MP01
Material Technical Data

Ceramics Consultancy Ltd

Document Issue Information					
Document Reference:-	CCCLMTIMP01		Suitable Casting Application's:-	Investment Casting - EQ / DS / SC	
Issue No:-	5		Suitable Casting Alloys / Steel:-	Nickel / Stainless / Carbon / Cobalt	
Issue Date:-	01 /02 /19		Typical Core Thickness - Fast Fire:-	Min = > 1mm	Max = < 30mm
Issued By:-	Mr Kevin Dawson		Typical Core Thickness - Slow Fire:-	Min = > 1mm	Max = < 100mm
Authorised By:-	Mr Dennis Dixon		Typical Core Shape:-	Low Complexity	
Process Application:-	Medium Pressure		Typical Core Features:-	Minor Detail	

Ceramic Core Body Composition		Limits	Typical Result - % of Ceramic Core Body
Silica	SiO_2	+/- N/A %	73.37%
Zircozon	$ZrSiO_4$	+/- N/A %	26.17%
Others		+/- N/A %	0.46%

Trace Element Analysis		Limits	Typical Result
Bismuth	Bi	+/- 1 ppm	5 ppm
Iron	Fe	+/- 50 ppm	500 ppm
Lead	Pb	+/- 10 ppm	20 ppm
Silver	Ag	+/- 10 ppm	20 ppm
Tin	Sn	+/- 10 ppm	20 ppm
Zinc	Zn	+/- 15 ppm	50 ppm

The following information is typical result's that can be expected using Test Bars (Dimensions 100mm x 12mm x 4mm) produced at Clan Ceramics Consultancy Ltd

Physical Properties	Limits	Typical Result - Fired to 1200°C
Apparent Porosity	+/- 2.50 %	28 %
True Porosity	+/- 2.50 %	30 %
Water Absorption	+/- 2.50 %	15 %
Apparent Bulk Density	+/- 0.50 %	1.85 gms/cm3
Bulk Density	+/- 0.50 %	2.50 gms/cm3
Creep Test	+/- 0.10 %	0.30 mm
Slump Test	+/- 0.10 %	0.10 mm
Thermal Expansion	+/- 0.10 %	0.20 %
Loss on Ignition	+/- 0.50 %	12.88 %

Process Shrink - From Mould to Fired	Limits	Typical Result - Fired to 1200°C
Free Linear Shrinkage (Tool to Fired)	+/- 10 %	1.00 %

Chemical Analysis	Limits	Fired to 1200°C	Fired to 1500°C
Cristobalite - Post Process Fired	+/- 5 %	5 %	25 %
Leachability - Moderate Sludge	+/- N/A %	100 %	100 %
Leachability - Break Up Time	+/- 20 %	60 Minutes	90 Minutes

Impregnation (Fired to 1200°C)	Limits	Modulus of Rupture - 3 Point Test @ 80mm Spacing			
		Psi	Mpa	Newtons	Deflection - mm
Injected (Green) Strength - Tested @ 20°C	+/- 10 %	1451	10.00	10.00	3.50
Fired @ 1200°C & Tested @ 20°C - Not Impregnated	+/- 10 %	2539	17.50	17.50	1.75
PVA Impregnated / Cured @ 120°C & Tested @ 20°C	+/- 10 %	7254	50.00	50.00	1.25
Fired & Tested @ 1500°C - Not Impregnated	+/- N/A %	N/A	N/A	N/A	N/A

Important Information

Test result's in this document are based upon the test's undertaken at External Test Facilities & Clan Ceramics Consultancy Ltd the results may vary due to:-

< The type and make of the equipment being used

< The environmental conditions within the facility where the tests are being undertaken

< The process settings and general maintenance on the equipment being used

< The operatives personal experience within the process environment

All test results and suggested limits are intended as a guideline only and do not form part of the basis for any inspection criteria as regards the pass or fail of any goods and / or services that are supplied - which in general would be determined by the customer's own particular requirements which would include testing of the materials prior to any purchase order being raised