

## Summary of the Advantages of the APS technology

Ref No.		APS Technology	Other Systems in Europe and the United States	
1.	Feedstock inputs and methodology	Continuous	Batch	Continuous
		Built in safety precautions to prevent explosion or spontaneous combustion.	Explosion and safety concerns	
2.	Heat sources	Multiple heat sources	Single heat source	
		Gas, diesel, steam	Gas, diesel, infrared, microwave, electrical	
3.	Pyrolysis and Heating Process	Indirect + direct steam heating Two stage process with steam. The maximum processing temperature of second stage is up to 850°C	Indirect heating One stage process Process temperature lower than 450°C	
4.	Cracking time for used tire Chips	< 15-17 min	>1.2hr	>35min
5.	Energy efficiency	> 85%	<30%	< 50%

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6.	Product Quality	1. Light fuel oil similar to diesel oil 2. High quality carbon black	1. Heavy oil 2. Poor quality carbon black		
		(a) Oil, sulfur content	Low sulfur content, better quality	High sulfur content, low quality	
			< 1%, can reach to 0.3% without catalyst	> 2%	> 2%
		(b) Carbon quality	High quality, no oil content, high iodine absorption rate, larger surface area	Low quality, high oil content, low iodine absorption, small surface area	
BET 120~800, Oil content <0.1% meets N220 standard with the addition of an acid purification system.	BET <60, Oil content > 1%, secondary waste		BET <60, Oil content >1% Secondary waste		
7.	Operating Efficiency	1. Complete cracking 2. High-quality carbon black 3. Fast cracking time – 15-17 minutes 4. Minimal vacuum	1. Cracking incomplete 2. low-quality carbon black oil, cannot be sold 3. Cracking requires longer time 4. Must be complete vacuum, as there are safety concerns		
8.	Application Range	Multi-purpose, all organic material	Single purpose.		