		**PQ VG**	**(+) (a)**				
		Leaf: shape of apex	**Feuille : forme de l'extrémité**	**Blatt: Form der Spitze**	**Hoja: forma del ápice**		
		acute	aigue	spitz	aguda	Gladden Orange Eye	1
		obtuse	obtuse	stumpf	obtusa		2
		rounded	arrondie	abgerundet	redondeada	Orange Gem	3
10.		**QN VG**	**(a)**				
		Leaf: intensity of green color of upper side	**Feuille : intensité de la couleur verte de la face supérieure**	**Blatt: Intensität der Grünfärbung der Oberseite**	**Hoja: intensidad del color verde del haz**		
		light	claire	hell	claro	Lemon Daisy	1
		medium	moyenne	mittel	medio	Orange Gem	2
		dark	foncée	dunkel	oscuro	Orea Neo	3
11.		**QN MS/VG**	**(+)**				
		Primary lateral shoot: number of flower heads	**Pousse latérale primaire : nombre d'inflorescences**	**Primärer Seitentrieb: Anzahl Blütenköpfe**	**Tallo lateral primario: número de capítulos**		
		very few	très petit	sehr wenige	muy bajo		1
		few	petit	wenige	bajo	Princess Golden	2
		medium	moyen	mittel	medio	Orange Gem	3
		many	grand	viele	alto		4
		very many	très grand	sehr viele	muy alto	Orea Neo	5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
11.		**QN MS/VG**	**(+)**				
		Primary lateral shoot: number of flower heads	**Pousse latérale primaire : nombre d'inflorescences**	**Primärer Seitentrieb: Anzahl Blütenköpfe**	**Tallo lateral primario: número de capítulos**		
		very few	très petit	sehr wenige	muy bajo		1
		few	petit	wenige	bajo	Princess Golden	2
		medium	moyen	mittel	medio	Orange Gem	3
		many	grand	viele	alto		4
		very many	très grand	sehr viele	muy alto	Orea Neo	5
12.		**QN MS/VG**	**(+)**				
		Peduncle: length	**Pédoncule : longueur**	**Blütenstandstiel: Länge**	**Pedúnculo: longitud**		
		short	court	kurz	corto	Orange Gem	3
		medium	moyen	mittel	medio	Oren	5
		long	long	lang	largo	Princess Golden	7
13.		**QN MS/VG**	**(+)**	**(b)**			
		Involucre: diameter	**Involucre : diamètre**	**Hülle: Durchmesser**	**Involucro: diámetro**		
		very small	très petit	sehr klein	muy pequeño	Fuyushirazu	1
		small	petit	klein	pequeño		2
		medium	moyen	mittel	medio	Orange Gem	3
		large	grand	groß	grande	Princess Golden	4
		very large	très grand	sehr groß	muy grande		5
14.	**(*)**	**PQ VG**	**(+)**	**(b)**			
		Flower head: type	**Inflorescence : type**	**Blütenkopf: Typ**	**Capítulo: tipo**		
		single	simple	einfach	simple	Fuyushirazu	1
		semi-double	semi-double	halbgefüllt	semidoble	Sunset Buff	2
		double	double	gefüllt	doble	Orange Gem	3
15.	**(*)**	**QN MG/MS/VG**		**(b)**			
		Flower head: diameter	**Inflorescence : diamètre**	**Blütenkopf: Durchmesser**	**Capítulo: diámetro**		
		small	petit	klein	pequeño	Madoka Almond Milk	3
		medium	moyen	mittel	medio	Lemon Daisy	5
		large	grand	groß	grande	Princess Golden	7

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
16. (*)	**QN MG/MS/VG**	**(b)**				
	Only varieties with Flower head: type: semi-double and double: Flower head: number of ray florets	**Seulement les variétés avec Inflorescence : type : semi-double et double: Inflorescence : nombre de pétales**	**Nur Sorten mit Blütenkopf: Typ: halbgefüllt und gefüllt: Blütenkopf: Anzahl der Zungenblüten**	**Solo variedades con capítulo: tipo: semidoble y doble: Capítulo: número de flores liguladas**		
	few	petit	wenige	bajo	Lemon Daisy	3
	medium	moyen	mittel	medio	Orange Gem	5
	many	grand	viele	alto	Alice Orange	7
17.	**QN VG**	**(+)** **(b), (c)**				
	Ray floret: attitude of basal part	**Pétale : port de la partie basale**	**Zungenblüte: Haltung des basalen Teils**	**Flor ligulada: porte de la parte basal**		
	upward	dressé	aufwärts gerichtet	ascendente	Orea Neo	1
	horizontal	horizontal	waagerecht	horizontal	Orange Gem	2
	downward	retombant	abwärts gerichtet	descendente		3
18. (*)	**QN MG/MS/VG**	**(b), (c)**				
	Ray floret: length	**Pétale : longueur**	**Zungenblüte: Länge**	**Flor ligulada: longitud**		
	short	court	kurz	corta	Madoka Orange Baukuchen	3
	medium	moyen	mittel	media	Sunset Buff	5
	long	long	lang	larga	Princess Golden	7
19. (*)	**QN MG/MS/VG**	**(b), (c)**				
	Ray floret: width	**Pétale : largeur**	**Zungenblüte: Breite**	**Flor ligulada: anchura**		
	very narrow	très étroit	sehr schmal	muy estrecha	Madoka Orange Baukuchen	1
	narrow	étroit	schmal	estrecha		2
	medium	moyen	mittel	media	Alice Orange	3
	broad	large	breit	ancha	Princess Golden	4
	very broad	très large	sehr breit	muy ancha		5
20.	**QN MS/VG**	**(+)** **(b), (c)**				
	Ray floret: ratio length/width	**Pétale : rapport longueur/largeur**	**Zungenblüte: Verhältnis Länge/Breite**	**Flor ligulada: relación longitud/anchura**		
	very low	très bas	sehr klein	muy baja	Gladden Orange Eye	1
	low	bas	klein	baja	Orange Gem	2
	medium	moyen	mittel	media		3
	high	élevé	groß	alta	Madoka Almond Milk	4
	very high	très élevé	sehr groß	muy alta		5

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
21.		**QN VG**	**(+) (b), (c)**				
		Ray floret: longitudinal axis	**Pétale : axe longitudinal**	**Zungenblüte: Längsachse**	**Flor ligulada: eje longitudinal**		
		moderately incurved	modérément incurvé	mäßig aufgebogen	moderadamente incurvado	Sunset Buff	1
		weakly incurved	faiblement incurvé	schwach aufgebogen	débilmente incurvado		2
		straight	droit	gerade	recto	Orea Neo	3
		weakly reflexed	faiblement récurvé	schwach zurückgebogen	levemente reflexo		4
		moderately reflexed	modérément récurvé	mäßig zurückgebogen	moderadamente reflexo		5
22.		**QN VG**	**(+) (b), (c)**				
		Ray floret: profile in cross section	**Pétale : profil en section transversale**	**Zungenblüte: Profil im Querschnitt**	**Flor ligulada: perfil de la sección transversal**		
		moderately concave	modérément concave	mäßig konkav	moderadamente cóncavo		1
		weakly concave	faiblement concave	schwach konkav	débilmente cóncavo	Neon	2
		flat	plat	flach	plano		3
		weakly convex	faiblement convexe	schwach konvex	débilmente convexo		4
		moderately convex	modérément convexe	mäßig konvex	moderadamente convexo	Orange Porcupine	5
23.	**(*)**	**PQ VG**	**(b), (c), (d)**				
		Ray floret: main color of upper side	**Pétale : couleur principale de la face supérieure**	**Zungenblüte: Hauptfarbe der Oberseite**	**Flor ligulada: color principal de la cara superior**		
		RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		
24.	**(*)**	**PQ VG**	**(b), (c), (d)**				
		Ray floret: secondary color of upper side	**Pétale : couleur secondaire de la face supérieure**	**Zungenblüte: Sekundärfarbe der Oberseite**	**Flor ligulada: color secundario de la cara superior**		
		RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		

	English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
25.	**(*) PQ VG**	**(+) (b), (c), (d)**				
	Ray floret: distribution of secondary color of upper side	**Pétale : répartition de la couleur secondaire de la face supérieure**	**Zungenblüte: Verteilung der Sekundärfarbe der Oberseite**	**Flor ligulada: distribución del color secundario de la cara superior**		
	none	aucune	keine	ausente		1
	basal quarter	quart basal	basales Viertel	en el cuarto basal		2
	basal half	moitié basale	basale Hälfte	en la mitad basal		3
	distal half	moitié distale	distale Hälfte	en la mitad distal		4
	distal quarter	quart distal	distales Viertel	en el cuarto distal		5
	tip	extrémité	Spitze	en la punta		6
	band	bande	Band	en una banda		7
26.	**(*) PQ VG**	**(b), (c), (d)**				
	Ray floret: tertiary color of upper side	**Pétale : couleur tertiaire de la face supérieure**	**Zungenblüte: Tertiärfarbe der Oberseite**	**Flor ligulada: color terciario de la cara superior**		
	RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		
27.	**(*) PQ VG**	**(+) (b), (c), (d)**				
	Ray floret: distribution of tertiary color of upper side	**Pétale : répartition de la couleur tertiaire de la face supérieure**	**Zungenblüte: Verteilung der Tertiärfarbe der Oberseite**	**Flor ligulada: distribución del color terciario de la cara superior**		
	none	aucune	keine	ausente		1
	basal quarter	quart basal	basales Viertel	en el cuarto basal		2
	distal quarter	quart distal	distales Viertel	en el cuarto distal		3
	tip	extrémité	Spitze	en la punta		4
	band	bande	Band	en una banda		5
28.	**(*) PQ VG**	**(b), (c), (d)**				
	Ray floret: main color of lower side	**Pétale : couleur principale de la face inférieure**	**Zungenblüte: Hauptfarbe der Unterseite**	**Flor ligulada: color principal de la cara inferior**		
	RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		
29.	**(*) PQ VG**	**(b), (c), (d)**				
	Ray floret: secondary color of lower side	**Pétale : couleur secondaire de la face inférieure**	**Zungenblüte: Sekundärfarbe der Unterseite**	**Flor ligulada: color secundario de la cara inferior**		
	RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
30.	**(*)**	**PQ VG**	**(+) (b), (c), (d)**				
		Ray floret: distribution of secondary color of lower side	**Pétale : répartition de la couleur secondaire de la face inférieure**	**Zungenblüte: Verteilung der Sekundärfarbe der Unterseite**	**Flor ligulada: distribución del color secundario de la cara inferior**		
		none	aucune	keine	ausente		1
		basal quarter	quart basal	basales Viertel	en el cuarto basal		2
		basal half	moitié basale	basale Hälfte	en la mitad basal		3
		distal half	moitié distale	distale Hälfte	en la mitad distal		4
		distal quarter	quart distal	distales Viertel	en el cuarto distal		5
		tip	extrémité	Spitze	en la punta		6
		band	bande	Band	en una banda		7
31.		**PQ VG**	**(b), (c), (d)**				
		Ray floret: tertiary color of lower side	**Pétale : couleur tertiaire de la face inférieure**	**Zungenblüte: Tertiärfarbe der Unterseite**	**Flor ligulada: color terciario de la cara inferior**		
		RHS Colour Chart (indicate reference number)	Code RHS des couleurs (indiquer le numéro de référence)	RHS-Farbkarte (Nummer angeben)	Carta de colores RHS (indíquese el número de referencia)		
32.		**PQ VG**	**(+) (b), (c), (d)**				
		Ray floret: distribution of tertiary color of lower side	**Pétale : répartition de la couleur tertiaire de la face inférieure**	**Zungenblüte: Verteilung der Tertiärfarbe der Unterseite**	**Flor ligulada: distribución del color terciario de la cara inferior**		
		none	aucune	keine	ausente		1
		basal quarter	quart basal	basales Viertel	en el cuarto basal		2
		distal quarter	quart distal	distales Viertel	en el cuarto distal		3
		tip	extrémité	Spitze	en la punta		4
		band	bande	Band	en una banda		5
33.	**(*)**	**QL VG**	**(+) (b), (e)**				
		Disc: type	**Disque : type**	**Scheibe: Typ**	**Disco: tipo**		
		daisy	marguerite	Margerite	margarita	Orange Gem	1
		anemone	anémone	Anemone	anémona	Princess Golden	2
34.	**(*)**	**QN MG/MS/VG**	**(+) (b), (e)**				
		Disc: diameter	**Disque : diamètre**	**Scheibe: Durchmesser**	**Disco: diámetro**		
		absent or very small	absent ou très petit	fehlend oder sehr klein	ausente o muy pequeño		1
		small	petit	klein	pequeño	Madoka Almond Milk	3
		medium	moyen	mittel	medio	Lemon Daisy	5
		large	grand	groß	grande	CL Tsunoda ATYB1	7
		very large	très grand	sehr groß	muy grande		9

		English	français	deutsch	español	Example Varieties Exemples Beispielssorten Variedades ejemplo	Note/ Nota
35.	**(*)**	**PQ VG**	**(+) (b), (e)**				
		Disc: main color	**Disque: couleur principale**	**Scheibe: Hauptfarbe**	**Disco: color principal**		
		green	vert	grün	verde		1
		yellow	jaune	gelb	amarillo		2
		orange	orange	orange	naranja		3
		reddish purple	pourpre rougeâtre	rötlich purpurn	púrpura rojizo		4
		dark purple	pourpre foncé	dunkelpurpurn	púrpura oscuro		5
		brown	brun	braun	marrón		6
36.		**QN MG/VG**	**(+)**				
		Only seed-propagated varieties: Time of beginning of flowering	**Seulement les variétés reproduites par voie sexuée : Époque de début de floraison**	**Nur samenvermehrte Sorten: Zeitpunkt des Blühbeginns**	**Solo variedades de reproducción sexuada: época de comienzo de la floración**		
		early	précoce	früh	temprana	Gladden Orange Eye	3
		medium	moyenne	mittel	media	Princess Golden	5
		late	tardive	spät	tardía		7

8. Explanations on the Table of Characteristics

8.1 Explanations covering several characteristics

Unless otherwise indicated, observations should be made when 50 % of the terminal flower heads of primary lateral shoots have fully opened.

Characteristics containing the following key in the Table of Characteristics should be examined as indicated below:

(a) Observations should be made on fully developed leaves taken from the middle third of the lateral shoots.

(b) Observations should be made on terminal flower heads of primary lateral shoots when the anthers in outer 2-3 rows of the disc florets have dehisced. If the disc is not visible, observations should be made when the terminal flower head is fully open but before it starts fading.

(c) The ray florets in the outermost row should be observed.

(d) The main color is the color with the largest surface area, the secondary color is the color with the second largest surface area, and the tertiary color is the color with the third largest surface area. In cases where the area of the main and secondary color are too similar to reliably decide which color has the largest area, the darker color is considered to be the main color. In cases where the area of the secondary and tertiary color are too similar to reliably decide which color has the second largest area, the darker color is considered to be the secondary color.

(e) To be recorded only when the disc is visible.

8.2 Explanations for individual characteristics

Ad. 1: Plant: growth habit

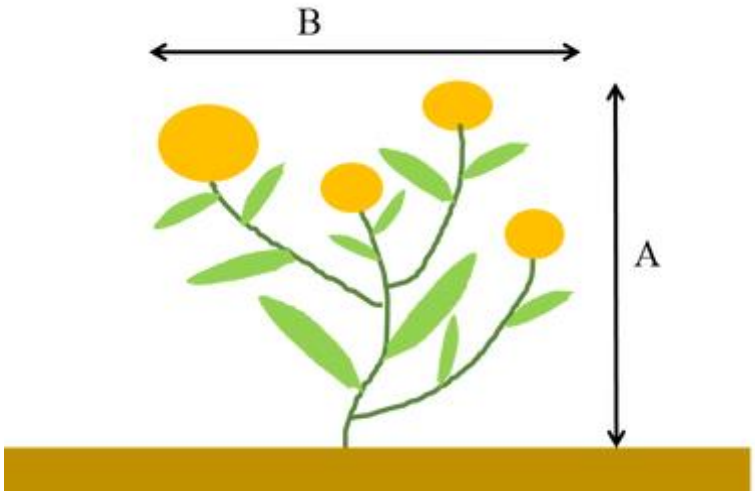
Calendulas can be grown in the ground or in pots. When grown in pots, the growth habit of state 3 can be more drooping than horizontal.

1
upright

2
semi-upright

3
horizontal

Ad. 2: Plant: height



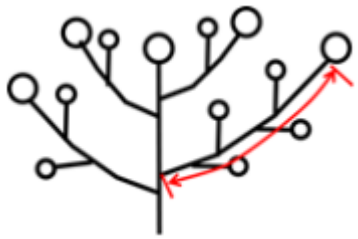
A = Plant: height
B = Plant: width

Ad. 3: Plant: width

See Ad. 2

Ad. 4: Primary lateral shoot: length

Observations should be made on the longest primary lateral shoot.



Ad. 5: Primary lateral shoot: length of internode

Observations should be made on the middle internode of the longest primary lateral shoot.

Ad. 6: Leaf: length

A = Leaf: length
B = Leaf: width

Ad. 7: Leaf: width

See Ad. 6

Ad. 8: Leaf: shape

1
oblong

2
oblanceolate

3
spatulate

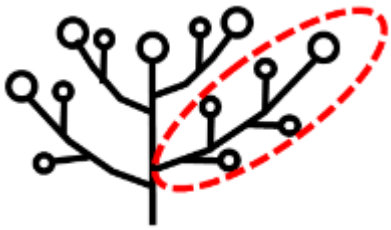
Ad. 9: Leaf: shape of apex

1
acute

2
obtuse

3
rounded

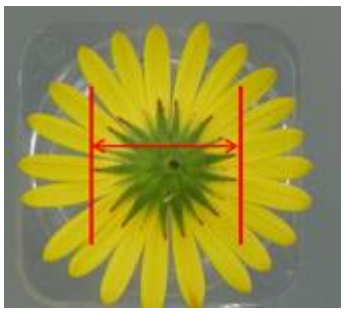
Ad. 11: Primary lateral shoot: number of flower heads



The number of flower heads should be assessed including flower buds, open flowers and faded flowers. Observations should be made on the longest primary lateral shoot.

Ad. 12: Peduncle: length

Ad. 13: Involucre: diameter



Ad. 14: Flower head: type

1
single

2
semi-double

3
double

1. single: flower heads with one row of ray florets.
2. semi-double: flower heads with two or three rows of ray florets.
3. double: flower heads with four or more rows of ray florets.

Ad. 17: Ray floret: attitude of basal part

1
upward

2
horizontal

3
downward

Ad. 20: Ray floret: ratio length/width

1
very low

3
medium

5
very high

Ad. 21: Ray floret: longitudinal axis

1
moderately incurved

2
weakly incurved

3
straight

4
weakly reflexed

5
moderately reflexed

Ad. 22: Ray floret: profile in cross section

Observation should be made at the midpoint.

Ad. 25: Ray floret: distribution of secondary color of upper side

1 none | 2 basal quarter | 3 basal half | 4 distal half | 5 distal quarter | 6 tip | 7 band

Ad. 27: Ray floret: distribution of tertiary color of upper side

1 none | 2 basal quarter | 3 distal quarter | 4 tip | 5 band

Ad. 30: Ray floret: distribution of secondary color of lower side

See Ad. 25

Ad. 32: Ray floret: distribution of tertiary color of lower side

See Ad. 27

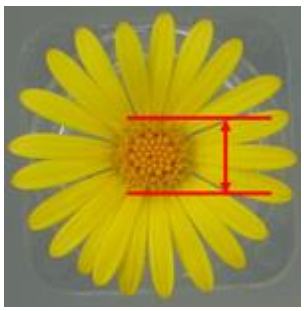
Ad. 33: Disc: type

Daisy type discs have small florets.
Anemone type discs have large petaloid or tubular florets.

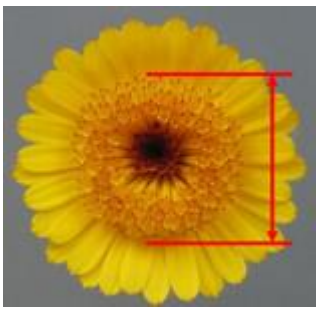
1
daisy

2
anemone

Ad. 34: Disc: diameter



daisy type



anemone type

Ad. 35: Disc: main color

Observations should be made on the central part of the disc when anthers of the 2-3 outer rows have dehisced.

Ad. 36: Only seed-propagated varieties: Time of beginning of flowering

Time of beginning of flowering is when the first flower head has fully opened on 50% of the plants.

9. Literature

Tsukamoto, Y., 1994: The Grand Dictionary of Horticulture, Volume 1. The Shogakukan Ltd. Chiyoda, Tokyo, JP, pp. 908-910.

10. Technical Questionnaire

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

	Application date: (not to be filled in by the applicant)

TECHNICAL QUESTIONNAIRE
to be completed in connection with an application for plant breeders' rights

1. Subject of the Technical Questionnaire

1.1	Botanical name	*Calendula* L.
1.2	Common name	Calendula
1.3	Species:	

2. Applicant

Name	
Address	
Telephone No.	
Fax No.	
E-mail address	
Breeder (if different from applicant)	

3. Proposed denomination and breeder's reference

Proposed denomination (if available)	
Breeder's reference	

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#4. Information on the breeding scheme and propagation of the variety

4.1 Breeding scheme

Variety resulting from:

4.1.1 Crossing

(a) controlled cross [ ]
(please state parent varieties)

(……..……..…) x (……..……..…)

female parent male parent

(b) partially known cross [ ]
(please state known parent variety(ies))

(……..……..…) x (……..……..…)

female parent male parent

(c) unknown cross [ ]

4.1.2 Mutation [ ]
(please state parent variety)

4.1.3 Discovery and development [ ]
(please state where and when discovered and how developed)

4.1.4 Other [ ]
(Please provide details)

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

4.2 Method of propagating the variety

4.2.1 Seed-propagated varieties

(a)	Self-pollination	[ ]
(b)	Cross-pollination	[ ]
(c)	Hybrid	[ ]
(d)	Other (please provide details)	[ ]

4.2.2 Vegetative propagation

(a)	Cuttings	[ ]
(b)	*In vitro* propagation	[ ]
(c)	Other (state method)	[ ]

4.2.3 Other [ ]
(Please provide details)

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

5. Characteristics of the variety to be indicated (the number in brackets refers to the corresponding characteristic in Test Guidelines; please mark the note which best corresponds).

	Characteristics	Example Varieties	Note
5.1 (1)	**Plant: growth habit**		
	upright	Princess Golden	1 [ ]
	semi-upright	Orange Gem	2 [ ]
	horizontal	Winter Sun	3 [ ]
5.2 (2)	**Plant: height**		
	very short		1 [ ]
	very short to short		2 [ ]
	short	Orange Gem	3 [ ]
	short to medium		4 [ ]
	medium	Sunset Buff	5 [ ]
	medium to tall		6 [ ]
	tall	Princess Golden	7 [ ]
	tall to very tall		8 [ ]
	very tall		9 [ ]
5.3 (6)	**Leaf: length**		
	very short		1 [ ]
	very short to short		2 [ ]
	short	Fuyushirazu	3 [ ]
	short to medium		4 [ ]
	medium	Alice Orange	5 [ ]
	medium to long		6 [ ]
	long	Orange Gem	7 [ ]
	long to very long		8 [ ]
	very long		9 [ ]
5.4 (14)	**Flower head: type**		
	single	Fuyushirazu	1 [ ]
	semi-double	Sunset Buff	2 [ ]
	double	Orange Gem	3 [ ]

	Characteristics	Example Varieties	Note
5.5 (15)	**Flower head: diameter**		
	very small		1 [ ]
	very small to small		2 [ ]
	small	Madoka Almond Milk	3 [ ]
	small to medium		4 [ ]
	medium	Lemon Daisy	5 [ ]
	medium to large		6 [ ]
	large	Princess Golden	7 [ ]
	large to very large		8 [ ]
	very large		9 [ ]
5.6 (16)	**Only varieties with Flower head: type: semi-double and double: Flower head: number of ray florets**		
	very few		1 [ ]
	very few to few		2 [ ]
	few	Lemon Daisy	3 [ ]
	few to medium		4 [ ]
	medium	Orange Gem	5 [ ]
	medium to many		6 [ ]
	many	Alice Orange	7 [ ]
	many to very many		8 [ ]
	very many		9 [ ]
5.7(i) (23)	**Ray floret: main color of upper side**		
	RHS Colour Chart (indicate reference number)		
5.7(ii) (23)	**Ray floret: main color of upper side**		
	white		1 [ ]
	light yellow		2 [ ]
	medium and dark yellow		3 [ ]
	yellow orange		4 [ ]
	orange		5 [ ]
	orange red		6 [ ]

	Characteristics	Example Varieties	Note
5.8(i) (24)	**Ray floret: secondary color of upper side**		
	RHS Colour Chart (indicate reference number)		
5.8(ii) (24)	**Ray floret: secondary color of upper side**		
	white		1 [ ]
	light yellow		2 [ ]
	medium and dark yellow		3 [ ]
	yellow orange		4 [ ]
	orange		5 [ ]
	orange red		6 [ ]
5.9 (25)	**Ray floret: distribution of secondary color of upper side**		
	none		1 [ ]
	basal quarter		2 [ ]
	basal half		3 [ ]
	distal half		4 [ ]
	distal quarter		5 [ ]
	tip		6 [ ]
	band		7 [ ]
5.10 (33)	**Disc: type**		
	daisy	Orange Gem	1 [ ]
	anemone	Princess Golden	2 [ ]
5.11 (35)	**Disc: main color**		
	green		1 [ ]
	yellow		2 [ ]
	orange		3 [ ]
	reddish purple		4 [ ]
	dark purple		5 [ ]
	brown		6 [ ]

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

6. Similar varieties and differences from these varieties

Please use the following table and box for comments to provide information on how your candidate variety differs from the variety (or varieties) which, to the best of your knowledge, is (or are) most similar. This information may help the examination authority to conduct its examination of distinctness in a more efficient way.

Denomination(s) of variety(ies) similar to your candidate variety	Characteristic(s) in which your candidate variety differs from the similar variety(ies)	Describe the expression of the characteristic(s) for the **similar** variety(ies)	Describe the expression of the characteristic(s) for **your** candidate variety
Example	*Plant: height*	*short*	*medium*

Comments:

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

#7. Additional information which may help in the examination of the variety

7.1 In addition to the information provided in sections 5 and 6, are there any additional characteristics which may help to distinguish the variety?

Yes [ ] No [ ]

(If yes, please provide details)

7.2 Are there any special conditions for growing the variety or conducting the examination?

Yes [ ] No [ ]

(If yes, please provide details)

7.3 Other information

A representative color photograph of the variety displaying its main distinguishing feature(s), should accompany the Technical Questionnaire. The photograph will provide a visual illustration of the candidate variety which supplements the information provided in the Technical Questionnaire.

The key points to consider when taking a photograph of the candidate variety are:

- Indication of the date and geographic location
- Correct labeling (breeder's reference)
- Good quality printed photograph (minimum 10 cm x 15 cm) and/or sufficient resolution electronic format version (minimum 960 x 1280 pixels)"

Further guidance on providing photographs with the Technical Questionnaire is available in document TGP/7 "Development of Test Guidelines", Guidance Note 35 (http://www.upov.int/tgp/en/).

[The link provided may be deleted by members of the Union when developing authorities' own test guidelines.]

Authorities may allow certain of this information to be provided in a confidential section of the Technical Questionnaire.

TECHNICAL QUESTIONNAIRE	Page {x} of {y}	Reference Number:

8. Authorization for release

(a) Does the variety require prior authorization for release under legislation concerning the protection of the environment, human and animal health?

Yes [ ] No [ ]

(b) Has such authorization been obtained?

Yes [ ] No [ ]

If the answer to (b) is yes, please attach a copy of the authorization.

9. Information on plant material to be examined or submitted for examination

9.1 The expression of a characteristic or several characteristics of a variety may be affected by factors, such as pests and disease, chemical treatment (e.g. growth retardants or pesticides), effects of tissue culture, different rootstocks, scions taken from different growth phases of a tree, etc.

9.2 The plant material should not have undergone any treatment which would affect the expression of the characteristics of the variety, unless the competent authorities allow or request such treatment. If the plant material has undergone such treatment, full details of the treatment must be given. In this respect, please indicate below, to the best of your knowledge, if the plant material to be examined has been subjected to:

(a)	Microorganisms (e.g. virus, bacteria, phytoplasma)	Yes [ ]	No [ ]
(b)	Chemical treatment (e.g. growth retardant, pesticide)	Yes [ ]	No [ ]
(c)	Tissue culture	Yes [ ]	No [ ]
(d)	Other factors	Yes [ ]	No [ ]

Please provide details for where you have indicated “yes”.

.....

10. I hereby declare that, to the best of my knowledge, the information provided in this form is correct:

Applicant’s name

Signature Date

[End of document]