

# COMBUSTIBLE DUST

## AND KST VALUES

### UNDERSTANDING COMBUSTIBLE DUSTS AND KST VALUES

#### FLAME PHYSICS

##### Determining KST

KST used to determine speed & pressure of a flame front in the event of explosion

K . S . T

K = thermal expansion

S = speed

T = temperature

Once KST is determined, it falls into one of four categories

ST-0

KST 0  
pmax 0

ST-1

KST 1-200  
pmax 10

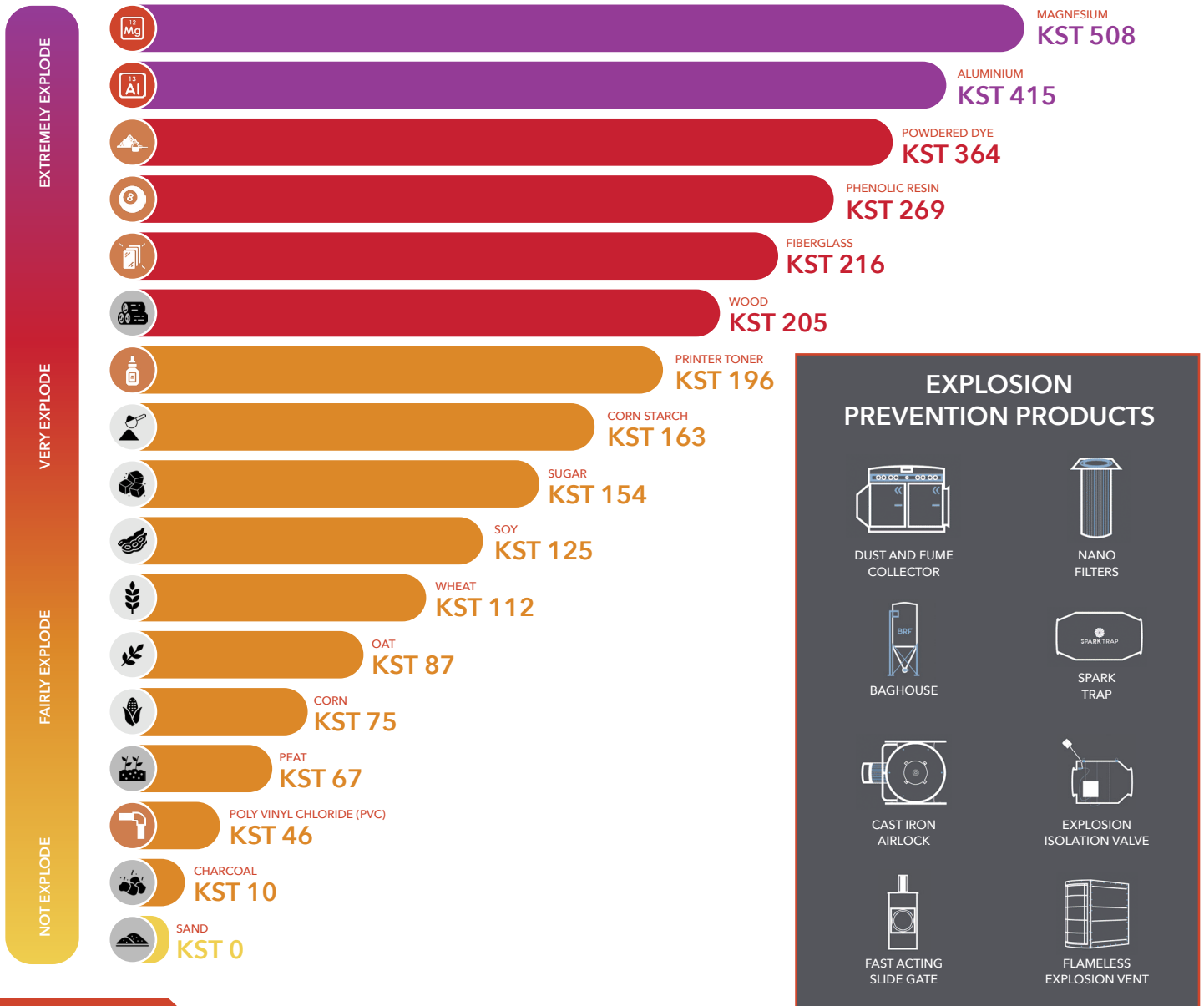
ST-2

KST 201-300  
pmax 10

ST-3

KST 300 and Above  
pmax 12

● Metal ● Chemical ● Natural ● Agriculture



#### EXPLOSION PREVENTION PRODUCTS



DUST AND FUME COLLECTOR



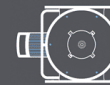
NANO FILTERS



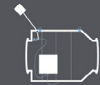
BAGHOUSE



SPARK TRAP



CAST IRON AIRLOCK



EXPLOSION ISOLATION VALVE



FAST ACTING SLIDE GATE



FLAMELESS EXPLOSION VENT

This infographic identifies the KST values of common metal, chemical, natural, and agricultural dusts found in manufacturing processes. KST is a general measurement of explosiveness and is a standard measurement for dust collection system design purposes. The explosive dust particle size range is between 10 and 95 microns.

## FLAME PHYSICS

KST is used to determine the speed and pressure of a flame front in the event of an explosion. To calculate the KST values of these common dusts, thermal expansion (K), speed (S), and temperature (T) are used. Once KST is determined, it falls into one of four categories:

- ST-0: KST 0, Pmax 10
- ST-1: KST 1-200, Pmax 10
- ST-2: KST 201-300, Pmax 10
- ST-3: KST 300 and above, Pmax 12

## DESCENDING KST VALUES OF COMMON DUSTS

These common dusts are listed in decreasing order of their KST values. The higher the KST number, the more explosive the dust is. Note that Magnesium dust and Aluminum dust with KST values of 508 and 415, respectively, are extremely explosive. Whereas, Poly Vinyl Chloride (PVC) and Charcoal with KST values of 46 and 10, respectively, are not very explosive. For reference, Sand with a KST value of 0 is not explosive at all. Please note that this information should be used as a reference only and should not be used in place of a dust test.

## EXPLOSION PREVENTION PRODUCTS

Kresco offers dust collection systems and accessories that help prevent an explosion in your factory. Our CDC Series Dust Collectors are offered with accessories and mechanisms that can help you comply with local jurisdictions and protect your workspace against the risks of explosion or fire caused by combustible dusts present in your environment.

# DUST COLLECTOR EXPLOSION PROTECTION

## What type of Explosion Protection Should be Used and Why?

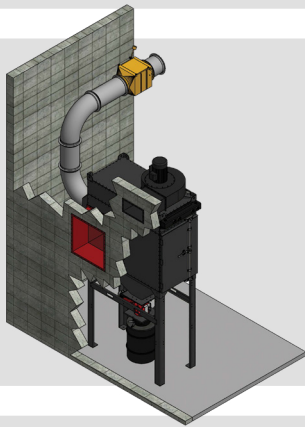
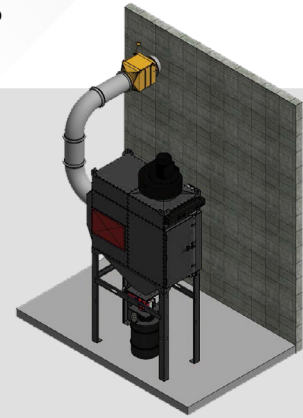
### COLLECTOR OUTSIDE - CLEAR SAFETY ZONE

#### Standards

- NFPA 652
- NFPA 68 (Venting)
- NFPA 69 12.2.4.4.1 (Rotary Airlock)

#### Protection

- Isolation on inlet line to collector
- Discharge directed to a safe unoccupied location (or outfitted with isolation to return back to the building or a process)
- Explosion venting on unit (Explosion relief panels directed towards an unoccupied area)
- Rotary airlock with close clearance as a form of isolation on discharge



### COLLECTOR INSIDE - VENTED OUTSIDE TO CLEAR SAFETY ZONE

#### Standards

- NFPA 652
- NFPA 68 6.8 (Venting Through Discharge Ducts)
- NFPA 69 12.2.4.4.1 (Rotary Airlock)

#### Protection

- Isolation on inlet line to collector
- Discharge directed to a safe unoccupied location (or outfitted with isolation to return back to the building or a process)
- Explosion venting on unit near exterior wall. Relief vent directed through the wall with properly sized discharge duct (Explosion relief panels directed towards an unoccupied area)
- Rotary airlock with close clearance as a form of isolation on discharge

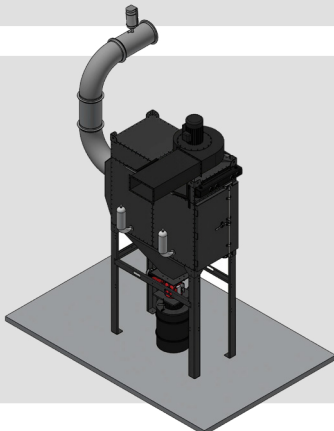
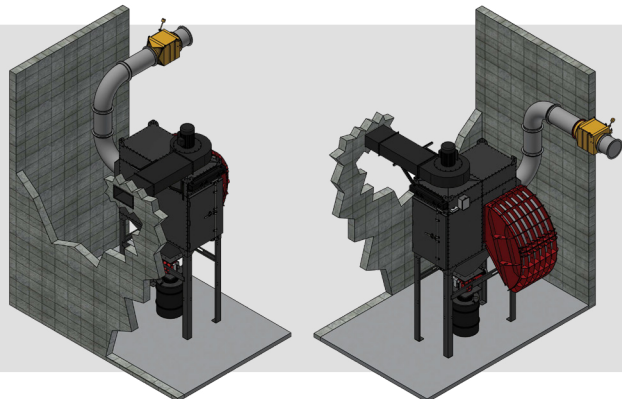
### COLLECTOR INSIDE - FLAMELESS VENT

#### Standards

- NFPA 652
- NFPA 68 6.9 (Venting with Flame Arresting and Particulate Retention)
- NFPA 69 12.2.4.4.1 (Rotary Airlock)

#### Protection

- Isolation on inlet line to collector
- Discharge directed to a safe unoccupied location (or outfitted with isolation to return back to the building or a process)
- Explosion venting into a Flameless vent (flame arresting device)
- Rotary airlock with close clearance as a form of isolation on discharge



### COLLECTOR INSIDE - SUPPRESSION

#### Standards

- NFPA 652
- NFPA 69 Chapter 10 (Deflagration Control by Suppression)
- NFPA 69 12.2.4.4.1 (Rotary Airlock)

#### Protection

- Isolation on inlet line to collector
- Discharge directed to a safe unoccupied location (or outfitted with isolation to return back to the building or a process)
- Chemical Suppression system designed to withstand a deflagration inside of the unit
- Rotary airlock with close clearance as a form of isolation on discharge