blueCONCRETE

implicit sustainable!

REFERENCE

blueCONCRETE the Next Generation of green concretes can be realized worldwide. The big advantage of this technology is the usage of local raw materials to develop a sustainable and stable concrete while improving the mechanical properties.

REFERENCE

One of the G.tecz clients is located in Austria. Since more than 20 years, they are producing concrete pre-cast elements like tubes or wall elements for reservoirs. The technological requirements of the material are high due to the material is in contact with waste water or other divers chemicals.

AIM

Aim was to reduce the CO_2 reduction of the material, a C60 concrete, to exceed a high sustainability within the scope of new national regulations. Coeval the workability of the material should have been improved and the fresh material properties stabilized against e.g. bleeding. Cost control and improving the margin while optimizing the concrete goes without saying.

RESULT

The blueCONCRETE optimization of the C60 and it's raw materials leaded to a reduction of about 30% cement next other fines. Workability and quality were improved. The concrete class was changed into a C90. The margin of the material increased up to 35 Euro / m^3.

CO_2 REDUCTION
81 kg/m^3

PRIMARY ENERGY REDUCTION
376 MJ/m^3

SLUMP
Increased

QUALITY
Increased

POROSITY
Decreased

WORKABILITY
Stabilized

COMPRESSIVE STRENGTH
C60 to C90

FLEXURAL STRENGTH
Increased

MARGIN
blueCONCRETE 35 Euro/m^3

blueCONCRETE PRODUCTION
Since 2008

SUSTAINABILITY

With the blueCONCRETE technology, 81 kg CO_2 per m^3 can be saved. These means a reduction of 376 MJ primary energy. With a daily production of about 40 m^3, the company decreased the CO_2 emissions per year by about 710 tons and 3.3 Million MJ Energy.

	Concrete C55/C60 [kg/m^3]	CO2-Emission [kg/$t_{raw\ material}$]	Primary Energy [MJ/$t_{raw\ material}$]	CO2-Emission [kg/$m^3_{concrete}$]	Primary Energy [MJ/$m^3_{concrete}$]
Cement	*400,00*	*686,00*	*3220,00*	*240,38*	*1126,86*
Gravels	*1802,00*	*2,0*	*31,0*	*3,60*	*56,22*
Fines	-	-	-	-	-
Plasticizer	*4,00*	*0,08*	*1,10*	*0,00*	*0,00*
Water	*175,00*	*0,00*	*0,00*	*0,00*	*0,00*
			Summ:	*278,32*	*1344,07*

	blueConcrete C60 [kg/m^3]	CO2-Emission [kg/$t_{raw\ material}$]	Primery Energy [MJ/$t_{raw\ material}$]	CO2-Emission [kg/$m^3_{concrete}$]	Primery Energy [MJ/$m^3_{concrete}$]
Cement	*280,00*	*686,00*	*3220,00*	*192,30*	*901,00*
Gravels	*1802,00*	*2,0*	*31,0*	*3,60*	*56,22*
Fines	*110*	*10,00*	*90,00*	*1,10*	*9,90*
Plasticizer	*4,00*	*0,08*	*1,10*	*0,00*	*0,00*
Water	*175,00*	*0,00*	*0,00*	*0,00*	*0,00*
			Summ:	*197,00*	*967,12*

The tables are showing the difference between the CO_2 emissions and waste of Primary Energy of a regular C55/C60 compared with the optimized blueCONCRETE C60.

MATERIAL PROPERTIES

The base material of the client was successfully used in the past - Now sustainability, workability, quality and mech. properties had to be improved with the blueCONCRETE technology:

COMPRESSIVE STRENGTH and flexural strength were increased without adding additional fibres. Compressive strength after 48 hours is 60 MPa and after 28 days about 100 MPa.

SLUMP of the blueCONCRETE is 68 cm within t_{500} 15 seconds. WATER / CEMENT ratio is about 0.41.

POROSITY reduced from 8.6 Vol.% to 6.5 Vol.%.
Capillary pores reduced from 0.4 Vol.% to 0.2 Vol.%
Water and gas impermeability not measurable.

DENSITY remained 2.41 kg/dm^3

WORKFLOW & SERVICE

Only a few steps are necessary: The first common step is always to fix the aim, the specification of the concrete class regarding mechanical demands and national codes. This goes along with the analysis of production facilities and handling of the raw materials, concrete and e.g. formwork. G.tecz analysis the raw materials in the lab with special equipment and optimizes the material. Test series will show the materials properties. The recipe will be transferred to your company and G.tecz will accompany you while the first production due to a final adaptation of the recipe. Services, like adaptation of the recipe in case of changing raw materials or our hotline are included and part of the aimed long-term relationship between our companies.

YOUR blueCONCRETE

This reference shows the enormus ecological and economical potential of sustainale concretes. Please contact G.tecz to determine your materials capability.

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