W1.44

Calculation of 3 component raw mix

The calculation assumes preliminary values of Hydraulic modulus and silica modulus.It refers either to raw materials or ignited (loss free) materials

Let proportions of limestone, clay and 2nd additive be

limestone	x	%								
clay	y	%					%			
2nd additive	z	%		SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	L.O.I.
1				S	A	F	C	M	
equation 1			**x+y+z = 100**						
2 Chemical compositions									
of materials are:		L	limestone	4.4	2.7	2.5	49.3	0.5	40.6
		C	clay	32.5	22.5	10.6	21.5	2.1	10.8
		S	2nd additive sand	94.4	2.5	1.8	0.5		0.8
on ignited basis				**7.41**	**2.70**	**2.50**	**49.30**	**0.50**	**40.60**
				36.43	**22.50**	**10.60**	**21.50**	**2.10**	**10.80**
				95.16	**2.50**	**1.80**	**0.50**	**0.00**	**0.80**

Assumptions

hydraulic modulus 2
silica modulus 1.6

hydraulic modulus of raw mix
equation 2 **LC*x+CCy+SC*z)/((LS+LR)*x+(CS+CR)*y+(SS+SR)*z) = H.M. = 2**

silica modulus of raw mix
equation3 **(LS*x+CS*y+SS*z)/(LR*x+CR*y+SR*z) = s.m. = 1.6**

By solving equations 1,2 and 3 for x,y, and z the prportions of limestone, clay and 2nd additive can be obtained.
In this case for raw materials for compositions as above,

x = 82.5 %
y = 11.1 %
z = 6.4 %

Similar calculations can be made for ignited or loss free basis with same results

source:Ottolabahn Cement Engineers Handbook