



**Research Centre for Environmental Technology and Management**  
*Investigator: Professor C.S. Poon, Tel:2766-6024, Email:cecspoon@polyu.edu.hk*

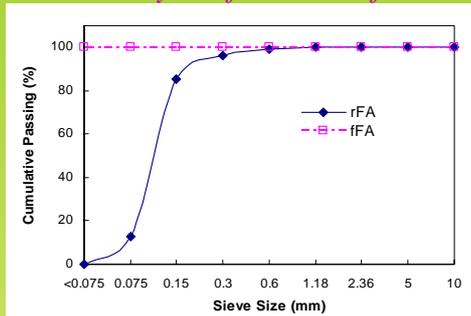
## Potential Applications of Rejected Fly Ash

### Objectives

- To explore potential applications of rejected fly ash (r-FA) since r-FA is considered a waste material due to its high carbon content and large particle size (>45 μm)
- To explore effective ways to activate the reactivity of r-FA

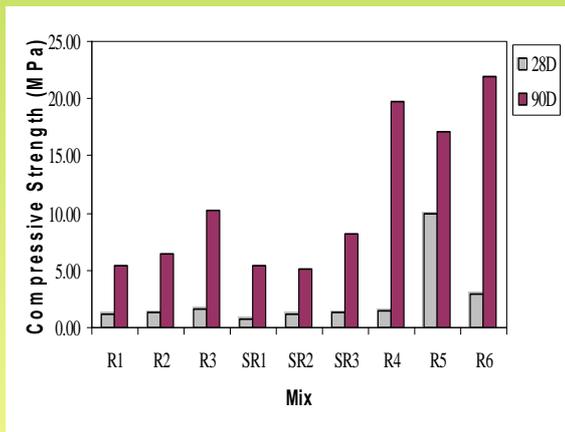
### Test Results

#### *Sieve Analysis of r-FA and f-FA*



- Both r-FA and f-FA are generated from burning coal during the generation of electricity
- f-FA complies with BS 3892 as less than 12.5 % of the particles are retained on the 45 μm sieve. The coarser r-FA is rejected from the classifying process.

#### *Compressive Strength*



Mix	r-FA	Ca(OH) <sub>2</sub>	FGD	Chemical Activator
<b>R1</b>	100	10		
<b>R2</b>	100	20		
<b>R3</b>	100	30	/	/
<b>R4</b>	100	30	10	/
<b>R5</b>	100	30	/	5.2 (Na <sub>2</sub> SO <sub>4</sub> )
<b>R6</b>	100*	30	/	/

SR: steam curing; R: curing at room temperature; \* ground  
 FGD: Flue gas desulphurization (FGD) sludge

#### *Leaching Test (TCLP) – Results of chemically stabilized / solidified heavy metal waste using r-FA*

Age	RNS		R		C		RFGD		f	
	28	56	28	56	28	56	28	56	28	56
<b>Pb</b>	0.38	0.59	0.12	1.05	0.18	0.71	8.07	2.25	2.60	0.02
<b>Zn</b>	0.07	0.03	0.04	0.04	0.30	0.04	0.01	0.11	0.03	0.01
<b>Cu</b>	nd									

RNS: r-FA + Cement + Na<sub>2</sub>SO<sub>4</sub>

R: r-FA + Cement

C: Cement

RFGD: r-FA + Cement + FGD

f: f-FA + Cement

### Conclusions

- r-FA can be used in cement-based solidification / stabilization processes for the treatment of toxic waste
- The addition of Na<sub>2</sub>SO<sub>4</sub> can effectively activate the reactivity of r-FA at 28 & 90 days
- The use of FGD and mechanical grinding are beneficial for the strength at 90 days