

CEMENT QUALITY IN NIGERIA

A PRESENTATION

BY

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**TO THE MEETING OF
STAKEHOLDERS ORGANISED BY
THE STANDARDS ORGANISATION
OF NIGERIA**

AT

**SHERATON HOTELS AND TOWERS
IKEJA, LAGOS**

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PREAMBLE

**COREN RECEIVED A
SITUATION REPORT
FROM SON ON CURRENT
DEVELOPMENTS IN THE
CEMENT
MANUFACTURING AND
DISTRIBUTION SECTOR
IN THE COUNTRY.**

**After careful
consideration of
the submission,
the following
observations were
made:**

[1] T h a t t h e r e i s a n
ALLEGATION by some civil
society groups of the presence
of some substandard cements
in circulation in Nigeria
[paragraph1];

[2] That over the recent past ***APPROVAL HAD BEEN GIVEN FOR THE MARKETING OF DIFFERENT GRADES OF CEMENT*** in the country without most of the consumers being aware of what was being marketed;

[3] That there is pressure for the ***“STREAMLINING OF THE TYPES OF CEMENT IN THE NIGERIAN MARKET”*** [paragraph 3];

[4] That globally, THREE TYPES OF CEMENT – GRADE 32.5, GRADE 42.5 AND GRADE 52.5 – are produced but there is focus and dominance of a particular grade in some countries. Example is the United States of America where Grades 42.5 and 52.5 account for over 92% of manufactured cement. No country is however reported to be producing only Grade 42.5 and above [paragraph 5];

**[5] That currently,
Grade 32.5 constitutes
about 50% of cement
produced in Nigeria
[paragraph 6];**

[6] That Grade 32.5 is ***SUITABLE FOR RENDERING [PLASTERING], BLOCK MAKING AND LIGHT CONCRETE ACTIVITIES*** while Grade 42.5 is suitable for more intensive applications such as in more solid structures and ***HEAVY CONCRETES, FLYOVERS, MARINE CONSTRUCTIONS, AMONG OTHERS*** [paragraph 6];

[7] That Grade 42.5 ***CAN PERFORM
THE FUNCTIONS*** of Grade 32.5
[paragraph 6];

[8] That ***ALL THE MAJOR CEMENT PRODUCERS [EXCEPT DANGOTE]*** are producing over **90%** as Grade 32.5 while DANGOTE produces about **13%** as Grade 32.5 [paragraph 6;

[9] That **SON** has
CONTINUOUSLY ensured that the
adopted standards are **STRICTLY**
adhered to by **ALL**
MANUFACTURERS [paragraph 7];

[10] That empirical evidence has shown that there **MAY BE** a correlation between the misapplication of cement types and building collapse [paragraph 8];

[11] That ***“INAPPROPRIATE APPLICATION”*** of cement types in concrete operations ***CAN BE CORRELATED*** with the frequency of building collapse [paragraph 8];

[12] That cases of building collapse ***WERE RARE*** during the period of large-scale importation of cement in Nigeria when the Grade 42.5 was the major cement type prescribed by the regulatory body [paragraph 9];

[13] That the rising proportion of Grade 32.5 in the present era has been ascribed, **“RIGHTLY OR WRONGLY”**, with the rise in the frequency of building collapse and construction hazards [paragraph 10];

[14] That a school of thought in the Cement Manufacturers Association of Nigeria [CMAN] is asking for a restriction of the cement type since it believes that the high rate of building collapse ***MIGHT HAVE BEEN CAUSED*** by wrong application of cement grades, with particular reference to the ratio of cement to sand and /or gravel. This view is said to have been ***FURTHER CONFIRMED*** through an independent survey carried out by SON.
[paragraph 10];

[15] That another school of thought believes that eventhough there is misapplication of cement type as a result of ignorance, the way forward lies in ***INTENSIFYING EDUCATION AND TRAINING END USERS*** on the correct use of the cement types in the long term [paragraph 10];

[16] That **GOVERNMENT** notes that as much as this may be the strategic way to go into the future, there are serious concerns about what happens in the interim in view of potential loss of lives [paragraph 10];

[17] That a survey has
CONFIRMED the ignorance of
block moulders in distinguishing
between the two grades of cement
[paragraph 11];

[18] That ***ALL THE KEY MANUFACTURERS*** have the capacity to make both grades of cement [paragraph 12];

[19] That the reason some manufacturers continue with the manufacture of Grade 32.5 is their claim that they ***WILL INCUR EXTRA COSTS*** in modifying some of their equipment if they have to phase out the production of this grade. It will also hurt their profits and invariably cause a hike in the price of cement [paragraph 12];

[20] That it is not in the interest of local cement producers for ***INCREASE IN THE RATE OF BUILDING COLLAPSE TO BE LINKED*** to the domestication of cement production, as this will lend credibility to claims that locally manufactured products are of lower quality compared to imported ones [paragraph 13];

[21] That manufacturers of Grade 32.5 have **TAKEN ADVANTAGE** of the level of ignorance in Nigeria in that the prices of all types of cement have remained the same, irrespective of the grade, in spite of the differential in cost of production [paragraph 14];

[22] That there is therefore a
***COMPELLING NEED FOR
MASS PUBLIC EDUCATION
AND ENLIGHTENMENT*** on
what the two grades are used for,
should they be retained [paragraph
15];

[23] That as a way forward, **one option** is that ***DIFFERENT TYPES OF CEMENT CAN BE MANUFACTURED AND IMPORTED INTO NIGERIA***, but the manufacturers and importers must clearly specify their standards and specifications. These must appear boldly on the cement bags and the inscription should easily be identified and understood by the buying public [paragraph 16];

[24] That a **second option** is to adopt and apply a uniform standard to all cement products in Nigeria. ***THIS SINGLE STANDARD COULD BE THE HIGHER GRADE WHICH IS GRADE 42.5*** for across the board application in Nigeria [paragraph 17];

[25] That the adoption of any standards for cement ***SHOULD NOT HAVE ADVERSE COST IMPLICATIONS*** for Nigerians either in the accessibility and/or affordability of the product [paragraph 18];

[26] That **SON** has a
***FUNCTIONAL LABORATORY
IN ENUGU*** for testing building
materials such as blocks, iron rods,
etc [paragraph 19];

[27] That there is a need for **UPGRADING** of facilities at the Enugu laboratory and for **CONSTRUCTION OF NEW ONES** in different parts of the country [paragraph 19].

**OUR
COMMENTS
ON THE
ABOVE**

[1] **Are there really substandard cements in Nigeria?** The answer is a categorical **NO** unless we are not to believe the **SON** statement that **“SON has CONTINUOUSLY** ensured that the adopted standards are **STRICTLY** adhered to by **ALL MANUFACTURERS** [paragraph 7]. **There seems to be a misunderstanding between lower strength and substandard.**

[2] **Cement Grade 32.5 is not a product of clinker manufacturing process from the kiln.** Normally, cement kilns are designed for higher grades of clinker and the clinker is **the same for all grades of Ordinary Portland Cement;**

[3] Different grades of Ordinary Portland cement are produced at the **POINT OF GRINDING OR BLENDING**. Lower grades take more additives thereby increasing the weight of cement obtainable from a quantity of clinker. This reduces the cost of production of the cement. Higher grades of cement are usually more expensive because of the **COST OF PRODUCTION OF THE CLINKER;**

[4] Grade 32.5 cement can be produced directly from a normal Ordinary Portland Cement manufacturing process but this will however involve changes in the technology;

[5] The energy requirement for the production of cement clinker can be regulated from the chemical composition of the raw materials;

[6] Grade 32.5 is not considered as a ***SWEET MATERIAL*** for cement clinker production because it requires higher retention and very rapid quenching of the outgoing clinker;

[7] The **strength of cement** specified is the **strength of cement mortar** and **not that of concrete**, which could be lower;

[8] There is currently no experimental data on the correlation between concrete strengths and the strengths of the cement grades in the Nigerian market;

[9] The public was largely **left in the dark** when different grades of cement were introduced into the market as against what we all knew as **ORDINARY PORTLAND CEMENT COMPLYING WITH BS 12:1958**. This ignorance is not just with block moulders, artisans etc. Most engineers, architects and others in the construction industry and even the **ACADEMICS** are still unaware that cements of different strengths are in circulation in the country. It is highly possible that even some of the **research publications by academics may have been based on wrong assumptions;**

[10] Currently, most **contract documents** in the country do not mention any of these grades of cement in their **SPECIFICATIONS** or **BILL OF ENGINEERING MEASUREMENT AND EVALUATION [BEME]** or **BILL OF QUANTITIES [BOQ]** as the case may be;

[11] **Building collapse** in Nigeria has mostly involved **storey buildings** with hardly anything heard about **bungalows**. This shows that **sandcrete blocks** currently produced with both types of cements do not seem to have problems. **It is when concrete is involved that we have problems and when it comes to concrete production, the blame cannot be put solely on the quality of cement.**

[12] Reports show that the consumption in some countries is as shown below:

COUNTRY	CEMENT STRENGTH CLASS		PACKING	
	32.5	42.5 OR HIGHER	50KG BAGS	BULK
GHANA	90%	10%	90%	10%
KENYA	88%	12%	93%	7%
COTE D'VOIRE	85%	15%	92%	8%
MOROCCO	83%	17%	73%	27%
INDIA	80%	20%	78%	22%
LEBANON	80%	20%	51%	49%
PHILIPPINES	85%	15%	89%	11%
NIGERIA	50%	50%		

[13[The supply of cement into the Nigerian market in 2013 was as follows:

COMPANY	YEAR 2013 IN MILLION TONS		
	CAPACITY	SALES	MARKET SHARE
DANGOTE	20.25	13.31	62.8%
LAFARGE/WAPCO/ ASHAKA	5.50	4.20	19.8%
UNICEM	2.50	1.95	9.2%
CCNN SOKOTO	0.50	0.50	2.4%
OTHERS	0.10	0.10	0.5%
IMPORTS [IBETO]		1.12	5.3%
TOTAL	28.85	21.18	100%

[14] The production by Grade from the manufacturing companies for 2013 were:

[14] The production by Grade from the manufacturing companies for 2013 were:

COMPANY	GRADE	
	32.5	42.5 OR HIGHER
DANGOTE	13%	87%
LAFARGE/WAPCO/ ASHAKA	90-95%	5-10%
UNICEM	90-95%	5-10%
CCNN SOKOTO	90-95%	5-10%
OTHERS	90-95%	5-10%
IMPORTS [IBETO]		100%
TOTAL		

[15] Some cement plants switched from production of Grade 32.5 to Grade 42.5 only less than a year ago;

[16] The cement manufacturers have printed the type of cement on the bags but the ***LABELS ARE TOO INCONSPICUOUS*** at the moment. Something more **eye-catching** is required or the use of **colour strips** is necessary for easy identification;

OUR RECOMMENDATIONS

[1] There is a need to undertake a **total quality assurance of the cement industry in Nigeria in order to establish the acceptability of the various grades of cement in the market;**

[2] Experimental and field tests are required to establish the relationship between the Ordinary Portland Cement grade sold in the market and the concrete strength;

**[3] There is need for the
establishment of a
Cement and Concrete
Institute in the country;**

[4] More time should be allowed before a **final decision is taken on the **realignment of the cement types in circulation** pending when more empirical, data will become available from **[1] and [2] above;****

[5] Massive public enlightenment should be undertaken to inform the public of the different types of cement in circulation in the market;

[6] The different cement grades should be conspicuously written on all the bags and in addition there should be colour codes in the form of band strip to differentiate the various grades;

[7] Stakeholders should be brought in at **all stages of development of new standards or review of any existing standard for materials/ processes and **COREN** should be involved when it affects engineering materials and processes. This is in line with the **SON Act 18 of 1990.****

[8] It must be noted that technical regulation is different from standard regulation.

SON apparently carries out technical regulation. To deviate from this trend, the SON should bring together the following stakeholders while establishing Engineering Standards: -

**(i) Manufacturers Association of Nigeria
(MAN).**

**(ii) Federation of Construction
Industries (FOCI).**

**(iii) Nigerian Society of Engineers
(NSE).**

**(iv) Association of Consulting
Engineers in Nigeria (ACEN).**

**(v) Committee of Deans of
Engineering and Technology
(CODET).**

**(iv) Nigerian Building and
Road Research Institute
(NBRRI).**

**(vii) Raw Materials
Research and
Development Council
(RMRDC).**

[9] There is the need for sponsorship of specific research for specific areas.

For now, sponsorship of such research can be undertaken by cement companies (in the case of cement) under the umbrella of Cement Manufacturing Companies of Nigeria (CEMAN)

[10] Cement Companies should establish their own laboratories. Considering that individual cement companies cannot have laboratories that can take care of all tests, there is need for collaboration with other laboratories while confirmation of tests is carried out in higher grade laboratories which should be certified by COREN

**THANKS FOR
LISTENING**