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 Na_2O 0,22 Al_2O_3 2,74 SiO_2 0,40 K_2O 1,61 B_2O_3

Formule pondérale

K_2O	10,074 %
Na_2O	9,943 %
Al_2O_3	5,997 %
B_2O_3	29,968 %
SiO_2	44,018 %

Formule en Pourcentage Molaire :

K_2O	7,181 %
Na_2O	10,772 %
Al_2O_3	3,950 %
B_2O_3	28,905 %
SiO_2	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 Al_2O_3 2,55 SiO_2
0,29 Na_2O 0,26 B_2O_3
0,19 K_2O 0,04 Fe_2O_3
0,05 BaO
0,41 PbO

Formule pondérale

K_2O	5,043 %
Na_2O	5,065 %
CaO	0,948 %
BaO	2,161 %
PbO	25,788 %
Al_2O_3	10,918 %
B_2O_3	5,101 %
Fe_2O_3	1,800 %
SiO_2	43,176 %

Formule en Pourcentage Molaire :

K_2O	4,492 %
Na_2O	6,856 %
CaO	1,418 %
BaO	1,182 %
PbO	9,693 %
Al_2O_3	8,983 %
B_2O_3	6,147 %
Fe_2O_3	0,946 %
SiO_2	60,284 %

Référence **FR5**

Désignation **Fritte silice zinc sans alumine**

Masse molaire **140,70**

Température **1000-1300 °C**

Dilatation **113,65 x 10-7 °C-1 (Appen)**

Formule Moléculaire **0,21 K2O** **1,10 SiO2**
0,17 Na2O
0,17 MgO
0,46 ZnO

Formule pondérale

K2O	**14,059 %**
Na2O	**7,489 %**
MgO	**4,870 %**
ZnO	**26,606 %**
SiO2	**46,976 %**

Formule en Pourcentage Molaire :

K2O	**9,953 %**
Na2O	**8,057 %**
MgO	**8,057 %**
ZnO	**21,801 %**
SiO2	**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 x 10-7 °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 Na2O	**0.33 SiO2**
0.16 MgO	**0.59 B2O3**
0.72 CaO	

Poids moléculaire : 165

Sorelslag has the following general formula:

TIO2 82%
FEO 8.0%
SIO2 2.0%
AL2O3 3.0%
MGO 5.0%

Rutile 0,793
Kaolin 0,04
Dolomite 0,12
Magnesium carbonate 0,078
Fe2O3 0,077

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

Composition %

6.90	**Na_2O**
4.8	**K_2O**
0.05	**MgO**
1.70	**CaO**
19.60	**Al_2O_3**
66.80	**SiO_2**
0.04	**Fe_2O_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:

TIO2 82%
FEO 8.0%
SIO2 2.0%
AL2O3 3.0%
MGO 5.0%

Rutile 0,793
Kaolin 0,04
Dolomite 0,12
Magnesium carbonate 0,078
Fe2O3 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

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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

K2O	**4,10 %**
Na2O	**2,70 %**
CaO	**5,85 %**
ZnO	**7,08 %**
Al2O3	**5,62 %**
B2O3	**12,11 %**
SiO2	**55,75 %**
ZrO2	**6,79 %**

Formule en Pourcentage Molaire :

K2O	**2,92 %**
Na2O	**2,92 %**
CaO	**7 %**
ZnO	**5,84 %**
Al2O3	**3,7 %**
B2O3	**11,67 %**
SiO2	**62,26 %**
ZrO2	**3,7 %**

C 1253

Référence **C 1253**

Désignation **Fritte boro-alcaline sans plomb**

Température **880 /920 °C**

Dilatation **71**

Formule Moléculaire

0,65 Na2O 0,19 Al2O3 2,5 SiO2
0,21 CaO 0,94 B2O3
0,08 ZnO
0,05 BaO

Formule pondérale

Na2O	**13,37 %**
CaO	**3,91 %**
BaO	**2,54 %**
ZnO	**2,16 %**
Al2O3	**6,43 %**
B2O3	**21,72 %**
SiO2	**49,86 %**

Formule en Pourcentage Molaire :

Na2O	**14,07 %**
CaO	**4,55 %**
BaO	**1,08 %**
ZnO	**1,73 %**
Al2O3	**4,11 %**
B2O3	**20,35 %**
SiO2	**54,11 %**

Hommel Frit 90

M.P./¡F 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 x10-6 Coefficient of expansion - a close substitute for Ferro Frit 3124

Hommel Frit 529

M.P./¡F 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

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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./¡F 1225.0

Equivalent Molecular Weight: 273.300

Molecular Formula of Hommel Frit 33:

Na_2O 0.282 B_2O_3 0.565 SiO_2 0.934

PbO 0.718

Percentage Analysis

20.54 % SiO_2

6.39 % Na_2O

58.71 % PbO

14.36 % B_2O_3

100 % TOTAL

Formule en Pourcentage Molaire :

Na_2O	**11,294 %**
PbO	**28,755 %**
B_2O_3	**22,547 %**
SiO_2	**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./¡F 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 x10-6 Coefficient of expansion melting range 1720¡ 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:

Na_2O 0.490 Al_2O_3 0.806 SiO_2 2.599

CaO 0.500 B_2O_3 0.911

MgO 0.010

Percentage Analysis

43.32 % SiO_2

22.80 % Al_2O_3

8.43 % Na_2O

0.11 % MgO

7.78 % CaO

17.56 % B_2O_3

---

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:

K_2O 0.029 Al_2O_3 0.556 SiO_2 3.403

Na_2O 0.202 B_2O_3 1.030

CaO 0.760

MgO 0.010

Percentage Analysis

52.30 % SiO_2

14.50 % Al_2O_3

0.70 % K_2O

3.20 % Na_2O

0.10 % MgO

10.90 % CaO

18.30 % B_2O_3

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:

Na_2O 0.400 Al_2O_3 0.300 SiO_2 5.000

CaO 0.300 B_2O_3 1.000

MgO 0.250

ZnO 0.050

Percentage Analysis

65.84 % SiO_2

6.71 % Al_2O_3

5.44 % Na_2O

2.21 % MgO

3.69 % CaO

0.89 % ZnO

15.23 % B_2O_3

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 Al_2O_3 0.097 SiO_2 0.609

B_2O_3 1.500

Percentage Analysis

17.70 % SiO_2

4.78 % Al_2O_3

27.13 % CaO

50.39 % B_2O_3

---

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./¡F 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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 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./¡F 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

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100 % TOTAL

Comments: 6.5 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 1350-1450

Potential Health Hazards:

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

Pemco Frit Pb-349

M.P./¡F 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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 2250-2320

Pemco Frit P-930

M.P./¡F 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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = 675 Melting Range ¡F = 1500-1600

Pemco Frit P-926

M.P./¡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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = 640 Melting Range ¡F = 1650-1700

Pemco Frit P-878

M.P./¡F 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 (50-450¡ C) I.F.P. ¡C = 650 Melting Range ¡F = 1500-1590

Pemco Frit P-830

M.P./¡F 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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = 605 Melting Range ¡F = 1320-1420

Pemco Frit P-827

M.P./¡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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 2000-2040

Pemco Frit P-802

M.P./¡F 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

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100 % TOTAL

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

Pemco Frit P-786

M.P./¡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

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100 % TOTAL

Comments: 7.2 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 1640-1910

Pemco Frit P-688

M.P./¡F 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

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100 % TOTAL

Comments: 8.0 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 1550-2100

Pemco Frit P-67

M.P./¡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

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100 % TOTAL

Comments: 7.0 x 10-6 coefficient of thermal expansion (50-450¡ C) Melting range: 1530-1760¡ F

Pemco Frit P-64

M.P./¡F 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

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100 % TOTAL

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

Pemco Frit P-626

M.P./¡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

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100 % TOTAL

Comments: 7.2 x 10-6 coefficient of thermal expansion (50-450¡ C) Melting range: 1460-1570¡ 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

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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./¡F 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 (50-450¡ C) I.F.P. ¡C = 689 Melting Range ¡F = 1600-1860

Pemco Frit P-54

Cost/lb: $.57

M.P./¡F 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

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100 % TOTAL

Comments: 8.9 x 10-6 coefficient of thermal expansion (50-450¡ C) Melting range: 1400-1480¡ F

Pemco Frit P-318

M.P./¡F 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

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100 % TOTAL

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

65.Pemco Frit P-404

M.P./¡F 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

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100 % TOTAL

Comments: 13.0 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = Melting Range ¡F = 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./¡F 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 x 10-6 coefficient of thermal expansion (50-450¡ C) melting range of 1420-1670¡ 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 x 10-6 coefficient of thermal expansion (50-450¡ C) m.p. 1320-1420¡ F

Pemco Frit P-238

M.P./¡F 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 x 10-6 coefficient of thermal expansion (50-450¡ C) I.F.P. ¡C = 535 Melting Range ¡F = 1450-1560

Leadless Frit

M.P./¡F 1600¡

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

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100 % TOTAL

Lead Sequisilicate

M.P./¡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¥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./¡F 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¡ C) 3 PbO¥2 SiO2

Potential Health Hazards:

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

Hommel Frit K3

M.P./¡F 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./¡F 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

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100 % TOTAL

Comments: 7.0 x 10-6 coefficient of thermal expansion (50-450¡ C)

Hommel Frit 259

M.P./¡F 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-alcaline 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

Na2O	**11,22 %**
CaO	**10,15 %**
Al2O3	**7,38 %**
B2O3	**27,73 %**
SiO2	**43,51 %**

Formule en Pourcentage Molaire :

Na2O	**11,63 %**
CaO	**11,63 %**
Al2O3	**4,65 %**
B2O3	**25,58 %**
SiO2	**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

K2O	**2,80 %**
Na2O	**1,85 %**
CaO	**15,21 %**
Al2O3	**13,83 %**
B2O3	**22,57 %**
SiO2	**43,73 %**

Formule en Pourcentage Molaire :

K2O	**1,96 %**
Na2O	**1,96 %**
CaO	**17,86 %**
Al2O3	**8,93 %**
B2O3	**21,35 %**
SiO2	**47,93 %**

7.Ferro Frit 3195

Cost/lb: $1.00
M.P./¡F 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

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 (50-450¡ 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

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 %**
SiO2 **21,21 %**

Formule en Pourcentage Molaire :

PbO **50 %**
SiO2 **50 %**

C 1250

Référence **C 1250**

Désignation **Bisilicate de plomb**

Température **900 / 1100 °C**

Dilatation **67**

Formule Moléculaire **1 PbO** **2 SiO2**

Formule pondérale

PbO	**65,00 %**
SiO2	**35,00 %**

Formule en Pourcentage Molaire :

PbO	**33,33 %**
SiO2	**66,67 %**

C 1249

Référence **C 1249**

Désignation **Bisilicate de plomb**

Température **600 / 700 °C**

Dilatation **83**

Formule Moléculaire **1 PbO** **2 SiO2**

Formule pondérale

PbO	**65,00 %**
SiO2	**35,00 %**

Formule en Pourcentage Molaire :

PbO	**33,33 %**
SiO2	**66,67 %**

5.Ferro Frit 3191

M.P./¡F 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**

Molaire % :

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

Comments:

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

4.Ferro Frit 3185

M.P./¡F 1350.0
Equivalent Molecular Weight: 807.240

Molecular Formula of Ferro Frit 3185:

K2O	**1.000**	**B2O3**	**4.430**	**SiO2**	**7.270**

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./¡F 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./¡F 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 (wheight %)

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./¡F 1400¡
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 (50-450¡ 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 %
Al2O3 4,78 %
B2O3 50,45 %
SiO2 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./¡F 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./¡F 2400
Silica/Alumina ratio: 3.1:1
Equivalent Molecular Weight: 166.974

Molecular Formula of Ferro Frit 3851:

CaO 0.014 Al2O3 0.439 SiO2 1.360
MgO 0.986

Percentage Analysis

48.92 %	**SiO2**
26.80 %	**Al2O3**
23.81 %	**MgO**
0.47 %	**CaO**
100 %	**TOTAL**

Comments:

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

43.Ferro Frit 3831

M.P./¡F 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**
100 %	**TOTAL**

Comments:

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

42.Ferro Frit 3824

M.P./¡F 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**
100 %	**TOTAL**

Comments:

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

41.Ferro Frit 3820

M.P./¡F 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 (50-450¡ C)

40.Ferro Frit 3819

Cost/lb: $.90
M.P./¡F 1400¡
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./¡F 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./¡F 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
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./¡F 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 x 10-6 coefficient of expansion; similar frits - Pemco Pb716

36.Ferro Frit 3485

M.P./¡F 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**

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./¡F 1050
Equivalent Molecular Weight: 352.610

Molecular Formula of Ferro Frit 3476:

PbO 1.000 B2O3 1.005 SiO2 0.992

Percentage Analysis

16.90 %	**SiO2**
63.30 %	**PbO**
19.80 %	**B2O3**
100 %	**TOTAL**

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./¡F 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
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 x 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./¡F 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**
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./¡F 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./¡F 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./¡F 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**

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./¡F 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./¡F 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
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./¡F 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

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**	**Al2O3**	**0.430**	**SiO2**	**2.510**
MgO	**0.877**	**B2O3**	**1.373**		

Percentage Analysis

45.38 %	**SiO2**
13.20 %	**Al2O3**
10.64 %	**MgO**
2.08 %	**CaO**
28.70 %	**B2O3**
100 %	**TOTAL**

Comments:

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

24.Ferro Frit 3289

M.P./¡F 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

Comments:

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

23.Ferro Frit 3286

M.P./¡F 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./¡F 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**

Comments:

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

21.Ferro Frit 3271

M.P./¡F 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**

Comments:

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

20.Ferro Frit 3270

M.P./¡F 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./¡F 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 (50-450¡ C)

18.Ferro Frit 3264

M.P./¡F 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./¡F 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**
100 %	**TOTAL**

Comments:

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

16.Ferro Frit 3248

M.P./¡F 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./¡F 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

Percentage Analysis

41.60 %	**SiO2**
5.30 %	**Al2O3**
53.10 %	**BaO**
100 %	**TOTAL**

Comments:

8.6 x10-6 Coefficient of expansion

14.Ferro Frit 3240

M.P./¡F 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 (50-450¡ C)

13.Ferro Frit 3227

M.P./¡F 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

Comments:

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

12.Ferro Frit 3226

M.P./¡F 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**

Comments:

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

11.Ferro Frit 3225

M.P./¡F 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 (50-450¡ C)

10.Ferro Frit 3224

M.P./¡F 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./¡F 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./¡F 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 Na2O	**0,210 Al2O3**	**1,919 SiO2**
0,220 K2O	**0,457 B2O3**	
0,363 CaO		
0,002 MgO		

PM 234,7

T° 920-1050

Percentage Analysis:

K2O	**8,72 %**
Na2O	**11,74 %**
CaO	**8,57 %**
MgO	**0,03 %**
Al2O3	**9,01 %**
B2O3	**13,39 %**
SiO2	**48,53 %**

Dilatation

Référence : 21 C003

Fritte Boracique

0,400 Na2O	**0,300 Al2O3**	**5 SiO2**
0,300 CaO	**1 B2O3**	
0,050 ZnO		
0,250 MgO		

PM 469,7

T° 1030-1180

Percentage Analysis:

Na2O	**5,43 %**
CaO	**3,69 %**
MgO	**2,21 %**
ZnO	**0,89 %**
Al2O3	**6,70 %**
B2O3	**15,25 %**
SiO2	**65,83 %**

Dilatation

Référence : 21 C004

Fritte Alcaline

0,733 NaO	**0,349 Al2O3**	**2,890 SiO2**
0,155 K2O	**0,816 B2O3**	
0,094 CaO		
0,018 MgO		
0,008 ZrO2		

PM 361,5

T° 900-1100

Percentage Analysis:

K2O	**4,38 %**
Na2O	**13,64 %**
CaO	**1,58 %**
MgO	**0,22 %**
Al2O3	**10,68 %**
B2O3	**17,06 %**
SiO2	**52,14 %**
ZrO2	**0,30 %**

Dilatation

Référence : 21C005

Fritte Alcaline

0.580 Na2O	**0.093 Al2O3**	**1.660 SiO2**
0.210 K2O	**0.105 B2O3**	
0.105 CaO		
0,105 BaO		

PM 193.60

T° 880-1060

Percentage Analysis:

K2O	**10,18 %**
Na2O	**18,51 %**
CaO	**3,03 %**
BaO	**8,29 %**
Al2O3	**4,88 %**
B2O3	**3,76 %**
SiO2	**51,35 %**

Dilatation

Référence : 21C006

Fritte Alcaline Tendre

0.764 Na2O	**0.279 Al2O3**	**2.172 SiO2**
0.026 K2O	**0.381 B2O3**	
0.210 CaO		

PM 273.2

T° 850-1000

Percentage Analysis:

K2O	**0,99 %**
Na2O	**19,17 %**
CaO	**4,77 %**
Al2O3	**11,51 %**
B2O3	**10,74 %**
SiO2	**52,82 %**

Dilatation

Référence : 21C007

Ferro Fritte

0.664 Na2O	**0,095 Al2O3**	**3.028 SiO2**
0.064 K2O	**0,097 B2O3**	
0.293 CaO		

PM 260,5

T° 900-1000

Percentage Analysis:

K2O	**2,30 %**
Na2O	**15,71 %**
CaO	**6,27 %**
Al2O3	**3,70 %**
B2O3	**2,58 %**
SiO2	**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-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

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**

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