

Cement-raw-mix-4-components-calculator

www.cementkilnbypassdust.com

Simple tool to calculate feeding percentage proportion of four raw materials

A- Enter Raw Materials Chemical Composition											C- Get feeding %
	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	LOI	Feeding %
LBESTONE											
CLAY											
Address1											
Address2											

B- Set The Targets		
LSF	SM	AM

Raw Meal	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	SUM	ASR

Clinker	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	SUM
	C ₂ S	C ₃ S	C ₄ A	C ₄ AF	LP%	AW	BI			

A- How does it work?

1- Enter the raw materials chemical composition:

A- Enter Raw Materials Chemical Composition											C- Get feeding %
	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	LOI	Feeding %
LBESTONE	48.51	6.18	1.16	0.54	2.27	0.24	0.05	0.09	0.06		48.61
CLAY	5.5	42.06	10.69	4.01	2.91	0.27	0.4	3.97	0.05		19.09
Address1	12.99	44.17	5	4.77	8.48	1.08	0.27	0.57	0.22		18.08
Address2	2.72	5.7	5	59.48	1.07	0.17	0.08	0.19	0.06		17.29

B- Set The Targets		
LSF	SM	AM

Raw Meal	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	SUM	ASR

Clinker	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	SUM
	C ₂ S	C ₃ S	C ₄ A	C ₄ AF	LP%	AW	BI			

2- Enter the targets of LSF, SM & AM, then it is done!

A- Enter Raw Materials Chemical Composition											C- Get feeding %
	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	LOI	Feeding %
LBESTONE	48.51	6.18	1.16	0.54	2.27	0.24	0.05	0.09	0.06		79.83%
CLAY	5.5	42.06	10.69	4.01	2.91	0.27	0.4	3.97	0.05		16.88%
Address1	12.99	44.17	5	4.77	8.48	1.08	0.27	0.57	0.22		2.94%
Address2	2.72	5.7	5	59.48	1.07	0.17	0.08	0.19	0.06		1.33%

B- Set The Targets		
LSF	SM	AM
0.86	2.75	1.1

Raw Meal	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	SUM	ASR
	40.02	13.06	2.85	1.80	2.54	0.35	0.11	0.71	0.07	61.64	0.44

Clinker	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MgO	SO ₃	Na ₂ O	K ₂ O	Cl	SUM
	C ₂ S	C ₃ S	C ₄ A	C ₄ AF	LP%	AW	BI			
	66.19	9.60	7.64	9.38	28.11	24.40	4.91			

B- Formulas:

1- Alumina Ratio (AR):

$$AR = \frac{Al_2O_3}{Fe_2O_3}$$

2- Silica Ratio (SR):

$$SR = \frac{SiO_2}{Al_2O_3 + Fe_2O_3}$$

3- Lime Saturation Factor (LSF):

$$LSF_{British\ Standard} = \frac{CaO - 0.7 \times SO_3}{2.8 \times SiO_2 + 1.2 \times Al_2O_3 + 0.65 \times Fe_2O_3}$$

4- Alite;(Tri-Calcium silicate)

$$C_3S_{AR>0.64} = 4.071 \times CaO - 7.602 \times SiO_2 - 6.718 \times Al_2O_3 - 1.430 \times Fe_2O_3 - 2.858 \times SO_3$$

5- Belite;(Di-calcium silicate):

$$C_2S = 8.602 \times SiO_2 + 1.078 \times Fe_2O_3 + 5.068 \times Al_2O_3 - 3.071 \times CaO$$

6- Celite;(Tri-Calcium Aluminate):

$$C_3A = 2.650 \times Al_2O_3 - 1.692 \times Fe_2O_3$$

7- Felite;(tetra-calcium aluminoferrite):

$$C_4AF = 3.043 \times Fe_2O_3$$

8- Percent Liquid @ 1450°C (Liquid Phase)

$$\%LP_{@1450^\circ C} = 1.13 \times C_3A + 1.35 \times C_4AF + MgO^* + Alkalis$$

(*MgO should not exceed 2%)

9- Coating Tendency/index:

$$AW = C_3A + C_4AF + 0.2 \times C_2S + 2 \times Fe_2O_3$$

10-Burnability Index:

$$B.I. = \frac{C_3S}{C_4AF + C_3A}$$

11-Alkali Sulfate Ratio (A.S.R.):

$$A.S.R. = \frac{SO_3}{K_2O + 0.5 \times Na_2O}$$