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GLASS PRODUCTION TECHNOLOGY: DEPTH CLASSIFICATION.

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Works out a scheme for the depth classification of subjects going with the Host Subject Glass Production Technology. Gives a list of 15 selected examples classified according to the scheme. Comments on the use of the schedule of Common Property Isolates in the design work.

Abbreviations Used

(A1)	= Array of Order 1	[P]	= Personality Facet
(A2)	= Array of Order 2	[1P]	= [P] of Round 1
(A3)	= Array of Order 3	[2P]	= [P] of Round 2
(AD)	= Alphabetical Device	(QI)	= Quasi Isolate(s)
(ADPN)	= Array Division by Packet Notation	*T*	= Telescoping of
		*T*1	= Telescoping 1 of
(BC)	= Basic Class(es)	*T*2	= Telescoping 2 of
(BS)	= Basic Subject(s)	...	... ...
(CPI)	= Common Property Isolates		
(FC)	= Fundamental category(ies)	*T*5	= Telescoping 5 of
(IN)	= Isolate Number(s)		

0 INTRODUCTION

In an earlier paper (1), a step-wise procedure to implement the new methodology (5) for the design and development of a scheme for depth classification of subjects going with the (BS) in Commodity Production Engineering, was described. In the present paper, the design of a scheme for the classification of subjects going with the Host Subject 'Glass Production Technology' is given. The schedule is provisional.

1 DEFINITION

11 Chemical Production Technology

The production of commodities involving chemical reactions and/or physico-chemical changes. It includes the production of commodities in which unit processes form the basis of the manufacturing operations such as it obtains in the case of petroleum refining, glass making, paper making, etc.

12 Glass

Glass is an inorganic material that is produced by fusion and subsequent cooling, the fused mass becoming rigid without crystallising.

2 BASIC CLASSES IN 'F CHEMICAL TECHNOLOGY'

It has been found convenient to divide the Main Subject 'Chemical Technology' into a few Canonical Subjects, each of which may be deemed a (BS). One such (BS) is 'Commodity Production Technology'.

It has also been found convenient to deem the subject 'Glass Production Technology' to go with the (BS) 'Commodity Production Technology'. The isolate 'Glass' is derived on the basis of the characteristic 'By Commodity'. The isolates derived on the basis of the characteristic 'By Commodity' will be the earliest of the isolates in [1P] — that is, occurring closest to the (BS) 'Commodity Production Technology' — in the facet structure. Thus, the subject 'Glass Production Technology' will be represented by the Host Subject:

Commodity Production Technology (BS), Glass [1P]

3 FIRST CHARACTERISTICS

31 In [1P]

A list of the First Characteristics that may be used as (QI), the isolates derived on the basis of which may be used for qualifying the 'Commodity Isolate' Glass occurring in [1P] — is given in Table 1 in Sec 311. These (QI) have been selected by blending the *a priori* and pragmatic approaches. The latter consisted in examining about 200 assorted micro documents and a few macro documents. Table 1 also indicates the second and later order (QI) by suitable indention.

311 Table I Quasi Isolates in [1P]

SN	Sector	Quasi Isolates
a	b	c
1–3	(S–(A))	By Brand
1		By Name of company
2		By Name of variety
3		By Code number
4	(S–(1))	By Make
5–13		By Purpose
5	(S–A)	By Chemical property-based purpose
6		By Electronic/electrical property-based purpose
7–9		By Optical property-based purpose
7		By Special radiation-property-based purpose
8		By Filtering and colouring-property-based purpose
9		By Illumination and visibility-based purpose
10		By Thermal property-based purpose
11		By Acoustical property-based purpose
12		By Structural-mechanical property-based purpose
13	(S–9A)	By Non-fabricated form
14–21		By Material of glass
14–19	(S–9a)	By Constituent
14	(S–1)	By Network former
15		By Stabiliser-modifier
16		By Flux
17–18		By Colouring agent
17		By Agent
18		By Form
19		By Minor constituent
20		By Nucleating agent

SN	Sector	Quasi Isolates
a	b	c
21	(S–z1)	By Raw material
22–83		By Property
22–30	(S–e)	By Chemical property
22–24	(S–f)	By Corrosion resistance
22		By Corroding agent
23		By Temperature
24		By Degree of attack
25–30		By Photochemical property
25–27		By Photosensitivity
25		By Kind of chance
26		By Radiation
27		By Time of fading
		By Photoconduction
28		By Secondary Electronic emission coefficient
29		By Quantum efficiency
30		By Photoluminiscence
31		By Thermo-chemical property
32	(S–d)	By Engineering property
32		By Machinability
33–36	(S–cT)	By Electrical property
33–35		By Dielectric property
33		By Loss factor
34		By Dielectric constant
35		By Power factor
36		By Electrical conductivity
37–43	(S–cR)	By Optical property
37	(S–cS)	By Stress optical Coefficient
38–40		By Absorption/Transmission
38		By Colour
39		By Particulate radiation
40		By Electromagnetic radiation
41		By Dispersion
42		By Birefringence
43		By Refractive index
44–51	(S–cP)	By Thermal property
44	(S–cQ)	By Melting point
45		By Thermal expansion
46		By Specific heat
47		By Thermal shock resistance
48		By Upper use temperature
48		By Log volume resistivity
50		By Thermal stress resistance
51		By Thermal conductivity
52–76	(S–c)	By Physical property
52	to	By Abrasion resistance
53	(S–cH)	By Coefficient of friction
54–56		By Permeability

SN	Sector	Quasi Isolates
a	b	c
54		By Gas
55		By Temperature
56		By Quantity
57		By Hardness
58		By Flexibility
59–65		By Viscosity points
59		By Strain point
60		By Annealing point
61		By Softening point
62		By Working range
63		By Working range index
64		By Relative gob temperature
65		By Melting range
66		By Surface tension
67		By Fatigue
68		By Tensile strength
69		By Compression strength
70		By Strength value
71		By Strength to weight ratio
72		By Design strength
73		By Poisson's ratio
74		By Young's modulus
75		By Density
76		By Weight
77–80	(S–b)	By Mathematical property
77–80		By Dimension
77		By Surface area
78		By Diameter/Thickness
79		By Breadth
80		By Length/Height
81–83	(S–a)	By General property
81		By Homogeneity
82–83		By Normality
82		By Number of seeds and blisters
83		By Number of blisters
84	(S–09A) to (S–0A)	By Process stage

312 SEQUENCE OF THE (QI)

The Group Strategy (2) was applied to derive a helpful sequence among the (QI). Examples of the result of its application are given in Tables 2 and 3.

313 TABLE 2. (QI) OF ORDER 1

SN	Quasi isolate	Correlated with (FC)	SN in Table 1
1	By Brand	Personality	1–3
2	By Make	Personality	4
3	By Purpose	Personality	5–13
4	By Material	Material (Matter)	14–21
5	By Property	Material (Attribute)	22·83
6	By Stage of processing	Time	84

314 TABLE 3. (QI) OF ORDER 2 CORRELATED WITH THE (QI) OF ORDER 1 'BY PROPERTY'

SN	Quasi isolate	Correlated with	SN in Table 1
1	By Chemical property	Matter (Attribute)	22–30
2	By Machinability	,, ,,	31
3	By Electrical property	,, ,,	32–35
4	By Optical property	,, ,,	36–42
5	By Thermal property	,, ,,	43–50
6	By Physical property	,, ,,	51–73
7	By Mathematical property	,, ,,	74–77
8	By General property	,, ,,	78–80

In column *c* of Table 1 in Sec 311 is given a list of the (QI) in the sequence derived by the use of the Group Strategy.

315 SEQUENCE OF ATTRIBUTE-ISOLATES

The isolates derived on the basis of the (QI) 'By Property' — correlated with the (FC) 'Matter (Attribute)' — have been arranged in a sequence parallel to that of the isolates in the schdule of (CPI) (4).

32 In [2P]

A list of the First Characteristics that may be used as (QI) in [2P] is given in Table 4, Sec 321. These (QI) have also been selected by blending the *a priori* and pragmatic approaches. The second and later order (QI) are indicated by suitable indention.

321 TABLE 4. QUASI ISOLATES IN [2P]

SN	Sector	Quasi isolates
a	b	c
1–27	(S–A)	By Process
1–18	(S–9A)	By Stage
1		By Raw material preparation
2		By Batch preparation
3–4		By Melt preparation
3		By Preparation
4		By Fining
5		By Form/Shape production
6		By Stress relief
7		By Finishing
7		By Cutting
8		By Drilling
9–10		By Grinding
9		By Finish
10		By Removal rate
11–13		By Polishing
11		By Method
12		By Flatness
13		By Surface finish
14		By Decoration
15–16		By Sealing
15		By Method
16		By Material sealed with
17–18		By Durability improvement
17		By Chemical toughening
18		By Tempering
19–57		By Operation
19		By Type of operation
20–27	(S–9a)	By Condition of operation
20		By Output
21		By Quantity used
22		By Tolerance
23		By Pressure
24		By Temperature
25		By Cooling rate
26		By Maximum-minimum temperature
27		By Time of operation
28–36	(S–1)	By Material used
28	(S–z1)	By Raw material
29		By Fining agent
30		By Binding agent
31		By Coupling agent
32		By Polishing agent
33		By Chilling agent
34		By Pool material for drawing
35		By Decorating agent
36		By Form of material

SN	Sector	Quasi Isolates
a	b	c
35–57	(S–a)	By Equipment used
37–55		By Purpose
37		By Unloading
38		By Storing
39		By Transfer
40		By Mixing
41		By Feeding
42–55		By Melting (Furnace)
42		By Number
43		By Kind
44		By Refractory
45		By Regeneration
46		By Shape
47		By Draught
48		By Stirring
49		By Forming
50		By Shaping
51		By Cutting
52		By Drilling
53		By Grinding
54		By Polishing
55		By Annealing
56–57		By Operation
56		By Method
57		By Power

322 SEQUENCE OF THE (QI)

The Group Strategy was applied to derive a helpful sequence among the (QI). In column *c* of Table 4 in Sec 321 is given a list of the (QI) in the sequence derived by the use of the Group Strategy.

4 NOTATION

41 'COMMODITY ISOLATES'

The provisional (IN) for the commodity isolates in [1P] and the resulting Host Class are as follows:

F8	Commodity production technology
F8,3	Food technology
F8,44	Ceramic and glass technology
F8,441	Ceramic technology
F8,445	Glass technology
F8,4Z	Macromolecular substance
F8,51	Rubber technology
F8,52	Plastics technology

42 ALLOCATION OF SECTORS TO (QI)

The provisional allocation of the sectors to the (QI) in [1P] is given in column *b* of Table 1 in Sec 311. In assigning the sectors, the factors to be taken into consideration have been mentioned earlier (3). As far as possible, the (IN) in the schedule of (CPI) have been used for the isolates derived on the basis of the (QI) 'By Property' in [1P]. In most cases, however, the last digit in Hindu-Arabic numerals in that schedule has been replaced by a Roman capital letter to facilitate the addition of units of measure to the (IN).

5 ANNOTATION

51 USE OF THE SCHEDULE OF (CPI)

Out of the 84 (QI) in [1P] over 60 were found to correlate with the (FC) Matter (Attribute) (*See* Sec 311 Table 1, Ser N 22–83). It was helpful to use the schedule of (CPI) already available (4), in the

1 Choice and naming the (QI) correlated with Matter (Attribute);
2 Arranging these (QI) in a helpful sequence; and
3 Allocating notation to them.

The Canon of Consistency and the Canons of Scheduled and Systematic Mnemonics have thus been conformed to, to a large extent. In the list of (QI) gaps were left 'automatically' providing for the future interpolation of new (QI). For example, the isolate 'Photoluminiscence' was not included in the schedule as it did not occur in the first set of 200 micro documents examined. However, it did occur in one of the documents examined subsequently. Interpolation of the new (QI) in the filiatory sequence and assigning it a notation was easy.

511 LENGTH OF NOTATION

In the schedule of (CPI), each (IN) generally contains more than two digits. Therefore, the use of those (IN) in the present schedule has resulted in (IN) with three or more digits in the case of the isolates derived on the basis of the 60 (QI) correlated with the (FC) Matter (Attribute). No attempt has been made to shorten the notation further. It will be more advantageous to do it after a fairly comprehensive schedule of (CPI) is prepared.

52 SEQUENCE OF THE ISOLATES IN THE SCHEDULE FOR 'PURPOSE'.

The number of commodities made of glass is very large. Therefore, the grouping of the commodities in a helpful sequence presented difficulties initially. However, it was noted that the use of glass in the fabrication of a particular commodity is largely dependent on the various physical and chemical properties of glass. This fact has been utilised in the arrangement of the isolates derived on the basis of the (QI) "By Purpose". Thus, we have (QI) of Order 2 such as

By Structural-mechanical-property-based-purpose
By Acoustical-property-based-purpose
By Thermal-property-based-purpose
By Optical-property-based-purpose
By Electronic-electrical-property-based-purpose.
By Chemical-property-based-purpose

Here again, the sequence of the (QI) parallels the sequence of the groups of isolates in the schedule or (CPI).

53 Economy

Economy in schedule-building has been achieved by conforming to the Canons of Scheduled and Systematic Mnemonics, and by using (ADPN). Examples are the isolates be derived by the (QI) to "By State of processing" in [1P], "By Source" in [1P], "By Raw material in [2P], and the sechdule for Matter (Material).

Only about 50 percent of the isolates have been enumerated. The other isolates can be got by one device or the other as indicated in the schedule.

6 Index to the Schedule

Note.—Isolates and (QI) in [2P] are indicated by "[2P]" preceding the (IN).

7 SCHEDULE

Isolates in [1P]

By Stage of processing

Note.—The (IN) enumerated in [2P] are to be used. Use (ADPN) wherever necessary. The (IN) so constructed is to be preceded by a "0" (zero) for use in [1P]. *The name of the process etc may be suitably modified for use as Feature Heading and Subject Heading.*

(*Illustrative*)

09B Tempered
09C2 Strengthened by ion exchange
09E1 Sealed with metal
09J0 (R23–M–23–L65) Polished with acid, to 0·00023 cm/25 cm flatness and 65A finish.

a *By General property*
a2 *By Normality*

a2E *By Number of blisters per* 30 g

Note.— Add the given figure and read it as an integer.

(*Illustrative*)

a2E3 3 blisters
a2E5 5 blisters

a2G *By Number of seeds and blisters per* 30 *g.*

Note.— Add the given figure and read it as an integer.

(*Illustrative*)

a2G30 30 seeds and blisters
a2G35 35 seeds and blisters

By Homogeneity

a7 Value

*Note.—*1 *Add the given figure interpolating a "0" (zero) between the two sets of digits*

2 *Multiply the given figure for the tolerance by* 100, *add the result to the (IN) derived according to Note* 1 *interpolating "A" between the two sets of digits. Read the result as an integer.*

(*Illustrative*)

a709 =5A12 Homogeneity value 9·5 ± 0·12

Grade

a7A A
a7B B
a7C C

b *By Mathematical property*

By Dimension (cm)

b6B *By Diameter/Thickness*

Note 1.—*Multiply the given figure by* 100, *add the result to b1B and read it as an integer.*

(*Illustrative*)

b6B8 0·08 cm
b6B80 0·8 cm

b6C *By Length/Height*

Note.—Add the given figure and read it as given in the document.

(*Illustrative*)

b6C70=6 70·6 cm
b6C95=3 95·3 cm

b6E *By Breadth*

Note.—Add the given figure and and read it as given in the document.

(*Illustrative*)

b6E65=3 65·3 cm
b6E80 80 cm

By Surface area

6G In sq cm

Note.—Add the given figure and read it as given in the document.

(*Illustrative*)

b6G475 475 sq cm
b6G810 810 sq cm

b6H In sq meters

Note.—Add the given figure and read it as

given in the document.
(Illustrative)
b6H1=3 1·3 sq m
b6H4=6 4·6 sq m

c *By Physical property*
c1B *By Weight* (g)
Note.—Correct the given figure to the tenth place, divide it by 10, add the result to c1B and read it as an integer.
c1B12 120 g
c1B250 2500 g

c1D *By Density* (g/cm^3)
Note.—Add the given figure and read it as given in the document.
(Illustrative)
c1D2=57 2·57 g/cm^3
c1D6=1 6·1 g/cm^3

c2B *By Young's modulus* ($Kg/sq\ cm \times 10^5$)
Note.—Add the given figure and read as given in the document.
(Illustrative)
c2B1=1 $1 \cdot 1 \times 10^5$
c2B5 $5 \cdot 0 \times 10^5$

c2F *By Poisson's ratio*
Note.—Add the digits following the decimal point in the given figure.
(Illustrative)
c2F16 0·16
c2F271 0·271

c2M *By Design strength* (Kg cm)
Note.—Divide the given figure by 10, add the result to c2M, and read it as an integer.
(Illustrative)
c2M12 12 Kg/sq cm
c2M140 140 Kg/sq cm

c2N *By Strength to weight ratio* (1×10^n)
*Note.—Add the given value fo*ᴾ *n and read it as an integer.*
(Illustrative)
c2N4 10^4
c2N6=5 $10^{6.5}$

c2P *By Strength value* (Kg/sq cm)
Note.—Divide the given figure by 1000, add the result to c2P and read it as an integer.
(Illustrative)
c2P28 28,000 Kg/sq cm
c2P1750 1750,000 Kg/sq cm

c2Q *By Compression strength* (Kg/sq cm)
Note.—Divide the given figure by 1000, add the result to c2Q and read it as an integer.
(Illustrative)
c2Q63 63,000 Kg/sq cm
c2Q126 126,000 Kg/sq cm

By Tensile strength (Kg/sq cm)
c2R 100 to 999 Kg/sq cm
Note.—Divide the given figure by 10, add the result to c2R, and read it as an integer.
(Illustrative)
c2R28 280 Kg/sq cm
c2R95 950 Kg/sq cm

c2S 1,000 to 9,999 Kg/sq cm
Note.—Divide the given figure by 100, add the result to c2S and read it as an integer.
(Illustrative)
c2S28 2800 Kg/sq cm
c2S95 9500 Kg/sq cm

c2T 10,000 to 99,999 Kg/sq cm
Note.—Divide the given figure by 1,000 add the result to c2T and read it as an integer.
(Illustrative)
c2T28 28,000 Kg/sq cm
cT295 95,000 Kg/sq cm

c2U Over 100,000
Note.—Divide the given figure by 10,000 add the result to c2U and read it as an integer.

(*Illustrative*)
c2U28 280,000 Kg/sq cm
c2U95 950,000 Kg/sq cm

c2X *By Fatigue* (Rockwell, Kg, cm)
Note.— Multiply the given figure for the impression by 1000 *and add the result. To this add the given figure for the load in Kg with "A" interpolated between the two sets of figures.*
(*Illustrative*)
c2X2=4A50 0·0024 for 50 Kg load
c2X1A30 0·001 for 30 Kg load

c3B *By Surface tension* (dynes/cm)
Note.—Add the given figure and read it as an integer.
(*Illustrative*)
c3B285 285 dynes
c3B310 310 dynes

c7 *By Viscosity points*
c7B *By Melting range* (Viscosity about 100P)
c7C *By Relative gob temperature* (10^3 P)

c7E *By Working range index*

c7F *By Working range* ($10^3 - 10^8$ P)

c7G *By Softening point* ($10^{7.6}$P)
c7H *By Annealing point* (10^{13}P)
c7J *By Strain point* ($10^{41.5}$P)
Note.— Add the given figure to the appropriate (IN) and read it as an integer.
(*Illustrative*)
c7C980 980° C relative gob temperature
c7E176 176 Working range index
c7G714 714° C Softening point
c7J497 497° C Strain point

cC *By Flexibility*
Note.— Add the given figure and read it as an integer.
(*Illustrative*)
cC15 15°
cC30 30°
cF1 *By Hardness*
cF1K In Knoop number
cF1M In Moh
Note.— Add the given figure to the appropriate (IN) and read it as an integer.
(*Illustrative*)
cF1K550 550 Knoop number
cF1M5 5 Moh

cF6D *By Permeability*

T (A5) *into* (A4) *begins*
cF6E *By Quantity* ($1/10^n$ cc)
Note.— Add the value of n and read it as an integer.
(*Illustrative*)
cF6E7=8 $1/10^{7.8}$ cc
cF6E9 $1/10^9$ cc

cF6F *By Temperature* (°C)
Note.— Divide the given figure by 10, *add the result to cF6F and read it as an integer.*
(*Illustrative*)
cF6F40 400° C
cF6F51 510° C

cF6G *By Gas*
cF6G1 Helium
cF6G2 Neon
cF6G3 Hydrogen
cF6G5 Oxygen
T (A5) *into* (A4) *ends*

cG *By Coefficient of friction*
cGB Glass on glass
Note.— Add the digits following the decimal point.
(*Illustrative*)
cGB16 0·16
cGN23 0·23
cGF Glass on oil
cGH Glass on fatty acid
Note.— Multiply the given figure by 1000 *add the result to cGF or cGH as the case may be, and read it as an integer.*
(*Illustrative*)
cGF3 0·003 for glass oiln

cGH15 0·015 for glass on fatty acid

cH *By Abrasion resistance (Glass loss per unit of time on standblasting under standard conditions)*
Note.— Add the given figure and read it as in the document.
(Illustrative)
cH0=6 0·6
cH3=5 3·5

cP *By Thermal property*
cPB *By Thermal conductivity*
(Cal per cm per °C per sec)
Note.— Multiply the given figure by 1000 *add the result to cPB and read it as an integer.*
(Illustrative)
cPB7=8 0·0078 cal per cm per °C
cPB28 0·028 cal per cm per °C

cPG *By Thermal stress resistance*
Note.— Add the given figure and read it as an integer.
(Illustrative)
cPG25 25
cPG55 55

By Log_{10} *volume resistivity*
(52 cm)
cPH At 25° C
cPK At 250° C
cPM At 350° C
Note.— Add the given figure to the appropriate (IN) and read it as given in the document.
(Illustrative)
cPH6=4 6·4 at 25° C
cPK11·3 11·3 at 250° C
cPM5 5·0 at 350° C

cPN *By Upper use temperature*
(° C)

T (A5) *into* (A4) *begins*
cPQ Normal
cPR Extreme
Note.— Divide the given figure by 10, *add the result to cPQ or cPR as the case may be, and read it as an integer.*
(Illustrative)
cPQ12 120° C normal
cPQ55 550° C extreme
T (A5) *into* (A4) *ends*

cPR *By Thermal shock resistance*
(for annealed plate 15 × 15 cm)

T 3 (A5) *into* (A4) *begins*
cPS For 0·32 cm thickness
cPT For 0·64 cm thickness
cPU For 1·28 cm thickness
Note.— Add the given figure to the appropriate (IN) and read it as an integer.
(Illustrative)
cPS350 350 for 0·32 cm thick plate
cPT250 250 for 0·64 cm thick plate
cPU225 225 for 0·28 cm thick plate
T 3(A5) *into* (A4) *ends*

cQD *By Specific heat*
Cal/cg) (°C)

T 1(A4) *into* (A3) *begins*
cQE At 25° C
cQG At 500°C
cQJ At 1000 °C
Note.— Multiply the given figure by 1000, *add the result to the appropriate (IN) and read as given in the document.*
(Illustrative)
cQG75 0·075 at 500° C
cQJ230 0·230 at 1000° C
T 1(A4) *into* (A3) *ends*

cQL *By Thermal expansion*
(° C × 10^5)

T 2 (A4) *into* (A3) *begins*
cQM From room temperature to setting point
cQP From 0 to 300° C
Note.— Add the given figure to the appropriate (IN) and read it as a integer.
(Illustrative)
cQM12 12 from room temperature to setting point
cQP25=6 25·6 from 0 to 300° C

cQR Ultra low expansion
cQS Zero expansion

cQV *By Melting point* (°C)
Note.— Divide the given figure by 10, add the result and read it as an integer.
(*Illustrative*)
cQV95 950° C
cQV167 1670° C

cR *By Optical property*
cR3B *By Refractive index* (at Sodium D line)
Note.— Add the given figure.
(*Illustrative*)
cR3B1=458 1·458
cR3B1=973 1·973

cR3C *By Birefringence*
Birefringent
Note.— Add the given figure for birefringence in mμ/cm and read it as an integer.
(*Illustrative*)
cR3C55 55 mμ/cm
cR3C95 95 mμ/cm
cR3G Non-birefringent

cR4 *By Dispersion*
(Fraunhofer lines C-F)
cR4B 0·001 to 0·01
Note.— Multiply the given figure by 100 and add the result to cR.
(*Illustrative*)
cR4B5 0·005
cR4B6=2 0·0062
cR4B15 0·015

By Absorption/Transmission (%)
cR7 *By Electromagnetic radiation*
cR7C Gamma ray
cR7D X-ray
cR7E Soft X-ray
cR7G Ultraviolet ray
cR7H Visible spectrum
cR7J Infra-red
cR7K Near infra-red
cR7L Middle infra-red
cR7M Far infra-red
cR7N Microwave
cR7P Radar wave
cR7R Television, FM radio wave
cR7S Shortwave radio wave
cR7T AM radio wave
cR7U Long wave radio wave

By Particulate radiation
cR7W Particle
cR7WH Electron
cR7WJ Beta particle
cR7WM Positron
cR7WN MU meson
CR7WP Pi meson
cR7WR Nucleon
cR7WS Proton
cR7WT Neutron
Note.— Add the given figure for the percentage of transmission and read it as an integer.
(*Illustrative*)
cR7H64 64% of light
cR7K52 52% of infra-red

cR8 *By Colour*
cR81 Clear
cR82 White
cR83 Red
cR831 Vermillion
cR832 Pink
cR833 Maroon
cR835 Purple
cR836 Rose
cR84 Orange
cR841 Yellow
cR843 Cream
cR845 Canary
cR847 Scarlet
cR85 Green
cR86 Blue
cR861 Indigo
cR87 Violet
cR91 Black
cR92 Brown
cR93 Grey
cR95 Chocolate
cR98 Multiple
Note.— To construct the (IN) for a depth of colour add the appropriate pair of digits from the following schedule for Depth of Colour to the (IN) for the colour.

Depth of colour
01 Light
02 Medium
04 Dull

05 Bright
06 Fast
07 Deep/Dark
(Illustrative)
cR8304 Dull red
cR8501 Light green

By Stress optical coefficient
Note.— Add the given figure and read it as given in the document.
(Illustrative)
cS2=5 2·5
cS2=6 3·6

cT *By Electrical property*
cT4A *By Electrical conductivity* (10^n ohm cm)
Note.— Add the value of n and read it as an integer.
(Illustrative)
cT4A8 10^8 ohm cm
cT4A12 10^{12} ohm cm

cT4B *By Dielectric property* (at 10^6 cps and 20° C)

T 3 (A5) *into* (A4) *begins*
cT4C *By Power factor*
Note.— Multiply the given figure by 10^4, *add the result to cT4C, and read it as an integer.*
(Illustrative)
cT4C12 0·0012
cT4C100 0·0100

cT4D *By Dielectric constant* ($\times 10^{-3}$)
Note.— Add the given figure and read it as an integer.
(Illustrative)
cT4D3=8 3·8
cT4D16=5 16·5

By Loss factor
cT4E Over 0·00001 and less than 0·0001
Note.— Multiply the given factor by 10^6, *add the result to cT4E and read it as an integer.*
(Illustrative)
cT4E28 0·000028
cT4E35 0·000035
cT4F 0·0001 to 0·001
Note.— Multiply the given figure by 10^5, *add the result to cT4F and read it as an integer.*
(Illustrative)
cT4F10 0·0001
cT4F25 0·00025
cT4G 0·001 to 0·001
Note.— Multiply the given figure by 10^4, *add the result to cT4G, and read it as an integer.*
(Illustrative)
cT4G15 0·0015
cT4G35 0·0035
cT4H Over 0·01
Note. — Multiply the given figure by 10^3, *add it to cT4H and read it as an integer.*
(Illustrative)
cT4H25 0·225
cT4H32 0·032

d *By Engineering property*
d8 *By Machinability*
d8B Machinable
d8C Linear tolerance (±)
d8D Hole diameter within (±)
d8E Spacing within (±)
d8G Flatness to (±)
Note. — Multiply the given (in cm) by 10^4, *add it to the appropriate (IN) and read it as an integer.*
(Illustrative)
d8C50 Linear tolerance ± 0·005 cm
d8D76 Hole diameter within ± 0·0076 cm
d8E50 Spacing within ± 0·005 cm

e *By Chemical property*
e4 *By Thermochemical property*
e41F Flame proof
e5 *By Photochemical property*
e51B *By Photoconduction*
By Secondary electronic emission coefficient for a given electron acceleration voltage.
Note.— Add the given figure for the coefficient to e51B and read it as an integer. Add to the resulting (IN) the given

figure for the voltage divided by 10. Interpolate "A" between the two sets of digits. Read the result as an integer.
(Illustrative)

e51B2A30 Coefficient of 2 at 300 V
e51B3=5A25 Coefficient of 3·5 at 250 V

By Quantum efficiency ($n \times 10^{-4}$)
Electromagnetic radiation
Note.— Divide e51 as for cR7.
(Illustrative)

e51G Ultraviolet
e51J Infra-red
Note.— Add the given figure for n to the (IN) for the appropriate radiation and read it as an integer.
(Illustrative)

e51G3 3×10^{-4} for ultraviolet

e52 *By Photoluminiscence build up*
e52B Low
e52B Medium
e52F High

e54 *By Photosensitivity*
e54A *By Time of fading* (sec)
Note.— Add the given figure and read it as an integer.
(Illustrative)

e54A65 65 sec
e54A250 250 sec

By Radiation
Note.— Divide e54 as for cR7.
(Illustrative)

e54G Ultraviolet
e54H Light

By Kind of change
e54X Photochromism (Phototropism)
e54Y Permanent (Irreversible) change

By Corrosion resistance
By Degree of attack

f61 Resistant (neutral glass)
f62 Negligible
f6B Corroded
Note.— Multiply the given figure (in mg/cm²/hr) by 10³, add the result to f68 and read it as an integer.
(Illustrative)

f6B1 0·001 mg/cm²/hr
f6B10 0·01 mg/cm²/hr
f6C Swelling
f6D Absorption
f6E Blooming

f6H *By Temperature* (° C)
Note.— Add the given figure and read it as an integer.
(Illustrative)

f6H150 150° C
f6H225 225° C

By Corroding agent
f6K Weathering
f6K1 Rating 1
f6K2 Rating 2
f6K3 Rating 3
f6L Water
f6L1 Sea water (5% Salt)
f6M Acid
f6M1 HF
f6M2 21% Phosphoric acid
f6M8 85% Phosphoric acid
f6M9 Other acids
Note.— To be derived by (AD).
f6P Base
f6P1 Weak
f6P13 3% Ammonium hydroxide
f6p2 Strong
f6P2K 6·9% Potassium hydroxide
6fP2N 5% Sodium hydroxide
f6R Halogen
f6S Metal salt
f6S3 Acid
f6S4 Neutral
f6S5 Basic
f6S51 0·5 N Sodium carbonate
f6Zb Inorganic nonmetallic halide
f6Zz Sulphur dioxide
f6Ze Dry Ammonia
f6Zg Oxidising chemical
f6Zh Reducing chemical
f6Zm Hydrocarbon
f6Zp Amine

f6Zr Polyhydroxyl aliphatic
f6Zt Mercaptan
f6Zv Oil and fat

By Starting/raw material
Note.— The (IN) enumerated in the schedule for 'source' at the end of the schedule for the constituents may be used prefixing 'z' to the (IN).
(Illustrative)
z12 Feldspar
z61 Soda ash
z71 Dolomite lime stone
In addition the following may be used
zF Glass
Note.—Use (ADPN) *for further division.*
(Illustrative)
zF0(9T) Glass powder
zF0(9V) Cullet

By Constituent
1 *By Nucleating agent*
Note.— To be derived by (AD) using international nomenclature.
(Illustrative)
1TIO2 Titanium oxide

2 *By Minor constituent*
21 Oxide
24 Fluoride
25 Sulphide
26 Phosphate
Note.— The specific constituent may be derived by (AD) using the international nomenclature for the element involved.
(Illustrative)
21AS Arsenic pentoxide
24BA Barium fluoride

By Colouring agent
4 *By Form*
42 Solution
45 Colloid
46 Suspension

5 *By Agent*
Note.— To be derived by (AD).
(Illustrative)
5CD Cadmium
5S Sulphur
5TT Titanium

6 *By Flux*
61 Sodium oxide
62 Potassium oxide
63 Boron trioxide
64 Nitre
66 Fluorine (Fluorspar)

7 *By Stabiliser and modifier oxide*
71 Calcium oxide
72 Magnesium oxide
73 Zinc oxide
74 Barium oxide
75 Aluminum oxide
76 Boric oxide
77 Lead oxide
78 Titania
79A Other oxides
Note.— To be derived by (AD) using international nomenclature.
(Illustrative)
79LI Lithium oxide
79SN Tin oxide

8 *By Network former oxide*
81 Silicon
82 Boron
83 Germanium
84 Aluminum
85 Phosphorus
86 Vanadium
87 Arsenic
88 Antimony
891 Zirconium
89A Other oxides
Note.— To be derived by (AD) using international nomenclature.
(Illustrative)
89BE Berellium oxide
89TA Tantalum oxide
8A Phosphate
Note.— To be derived by (AD) using international nomenclature
(Illustrative)
8LI Lithium Phosphate
Note.— An isolate representing the source of a constituent may be added to the appropriate (IN) in the schedule for consti-

tuent. For illustrative examples see at the end of this schedule for 'Source'.

11 Glass sand (Quartz)
12 Feldspar
13 Petalite
15 Nepheline
16 Syenite
18 $PbSiO_3$
21 Calc ium alumina
23 Alumina hydrate

31 Borax
33 Boric acid

41 Lepidolite
43 Spodumene
45 Lithium carbonate

51 Pearl ash
53 Potassium carbonate
61 Soda ash

71 Dolomite limestone
73 Calcined magnesite
75 High-Ca limestone

81 Litharge
83 Barium carbonate
85 Zinc oxide

(*Illustrative*)

6331 Boron oxide from borax
7512 Aluminium oxide from feldspar
8116 Silicon dioxide from syenite

Note.— The (IN) for the percentage of a constituent in glass may be constructed by adding the given figure for the % to the appropriate (IN) for the constituent interpolating "0" (zero) between the two sets of digits.

(*Illustrative*)

61012=5 Sodium oxide, 12·5%
6161012=5 Sodium oxide from Soda ash, 12·5%
7LI02 Lithium oxide, 2%
7LI4302 Lithium oxide from Spodumene, 2%
81071=8 Silicon dioxide, 71%
8116072 Silicon dioxide from Syenite, 72%

9a *By Glass type*

T (A2) *into* (A1) *begins*

9b Silicate glass

T1 (A3) *into* (A1) *begins*

9c Soda-lime glass
9d Lead glass
9e Boro-silicate glass
9f Alumino silicate glass
9g 96% silica glass
9h Fused silica glass

T1 (A3) *into* (A1) *ends*

9k Lindeman glass
9m Non-silicate glass

T2 (A3) *into* (A1) *begins*

9n Phosphate glass
9p Borate glass
9r Rare earth borate glass
9s Calcium aluminate
9t Calcium germanate
9v Arsenic trisulphide

T2 (A3) *into* (A1) *ends*

9x Glass-ceramic

T (A2) *into* (A1) *ends*

Note.— The above isolates may be used if the individual constituents are not specified.

9A *By Purpose*

T (A2) *into* (A1) *begins*

By Non-fabricated form

9B Plate
9B8 Laminated
9F Sheet
9F1 Reinforced
9J Strip
9J2 Ribbon
9L Rod (cane)
9N Tubing
9T Powder
9T8 Sintered compact
9U Marble
9V Cullet
9W Fibre glass
9W1 Beta glass
9W3 Torsion
9W4 Discontinuous
9W7 Continuous
9X Porous
9Y Foam Glass

	By Fabricated form
	By Structural-Mechanical property-based-purpose
C1	Instrument house for deep submergence vehicle
C2	Jewel bearing
C3	Optically flat surface plates (machinist's flats)
C5	Paraboloidal reflector shell for
C51	Sealed beam headlight
C55	Projector lamp
C7	Accurate bore tube flow-meter
D1	Blue-print machine
D15	Cylinder
D18	Sheet
D2	Mould for flexographic printing
D22	Rubber
D25	Plastics
E1	Diffusion vacuum pump
E2	Oil cap
E3	Lubricator cap
EB	Roller for yarn
EC	Pulley or Godet wheel for yarn
EF	Filter
EH	Slide-valve disc
EH5	Rotary valve seat
EH8	Gas meter valve
EK	Textile
EP	Level vial
G1	Flexible automobile window
G18	Windshield
G7	Safety window
G73	Bullet-proof window
G76	Machine window
G8	Door panel
GB	Safety screen
GB1	Fire screen
GF	Back stop
GH	Building block
GJ	Casing
GM	Cover
GP	Spacer
GR	Mirror disc for reflecting telescope
GT	Float
GV	Abrasive
J1	Bead
J15	Oil well propping
J3	Fluid amplifier
J6	Multi lead
J65	Videograph
J7	Telescope mirror
L	*By Acoustical property-based purpose*
L1	Wools and mat
	By Thermal-property-based purpose
M1	Cooking ware
M3	Honeycomb heat ex-changer
M35	Gas turbine
M4	Honeycomb burner
M6	Insulation
MB	Improved solar-shielding window
MD	Frost-free windshield
ME	Frost-free window
MG	High temperature filter
MH	Solder seal
MK7	Oven window
ML1	Furnace core
ML2	Furnace lining
ML7	Furnace window
MN	Pipe line for heat-exchange
MP	Induction-furnace crucible
MQ	Calcination
MQ1	Jar
MQ3	Tray
MR	Thermocouple protection tube
MS	Heat-absorption sheet
MT1	Dewar flask
MT7	Vacuum bottle
MV	Thermometer tubing
MX	Heat insulation
MX1	Double glazed window
	By Optical-property based-purpose
P	*By Illumination and visibility*
P1	Window (Ordinary)
P3	Skylight
P4	Tile
P5	Incandescent lamp
P55	Envelope
P56	Cover lens
	Glass-ware with
PB2	Diffusion light control
PB3	Lense-action prismatic light control
PC5	Glare removing glass louvre
PD	Explosion globe
Q	*By Optical*
Q1	Lens
Q3	Prism
QC	Mirror

QL1	Eyeglass
QL4	Goggle
R	*By Filtering and colouring*
R2	Ultraviolet transmission
R21	Germicidal lamp
R22	Tubing
R23	Sun-lamp envelop
R25	Black-light tube
R27	Black-light bulb
R28	Filter sheet
R4	Heat and IR transmission
R47	Heat-lamp bulb
R48	Black-light filter
R5	Technical coloured
R51	Signal-ware
R53	Prismatic lens
R55	Roundel
R6	Colour filter
R61	Sheet
R63	Cover
T	*By Special-radiation-property-based use*
T5	Glass laser
T6	Laser beam reflector
T7	Fibre optics
T8	Microwave transmitting radome
TD	X-ray dosimeter glass
TF	Short ultrasonic delay line glass
TG	IR dome
TH	Radioactivity-free photo-multiplier
TJ	Radiation breakdown-proof window
TM	Glass beads for road paint
TN	Light sensitive
TN1	Sign
TN3	Radio face
TN6	Clock face
W	*By Electronic-Electrical property-based purpose*
W2	Insulation
W4	Lighting airester body
W8	Condenser
WB	Fuse plug body
WD	X-ray tube envelope
WE	TV tube
WG	Mercury switch envelop
WH	Metalised glass container hermetically sealed
WK3	Metallised glass (High frequency electronic component)
WM	Sealing glass
WN	Radiant heating panel
WP	Image orthicon tube in TV camera
WR	Subtrate for high-reliability film resistor
WT	Glass electrode
WV	Conductive rowing for ignition cable
WX	Capacitor
Y	*By Chemical and other property-based purpose*
Y1	Container
Y11	Tank
Y12	Jar
Y15	Bottle
Y16	Tumbler
Y3	Cooking utensil
Y5	Pipe line
Y7	Tube
YB	Centrifugal pump part
YD	Laboratory apparatus
YG	Fractionating column
YJ	Sight glass
YM	Gauge glass
	T (A2) *into* (A1) *ends*
	By Make
	Note.— To be derived by Geographical Device
	(*Illustrative*)
(1)	
(42)	Japanese
(73)	American
(A)	*By Brand*
	By Name of company
	Note.— To be derived by (*AD*).
	(*Illustrative*)
(C)	Coning Glass works
(P)	Pilkington Brothers
(PI)	Pittsburgh Plate Glass
	By Name of variety
	Note.— To be derived by (*AD*).
	(*Illustrative*)
(P)	Pyrex
	By Code number
	Note.—The given number to be used as (IN).
	(*Illustrative*)
(8603)	8603
(9606)	9606
(9608)	9608

Note.— The (IN) for the isolates derived by each of the above (QI) are to be connected by "=".

(Illustrative)

(C=8603) Corning 8603
(C=P) Corning Pyrex

Isolates in [M]

Matter

Note. — The isolates derived on the basis of the (QI) 'By Substance' in [2P] are to be used. The (IN) taken from that schedule should be preceded by a ";" (semi-colon) when used to represent an isolate in [M].

(Illustrative)

zGM1 Sodium chloride
61 Sodium oxide
72 Magnesium oxide

Attribute

Note.— The schedule of 'Common Property Isolates' already prepared (4) has been used.

Isolates in [E]

Note.— The provisional schedule of 'Common Energy Isolates' (unpublished) has been used.

Isolates in [2P]

a *By Equipment*

T1 (A2) into (A1) begins

By operation

By power

b2 Mechanical
b5 Electrical

By Method

bC Manual
bD Automatic
bF Semi-automatic

c *By Annealing equipment*

c1 Batch-type kiln
c3 Continuous lehr
c34 Conveyor-belt type
c4 Semi-continuous lehr
c43 Pass type
c6 Zonal lehr

d *By Polishing equipment*

d2 Plastic
d3 Cellulose
d6 Felt
d8 Pitch

f *By Grinding equipment*

f1 Sand paper
f2 Garnet
f3 Corundum
f5 Carbide
f51 Silicon
f52 Boron
f8 Diamond
fB Loose form
fF Grinding wheel
fH Fabric felt

h *By Drilling equipment*

h5 Carbide drill
h8 Bonded diamond drill

j *By Cutting equipment*

j2 Band saw
j25 Circular blade
j28 Wire blade
j3 File
j5 Carbide wheel
j8 Steel wheel

m *By Shaping equipment*

m1 Blow pipe
m3 Lipping paddle
m5 Carbon stick
m6 Table
m8 Roll
mC Corning ribbon machine
mD Danner machine
mI Ivanhoe machine
mP Philips carousel machine
mU Updraw machine
mV Vello machine
mW Westlake machine
p Mold
p1 Coated
p11 Shellac
p13 Varnish
p14 Varnish and mixture of charcoal and linseed oil
pB Block
pD Split
pE Font

pG Paste
pJ Hot iron
pM Individual section

r *By Forming equipment*
r1 Suction type
r11 Owens
r12 O'neill
r15 Roirant
r17 Monish
r6 Automatic god-fed
r61 Lynch
r63 Hartford IS
r64 J-P
r65 MPS
r67 PB
r68 PBS

t *By Stirring equipment*
t1 Bridgewall
t3 Floater
t5 Bubbler

By Melting equipment
v Furnace

vB *By Draught*
vB1 Upward
vB7 Downward

vD *By Shape*
vD1 Rectangular
vD5 Circular

vF *By Regeneration*
vF1 Regeneration
vF3 Recuperation
vF5 Direct fired

vH *By Refractory*
vH1 Fusion cast
vH2 Zircon
vH3 Silica
vH5 Fireclay
vH7 High alumina
vBH Basic
vHD Insulating

vK *By Kind*
vK1 Clay pot
vK11 Open
vK12 Covered
vK3 Day tank
vK5 Continuous tank

vM *By Number*
Note.— Add the given figure and read it as an integer.
(*Illustrative*)
vM2 2
vM3 3

w *By Feeding (Charging) equipment*
w1 Screw feeder
w3 Pusher-type feeder
w5 Blanket batch type feeder

zb *By Mixing equipment*
zb1 Barrel
zb15 Rotating

zd *By Transfer equipment*
zd1 Bucket elevator
zd2 Belt conveyor
zd3 Screw conveyor
zd5 Pneumatic conveyor
zd8 Combination

zf *By Storing equipment*
zf1 Silo
zf11 Hollow tile
zf13 Concrete
zf18 Steel
zf5 Original package

zh *By Unloading equipment*
zh3 Vibrator-gravity
zh4 Drag shovel
zh6 Vacuum system
*T*1 (A2) *into* (A1) *ends*

z1 *By Material used.*

*T*2 (A2) *into* (A1) *begins*
z2 *By Form*
z21 Powder
z25 Liquid
z26 Colloid
zB *By Chilling agent*
zB4 Fused salt
zB5 oil
zB51 Kerosene
zB8 Blast of air

zD *By Decorating agent*
zD5 Liquid metal
Note.— To be derived by (AD) using international nomenclature.
(*Illustrative*)
zD5AU Gold
zD5PD Pallad·um

zE	*By Pool material in drawing*
zE1	Inorganic salt
zE5	Molten metal
zG	*By Polishing agent*
zG3	Acid
zG5	Cerium oxide
zG6	Zirconium oxide
zG7	Ferric oxide
zJ	*By Coupling agent*
zJ1	Glycidoxyl propyl-trimethoxysilane
zJ3	Gamma-ammopropyl-trimethoxysilane
zM	*By Binding agent*
zM1	Starch-oil combination
zR	*By Fining agent*
zR1	Oxide
zR12	Cerium oxide
zR13	Manganese oxide
zR15	Antimony oxide
zR2	Peroxide
zR4	Halide
zR41	Sodium chloride
zR43	Potassium chloride
zR6	Chlorate
zR61	Perchlorate
zR8	Nitrate
zR81	Potassium nitrate
zRB	Ammonium salt
zRD	Sulphate
zRF	Water
zRJ	Steam

By Raw Material

Note.— Use the (IN) *got on the basis of the* (QI) '*By Constituent*' *in* [1P1]

(*Illustrative*)

6	Flux material
63	Boron oxide
81	Silicon dioxide

T 2 (A2) *into* (A1) *ends*

9a	*By Conditions of operation*

T 3 (A2) *into* (A1) *begins*

9b	*By Time of operation*

T 1 (A3) *into* (A1) *begins*

9c	In days (over 24 hours)
9d	In hours (over 60 minutes)
9e	In minutes (over 60 sec)
9f	In seconds (Less than 60 seconds)

Note.— Add the given figure to the appropriate (IN) *and read it as an integer.*

(*Illustrative*)

9c2	2 days
9d3	3 hours
9e55	55 minutes
9f55	55 seconds

T 1 (A3) *into* (A1) *ends*

9g	*By Maximum-minimum temperature*

Note.— Add the given figures for the maximum and minimum temperatures in that sequence interpolating a "—" between the two sets of digits. Read the result as an integer.

(*Illustrative*)

9g650→450	650 to 450° C
9g950→350	950 to 450° C
9h	*By Cooling rate* (Temperature drop/hr)

Note.— Add the given figure and read it as an integer.

(*Illustrative*)

9h15	15° C per hour
9h23	23° C per hour
9j	*By Temperature* (°C)

Note.— Add the given figure and read it as an integer.

(*Illustrative*)

9j350	350°C
9j1740	1740° C
9k	*By Pressure* (Kg/sq cm)

Note.— Add the given figure and read it as an integer.

(*Illustrative*)

9k5=6	5·6 Kg/sq cm
9k8=4	8·4 Kg/sq cm
9m	*By Tolerance* (±)

Note.— Multiply the given figure by 10^4, *add the result to it and read it as an integer.*

(*Illustrative*)

9m15	± 0·0015
9m21	± 0·0021

	By Quantity used
9p	In wt %
9q	In Kg
	Note.— Add the given figure to the appropriate (IN) and read it as an integer.
	(Illustrative)
9p55	55% by wt
9q350	450 Kg
9s	*By Output*
	*T*2 (A2) *into* (A1) *begins*
9t	Per minute (Kg)
9u	Per hour (Metric ton)
9v	Per day (Metric ton)
	(Illustrative)
9t2=5	2·5 Kg/min
9u12	12 metric tons/day
9u130	130 metric tons/day
	By Type of operation
91	Batch
93	Continuous
96	Discontinuous
9A	*By Stage*
	*T*3 (A3) *into* (A1) *begins*
	By Quality improvement
9B	*By Tempering* (Prestressing)
9B4	Heating and chilling
9B8	Gas hearth process
9C	*By Chemical toughening*
9C2	*By Ion exchange*
9D	*By Finishing*
	T (A4) *into* (A1) *begins*
9E	*By Sealing*
	By Material to which sealed
9E1	Metal
9E3	Ceramics
9E4	Glass
9E5	Plastics
	By Method
9EB	Blowing
9ED	Pulling
9EF	Heating
9G	*By Decoration*
9G1	Acid etching
9G2	Copper wheel engraving
9G3	Glazing
9G31	Brush
9G32	Stencil
9G33	Banding
9G35	Rubber Stamping
9G36	Offset process
9G37	Electrostatic print
9G38	Silk screen print
9G5	Staining
9J	*By Polishing*
	*T*1 (A5) *into* (A1) *begins*
9L	*By Surface finish* (Å)
	Note.— Add the given figure and read it as an integer.
	(Illustrative)
9L50	50 Å
9L61	61 Å
9M	*By Flatness* (cm/25cm)
	Note.— Multiply the given figure by 10^6*, add the result to 94 and read it as an integer.*
	(Illustrative)
9M15	0·00015
9M23	0·00023
9R	*By Method*
9P3	Acid (70% HFl + 98% H_2SO_4; 50–50)
9P4	Fire polish
	T (A5) *into* (A1) *begins*
9R	*By Grinding*
	T (A6) *into* (A1) *begins*
9S	*By Removal rate*
	Note.— Multiply the given figure by 10^2*, add the result to 9S and read it as an integer.*
	(Illustrative)
9S5	0·05
9S11	0·11
9T	*By Finish*
	(Arithmetic average)
	Note.— Add the given figure and read it as an integer.
	(Illustrative)
9T3	3
9T4=5	4·5
	*T*2 (A5) *into* (A1) *ends*

9V	*By Drilling*
9V3	Ultrasonic + abrasive
9V5	Electronic beam
9X	*By Cutting*
9X1	Flame cut off
9X2	Sawing
9X3	Score breaking
9X4	Score-thermal crack off
9X6	Thermal crack off
	By Stress relief
B1	Annealing
	By Form/Shape production
C1	Repressing
C2	Redrawing
C4	Dry gaging
C6	Flame blowing
C8	Air blowing
CB	Drawing
CB1	Upward
CD	Rolling
CG	Floating (Pilkington process)
CH	Casting
CJ2	Slip casting
CJ5	Centrifugal casting
CM	Blowing
CP	Pressing
D1	Lamination
D2	Sagging
D3	Shrinking
D5	Foaming
D7	Leaching
DS	Multiform process
E1	Fourcault
E2	Libbey-Owens
E3	Pittsburgh plate glass
E4	Bishernoux
E5	Ford
E6	Pilkington
	By Melt preparation
G1	Conditioning
G3	Bubbling
G5	Stirring
J	*By Fining*
J1	Raising temperature
J2	Pressure applicatoin
	By Batch preparation
M2	Charging
M4	Mixing
M6	Weighing
	By Raw material preparation
P1	Storing
P4	Movement to store
P6	Unloading

8 EXAMPLES

1 F8,445;a247:a3,B1–c6–bD *where*

F8,445;a247:a3, B1–c6–bD	GLASS, Stress, Removal, ANNEALING, Zonal lehr, Automatic operation

N65 BOWMAN (E W) and WILLIAMS (J H). Annealing of glass with the automated zonal lehr. (Nat glass budg. 80, 42; 1965; 16–9).

2 F8,445;f6M-f610gF8,445–89CE;07CE3=cE4 *where*

F8,445;f6M-f610g F8,445–89CE;07CE3 =CE4	GLASS, Acid resistance *influenced by* CONSTITUENT: Cerium 3-Cerium 4 ratio

N62 GOTTARDI (V), PAOLETTI (G) and TORNATI (M). Ratio Ce^{3+}/Ce^{4+} in the melting of different glasses and its influence on their properties. (Vetro silic. 6,35;1962;12–6). (Glass tech abstr. 7; 1966;655)
[Cross reference entries may be prepared for the other subjects dealt with in the document].

3 F8,445,07;a241;b330gF8,4450;a247 *where*

F8,445,07;	GLASS, Surface,
a241;b330g	FLAW, Distribution *influenced by*
F8,44;a247	STRESS in glass

N66 GREENE (C H). Surface flaws in glass and the statistics of flaw distribution. (Glass tech. 7;1966;54–66).

F8,445–09C;cJ:fR *where*

F8,445–09C;	GLASS, Chemically, strengthened
cJ:fR	FATIGUE, Test

N66 I C G, SUB-COMMITTEE A6. Practical strength of a chemically toughened glass. (Silic industr. 31;1966;165–7). (Phys chem glass, abstr. 7;1966;605).

5 F8,445–0E;b733–cP:b1 *where*

F8,445–0E;	GLASS, Melt,
b733–cP:b1	CONVECTIVE FLOW, Heating, calculation

N65 VON PESCHKE (J). Calculation of convective flows which occur in glass melts. (Glastech ber. 38;1965;276–81). (Glass tech abst. 7;1966;500).

6 F8,445–9e–81056=8–79SB1=4–79LI0=1–77015=3–7502=5–7401=5–7201=4–7100=6–63016=1–6201–6104=2–0E0(vK3);a76:fD,S *where*

F8,445–9e–	GLASS, Borosilicate type,
81056=8–	NETWORK FORMER: SiO_2 56·8%,
79SB1=4–79LI0=1–77015 =3–7502=5–7401=5–7201=4–7100=6–	STABILISER MODIFIER (%): Sb_2O_3 1·4, Li_2O 0·1, PbO 15·3, Al_2O_3 2·5, BaO 1·5, MgO 1·4, CaO 0·6,
63016=1–6201–6104=2–	FLUX(%): B_2O_3 16·1, K_2O 1, Na_2O 4·2,
0E0(vK3);	MELT, Tank,
a76:	HOMOGENEITY,
fD,S	ANALYSIS, Shelyubskii method

N66 SHILLING (G) and WEISS (W). Experiments to determine the homogeneity of glasses by the Shelyubskii method. (Glass tech. 7;1966;66–71).

7 F8,445–9f–81045→65–75010→20–7205→20–7103→25;cB70gF8,445:d2,1 *where*

F8,445–9f–	GLASS, Alumino-silicate type,
81045→65–	NETWORK FORMER: SiO_2 45–65%,
75010→20–7205→20–7103→25;	STABILISER/MODIFIER (%): Al_2O 10–20, MgO 5–20, CaO 3–25,
cB70g	CRYSTALLINITY *influenced by*
F8,445:d2,1	NUCLEATING AGENT

N66 LEGER (L) and BRAY (J). Experimental study of the controlled crystallisation of alkaline earth silico aluminate glasses. (Glass tech. 7;1966;134–42). [Cross reference entries may be prepared for the other subjects dealt with in the document].

8 F8,445–9f–81058 = 2–79LIO = 1–7806–3–75024–61010 = 2–c7J695–09C2;a24760gF8,445;c231: 02,9C20(9b·9j) *where*

F8,445–9f–	GLASS, Alumino-silicate type,
81058 = 2–	NETWORK FORMER: SiO_2 58·2,
79LI0 = 1–7806–3–75024–	STABILISER/MODIFIER (%): Li_2O 0·1, TiO_2, 6·3, Al_2O_3 24,
61010 = 2–	FLUX: Na_2O 10·2%
c7J695–	STRAIN POINT: 695°C
09C2;	CHEMICAL STRENGTHENING: Ion exchange method
a24760g	STRESS CURVE *influenced by*
F8,445;c231:02,	STRENGTH, Improvement,
9C20 (9j–9b)	ION EXCHANGE METHOD, Temperature of operation, Time of operation

N66 BURGGRAAF (A J). Strengthening of glass by ion exchange. Part 2 Stress formation and stress relaxation after ion exchange in alkali alumino-silicate glasses in connection with structural changes in the glass. (Phys chem glass. 7;1966;169–72).

9 F8,445–9F:d2,E2–CB1–zE5AL *where*

F8,445–	GLASS,
9F:d2,	SHEET, Production
E2–CB1–zE5AL	LIBBEY-OWENS Process, Upward drawing, Pool material: Molten aluminium

N65 PLUMAT (E). Upward drawing of sheet glass. (U S patent. 3, 193, 365 (1965)).

10 F8,445–9W–9e–89BE0→8–81040→55–7LI0 = 1→1–75019→20–7205→20–63010→20–c2R506→730–c2B9→12 = 3–c1D2→2 = 47 *where*

F8,445–9W–	GLASS, Fibre
9e–	BOROSILICATE TYPE,
89BE0→8–81040→55–	NETWORK FORMER (%): BeO 0–8, SiO_2 40–55,
7LI0 = 1→1–75019→20–7205→20–	STABILISER/MODIFIER (%): LOi_2 0·1–1·0, Al_20_3 19–20, MgO 5–20,
63010→20–	FLUX: B_2O_3 10–20%,
c2R506→730–c2B9→12 = 3–c1D2→2 = 47	PHYSICAL PROPERTY: Tensile strength 506–730, Youngs Modulus 9–12·3, Density 2–2·47

N65 THOMAS (G L). High tensile strength, low density glasses for fibre manufacture. (U S patent. 3,183,104 (1965)). (Glass tech abstr. 7; 1966;492).

11 F8,445–9Y–zF0(9T);20gF8,445–zF0(9T),1;b6 *where*

F8,445–	GLASS
9Y–	PURPOSE: Foam Glass,
zF0(9T);	STARTING MATERIAL: Glass powder,
20g	STRUCTURE *influenced by*
F8,445–zF0(9T);bF22;b6	RAW MATERIAL, Grain, Size

N64 CZERWINSKI (Z). Relationship between the foaming process and the specific surface of the glass grains used. (Szklo ceram. 15;1964;199–201). (Glass tech, abstr. 7;1966;67).
[A cross reference entry may be prepared for the other subjects dealt with in the document].

12 F8,445-J1-8202=8-8108=2-79LI01-78037-7502=4-74044=1-730=2-7103=5-610=4-24BA1=3-cR3B1=91→1=93 *where*

F8,445-	GLASS,
J1-	PURPOSE: Bead,
8202=8-8108=2-	NETWORK FORMER (%): B_2O_3 2·8, SiO_2 8·2,
79LI0=1-78037-7502=4-74044=1-730=2-7103=5-	STABILISER/MODIFIER (%): Li_2O 0·1, TiO_2 37, Al_2O_3 2·4, BaO 44·1, ZnO, 0·2, CaO 3·5,
610=4-	FLUX: Na_2O 0·4
24BA1=3	BARIUM FLUORIDE: 1·3%
cR3B1→91→1=93	REFRACTIVE INDEX: 1·91–1·93

N65 ALEXANDER (E M) and LABINO (D). Glass of high refractive index for making glass beads. (U S patent. 3,193,401 (1965)). (Glass tech, abstr. 7;1966;496).

13 F8,445-T7-9e-81035→50-79R15→25-7503→11-63022→38-cR73B1=5-cQL75-c7G715 *where*

F8,445—	GLASS,
T7 —	PURPOSE: Fibre optics
9e-	BOROSILICATE TYPE,
81035→50-	NETWORK FORMER: SiO_2 35–50%
79R15→25-7503→11-	STABILISER/MODIFIER (%): Rb_2O 15–25, Al_2O_3 3–11
63022→38-	FLUX: B_2O_3 22–38%,
cR73BJ-	REFACTIVE INDEX: 1·5,
cQL75-	THERMAL EXPANSION: 75×10^{-7}
c7G715	SOFTENING POINT: 715°C.

N65 HAGEDORN (E C). Glass for fibre optics. (U S patent. 3,198 642 (1965)). (Glass tech, abstr. 7;1966;669).

14 F8,445-TD-9n-8LI91-8AL4=85-8AG1=07-7603=08-e52B *where*

F8,445,	GLASS,
TD-	PURPOSE: Dosimeter
9n-	PHOSPHATE TYPE,
8LI91-8AL4=85-8AG=07-	NETWORK FORMER (%): $LiPO_3$ 91, Al1·07, $(PO_3)_3$ 4·85, $AgPO_3$
7603=08-	STABILISER/MODIFIER: B_2O_3%
e52B	PHOTOLUMINISCENCE: Low

N65 BECKER (K). New dosimeter glass with improved properties. (Nucl instrum meth 36;1965;323–4).

15 F8,445-Y1-9b-81072→74=1-709=1→13=1-6015→16=8-cQP88=2-c7J497-c7H539-c7G714-c7E176-c7C1207-c1D2=4997-a7B-a2G35-a2E3 *where*

F8,445-	GLASS,
Y1-	PURPOSE: Container

9b–	SILICATE TYPE,
81072→74=1–	NETWORK FORMER: SiO_2 72–74·1%
709=1→13=1–	STABILISER/MODIFIER: Oxides 9·1–13·1%,
6015→16=8–	FLUX: 15–16·8%,
cQP88=2–	THERMAL EXPANSION: $88 \cdot 2 \times 10^{-7}$
c7J497–c7H539–c7G714–c7E176–c7C1207–	VISCOSITY POINTS: Strain point 497° C, Annealing point 539° C, Softening temperature 714° C, Working range index 176, Relative gob temperature 1207° C
c1D2=4997–	DENSITY: 2·4997 g/cm³
a7B–	HOMOGENEITY: Grade B,
a2G35–a2E3	SEEDS AND BLISTERS: 35 per 30 g; Blister 3 per 30 g

N65 SONNE (C R) and LESTER (W R). Container glass compositions (1932–64). (Glass industr. 46;1965;132–7, 163–4, 198–201 236–7).

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1 Sec 0 NEELAMEGHAN (A), GOPINATH (M A), and DENTON (P H). Motor vehicle production: Depth classification: A demonstration. (Lib sc. 4; 1967; Paper H).

2 Sec 312 ——, ——, and ——. (*ibid.* Sec 5).

3 Sec 42 ——, ——, and ——. (*ibid.* Sec 91).

4 Sec 315 51 RANGANATHAN (S R). Common property isolates. (An lib sc. 7; 1960; 1–12).

5 Sec 0 ——. Design of depth classification: Methodology. (Lib sc. 1; 1964; Paper A).