

Référence FR9
Désignation Fritte au zircon
Masse molaire 294,73
Température 940-980 °C
Dilatation 68,57 x 10⁻⁷ °C⁻¹ (Appen)
Formule Moléculaire 0,32 CaO 0,38 Al₂O₃ 2,28 SiO₂
 0,24 Na₂O 0,34 B₂O₃ 0,20 ZrO₂
 0,16 K₂O
 0,28 ZnO

Formule pondérale
 K₂O 5,114 %
 Na₂O 5,047 %
 CaO 6,089 %
 ZnO 7,731 %
 Al₂O₃ 13,146 %
 B₂O₃ 8,031 %
 SiO₂ 46,481 %
 ZrO₂ 8,361 %

Formule en Pourcentage Molaire :

K₂O 3,810 %
 Na₂O 5,714 %
 CaO 7,619 %
 ZnO 6,667 %
 Al₂O₃ 9,048 %
 B₂O₃ 8,095 %
 SiO₂ 54,286 %
 ZrO₂ 4,762 %

Référence FR8
Désignation Fritte Boro-calcique
Masse molaire 212,19
Température 920-1000 °C
Dilatation 84,95 x 10⁻⁷ °C⁻¹ (Appen)
Formule Moléculaire 0,68 CaO 0,03 Al₂O₃ 1,75 SiO₂
0,21 Na₂O 0,61 B₂O₃
0,11 K₂O

Formule pondérale

K₂O 4,883 %
Na₂O 6,134 %
CaO 17,972 %
Al₂O₃ 1,442 %
B₂O₃ 20,014 %
SiO₂ 49,555 %

Formule en Pourcentage Molaire :

K₂O 3,245 %
Na₂O 6,195 %
CaO 20,059 %
Al₂O₃ 0,885 %
B₂O₃ 17,994 %
SiO₂ 51,622 %

Référence FR7
Désignation Fritte Boro-alcaline
Masse molaire 374,01
Température 800-950 °C
Dilatation 93,43 x 10⁻⁷ °C⁻¹ (Appen)
Formule Moléculaire 0,60 Na₂O 0,22 Al₂O₃ 2,74 SiO₂
0,40 K₂O 1,61 B₂O₃

Formule pondérale

K₂O 10,074 %
Na₂O 9,943 %
Al₂O₃ 5,997 %
B₂O₃ 29,968 %
SiO₂ 44,018 %

Formule en Pourcentage Molaire :

K₂O 7,181 %
Na₂O 10,772 %
Al₂O₃ 3,950 %
B₂O₃ 28,905 %
SiO₂ 49,192 %

Référence **FR6**
Désignation **Fritte alcaline craquelée transparente très brillante**
Masse molaire **354,86**
Température **940-980 °C**
Dilatation **89,54 x 10⁻⁷ °C⁻¹ (Appen)**
Formule Moléculaire **0,06 CaO 0,38 Al₂O₃ 2,55 SiO₂**
 0,29 Na₂O 0,26 B₂O₃
 0,19 K₂O 0,04 Fe₂O₃
 0,05 BaO
 0,41 PbO

Formule pondérale
K₂O 5,043 %
Na₂O 5,065 %
CaO 0,948 %
BaO 2,161 %
PbO 25,788 %
Al₂O₃ 10,918 %
B₂O₃ 5,101 %
Fe₂O₃ 1,800 %
SiO₂ 43,176 %

Formule en Pourcentage Molaire :

K₂O 4,492 %
Na₂O 6,856 %
CaO 1,418 %
BaO 1,182 %
PbO 9,693 %
Al₂O₃ 8,983 %
B₂O₃ 6,147 %
Fe₂O₃ 0,946 %
SiO₂ 60,284 %

Référence FR5
Désignation Fritte silice zinc sans alumine
Masse molaire 140,70
Température 1000-1300 °C
Dilatation $113,65 \times 10^{-7} \text{ }^{\circ}\text{C}^{-1}$ (Appen)
Formule Moléculaire 0,21 K₂O 1,10 SiO₂
0,17 Na₂O
0,17 MgO
0,46 ZnO

Formule pondérale

K ₂ O	14,059 %
Na ₂ O	7,489 %
MgO	4,870 %
ZnO	26,606 %
SiO ₂	46,976 %

Formule en Pourcentage Molaire :

K ₂ O	9,953 %
Na ₂ O	8,057 %
MgO	8,057 %
ZnO	21,801 %
SiO ₂	52,133 %

Référence **FR4**
Désignation **Fritte Silico-alcalinocalcaire**
Masse molaire **217,14**
Température **1000-1300 °C**
Dilatation **122,35 x 10⁻⁷ °C⁻¹ (Appen)**
Formule Moléculaire **0,30 CaO 0,03 Al₂O₃ 2,40 SiO₂**
 0,40 Na₂O
 0,30 K₂O

Formule pondérale

K₂O **13,014 %**
Na₂O **11,418 %**
CaO **7,748 %**
Al₂O₃ **1,409 %**
SiO₂ **66,411 %**

Formule en Pourcentage Molaire :

K₂O **8,746 %**
Na₂O **11,662 %**
CaO **8,746 %**
Al₂O₃ **0,875 %**
SiO₂ **69,971 %**

Référence FR3
Désignation Fritte Boro-calcique sans plomb
Masse molaire 443,56
Température 980-1020 °C
Dilatation 61,50 x 10⁻⁷ °C⁻¹ (Appen)
Formule Moléculaire 0,50 CaO 0,45 Al₂O₃ 3,88 SiO₂
 0,25 Na₂O 1,40 B₂O₃
 0,25 K₂O

Formule pondérale

K₂O 5,309 %
 Na₂O 3,493 %
 CaO 6,322 %
 Al₂O₃ 10,344 %
 B₂O₃ 21,973 %
 SiO₂ 52,559 %

Formule en Pourcentage Molaire :

K₂O 3,715 %
 Na₂O 3,715 %
 CaO 7,429 %
 Al₂O₃ 6,686 %
 B₂O₃ 20,802 %
 SiO₂ 57,652 %

Référence FR2
Désignation Bisilicate de plomb
Masse molaire 372,21
Température 950-1000 °C
Dilatation 61,40 x 10⁻⁷ °C⁻¹ (Appen)
Formule Moléculaire 1 PbO 2,48 SiO₂
Formule pondérale
 PbO 59,966 %
 SiO₂ 40,034 %
Formule en Pourcentage Molaire :
 PbO 28,736 %
 SiO₂ 71,264 %

Référence FR1
Désignation Monosilicate de plomb
Masse molaire 279,08
Température 750-800 °C
Dilatation $85,67 \times 10^{-7} \text{ } ^\circ\text{C}^{-1}$ (Appen)
Formule Moléculaire 1 PbO 0,93 SiO₂
Formule pondérale
PbO 79,977 %
SiO₂ 20,023 %
Formule en Pourcentage Molaire :
PbO 51,813 %
SiO₂ 48,187 %

Référence **FR10**
Désignation **Fritte calco alcaline**
Masse molaire **243,24**
Température **980-1020 °C**
Dilatation **77,36 x 10⁻⁷ °C⁻¹ (Appen)**
Formule Moléculaire **0,17 K₂O** **0,12 Al₂O₃** **1,93 SiO₂**
 0,20 Na₂O **0,78 B₂O₃**
 0,19 MgO
 0,44 CaO

Formule pondérale

K₂O	6,583 %
Na₂O	5,096 %
CaO	10,144 %
MgO	3,148 %
Al₂O₃	5,030 %
B₂O₃	22,324 %
SiO₂	47,674 %

Formule en Pourcentage Molaire :

K₂O	4,439 %
Na₂O	5,222 %
CaO	11,488 %
MgO	4,961 %
Al₂O₃	3,133 %
B₂O₃	20,366 %
SiO₂	50,392 %

Oxyde de Fer Rouge / Oxyde de Fer Noir

100 % d'Oxyde de Fer Rouge = 89.98 % d'Oxyde de Fer Noir

Carbonate de Cobalt / Oxyde de Cobalt

100 % de Carbonate de Cobalt = 67.483 % Oxyde de Cobalt

Carbonate de Cuivre / Oxyde de Cuivre

100 % de Carbonate de Cuivre = 64,38 % d'Oxyde de Cuivre

Substitution Gerstley borate

Fritte 3221 Johnson/Matthey		100
Néphéline syénite	80	
Ball clay (l'argile)	20	

Formule Molaire Moyenne :

0.12 Na ₂ O	0.33 SiO ₂
0.16 MgO	0.59 B ₂ O ₃
0.72 CaO	

Poids moléculaire : 165

Sorelslag has the following general formula:

TiO ₂	82%
FeO	8.0%
SiO ₂	2.0%
Al ₂ O ₃	3.0%
MgO	5.0%

Rutile	0,793
Kaolin	0,04
Dolomite	0,12
Magnesium carbonate	0,078
Fe ₂ O ₃	0,077

**Feldspath sodique courant;
utilisé en porcelaine pour sa faible teneur en fer.**

Composition %

6.90	Na ₂ O
4.8	K ₂ O
0.05	MgO
1.70	CaO
19.60	Al ₂ O ₃
66.80	SiO ₂
0.04	Fe ₂ O ₃

0.20 perte au feu.

Carbonate de Baryum / Carbonate de Strontium

100 %de Carbonate de Baryum = 74.81 % de Carbonate de Strontium

Sorelslag has the following general formula:

TiO ₂	82%
FeO	8.0%
SiO ₂	2.0%
Al ₂ O ₃	3.0%
MgO	5.0%

Rutile	0,793
Kaolin	0,04
Dolomite	0,12
Magnesium carbonate	0,078
Fe ₂ O ₃	0,077

Ground Glass

Silica/Alumina ratio: 60.3:1

Equivalent Molecular Weight: 242.381

Molecular Formula of Ground Glass:

K₂O 0.026 Al₂O₃ 0.047 SiO₂ 2.865

Na₂O 0.508 B₂O₃ 0.105

CaO 0.346

MgO 0.120

Percentage Analysis (wheight %)

71.00 % SiO₂

2.00 % Al₂O₃

1.00 % K₂O

13.00 % Na₂O

2.00 % MgO

8.00 % CaO

3.00 % B₂O₃

100 % TOTAL

Comments: An estimated analysis of your average window glass.

Glass - window

Silica/Alumina ratio: 247.1:1

Equivalent Molecular Weight: 212.046

Molecular Formula of Glass - window:

K2O	0.002	Al2O3	0.010	SiO2	2.570
Na2O	0.464	B2O3	0.003	SO3	0.008
CaO	0.323	Fe2O3	0.001		
MgO	0.211				

Percentage Analysis (wheight %)

72.79 % SiO2
0.50 % Al2O3
0.10 % K2O
13.55 % Na2O
4.02 % MgO
8.54 % CaO
0.10 % B2O3
0.10 % Fe2O3
0.30 % SO3

100 % TOTAL

Comments: Average (approximate) analysis for window-type glass.

C 1255

Référence C 1255
Désignation Fritte zirconifère
Température 920 / 1020 °C
Dilatation 58

Formule Moléculaire
0,30 NaKO 0,19 Al₂O₃ 3,2 SiO₂
0,36 CaO 0,60 B₂O₃
0,30 ZnO
0,19 ZrO₂

Formule pondérale

K ₂ O	4,10 %
Na ₂ O	2,70 %
CaO	5,85 %
ZnO	7,08 %
Al ₂ O ₃	5,62 %
B ₂ O ₃	12,11 %
SiO ₂	55,75 %
ZrO ₂	6,79 %

Formule en Pourcentage Molaire :

K ₂ O	2,92 %
Na ₂ O	2,92 %
CaO	7 %
ZnO	5,84 %
Al ₂ O ₃	3,7 %
B ₂ O ₃	11,67 %
SiO ₂	62,26 %
ZrO ₂	3,7 %

C 1253

Référence C 1253
Désignation Fritte boro-alcaline sans plomb
Température 880 /920 °C
Dilatation 71

Formule Moléculaire

0,65 Na ₂ O	0,19 Al ₂ O ₃	2,5 SiO ₂
0,21 CaO	0,94 B ₂ O ₃	
0,08 ZnO		
0,05 BaO		

Formule pondérale

Na ₂ O	13,37 %
CaO	3,91 %
BaO	2,54 %
ZnO	2,16 %
Al ₂ O ₃	6,43 %
B ₂ O ₃	21,72 %
SiO ₂	49,86 %

Formule en Pourcentage Molaire :

Na ₂ O	14,07 %
CaO	4,55 %
BaO	1,08 %
ZnO	1,73 %
Al ₂ O ₃	4,11 %
B ₂ O ₃	20,35 %
SiO ₂	54,11 %

Hommel Frit 90

M.P./jF 1550

Silica/Alumina ratio: 9.6:1

Equivalent Molecular Weight: 267.200

Molecular Formula of Hommel Frit 90:

K2O 0.012 Al2O3 0.255 SiO2 2.440

Na2O 0.273 B2O3 0.535

CaO 0.665

MgO 0.050

Percentage Analysis

54.86 % SiO2

9.74 % Al2O3

0.42 % K2O

6.33 % Na2O

0.76 % MgO

13.97 % CaO

13.92 % B2O3

100 % TOTAL

Formule en Pourcentage Molaire :

K2O 0,284 %

Na2O 6,458 %

CaO 15,732 %

MgO 1,183 %

Al2O3 6,033 %

B2O3 12,633 %

SiO2 57,677 %

Comments: 7.7×10^{-6} Coefficient of expansion - a close substitute for Ferro Frit 3124

Hommel Frit 529

M.P./jF 1400

Silica/Alumina ratio: 28.8:1

Equivalent Molecular Weight: 253.300

Molecular Formula of Hommel Frit 529:

K2O 0.057 Al2O3 0.101 SiO2 2.900

Na2O 0.680 B2O3 0.095

CaO 0.263

Percentage Analysis

68.76 % SiO2

4.05 % Al2O3

2.11 % K2O

16.65 % Na2O

5.82 % CaO

2.61 % B2O3

100 % TOTAL

ormule en Pourcentage Molaire :

K2O 1,392 %

Na2O 16,61 %

CaO 6,424 %

Al2O3 2,467 %

B2O3 2,32 %

SiO2 70,787 %

Comments: 9.6 x10-6 Coefficient of expansion - a close substitute for Ferro Frit 3110

Hommel Frit 33

M.P./jF 1225.0

Equivalent Molecular Weight: 273.300

Molecular Formula of Hommel Frit 33:

Na₂O 0.282 B₂O₃ 0.565 SiO₂ 0.934
PbO 0.718

Percentage Analysis

20.54 % SiO₂

6.39 % Na₂O

58.71 % PbO

14.36 % B₂O₃

100 % TOTAL

Formule en Pourcentage Molaire :

Na₂O 11,294 %
PbO 28,755 %
B₂O₃ 22,547 %
SiO₂ 37,405 %

Comments: 10.9 x10⁻⁶ Coefficient of expansion O. Hommel Co.

Potential Health Hazards:

contains Lead - avoid ingestion. DO NOT USE FOR WARE INTENDED FOR FOOD.

Hommel Frit 24

Equivalent Molecular Weight: 353.200

Molecular Formula of Hommel Frit 24:

Na2O 0.186 Al2O3 0.109 SiO2 2.571

CaO 0.305 B2O3 0.653

PbO 0.509

Percentage Analysis

43.74 % SiO2

3.15 % Al2O3

3.27 % Na2O

4.85 % CaO

32.15 % PbO

12.85 % B2O3

100 % TOTAL

Formule en Pourcentage Molaire :

Na2O 4,296 %

CaO 7,044 %

PbO 11,732 %

Al2O3 2,517 %

B2O3 15,058 %

SiO2 59,353 %

Comments: 7.5 x10-6 Coefficient of expansion

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD.

Hommel Frit 14

M.P./iF 1720

Equivalent Molecular Weight: 190.900

Molecular Formula of Hommel Frit 14:

Na2O 0.319 B2O3 0.639 SiO2 1.473

CaO 0.681

Percentage Analysis

46.36 % SiO2

10.36 % Na2O

20.02 % CaO

23.26 % B2O3

100 % TOTAL

Formule en Pourcentage Molaire :

Na2O 10,261 %

CaO 21,904 %

B2O3 20,489 %

SiO2 47,346 %

Comments: 9.2×10^{-6} Coefficient of expansion melting range 1720_i F A close substitute for Ferro Frit 3134

PotteryCrafts Frit P2962

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 194.191

Molecular Formula of PotteryCrafts Frit P2962:

K2O 0.210 Al2O3 0.093 SiO2 1.660
Na2O 0.580 B2O3 0.105
CaO 0.105
BaO 0.105

Percentage Analysis

51.34 % SiO2
4.88 % Al2O3
10.19 % K2O
18.51 % Na2O
3.03 % CaO
8.29 % BaO
3.75 % B2O3

100 % TOTAL

Comments: High alkaline frit. From PotteryCrafts in England.

116.Pottery Craft 2955

Mol Wt: 234.7

M.P. 920 - 1050 C

Molecular Formula:

K2O 0.214 Al2O3 1.205 SiO2 1.884
Na2O 0.417 B2O3 0.425
CaO 0.366
MgO 0.002

PotteryCrafts Frit P2961

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 360.333

Molecular Formula of PotteryCrafts Frit P2961:

Na₂O 0.490 Al₂O₃ 0.806 SiO₂ 2.599

CaO 0.500 B₂O₃ 0.911

MgO 0.010

Percentage Analysis

43.32 % SiO₂

22.80 % Al₂O₃

8.43 % Na₂O

0.11 % MgO

7.78 % CaO

17.56 % B₂O₃

100 % TOTAL

Comments: Standard alkaline frit. From PotteryCrafts in England.

PotteryCrafts Frit P2960

Silica/Alumina ratio: 6.1:1

Equivalent Molecular Weight: 390.745

Molecular Formula of PotteryCrafts Frit P2960:

K₂O 0.029 Al₂O₃ 0.556 SiO₂ 3.403

Na₂O 0.202 B₂O₃ 1.030

CaO 0.760

MgO 0.010

Percentage Analysis

52.30 % SiO₂

14.50 % Al₂O₃

0.70 % K₂O

3.20 % Na₂O

0.10 % MgO

10.90 % CaO

18.30 % B₂O₃

100 % TOTAL

Comments: From PotteryCrafts in England.

PotteryCrafts Frit P2959

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 456.087

Molecular Formula of PotteryCrafts Frit P2959:

Na₂O 0.400 Al₂O₃ 0.300 SiO₂ 5.000

CaO 0.300 B₂O₃ 1.000

MgO 0.250

ZnO 0.050

Percentage Analysis

65.84 % SiO₂

6.71 % Al₂O₃

5.44 % Na₂O

2.21 % MgO

3.69 % CaO

0.89 % ZnO

15.23 % B₂O₃

100 % TOTAL

Comments: High temperature borax frit. From PotteryCrafts in England.

PotteryCrafts Frit P2958

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 447.071

Molecular Formula of PotteryCrafts Frit P2958:

K₂O	0.057	Al₂O₃	0.523	SiO₂	4.310
Na₂O	0.515	B₂O₃	1.060		
CaO	0.428				

Percentage Analysis

57.90 % SiO₂

11.93 % Al₂O₃

1.20 % K₂O

7.14 % Na₂O

5.37 % CaO

16.46 % B₂O₃

100 % TOTAL

Comments: borax frit. From PotteryCrafts in England.

PotteryCrafts Frit P2957

Silica/Alumina ratio: 6.1:1

Equivalent Molecular Weight: 454.455

Molecular Formula of PotteryCrafts Frit P2957:

K2O 0.132 Al2O3 0.418 SiO2 4.703
Na2O 0.264 B2O3 0.963
CaO 0.594
MgO 0.010

Percentage Analysis

62.15 % SiO2
9.38 % Al2O3
2.74 % K2O
3.60 % Na2O
0.09 % MgO
7.33 % CaO
14.71 % B2O3

100 % TOTAL

Comments: borax frit. From PotteryCrafts in England.

PotteryCrafts Frit P2954

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 206.705

Molecular Formula of PotteryCrafts Frit P2954:

CaO 1.000 Al₂O₃ 0.097 SiO₂ 0.609

B₂O₃ 1.500

Percentage Analysis

17.70 % SiO₂

4.78 % Al₂O₃

27.13 % CaO

50.39 % B₂O₃

100 % TOTAL

Comments: Calcium borate frit. From PotteryCrafts in England.

PotteryCrafts Frit P2951

Equivalent Molecular Weight: 325.690

Molecular Formula of PotteryCrafts Frit P2951:

PbO 1.000 SiO2 1.540

TiO2 0.125

Percentage Analysis

28.40 % SiO2

68.53 % PbO

3.07 % TiO2

100 % TOTAL

Comments: Lead sesquisilicate frit. From PotteryCrafts in England.

PotteryCrafts Frit P2950

Silica/Alumina ratio: 6.1:1

Equivalent Molecular Weight: 343.688

Molecular Formula of PotteryCrafts Frit P2950:

PbO 1.000 Al₂O₃ 0.086 SiO₂ 1.860

Percentage Analysis

32.50 % SiO₂

2.55 % Al₂O₃

64.95 % PbO

100 % TOTAL

Comments: Lead bisilicate frit. From PotteryCrafts in England.

PotClays Frit 2279

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 534.695

Molecular Formula of PotClays Frit 2279:

CaO 0.350 Al₂O₃ 0.430 SiO₂ 5.720

MgO 0.272 B₂O₃ 1.380

ZnO 0.187

Li₂O 0.190

Percentage Analysis

64.25 % SiO₂

8.20 % Al₂O₃

2.05 % MgO

3.67 % CaO

1.06 % Li₂O

2.85 % ZnO

17.92 % B₂O₃

100 % TOTAL

Comments: Low expansion frit. From PotClays in England.

PotClays Frit 2275

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 178.835

Molecular Formula of PotClays Frit 2275:

K₂O 0.330 Al₂O₃ 0.100 SiO₂ 1.500

Na₂O 0.500 B₂O₃ 0.100

CaO 0.170

Percentage Analysis

50.38 % SiO₂

5.70 % Al₂O₃

17.38 % K₂O

17.33 % Na₂O

5.33 % CaO

3.88 % B₂O₃

100 % TOTAL

Comments: High alkaline frit. From PotClays in England.

PotClays Frit 2270

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 423.508

Molecular Formula of PotClays Frit 2270:

Na₂O 0.414 Al₂O₃ 0.236 SiO₂ 3.850

CaO 0.413 B₂O₃ 0.827 ZrO₂ 0.426

MgO 0.112

ZnO 0.061

Percentage Analysis

54.60 % SiO₂

5.68 % Al₂O₃

6.06 % Na₂O

1.07 % MgO

5.47 % CaO

1.17 % ZnO

13.56 % B₂O₃

12.39 % ZrO₂

100 % TOTAL

Comments: White zircon borax frit. From PotClays in England.

PotClays Frit 2268

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 206.705

Molecular Formula of PotClays Frit 2268:

CaO 1.000 Al₂O₃ 0.097 SiO₂ 0.609

B₂O₃ 1.500

Percentage Analysis

17.70 % SiO₂

4.78 % Al₂O₃

27.13 % CaO

50.39 % B₂O₃

100 % TOTAL

Comments: Calcium borate frit. From PotClays in England.

PotClays Frit 2263

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 233.533

Molecular Formula of PotClays Frit 2263:

K2O 0.033 Al2O3 0.173 SiO2 1.880

Na2O 0.330 B2O3 0.630

CaO 0.634

MgO 0.003

Percentage Analysis

48.35 % SiO2

7.55 % Al2O3

1.33 % K2O

8.76 % Na2O

0.05 % MgO

15.22 % CaO

18.73 % B2O3

100 % TOTAL

Comments: Standard borate frit. From PotClays in England.

PotClays Frit 2262

Equivalent Molecular Weight: 326.206

Molecular Formula of PotClays Frit 2262:

PbO 1.000 SiO2 1.549

TiO2 0.125

Percentage Analysis

28.51 % SiO2

68.43 % PbO

3.06 % TiO2

100 % TOTAL

Comments: lead sesquisilicate frit. From PotClays in England.

PFrit 2261 PotClays

Silica/Alumina ratio: 8.2:1

Equivalent Molecular Weight: 343.688

Molecular Formula of PotClays Frit 2261:

PbO 1.000 Al₂O₃ 0.086 SiO₂ 1.860

Percentage Analysis

32.50 % SiO₂

2.55 % Al₂O₃

64.95 % PbO

100 % TOTAL

Comments: lead bisilicate frit. From PotClays in England.

Pemco Frit Pb-83

M.P./iF 1050

Equivalent Molecular Weight: 271.487

Molecular Formula of Pemco Frit Pb-83:

Na2O 0.280 B2O3 0.563 SiO2 0.904

PbO 0.720

Percentage Analysis

20.00 % SiO2

6.40 % Na2O

59.20 % PbO

14.40 % B2O3

100 % TOTAL

Comments: 10.4×10^{-6} coefficient of thermal expansion (50-450i C) I.F.P. iC = Melting Range iF = 1000-1050

Potential Health Hazards:

contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD.

Pemco Frit Pb-742

Cost/lb: \$1.00

M.P./iF 1400

Silica/Alumina ratio: 21.5:1

Equivalent Molecular Weight: 355.500

Molecular Formula of Pemco Frit Pb-742:

Na2O 0.210 Al2O3 0.121 SiO2 2.589

CaO 0.289 B2O3 0.670

PbO 0.501

Percentage Analysis

43.76 % SiO2

3.46 % Al2O3

3.66 % Na2O

4.57 % CaO

31.47 % PbO

13.09 % B2O3

100 % TOTAL

Comments: 6.5×10^{-6} coefficient of thermal expansion (50-450i C) I.F.P. iC = Melting Range iF = 1350-1450

Potential Health Hazards:

contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD.

Pemco Frit Pb-349

M.P./iF 1670.0

Silica/Alumina ratio: 14.7:1

Equivalent Molecular Weight: 312.850

Molecular Formula of Pemco Frit Pb-349:

K2O 0.090 Al2O3 0.190 SiO2 2.802

Na2O 0.091 B2O3 0.360

CaO 0.580

PbO 0.240

Percentage Analysis

53.80 % SiO2

6.20 % Al2O3

2.70 % K2O

1.80 % Na2O

10.40 % CaO

17.10 % PbO

8.00 % B2O3

100 % TOTAL

Comments: 6.5×10^{-6} coefficient of thermal expansion (50-450; C) I.F.P. iC = Melting Range iF = 1590-1670

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD.

Pemco Frit P-941

M.P./ F 2250

Silica/Alumina ratio: 5.3:1

Equivalent Molecular Weight: 218.303

Molecular Formula of Pemco Frit P-941:

CaO 0.128 Al₂O₃ 0.420 SiO₂ 2.217

MgO 0.872

Percentage Analysis

61.00 % SiO₂

19.60 % Al₂O₃

16.10 % MgO

3.30 % CaO

100 % TOTAL

Comments: 4.4×10^{-6} coefficient of thermal expansion (50-450 C) I.F.P. C = Melting Range F = 2250-2320

Pemco Frit P-930

M.P./iF 1500

Silica/Alumina ratio: 21.7:1

Equivalent Molecular Weight: 300.585

Molecular Formula of Pemco Frit P-930:

Na2O	0.209	Al2O3	0.121	SiO2	2.617
CaO	0.289	B2O3	0.667	ZrO2	0.029
SrO	0.502				

Percentage Analysis

52.30 % SiO2

4.10 % Al2O3

4.30 % Na2O

5.40 % CaO

17.31 % SrO

15.40 % B2O3

1.20 % ZrO2

100 % TOTAL

Comments: 6.8×10^{-6} coefficient of thermal expansion (50-450; C) I.F.P. iC = 675 Melting Range iF = 1500-1600

Pemco Frit P-926

M.P./ μ F 1650

Silica/Alumina ratio: 17.2:1

Equivalent Molecular Weight: 266.992

Molecular Formula of Pemco Frit P-926:

K₂O 0.241 Al₂O₃ 0.131 SiO₂ 2.245

Na₂O 0.732 B₂O₃ 0.719

Li₂O 0.027

Percentage Analysis

50.50 % SiO₂

4.99 % Al₂O₃

8.50 % K₂O

17.00 % Na₂O

0.30 % Li₂O

18.70 % B₂O₃

100 % TOTAL

Comments: 8.4×10^{-6} coefficient of thermal expansion (50-450 μ C) I.F.P. μ C = 640 Melting Range μ F = 1650-1700

Pemco Frit P-878

M.P./iF 1500

Equivalent Molecular Weight: 261.140

Molecular Formula of Pemco Frit P-878:

Na2O	0.320	B2O3	0.639	SiO2	1.879
CaO	0.680	ZrO2	0.373		

Percentage Analysis

43.21 % SiO2

7.60 % Na2O

14.60 % CaO

17.00 % B2O3

17.60 % ZrO2

100 % TOTAL

Comments: 7.9 x 10-6 coefficient of thermal expansion (50-450i C) I.F.P. iC = 650 Melting Range iF = 1500-1590

Pemco Frit P-830

M.P./iF 1320

Equivalent Molecular Weight: 271.159

Molecular Formula of Pemco Frit P-830:

Na₂O 0.652 B₂O₃ 0.843 SiO₂ 2.542

CaO 0.348

Percentage Analysis

56.30 % SiO₂

14.90 % Na₂O

7.20 % CaO

21.60 % B₂O₃

100 % TOTAL

Comments: 8.6×10^{-6} coefficient of thermal expansion (50-450; C) I.F.P. iC = 605 Melting Range iF = 1320-1420

Pemco Frit P-827

M.P./ μ F 2000

Silica/Alumina ratio: 11.1:1

Equivalent Molecular Weight: 181.426

Molecular Formula of Pemco Frit P-827:

K₂O 0.096 Al₂O₃ 0.141 SiO₂ 1.556

Na₂O 0.041

CaO 0.427

MgO 0.050

ZnO 0.321

BaO 0.065

Percentage Analysis

51.50 % SiO₂

7.90 % Al₂O₃

5.00 % K₂O

1.40 % Na₂O

1.10 % MgO

13.20 % CaO

5.50 % BaO

14.39 % ZnO

100 % TOTAL

Comments: 7.0×10^{-6} coefficient of thermal expansion (50-450 μ C) I.F.P. μ C = Melting Range μ F = 2000-2040

Pemco Frit P-802

M.P./iF 1350

Silica/Alumina ratio: 8.8:1

Equivalent Molecular Weight: 275.452

Molecular Formula of Pemco Frit P-802:

K2O 0.202 Al2O3 0.260 SiO2 2.291

Na2O 0.360 B2O3 0.655

CaO 0.438

Percentage Analysis

49.94 % SiO2

9.61 % Al2O3

6.91 % K2O

8.11 % Na2O

8.91 % CaO

16.51 % B2O3

100 % TOTAL

Comments: 9.9 x 10⁻⁶ coefficient of thermal expansion (50-450i C) I.F.P. iC = 558 Melting Range iF = 1350-1450

Pemco Frit P-786

M.P./ μ F 1640

Silica/Alumina ratio: 14.8:1

Equivalent Molecular Weight: 283.119

Molecular Formula of Pemco Frit P-786:

K₂O 0.090 Al₂O₃ 0.189 SiO₂ 2.791

Na₂O 0.091 B₂O₃ 0.359

CaO 0.581

SrO 0.238

Percentage Analysis

59.20 % SiO₂

6.80 % Al₂O₃

2.99 % K₂O

2.00 % Na₂O

11.50 % CaO

8.70 % SrO

8.80 % B₂O₃

100 % TOTAL

Comments: 7.2×10^{-6} coefficient of thermal expansion (50-450 μ C) I.F.P. μ C = Melting Range μ F = 1640-1910

Pemco Frit P-688

M.P./iF 1550

Silica/Alumina ratio: 11.9:1

Equivalent Molecular Weight: 160.785

Molecular Formula of Pemco Frit P-688:

K2O 0.051 Al2O3 0.111 SiO2 1.312

Na2O 0.041

CaO 0.453

MgO 0.171

ZnO 0.172

BaO 0.111

Percentage Analysis

49.00 % SiO2

7.01 % Al2O3

2.99 % K2O

1.60 % Na2O

4.30 % MgO

15.80 % CaO

10.60 % BaO

8.70 % ZnO

100 % TOTAL

Comments: 8.0×10^{-6} coefficient of thermal expansion (50-450i C) I.F.P. iC = Melting Range iF = 1550-2100

Pemco Frit P-67

M.P./ μ F 1530

Silica/Alumina ratio: 5.9:1

Equivalent Molecular Weight: 310.163

Molecular Formula of Pemco Frit P-67:

K₂O 0.119 Al₂O₃ 0.368 SiO₂ 2.169

Na₂O 0.190 B₂O₃ 1.161

CaO 0.691

Percentage Analysis

42.00 % SiO₂

12.10 % Al₂O₃

3.60 % K₂O

3.80 % Na₂O

12.50 % CaO

26.00 % B₂O₃

100 % TOTAL

Comments: 7.0×10^{-6} coefficient of thermal expansion (50-450 μ C) Melting range: 1530-1760 μ F

Pemco Frit P-64

M.P./iF 1299.9

Silica/Alumina ratio: 68.0:1

Equivalent Molecular Weight: 206.958

Molecular Formula of Pemco Frit P-64:

K2O	0.010	Al2O3	0.020	SiO2	1.360
Na2O	0.160	B2O3	0.290	ZrO2	0.170
CaO	0.330	F	0.220		
ZnO	0.390				
BaO	0.110				

Percentage Analysis

39.47 % SiO2

0.99 % Al2O3

0.46 % K2O

4.79 % Na2O

8.94 % CaO

8.15 % BaO

15.34 % ZnO

9.73 % B2O3

10.12 % ZrO2

2.02 % F

100 % TOTAL

Comments: 7.8 x 10⁻⁶ coefficient of thermal expansion (50-450i C) I.F.P. iC = 616 Melting Range iF = 1300-1420

Pemco Frit P-626

M.P./ μ F 1500

Silica/Alumina ratio: 15.5:1

Equivalent Molecular Weight: 371.802

Molecular Formula of Pemco Frit P-626:

Na₂O 0.336 Al₂O₃ 0.197 SiO₂ 3.044

BaO 0.664 B₂O₃ 0.664

Percentage Analysis

49.19 % SiO₂

5.40 % Al₂O₃

5.60 % Na₂O

27.40 % BaO

12.40 % B₂O₃

100 % TOTAL

Comments: 7.2×10^{-6} coefficient of thermal expansion (50-450 μ C) Melting range: 1460-1570 μ F Ferro frit 3289 is a direct substitute.

Pemco Frit P-609

M.P./°C 625.0

Silica/Alumina ratio: 12.5:1

Equivalent Molecular Weight: 255.679

Molecular Formula of Pemco Frit P-609:

K₂O	0.030	Al₂O₃	0.200	SiO₂	2.500
Na₂O	0.090	B₂O₃	0.330		
CaO	0.320				
MgO	0.210				
Li₂O	0.140				
SrO	0.210				

Percentage Analysis

59.06 % SiO₂

8.02 % Al₂O₃

1.11 % K₂O

2.19 % Na₂O

3.33 % MgO

7.06 % CaO

8.56 % SrO

1.65 % Li₂O

9.01 % B₂O₃

100 % TOTAL

Comments: 6.9 x 10⁻⁶ coefficient of thermal expansion (50-450° C) Melting point 1430-1530°F

Pemco Frit P-586

M.P./iF 1600

Silica/Alumina ratio: 10.2:1

Equivalent Molecular Weight: 188.802

Molecular Formula of Pemco Frit P-586:

K2O	0.080	Al2O3	0.152	SiO2	1.550
Na2O	0.049	B2O3	0.122		
CaO	0.481				
MgO	0.028				
ZnO	0.311				
BaO	0.050				

Percentage Analysis

49.30 % SiO2

8.20 % Al2O3

4.00 % K2O

1.60 % Na2O

0.60 % MgO

14.30 % CaO

4.09 % BaO

13.41 % ZnO

4.50 % B2O3

100 % TOTAL

Comments: 7.5 x 10⁻⁶ coefficient of thermal expansion (50-450i C) I.F.P. iC = 689 Melting Range iF = 1600-1860

Pemco Frit P-54

Cost/lb: \$.57

M.P./iF 1400

Equivalent Molecular Weight: 189.700

Molecular Formula of Pemco Frit P-54:

Na2O 0.320 B2O3 0.635 SiO2 1.457

CaO 0.680

Percentage Analysis

46.17 % SiO2

10.46 % Na2O

20.12 % CaO

23.26 % B2O3

100 % TOTAL

Comments: 8.9×10^{-6} coefficient of thermal expansion (50-450; C) Melting range: 1400-1480; F

Pemco Frit P-318

M.P./iF 1650

Equivalent Molecular Weight: 366.022

Molecular Formula of Pemco Frit P-318:

BaO 1.000 B2O3 1.049 SiO2 2.328

Percentage Analysis

38.20 % SiO2

41.90 % BaO

19.90 % B2O3

100 % TOTAL

Comments: 7.0 x 10⁻⁶ coefficient of thermal expansion (50-450i C) I.F.P. iC = 650 Melting Range iF = 1650-1800

65.Pemco Frit P-404

M.P./iF 1430

Silica/Alumina ratio: 6.7:1

Equivalent Molecular Weight: 186.834

Molecular Formula of Pemco Frit P-404:

K2O 0.238 Al2O3 0.198 SiO2 1.325

Na2O 0.139

CaO 0.406

BaO 0.217

Percentage Analysis

42.60 % SiO2

10.80 % Al2O3

12.00 % K2O

4.60 % Na2O

12.20 % CaO

17.80 % BaO

100 % TOTAL

Comments: 13.0 x 10⁻⁶ coefficient of thermal expansion (50-450i C) I.F.P. iC = Melting Range iF = 1430-1960

Pemco Frit P-311

M.P./°C 1500

Silica/Alumina ratio: 9.2:1

Equivalent Molecular Weight: 275.056

Molecular Formula of Pemco Frit P-311:

K₂O 0.020 Al₂O₃ 0.270 SiO₂ 2.486

Na₂O 0.288 B₂O₃ 0.570

CaO 0.691

Percentage Analysis

54.30 % SiO₂

10.00 % Al₂O₃

0.70 % K₂O

6.50 % Na₂O

14.10 % CaO

14.40 % B₂O₃

100 % TOTAL

Comments: 7.0 x 10⁻⁶ coefficient of thermal expansion (50-450° C) IFP 669 °C melting range 1500-1630°F

Pemco Frit P-283

Cost/lb: \$1.62

M.P./iF 1420

Silica/Alumina ratio: 22.0:1

Equivalent Molecular Weight: 344.200

Molecular Formula of Pemco Frit P-283:

Na2O 0.922 Al2O3 0.199 SiO2 4.385

CaO 0.018

MgO 0.060

Percentage Analysis

76.50 % SiO2

5.90 % Al2O3

16.60 % Na2O

0.70 % MgO

0.30 % CaO

100 % TOTAL

Comments: 9.2×10^{-6} coefficient of thermal expansion (50-450i C) melting range of 1420-1670i F

Pemco Frit P-25

Cost/lb: \$.62

M.P./ F 1400.0

Silica/Alumina ratio: 6.9:1

Equivalent Molecular Weight: 318.900

Molecular Formula of Pemco Frit P-25:

K₂O 0.184 Al₂O₃ 0.381 SiO₂ 2.629

Na₂O 0.760 B₂O₃ 0.774

CaO 0.029

ZnO 0.028

Percentage Analysis

49.55 % SiO₂

12.17 % Al₂O₃

5.43 % K₂O

14.78 % Na₂O

0.50 % CaO

0.70 % ZnO

16.86 % B₂O₃

100 % TOTAL

Comments: 10.0×10^{-6} coefficient of thermal expansion (50-450 C) m.p. 1320-1420 F

Pemco Frit P-238

M.P./iF 1450.0

Silica/Alumina ratio: 4.3:1

Equivalent Molecular Weight: 670.728

Molecular Formula of Pemco Frit P-238:

K2O 0.221 Al2O3 1.086 SiO2 4.635

Na2O 0.779 B2O3 3.062

Percentage Analysis

41.50 % SiO2

16.50 % Al2O3

3.10 % K2O

7.20 % Na2O

31.70 % B2O3

100 % TOTAL

Comments: 7.6×10^{-6} coefficient of thermal expansion (50-450i C) I.F.P. iC = 535 Melting Range iF = 1450-1560

Leadless Frit

M.P./iF 1600i

Silica/Alumina ratio: 9.4:1

Equivalent Molecular Weight: 279.314

Molecular Formula of Leadless Frit:

K2O 0.002 Al2O3 0.274 SiO2 2.580

Na2O 0.287 B2O3 0.553

CaO 0.711

Percentage Analysis

55.50 % SiO2

10.02 % Al2O3

0.07 % K2O

6.38 % Na2O

14.28 % CaO

13.76 % B2O3

100 % TOTAL

Lead Sequisilicate

M.P./ T_c 850

Equivalent Molecular Weight: 626.700

Molecular Formula of Lead Sequisilicate:

PbO 1.000 SiO₂ 2.000

Percentage Analysis

34.99 % SiO₂

65.01 % PbO

100 % TOTAL

Comments: 2 PbO \times 3 SiO₂

Potential Health Hazards:

TOXIC-avoid ingestion. DO NOT USE IN GLAZES FOR WARE INTENDED FOR FOOD.

Lead Monosilicate

Cost/lb: \$1.92

M.P./iF 1340.0

Equivalent Molecular Weight: 262.609

Molecular Formula of Lead Monosilicate:

PbO 1.000 SiO₂ 0.656

Percentage Analysis

15.00 % SiO₂

85.00 % PbO

100 % TOTAL

Comments: 9.3 x 10⁻⁶ coefficient of thermal expansion (50-450_i C) 3 PbO₂ SiO₂

Potential Health Hazards:

TOXIC-avoid ingestion. DO NOT USE ON WARE INTENDED FOR FOOD.

Hommel Frit K3

M.P./iF 1450

Equivalent Molecular Weight: 274.218

Molecular Formula of Hommel Frit K3:

Na₂O 0.669 B₂O₃ 0.864 SiO₂ 2.568

CaO 0.331

Percentage Analysis

56.24 % SiO₂

15.12 % Na₂O

6.77 % CaO

21.87 % B₂O₃

100 % TOTAL

Comments: 8.5 x 10⁻⁶ coefficient of thermal expansion (50-450; C)

Hommel Frit G26

M.P./jF 1480

Silica/Alumina ratio: 75.1:1

Equivalent Molecular Weight: 207.836

Molecular Formula of Hommel Frit G26:

K2O	0.010	Al2O3	0.019	SiO2	1.389
Na2O	0.154	B2O3	0.299	ZrO2	0.173
CaO	0.323	F	0.124		
ZnO	0.403				
BaO	0.109				

Percentage Analysis

40.14 % SiO2

0.91 % Al2O3

0.47 % K2O

4.60 % Na2O

8.72 % CaO

8.04 % BaO

15.79 % ZnO

9.97 % B2O3

10.24 % ZrO2

1.13 % F

100 % TOTAL

Comments: 7.0×10^{-6} coefficient of thermal expansion (50-450j C)

Hommel Frit 259

M.P./iF 1500

Silica/Alumina ratio: 7.1:1

Equivalent Molecular Weight: 324.203

Molecular Formula of Hommel Frit 259:

K2O	0.208	Al2O3	0.374	SiO2	2.639
Na2O	0.739	B2O3	0.770	F	0.247
CaO	0.016				
ZnO	0.038				

Percentage Analysis

48.91 % SiO2

11.75 % Al2O3

6.04 % K2O

14.14 % Na2O

0.27 % CaO

0.94 % ZnO

16.50 % B2O3

1.45 % F

100 % TOTAL

Comments: 10.3 x10-6 Coefficient of expansion

C 1254

Référence C 1254
Désignation Fritte calco-alkaline sans plomb
Température 800 / 920 °C
Dilatation 85

Formule Moléculaire
0,50 Na₂O 0,20 Al₂O₃ 2 SiO₂
0,50 CaO 1,10 B₂O₃

Formule pondérale

Na ₂ O	11,22 %
CaO	10,15 %
Al ₂ O ₃	7,38 %
B ₂ O ₃	27,73 %
SiO ₂	43,51 %

Formule en Pourcentage Molaire :

Na ₂ O	11,63 %
CaO	11,63 %
Al ₂ O ₃	4,65 %
B ₂ O ₃	25,58 %
SiO ₂	46,51 %

C 1252

Référence C 1252
Désignation Fritte borocalcique sans plomb
Température 900 / 980 °C
Dilatation 58

Formule Moléculaire
0,18 NaKO 0,41 Al₂O₃ 2,2 SiO₂
0,82 CaO 0,98 B₂O₃

Formule pondérale

K ₂ O	2,80 %
Na ₂ O	1,85 %
CaO	15,21 %
Al ₂ O ₃	13,83 %
B ₂ O ₃	22,57 %
SiO ₂	43,73 %

Formule en Pourcentage Molaire :

K ₂ O	1,96 %
Na ₂ O	1,96 %
CaO	17,86 %
Al ₂ O ₃	8,93 %
B ₂ O ₃	21,35 %
SiO ₂	47,93 %

7.Ferro Frit 3195

Cost/lb: \$1.00

M.P./iF 1500.1

Silica/Alumina ratio: 6.8:1

Equivalent Molecular Weight: 340.900

Molecular Formula of Ferro Frit 3195:

Na2O	0.313	Al2O3	0.404	SiO2	2.751
CaO	0.686	B2O3	1.099		

Percentage Analysis

48.50 %	SiO2
12.10 %	Al2O3
5.70 %	Na2O
11.30 %	CaO
22.40 %	B2O3

100 %	TOTAL
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Formule en Pourcentage Molaire :

Na2O	5,96 %
CaO	13,06 %
Al2O3	7,69 %
B2O3	20,92 %
SiO2	52,37 %

Comments:

7.1 x 10⁻⁶ coefficient of thermal expansion (50-450j C)

6.Ferro Frit 3193

Silica/Alumina ratio: 11.7:1

Equivalent Molecular Weight: 271.500

Molecular Formula of Ferro Frit 3193:

K2O	0.074	Al2O3	0.208	SiO2	2.440
Na2O	0.407	B2O3	0.610		
CaO	0.519				

Percentage Analysis

53.99 %	SiO2
7.81 %	Al2O3
2.57 %	K2O
9.29 %	Na2O
10.72 %	CaO
15.61 %	B2O3

100 %	TOTAL
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Formule en Pourcentage Molaire :

K2O	1,74 %
Na2O	9,56 %
CaO	12,19 %
Al2O3	4,88 %
B2O3	14,33 %
SiO2	57,3 %

Comments:

? x10 x10-6 Coefficient of expansion

C 1251

Référence C 1251
Désignation Monosilicate de plomb
Température 900 / 1100 °C
Dilatation 83
Formule Moléculaire 1 PbO 1 SiO₂

Formule pondérale

PbO	78,79 %
SiO ₂	21,21 %

Formule en Pourcentage Molaire :

PbO	50 %
SiO ₂	50 %

C 1250

Référence	C 1250	
Désignation	Bisilicate de plomb	
Température	900 / 1100 °C	
Dilatation	67	
Formule Moléculaire	1 PbO	2 SiO ₂
Formule pondérale		
	PbO	65,00 %
	SiO ₂	35,00 %

Formule en Pourcentage Molaire :

	PbO	33,33 %
	SiO ₂	66,67 %

C 1249

Référence	C 1249	
Désignation	Bisilicate de plomb	
Température	600 / 700 °C	
Dilatation	83	
Formule Moléculaire	1 PbO	2 SiO ₂
Formule pondérale		
	PbO	65,00 %
	SiO ₂	35,00 %
Formule en Pourcentage Molaire :		
	PbO	33,33 %
	SiO ₂	66,67 %

5.Ferro Frit 3191

M.P./iF 1300

Equivalent Molecular Weight: 248.900

Molecular Formula of Ferro Frit 3191:

Na2O	0.501	B2O3	1.002	SiO2	2.000
CaO	0.499				

Percentage Analysis (weight %)

Na2O	12,47 %
CaO	11,24 %
B2O3	28,02 %
SiO2	48,27 %

100 %	TOTAL
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Molaire % :

Na2O	12,52 %
CaO	12,47 %
B2O3	25,04 %
SiO2	49,98 %

Comments:

9.2 x 10⁻⁶coefficient of thermal expansion (50-450j C)

4.Ferro Frit 3185

M.P./iF 1350.0

Equivalent Molecular Weight: 807.240

Molecular Formula of Ferro Frit 3185:

K2O	1.000	B2O3	4.430	SiO2	7.270
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Percentage Analysis (weight %)

52.08 %	SiO2
11.23 %	K2O
36.69 %	B2O3
100 %	TOTAL

Percentage Molaire :

K2O	7,87 %
B2O3	34,88 %
SiO2	57,24 %

Comments:

6.0 x 10⁻⁶ coefficient of thermal expansion (50-450)

3.Ferro Frit 3134

Cost/lb: \$1.00

M.P./iF 1450.0

Equivalent Molecular Weight: 190.800

Molecular Formula of Ferro Frit 3134:

Na2O	0.317	B2O3	0.634	SiO2	1.476
CaO	0.683				

Percentage Analysis (weight %)

46.50 %	SiO2
10.30 %	Na2O
20.10 %	CaO
23.10 %	B2O3

100 %	TOTAL
-------	-------

Percentage Molaire % :

Na2O	10,2 %
CaO	21,98 %
B2O3	20,34 %
SiO2	47,47 %

Comments:

9.6 x 10-6 coefficient of thermal expansion (50-450; C)

2.Ferro Frit 3124

M.P./_jF 1600.0

Silica/Alumina ratio: 9.5:1

Equivalent Molecular Weight: 277.500

Molecular Formula of Ferro Frit 3124:

K2O	0.020	Al2O3	0.269	SiO2	2.555
Na2O	0.282	B2O3	0.547		
CaO	0.698				

Percentage Analysis (weight %)

55.31 %	SiO2
9.90 %	Al2O3
0.70 %	K2O
6.30 %	Na2O
14.10 %	CaO
13.70 %	B2O3

Formule Molaire %

K2O	0,48 %
Na2O	6,46 %
CaO	15,96 %
Al2O3	6,16 %
B2O3	12,5 %
SiO2	58,45 %

Comments:

7.9 x 10⁻⁶ coefficient of thermal expansion (50-450; C)

1.Ferro Frit 3110

M.P./iF 1400j

Silica/Alumina ratio: 31.7:1

Equivalent Molecular Weight: 259.100

Molecular Formula of Ferro Frit 3110:

K2O	0.064	Al2O3	0.095	SiO2	3.003
Na2O	0.644	B2O3	0.097		
CaO	0.293				

Percentage Analysis (weight %)

69.63 %	SiO2
3.73 %	Al2O3
2.31 %	K2O
15.40 %	Na2O
6.34 %	CaO
2.59 %	B2O3

Formule Molaire %

K2O	1,53 %
Na2O	15,35 %
CaO	6,98 %
Al2O3	2,26 %
B2O3	2,31 %
SiO2	71,57 %

Comments:

10.1 x 10⁻⁶ coefficient of thermal expansion (50-450j C)

23A.Ferro Frit 3288

Wt: 225.5

Fusion temp 1800 F

Molecular Formula:

Na2O	0.31	Al2O3	0.11	SiO2	1.89
K2O	0.01	B2O3	0.61		
CaO	0.68				

Percentage Analysis: (Weight%)

50.36 %	SiO2
4.97 %	Al2O3
0.42 %	K2O
8.52 %	Na2O
16.91 %	CaO
18.82 %	B2O3

Comments:

similar frits - Fusion F-65, Glostex GF-103

Slag UGS

it is a "synthetic rutile":

TIO2	94.13%
FE2O3	1.09%
AL2O3	0.45%
CAO	0.11%
MGO	0.45%
P2O5	0.004%
MNO	0.02%
SIO2	2.69%
CR2O3	0.08%
V2O5	0.42%
ZRO2	0.07%
NB2O5	0.01%
CL-	0.12%
L.O.I.	0.35%

Frit KPM 4108

Na2O	0.319	Al2O3	0.07	SiO2	1.992
CaO	0.681	B2O3	0.636		

Percentage Analysis:

Na2O	8,63 %
CaO	16,67 %
Al2O3	3,12 %
B2O3	19,33 %
SiO2	52,25 %

Référence : 21 C001

Fritte Boracique

1 CaO 0,097 Al₂O₃ 0,609 SiO₂
 1,5 B₂O₃

PM 207,1

T° 1050-1160

Percentage Analysis:

CaO	27,09 %
Al ₂ O ₃	4,78 %
B ₂ O ₃	50,45 %
SiO ₂	17,68 %

Dilatationn 6,1

46.Ferro Frit CC257

Mol Wt: 280.6

Molecular Formula:

K2O	0.045	Al2O3	0.253	SiO2	2.177
Na2O	0.024	TiO2	0.077		
CaO	0.275				
MgO	0.022				
SrO	0.015				
BaO	0.619				

Percentage Analysis:

46.60 %	SiO2
9.20 %	Al2O3
0.79 %	K2O
1.00 %	Na2O
5.50 %	CaO
0.31 %	MgO
33.80 %	BaO
0.57 %	SrO
2.20 %	TiO2

45.Ferro Frit 5301

Cost/lb: \$1.00

M.P./iF 1500

Silica/Alumina ratio: 6.3:1

Equivalent Molecular Weight: 247.144

Molecular Formula of Ferro Frit 5301:

K2O	0.134	Al2O3	0.274	SiO2	1.720
Na2O	0.765	B2O3	0.418	F	1.115
CaO	0.101				

Percentage Analysis

41.80 %	SiO2
11.30 %	Al2O3
5.11 %	K2O
19.19 %	Na2O
2.29 %	CaO
11.74 %	B2O3
8.57 %	F

100 % TOTAL

Comments:

11.6 x10-6 Coefficient of expansion

44A.Ferro Frit 4364

Molecular Formula:

PbO 1.0 Al₂O₃ 0.09 SiO₂ 1.95

Percentage Analysis:

**33.57 % SiO₂
2.48 % Al₂O₃
63.94 % PbO**

Comments:

? source of data

44.Ferro Frit 3851

M.P./_iF 2400

Silica/Alumina ratio: 3.1:1

Equivalent Molecular Weight: 166.974

Molecular Formula of Ferro Frit 3851:

CaO	0.014	Al ₂ O ₃	0.439	SiO ₂	1.360
MgO	0.986				

Percentage Analysis

48.92 %	SiO ₂
26.80 %	Al ₂ O ₃
23.81 %	MgO
0.47 %	CaO

100 % TOTAL

Comments:

4.2 x 10⁻⁶ coefficient of thermal expansion (50-450_i C)

43.Ferro Frit 3831

M.P./_iF 1700

Silica/Alumina ratio: 6.8:1

Equivalent Molecular Weight: 186.233

Molecular Formula of Ferro Frit 3831:

K2O	0.238	Al2O3	0.194	SiO2	1.320
Na2O	0.139				
CaO	0.405				
BaO	0.218				

Percentage Analysis

42.57 %	SiO2
10.62 %	Al2O3
12.04 %	K2O
4.63 %	Na2O
12.20 %	CaO
17.95 %	BaO
<hr/>	
100 %	TOTAL

Comments:

11.9 x 10⁻⁶ coefficient of thermal expansion (50-450_i C)

42.Ferro Frit 3824

M.P./iF 1400

Equivalent Molecular Weight: 235.796

Molecular Formula of Ferro Frit 3824:

Na2O	0.347	B2O3	0.988	SiO2	1.620
CaO	0.188				
ZnO	0.465				

Percentage Analysis

41.26 %	SiO2
9.12 %	Na2O
4.47 %	CaO
16.05 %	ZnO
29.10 %	B2O3
<hr/>	
100 %	TOTAL

Comments:

8.3 x 10⁻⁶ coefficient of expansion (50-450; C)

41.Ferro Frit 3820

M.P./iF 1650

Silica/Alumina ratio: 6.6:1

Equivalent Molecular Weight: 254.981

Molecular Formula of Ferro Frit 3820:

K2O	0.220	Al2O3	0.326	SiO2	2.160
Na2O	0.210	B2O3	0.170	ZrO2	0.060
CaO	0.240				
MgO	0.030				
ZnO	0.300				

Percentage Analysis

50.88 %	SiO2
13.03 %	Al2O3
8.13 %	K2O
5.10 %	Na2O
0.47 %	MgO
5.28 %	CaO
9.57 %	ZnO
4.63 %	B2O3
2.90 %	ZrO2

100 % TOTAL

Comments:

9.2 x 10⁻⁶ coefficient of thermal expansion (50-450j C)

40.Ferro Frit 3819

Cost/lb: \$.90

M.P./iF 1400i

Silica/Alumina ratio: 6.4:1

Equivalent Molecular Weight: 324.200

Molecular Formula of Ferro Frit 3819:

K2O	0.252	Al2O3	0.407	SiO2	2.615
Na2O	0.691	B2O3	.787		
CaO	0.018				
ZnO	0.040				

Percentage Analysis

48.48 %	SiO2
12.81 %	Al2O3
7.31 %	K2O
13.21 %	Na2O
0.30 %	CaO
1.02 %	ZnO
16.87 %	B2O3
100 %	TOTAL

Comments:

10.3 x10-6 Coefficient of expansion

39.Ferro Frit 3814

M.P./iF 1500

Silica/Alumina ratio: 17.0:1

Equivalent Molecular Weight: 225.138

Molecular Formula of Ferro Frit 3814:

K2O	0.009	Al2O3	0.110	SiO2	1.870
Na2O	0.315	B2O3	0.624		
CaO	0.676				

Percentage Analysis

49.89 %	SiO2
4.98 %	Al2O3
0.38 %	K2O
8.67 %	Na2O
16.84 %	CaO
19.25 %	B2O3
100 %	TOTAL

Comments:

8.9 x 10-6 coefficient of expansion (50-450; C)

38.Ferro Frit 3576

M.P./iF 1500

Silica/Alumina ratio: 19.6:1

Equivalent Molecular Weight: 339.301

Molecular Formula of Ferro Frit 3576:

Na2O	0.208	Al2O3	0.116	SiO2	2.283
CaO	0.291	B2O3	0.670	ZrO2	0.022
PbO	0.501				

Percentage Analysis

40.41 %	SiO2
3.50 %	Al2O3
3.80 %	Na2O
4.80 %	CaO
32.99 %	PbO
13.70 %	B2O3
0.80 %	ZrO2
<hr/>	
100 %	TOTAL

Comments:

7.1 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices for lead glazes.

37D.Ferro Frit 3565

Mol Wt: 326.9

Fusion temp: 1600 F

Molecular Formula:

K2O	0.104	Al2O3	0.180	SiO2	2.938
Na2O	0.084	B2O3	0.366	ZrO2	0.055
CaO	0.577				
PbO	0.234				

Percentage Analysis:

54.0 %	SiO2
5.6 %	Al2O3
1.6 %	K2O
3.0 %	Na2O
9.9 %	CaO
16.0 %	PbO
7.8 %	B2O3
2.1 %	ZrO2

Comments:

Lead borosilicate frit for use in glazes ^01 - ^5; 7.2 x 10-6 coefficient of expansion; similar

37C.Ferro Frit 3516

Wt: 236.1

Fusion temp: 1400 F

Molecular Formula:

K2O	0.044	Al2O3	0.061	SiO2	1.24
Na2O	0.040	B2O3	0.442		
CaO	0.517				
MgO	0.001				
PbO	0.398				

Percentage Analysis:

31.6 %	SiO2
2.6 %	Al2O3
1.8 %	K2O
1.1 %	Na2O
12.3 %	CaO
37.6 %	Pbo
13.0 %	B2O3
trace	MgO

Comments:

Source William Hunt in Ceramics Monthly May 1978 26(5) p.48-54; 7.6 x 10-6 coefficient of

37B.Ferro Frit 3498

Raw Weight: 341.81

Analysis & Unity Formula:

PbO	1.00	Al2O3	0.08	SiO2	1.83
PbO	65.30 %				
Al2O3	2.50 %				
SiO2	32.20 %				

Comments:

Contains lead; Hammond B300 is similar (from Tony Hansen, Clayart archives 11 Mar 98)

37A.Ferro Frit 3496

Wt: 361.5

Fusion temp: 1400 F

Molecular Formula:

K2O	0.05	Al2O3	0.17	SiO2	3.00
Na2O	0.14	B2O3	0.22		
CaO	0.27				
PbO	0.54				

Percentage Analysis:

49.7 %	SiO2
4.9 %	Al2O3
1.4 %	K2O
2.4 %	Na2O
4.2 %	CaO
33.1 %	PbO
4.3 %	B2O3

Comments:

**7.1 x 10-6 coefficient of expansion; similar frits - Pemco Pb-742,
Hommel 373, Fusion FL-28**

37.Ferro Frit 3493

M.P./jF 1500

Silica/Alumina ratio: 24.5:1

Equivalent Molecular Weight: 375.093

Molecular Formula of Ferro Frit 3493:

K2O	0.076	Al2O3	0.114	SiO2	2.792
Na2O	0.091	B2O3	0.697		
CaO	0.308				
PbO	0.526				

Percentage Analysis

44.70 %	SiO2
3.10 %	Al2O3
1.90 %	K2O
1.50 %	Na2O
4.60 %	CaO
31.30 %	PbO
12.90 %	B2O3
100 %	TOTAL

Comments:

6.7 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion.

safe firing practices

36A.Ferro Frit 3489

Mol Wt: 248.3

Fusion temp: 1500 F

Molecular Formula:

CaO	0.248	SiO2	1.108
PbO	0.752		

Percentage Analysis:

26.8 %	SiO2
5.6 %	CaO
67.6 %	PbO

Comments:

Lead / calcium silicate; 7.3×10^{-6} coefficient of expansion; similar frits - Pemco Pb716

36.Ferro Frit 3485

M.P./iF 1300

Equivalent Molecular Weight: 335.807

Molecular Formula of Ferro Frit 3485:

Na2O	0.330	B2O3	0.667	SiO2	1.990
PbO	0.670				

Percentage Analysis

35.60 %	SiO2
6.10 %	Na2O
44.51 %	PbO
13.80 %	B2O3

100 %	TOTAL
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Comments:

7.7 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

35B.Ferro Frit 3482

Wt: 365.5

Fusion temp: 1400 F

Molecular Formula:

K2O	0.152	B2O3	0.318	SiO2	2.62
Na2O	0.159	TiO2	0.442		
CaO	0.212	F	0.424		
PbO	0.477				

Percentage Analysis:

43.1 %	SiO2
3.9 %	K2O
2.7 %	Na2O
3.3 %	CaO
29.1 %	PbO
6.0 %	B2O3
9.7 %	TiO2
2.2 %	F

Comments:

**Source - William Hunt in Ceramics Monthly May 1978 26 (5) p. 48-54;
8.3 x 10⁻⁶ coefficient**

35A.Ferro Frit 3481

Mol Wt: 293.1

Fusion temp:

Molecular Formula:

K2O	0.037	Al2O3	0.201	SiO2	2.432
Na2O	0.146	B2O3	0.261		
CaO	0.517				
Pbo	0.299				

Percentage Analysis:

49.9 %	SiO2
7.0 %	Al2O3
1.2 %	K2O
3.1 %	Na2O
9.9 %	CaO
22.8 %	PbO
6.2 %	B2O3

Comments:

Calcium / lead borosilicate frit; similar frits - Hommel 403

35.Ferro Frit 3476

M.P./iF 1050

Equivalent Molecular Weight: 352.610

Molecular Formula of Ferro Frit 3476:

PbO	1.000	B2O3	1.005	SiO2	0.992
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Percentage Analysis

16.90 %	SiO2
63.30 %	PbO
19.80 %	B2O3

100 %	TOTAL
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Comments:

6.0 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

34.Ferro Frit 3471

M.P./_iF 1500

Silica/Alumina ratio: 12.5:1

Equivalent Molecular Weight: 259.064

Molecular Formula of Ferro Frit 3471:

K2O	0.071	Al2O3	0.099	SiO2	1.238
Na2O	0.021	B2O3	0.459		
CaO	0.300				
BaO	0.253				
PbO	0.354				

Percentage Analysis

28.70 %	SiO2
3.90 %	Al2O3
2.60 %	K2O
0.50 %	Na2O
6.50 %	CaO
15.00 %	BaO
30.49 %	PbO
12.30 %	B2O3
<hr/>	
100 %	TOTAL

Comments:

8.0 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

33C.Ferro Frit 3470

Mol Wt: 232.0

Fusion temp: 1350 F

Molecular Analysis:

Na2O	0.08	Al2O3	0.13	SiO2	1.07
CaO	0.23	B2O3	0.28		
ZnO	0.26				
PbO	0.43				

Percentage Analysis:

27.7 %	SiO2
5.8 %	Al2O3
2.2 %	Na2O3
5.6 %	CaO
9.0 %	ZnO
41.2 %	PbO
8.5 %	B2O3

Comments:

**Lead zinc borosilicate frit; 7.5 x 10-6 coefficient of expansion;
similar frits - Fusion**

33B.Ferro Frit 3467

Wt: 343.5

Fusion temp: 1700 F

Molecular Analysis:

K2O	0.06	Al2O3	0.31	SiO2	3.23
Na2O	0.13	B2O3	0.22		
CaO	0.49				
MgO	0.05				
PbO	0.26				

Percentage Analysis:

56.5 %	SiO2
9.1 %	Al2O3
1.7 %	K2O
2.4 %	Na2O
0.6 %	MgO
17.2 %	PbO
4.5 %	B2O3

Comments:

Lead borosilicate frit. 6.9×10^{-6} coefficient of expansion; similar frits - Pemco Pb2F-35, and Fusion FL-17

33A.Ferro Frit 3466

Wt: 329.0

Fusion temp: 1500 F

Molecular Formula:

K2O	0.049	Al2O3	0.287	SiO2	2.89
Na2O	0.143	B2O3	0.266		
CaO	0.418				
BaO	0.033				
ZnO	0.096				
PbO	0.261				

Percentage Analysis:

52.7 %	SiO2
8.9 %	Al2O3
1.4 %	K2O
2.7 %	Na2O
7.1 %	CaO
1.5 %	BaO
2.4 %	ZnO
17.7 %	PbO
5.6 %	B2O3

Comments:

**Source - William Hunt in Ceramics Monthly May 1978 26 (5) p. 48-54;
7.2 x 10⁻⁶ coefficient**

33.Ferro Frit 3465

M.P./iF 1600

Equivalent Molecular Weight: 265.314

Molecular Formula of Ferro Frit 3465:

Na2O	0.616	B2O3	0.772	SiO2	2.319
CaO	0.308				
PbO	0.076				

Percentage Analysis

52.50 %	SiO2
14.40 %	Na2O
6.50 %	CaO
6.40 %	PbO
20.20 %	B2O3
<hr/>	
100 %	TOTAL

Comments:

9.7 x 10-6 coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

32.Ferro Frit 3454

M.P./iF 1450.0

Silica/Alumina ratio: 10.1:1

Equivalent Molecular Weight: 708.228

Molecular Formula of Ferro Frit 3454:

K2O	0.120	Al2O3	0.480	SiO2	4.846
Na2O	0.217	B2O3	3.121		
CaO	0.126				
PbO	0.536				

Percentage Analysis

41.10 %	SiO2
6.90 %	Al2O3
1.60 %	K2O
1.90 %	Na2O
1.00 %	CaO
16.90 %	PbO
30.60 %	B2O3
100 %	TOTAL

Comments:

5.5 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

31.Ferro Frit 3435

M.P./iF 1300

Silica/Alumina ratio: 32.8:1

Equivalent Molecular Weight: 302.572

Molecular Formula of Ferro Frit 3435:

K2O	0.045	Al2O3	0.065	SiO2	2.146
Na2O	0.210	B2O3	0.710		
CaO	0.394				
PbO	0.351				

Percentage Analysis

42.60 %	SiO2
2.20 %	Al2O3
1.40 %	K2O
4.30 %	Na2O
7.30 %	CaO
25.89 %	PbO
16.30 %	B2O3
100 %	TOTAL

Comments:

7.5 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

**Contains Lead-
safe firing practices**

30.Ferro Frit 3419

M.P./iF 1000

Equivalent Molecular Weight: 271.362

Molecular Formula of Ferro Frit 3419:

Na2O	0.280	B2O3	0.567	SiO2	0.899
PbO	0.720				

Percentage Analysis

19.90 %	SiO2
6.40 %	Na2O
59.20 %	PbO
14.50 %	B2O3

100 %	TOTAL
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Comments:

8.2 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

29.Ferro Frit 3417

M.P./iF 1400.0

Silica/Alumina ratio: 24.6:1

Equivalent Molecular Weight: 382.527

Molecular Formula of Ferro Frit 3417:

K2O	0.077	Al2O3	0.113	SiO2	2.780
Na2O	0.095	B2O3	0.691	ZrO2	0.075
CaO	0.306				
PbO	0.522				

Percentage Analysis

43.65 %	SiO2
3.01 %	Al2O3
1.90 %	K2O
1.54 %	Na2O
4.49 %	CaO
30.46 %	PbO
12.54 %	B2O3
2.42 %	ZrO2
100 %	TOTAL

Comments:

6.7 x 10⁻⁶ coefficient of expansion (50-450; C)

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

28.Ferro Frit 3403

M.P./iF 1500

Silica/Alumina ratio: 20.7:1

Equivalent Molecular Weight: 307.500

Molecular Formula of Ferro Frit 3403:

K2O	0.046	Al2O3	0.069	SiO2	1.439
Na2O	0.015				
CaO	0.006				
PbO	0.934				

Percentage Analysis

28.10 %	SiO2
2.30 %	Al2O3
1.40 %	K2O
0.30 %	Na2O
0.10 %	CaO
67.79 %	PbO
<hr/>	
100 %	TOTAL

Comments:

7.2 x10-6 Coefficient of expansion

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

28B.Ferro Frit 3396

Mol Wt: 331.7

Fusion temp: 1300 F

Molecular Formula:

Na2O	0.502	B2O3	1.004	SiO2	1.99
PbO	0.498				

Percentage Analysis:

36.1 %	SiO2
9.4 %	Na2O
33.5 %	PbO
21.0 %	B2O3

Comments:

**Source - William Hunt in Ceramics Monthly May 1978 26 (5) p.48-54;
8.3 x 10⁻⁶ coefficient**

28A.Ferro Frit 3304

Mol Wt: 382.5

Fusion temp:1500 F

Molecular Formula:

Na2O	0.07	Al2O3	0.15	SiO2	2.58
PbO	0.93				

Percentage Analysis:

40.5 %	SiO2
1.1 %	Na2O
54.4 %	PbO

Comments:

6.6 x 10⁻⁶ coefficient of expansion; similar frits - Hommel 61

27.Ferro Frit 3300

M.P./jF 1700

Silica/Alumina ratio: 7.2:1

Equivalent Molecular Weight: 207.400

Molecular Formula of Ferro Frit 3300:

K2O	0.071	Al2O3	0.187	SiO2	1.340
Na2O	0.025				
CaO	0.326				
MgO	0.022				
ZnO	0.267				
BaO	0.083				
PbO	0.206				

Percentage Analysis

38.81 %	SiO2
9.19 %	Al2O3
3.22 %	K2O
0.75 %	Na2O
0.43 %	MgO
8.82 %	CaO
6.14 %	BaO
22.17 %	PbO
10.48 %	ZnO
100 %	TOTAL

Comments:

8.3 x10-6 Coefficient of expansion

Potential Health Hazards:

Contains Lead-avoid ingestion. NOT FOR USE WITH WARE INTENDED FOR FOOD. Follow safe firing practices

101.Ferro Frit 3293

Wt: 341.5

Molecular Formula:

Na2O	0.920	Al2O3	0.198	SiO2	4.342
MgO	0.068				
CaO	0.012				

Percentage Analysis:

76.4%	SiO2
5.9 %	Al2O3
16.7 %	Na2O
0.2 %	CaO
0.8 %	MgO

Comments:

Sodium silicate frit - no boron; similar frits - Pemco

26.Ferro Frit 3292

Silica/Alumina ratio: 9.7:1

Equivalent Molecular Weight: 334.600

Molecular Formula of Ferro Frit 3292:

K2O	0.110	Al2O3	0.351	SiO2	3.399
Na2O	0.162	B2O3	0.274		
CaO	0.626				
MgO	0.058				
Li2O	0.045				
SrO	0.134				

Percentage Analysis

61.49 %	SiO2
10.77 %	Al2O3
3.12 %	K2O
3.02 %	Na2O
0.71 %	MgO
10.57 %	CaO
4.18 %	SrO
0.40 %	Li2O
5.74 %	B2O3

100 %	TOTAL
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Comments:

? x10-6 Coefficient of expansion

25.Ferro Frit 3291

Silica/Alumina ratio:

Equivalent Molecular Weight: 332.184

Molecular Formula of Ferro Frit 3291:

CaO	0.123	Al ₂ O ₃	0.430	SiO ₂	2.510
MgO	0.877	B ₂ O ₃	1.373		

Percentage Analysis

45.38 %	SiO ₂
13.20 %	Al ₂ O ₃
10.64 %	MgO
2.08 %	CaO
28.70 %	B ₂ O ₃

100 %	TOTAL
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Comments:

3.9 x 10⁻⁶ coefficient of expansion (50-450; C)

24.Ferro Frit 3289

M.P./iF 1500

Silica/Alumina ratio: 15.5:1

Equivalent Molecular Weight: 374.127

Molecular Formula of Ferro Frit 3289:

Na2O	0.332	Al2O3	0.198	SiO2	3.070
BaO	0.668	B2O3	0.668		

Percentage Analysis

49.30 %	SiO2
5.40 %	Al2O3
5.50 %	Na2O
27.40 %	BaO
12.40 %	B2O3

100 %	TOTAL
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Comments:

8.2 x 10-6 coefficient of thermal expansion (50-450; C)

23.Ferro Frit 3286

M.P./iF 1750

Silica/Alumina ratio: 16.5:1

Equivalent Molecular Weight: 289.525

Molecular Formula of Ferro Frit 3286:

K2O	0.104	Al2O3	0.176	SiO2	2.900
Na2O	0.080	B2O3	0.367		
CaO	0.576				
SrO	0.240				

Percentage Analysis

60.16 %	SiO2
6.20 %	Al2O3
3.38 %	K2O
1.71 %	Na2O
11.16 %	CaO
8.59 %	SrO
8.80 %	B2O3
100 %	TOTAL

Comments:

7.5 x 10⁻⁶ coefficient of thermal expansion (50-450; C)

22.Ferro Frit 3278

M.P./iF 1400

Equivalent Molecular Weight: 270.447

Molecular Formula of Ferro Frit 3278:

Na2O	0.669	B2O3	0.842	SiO2	2.530
CaO	0.331				

Percentage Analysis

56.19 %	SiO2
15.33 %	Na2O
6.86 %	CaO
21.62 %	B2O3

100 %	TOTAL
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Comments:

9.7 x 10⁻⁶ coefficient of expansion (50-450; C)

21.Ferro Frit 3271

M.P./iF 1500

Equivalent Molecular Weight: 247.577

Molecular Formula of Ferro Frit 3271:

Na2O	0.514	B2O3	0.768	SiO2	2.250
CaO	0.486				

Percentage Analysis

54.58 %	SiO2
12.87 %	Na2O
11.01 %	CaO
21.54 %	B2O3

100 %	TOTAL
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Comments:

9.3 x 10⁻⁶ coefficient of expansion (50-450; C)

20.Ferro Frit 3270

M.P./iF 1500

Silica/Alumina ratio: 10.1:1

Equivalent Molecular Weight: 273.569

Molecular Formula of Ferro Frit 3270:

K2O	0.159	Al2O3	0.232	SiO2	2.340
Na2O	0.380	B2O3	0.648		
CaO	0.461				

Percentage Analysis

51.37 %	SiO2
8.65 %	Al2O3
5.47 %	K2O
8.61 %	Na2O
9.45 %	CaO
16.45 %	B2O3

100 % **TOTAL**

Comments:

9.4 x 10⁻⁶ coefficient of expansion (50-450; C)

19.Ferro Frit 3269

M.P./iF 1400

Silica/Alumina ratio: 6.4:1

Equivalent Molecular Weight: 356.634

Molecular Formula of Ferro Frit 3269:

K2O	0.306	Al2O3	0.462	SiO2	2.950
Na2O	0.641	B2O3	0.778	F	0.300
CaO	0.009				
ZnO	0.044				

Percentage Analysis

49.68 %	SiO2
13.21 %	Al2O3
8.08 %	K2O
11.14 %	Na2O
0.14 %	CaO
1.00 %	ZnO
15.15 %	B2O3
1.60 %	F
100 %	TOTAL

Comments:

10.0 x 10⁻⁶ coefficient of expansion (50-450i C)

18.Ferro Frit 3264

M.P./iF 1400

Silica/Alumina ratio: 12.9:1

Equivalent Molecular Weight: 291.087

Molecular Formula of Ferro Frit 3264:

Na2O	0.984	Al2O3	0.192	SiO2	2.470
CaO	0.005	B2O3	0.885		
MgO	0.011				

Percentage Analysis

50.96 %	SiO2
6.72 %	Al2O3
20.95 %	Na2O
0.15 %	MgO
0.10 %	CaO
21.11 %	B2O3
100 %	TOTAL

Comments:

11.0 x 10⁻⁶ coefficient of expansion (50-450; C)

17.Ferro Frit 3249

M.P./_iF 1900

Silica/Alumina ratio: 5.4:1

Equivalent Molecular Weight: 274.200

Molecular Formula of Ferro Frit 3249:

CaO	0.171	Al₂O₃	0.357	SiO₂	1.920
MgO	0.829	B₂O₃	1.140		

Percentage Analysis

42.10 %	SiO₂
13.30 %	Al₂O₃
12.20 %	MgO
3.50 %	CaO
28.90 %	B₂O₃
<hr/>	
100 %	TOTAL

Comments:

4.0 x 10⁻⁶ coefficient of thermal expansion (50-450_i C)

16.Ferro Frit 3248

M.P./iF 1900

Silica/Alumina ratio: 7.2:1

Equivalent Molecular Weight: 411.346

Molecular Formula of Ferro Frit 3248:

K2O	0.307	Al2O3	0.609	SiO2	4.410
Na2O	0.108	B2O3	0.276		
CaO	0.383				
MgO	0.202				

Percentage Analysis

64.39 %	SiO2
15.09 %	Al2O3
7.03 %	K2O
1.63 %	Na2O
1.98 %	MgO
5.22 %	CaO
4.66 %	B2O3
100 %	TOTAL

Comments:

6.8 x 10⁻⁶ coefficient of thermal expansion (50-450; C)

15.Ferro Frit 3247

M.P./_iF 1850

Silica/Alumina ratio: 13.3:1

Equivalent Molecular Weight: 288.827

Molecular Formula of Ferro Frit 3247:

BaO	1.000	Al₂O₃	0.150	SiO₂	2.001
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Percentage Analysis

41.60 %	SiO₂
5.30 %	Al₂O₃
53.10 %	BaO
<hr/>	
100 %	TOTAL

Comments:

8.6 x10⁻⁶ Coefficient of expansion

14.Ferro Frit 3240

M.P./iF 1500

Silica/Alumina ratio: 75.6:1

Equivalent Molecular Weight: 207.205

Molecular Formula of Ferro Frit 3240:

K2O	0.012	Al2O3	0.018	SiO2	1.360
Na2O	0.152	B2O3	0.295	ZrO2	0.172
CaO	0.326	F	0.209		
ZnO	0.403				
BaO	0.107				

Percentage Analysis

39.42 %	SiO2
0.89 %	Al2O3
0.55 %	K2O
4.55 %	Na2O
8.82 %	CaO
7.92 %	BaO
15.83 %	ZnO
9.89 %	B2O3
10.23 %	ZrO2
1.92 %	F
100 %	TOTAL

Comments:

8.6 x 10-6 coefficient of thermal expansion (50-450i C)

13.Ferro Frit 3227

M.P./iF 1300

Silica/Alumina ratio: 4.2:1

Equivalent Molecular Weight: 372.807

Molecular Formula of Ferro Frit 3227:

K2O	0.162	Al2O3	0.568	SiO2	2.360
Na2O	0.838	B2O3	1.526		

Percentage Analysis

38.02 %	SiO2
15.53 %	Al2O3
4.09 %	K2O
13.93 %	Na2O
28.42 %	B2O3

100 %	TOTAL
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Comments:

9.8 x 10-6 coefficient of expansion (50-450; C)

12.Ferro Frit 3226

M.P./iF 1450

Silica/Alumina ratio: 98.7:1

Equivalent Molecular Weight: 586.550

Molecular Formula of Ferro Frit 3226:

Na2O	0.693	Al2O3	0.052	SiO2	5.130
CaO	0.307	B2O3	3.067		

Percentage Analysis

52.53 %	SiO2
0.90 %	Al2O3
7.32 %	Na2O
2.94 %	CaO
36.31 %	B2O3

100 %	TOTAL
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Comments:

6.3 x 10-6 coefficient of expansion (50-450; C)

11.Ferro Frit 3225

M.P./iF 1650

Silica/Alumina ratio: 13.5:1

Equivalent Molecular Weight: 1232.779

Molecular Formula of Ferro Frit 3225:

Na2O	0.879	Al2O3	0.991	SiO2	13.340
CaO	0.055	B2O3	3.893		
MgO	0.066				

Percentage Analysis

64.99 %	SiO2
8.19 %	Al2O3
4.42 %	Na2O
0.22 %	MgO
0.25 %	CaO
21.93 %	B2O3

100 % **TOTAL**

Comments:

5.0 x 10⁻⁶ coefficient of expansion (50-450i C)

10.Ferro Frit 3224

M.P./jF 1600

Silica/Alumina ratio: 11.0:1

Equivalent Molecular Weight: 1021.178

Molecular Formula of Ferro Frit 3224:

Na2O	0.879	Al2O3	0.913	SiO2	10.000
CaO	0.051	B2O3	3.850		
MgO	0.070				

Percentage Analysis

58.81 %	SiO2
9.11 %	Al2O3
5.34 %	Na2O
0.28 %	MgO
0.28 %	CaO
26.18 %	B2O3
100 %	TOTAL

Comments:

5.8 x 10⁻⁶ coefficient of expansion (50-450; C)

9.Ferro Frit 3221

M.P./jF 1450

Silica/Alumina ratio: 3.8:1

Equivalent Molecular Weight: 398.967

Molecular Formula of Ferro Frit 3221:

K2O	0.175	Al2O3	0.691	SiO2	2.610
Na2O	0.812	B2O3	1.501		
CaO	0.013				

Percentage Analysis

39.29 %	SiO2
17.66 %	Al2O3
4.13 %	K2O
12.61 %	Na2O
0.18 %	CaO
26.12 %	B2O3
100 %	TOTAL

Comments:

9.4 x 10-6 coefficient of expansion (50-450; C)

8.Ferro Frit 3211

M.P./iF 1750

Equivalent Molecular Weight: 133.400

Molecular Formula of Ferro Frit 3211:

CaO 1.000 B2O3 1.111

Percentage Analysis

**42.09 % CaO
57.91 % B2O3**

100 % TOTAL

Comments:

7.5 x 10-6 coefficient of expansion (50-450; C)

Référence : 21 C002

Fritte Boracique

0,450 Na ₂ O	0,210 Al ₂ O ₃	1,919 SiO ₂
0,220 K ₂ O	0,457 B ₂ O ₃	
0,363 CaO		
0,002 MgO		

PM 234,7

T° 920-1050

Percentage Analysis:

K ₂ O	8,72 %
Na ₂ O	11,74 %
CaO	8,57 %
MgO	0,03 %
Al ₂ O ₃	9,01 %
B ₂ O ₃	13,39 %
SiO ₂	48,53 %

Dilatation

Référence : 21 C003

Fritte Boracique

0,400 Na ₂ O	0,300 Al ₂ O ₃	5 SiO ₂
0,300 CaO	1 B ₂ O ₃	
0,050 ZnO		
0,250 MgO		

PM 469,7

T° 1030-1180

Percentage Analysis:

Na ₂ O	5,43 %
CaO	3,69 %
MgO	2,21 %
ZnO	0,89 %
Al ₂ O ₃	6,70 %
B ₂ O ₃	15,25 %
SiO ₂	65,83 %

Dilatation

Référence : 21 C004

Fritte Alcaline

0,733 NaO	0,349 Al ₂ O ₃	2,890 SiO ₂
0,155 K ₂ O	0,816 B ₂ O ₃	
0,094 CaO		
0,018 MgO		
0,008 ZrO ₂		

PM 361,5

T° 900-1100

Percentage Analysis:

K ₂ O	4,38 %
Na ₂ O	13,64 %
CaO	1,58 %
MgO	0,22 %
Al ₂ O ₃	10,68 %
B ₂ O ₃	17,06 %
SiO ₂	52,14 %
ZrO ₂	0,30 %

Dilatation

Référence : 21C005

Fritte Alcaline

0.580 Na ₂ O	0.093 Al ₂ O ₃	1.660 SiO ₂
0.210 K ₂ O	0.105 B ₂ O ₃	
0.105 CaO		
0,105 BaO		

PM 193.60

T° 880-1060

Percentage Analysis:

K ₂ O	10,18 %
Na ₂ O	18,51 %
CaO	3,03 %
BaO	8,29 %
Al ₂ O ₃	4,88 %
B ₂ O ₃	3,76 %
SiO ₂	51,35 %

Dilatation

Référence : 21C006

Fritte Alcaline Tendre

0.764 Na₂O
0.026 K₂O
0.210 CaO

0.279 Al₂O₃
0.381 B₂O₃

2.172 SiO₂

PM 273.2

T° 850-1000

Percentage Analysis:

K ₂ O	0,99 %
Na ₂ O	19,17 %
CaO	4,77 %
Al ₂ O ₃	11,51 %
B ₂ O ₃	10,74 %
SiO ₂	52,82 %

Dilatation

Référence : 21C007

Ferro Fritte

0.664 Na₂O
0.064 K₂O
0.293 CaO

0,095 Al₂O₃
0,097 B₂O₃

3.028 SiO₂

PM 260,5

T° 900-1000

Percentage Analysis:

K ₂ O	2,30 %
Na ₂ O	15,71 %
CaO	6,27 %
Al ₂ O ₃	3,70 %
B ₂ O ₃	2,58 %
SiO ₂	69,44 %

Dilatation

Substitutions_Pemco_O-Hommel_Ferro

A Cross Reference List Of Comparable Frits

Pemco	O-Hommel	Ferro
P-54	14	3134
P-25	25	3269
P-830	K-3	3278
Pb-723	437	3403
Pb-63	24	3417
Pb-83	33	3419
Pb-1307	11	3470
Pb-1151	27	3482
Pb-801	520	3485
Pb-716		3489
Pb-742	373	3493
Pb-1K-75	474	3532
Pb-349		3565
P-311	90	3124
P-1409		3249
P-786	630	CC-268
P626	400	3289
	450	221-394
Pv-IV-48		FB-179-G
	467	CZ-111
P-802	378	3270
Pb-IR40		3471
	595	3496
	642	CC-270
	472	FB-268-0

Substitution QIT Red Dust

Oxyde de Fer Rouge	0.820
Silice	0.050
Carbonate de Calcium	0.060
Dolomie	0.050
Oxyde de Zinc	0.020

Total	1.000
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A Cross Reference List Of Comparable Frits

Pemco	O-Hommel	Ferro
P-54	14	3134
P-25	25	3269
P-830	K-3	3278
Pb-723	437	3403
Pb-63	24	3417
Pb-83	33	3419
Pb-1307	11	3470
Pb-1151	27	3482
Pb-801	520	3485
Pb-716		3489
Pb-742	373	3493
Pb-IK-75	474	3532
Pb-349		3565
P-311	90	3124
P-1409		3249
P-786	630	CC-268
P626	400	3289
	450	221-394
Pv-IV-48		FB-179-G
	467	CZ-111
P-802	378	3270
Pb-IR40		3471
	595	3496
	642	CC-270
	472	FB-268-0