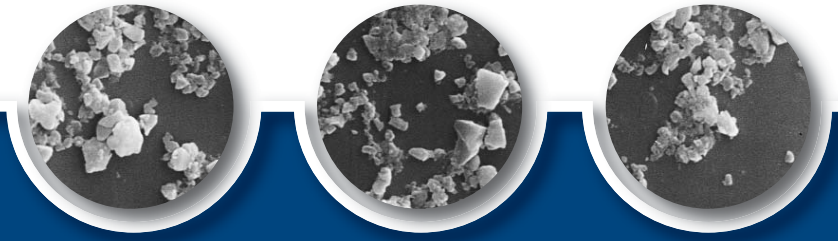

POLCARB™ 40SV & 50SV
IN pPVC CABLE APPLICATIONS

Conventional ground calcium carbonates are included in pPVC cable formulations to give the optimum cost effective balance of mechanical, electrical and thermal properties. Grades coated with stearic acid are particularly suitable for these applications.

Polcarb™ 40SV and **Polcarb™ 50SV** are IMERYS products manufactured from our extensive French chalk deposits.

The properties of **Polcarb™ 40SV** and **Polcarb™ 50SV** are given in Table 1.

EXPERIMENTAL

Polcarb™ 40SV and **Polcarb™ 50SV** have been compared with a coated ground chalk, manufactured by another company, in two pPVC cable formulations (lead stabilised and calcium/zinc stabilised). The formulations are shown in Tables 2 and 3.

The pPVC blends were hand-mixed, then processed on a two-roll mill heated to 150°C. Test plaques (nominally 1.5mm) were pressed out at 160°C for 5 minutes. The plaques were then tested for colour, tensile properties, volume resistivity and heat stability.

TABLE 1: PRODUCT PROPERTIES

	Polcarb™ 40SV	Polcarb™ 50SV
Brightness (ISO)	81	82
+ 53 µm (% max)	0.01	0.01
- 2 µm (%)	38	45
Moisture as produced (% max)	0.2	0.2
Stearate (%)	0.35	0.45
Other Typical Properties		
Specific Gravity (g/cm^3)	2.7	2.7
Surface Area (BET; m^2/g)	2.5	2.8
pH	9	9

CONCLUSIONS

Our experimental data (Tables 4 - 7) show that **Polcarb™ 40SV** and **Polcarb™ 50SV** give comparable results to the calcium carbonate filler widely used throughout the industry.

TABLE 2: FORMULATION A
LEAD STABILISED pPVC CABLE FORMULATION

Formulation	phr
PVC(K70) resin	100
Di-2-ethylhexylphthalate plasticiser	38
Chlorinated paraffin plasticiser extender	18
Calcium/Zinc stabiliser	3
Stearic Acid	0.5
Filler	75

TABLE 3: FORMULATION B
CALCIUM/ZINC STABILISED PPVC CABLE FORMULATION

Formulation	phr
PVC(K70) resin	100
Di-2-ethylhexylphthalate plasticiser	38
Chlorinated paraffin plasticiser extender	18
Calcium/Zinc stabiliser	3
Stearic Acid	0.5
Filler	75

TABLE 4: COLOUR (CIELAB) OF PPVC COMPOUNDS

		Formulation A:			Formulation B:		
		Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk	Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk
Colour	L*	75	76	73	73	74	71
	a*	3	3	3	3	3	3
	b*	14	13	13	15	14	14

TABLE 5: TENSILE PROPERTIES (SIMILAR TO ISO 527) OF PPVC COMPOUNDS

	Formulation A:			Formulation B:		
	Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk	Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk
Tensile Strength (MPa)	14.7	15.9	16.9	13	13	13.1
Elongation (%)	280	280	280	270	280	270

TABLE 6: ELECTRICAL PROPERTIES OF PPVC COMPOUNDS: VOLUME RESISTIVITY (TΩ.CM)

	Formulation A:			Formulation B:		
	Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk	Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk
23°C	215	281	210	18	23	25
60°C	5	7	8	0.1	0.1	0.3
23°C (24hr in H_2O)	117	105	81	18	20	19

TABLE 7: HEAT STABILITY (ISO 182-1) OF PPVC COMPOUNDS

	Formulation A:			Formulation B:		
	Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk	Polcarb 40SV	Polcarb 50SV	Coated Ground Chalk
Heat Stability (Mins at 200°C)	37	38	34	58	59	59

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PFME/P103 - First Edition - 02/04 | World Minerals is a Member of Imerys