Spark Cooler
BLENDER PRODUCTS INC.

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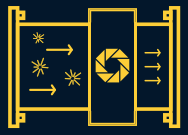
About Spark Cooler

The Spark Cooler is the industry leader in spark mitigation for metal fabrication and other low-load material processing applications, under non-explosive conditions. The Spark Cooler provides spark reduction and low pressure drop to reduce filter fires and equipment damage to industrial dust collection systems.

Reduce Sparks in Dust Collection Systems

Reduce Cost and Disruptions of Metal Dust Fires



Processes and Applications

Metal Fab Processes
- Metal Grinding
- Resistance Welding
- Plasma Cutting
- Laser Cutting

Thermal Spray

Metal Processes
- Fabrication facilities
- Automotive plants
- Foundries
- Metal Recycling

Coffee, dry food processing

Charcoal manufacturing

Biomass power generation

Battery Recycling

Shoe and tire grinding (rubber)

Performance Advantages

Greatly reduced damage to filter media

Zero footprint/space requirement

Easy installation

Works in vertical or horizontal position

No secondary dust accumulation point

Spark Mitigation

Sparks from metal processing applications can ignite the combustible metal dust and/or filter media in the collection device.

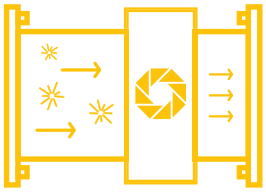
- Leads to equipment damage
- Production down-time resulting in lost revenue
- Filter and dust collection equipment replacement costs

Mitigate sparks in the duct before they enter the dust collector with the Spark Cooler.

- Cool and arrest sparks without water or chemical injection
- Reduce burn-damage to filter media
- Reduce duct and dust collector damage

Business Operations Benefits

- Virtually eliminates system maintenance downtime
- Static device – no moving parts, no electrical controls
- Retrofit or new applications
- **Quick payback (1 line shut down or 2-3 filter damage incidents)**
- Integral part of Plant Safety Program and acceptable under NFPA 69, 484, and 652



How It Works:

The Spark Cooler creates turbulence to increase the relative velocity between the sparks and the conveying air stream which provides a 2-part benefit:

1. Accelerates the chemical reaction between the fuel of the spark and oxygen in the air causing the spark to burn out.
2. Increase heat transfer between the spark and the air stream to cool the hot particle.

Importance of Particle Size and Downstream Distance:

Particle sizes larger than 50 micron make up a small percentage of the total particles captured by a dust collector in typical metal processing applications, however, they have a greater potential to cause a fire as they take longer to burn out and cool and contain more energy than the majority of smaller particles. The distance between the Spark Cooler® and the dust collector is critical to allow these mechanisms to cool the spark. The longer the distance the more successful the Spark Cooler will be at cooling the spark below an ignition temperature by the time it reaches the filters.

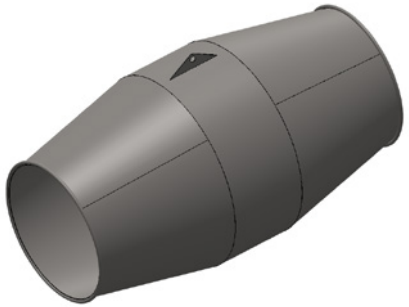
Title of Information Below

Velocity	Optimal: 2500-4500 fpm Acceptable: 1500-5000 fpm
Temperature	Typical: Ambient shop air Acceptable: up to 300°F
Particle Size*	0.1 - 1,500 microns Typical for normally operating weld, plasma, laser and grinding applications
Duct Distance*	Upstream: ≥1 diameters Downstream: Optimal: ≥10 diameters Minimum: 5 diameters Can be horizontal or vertical

**Higher velocities convey larger particles. Particle sizes vary by application. Larger particles take longer to cool.*

Connection Types Available

Bolted Flange



Rolled Edge

Slip-Fit

Selection Process

Step 1: Identify the duct diameter.

Step 2: Confirm air flow.*

Step 3: Identify the corresponding model number.

Step 4: Select the material and connection type.

Step 5: Select any optional features.

**Reference the size table on the page 8.*

Spark Cooler® Model Number

SC	14	C	4	K	ID[1]	CR[2]

Description	Code
Spark Cooler®	SC

Size	Code
Duct/Connection Size (in)	4- 80

Shape of Duct	Code
Circular	C
Rectangular	R

Fabrication Material	Code
304L Stainless Steel	1
316L Stainless Steel	2
Carbon Steel (Bare, Unpainted)	3
Painted Carbon Steel	4
Abrasion Resistant Steel, Painted	5

Code	Connection Type
K	Bolted Flange(Standard Pattern)
R	Rolled Edge (For Quick Clamp)
S	Slip Fit

Code	Optional Features
ID	Inspection Door in Upstream Cone
SCN14	Removable Screen - 14 Mesh (0.051" / 1300 micron openings)
SCN4	Removable Screen - 4 Mesh (0.215 "/ 5500 micron openings)

Code	Custom Paint Options
HT	High Temperature Rated Powder Coat[3]
CR	Corrosion Resistant Interior Primer
Cust	Custom Paint Color

[1] Leave options blank if none selected

[2] Standard paint is powder coated black (BK-01) and rated up to 300°F

[3] High temperature rated paint is silver powder coat up to 600°F, other options are available

Size, Flow Rate, Pressure Drop, and Distance Requirements

Sizing		Flow Rate					Dimensions (Inches)		Weight (lbs)	Optimal Distance (Inches)*		
Spark Color Model #	Duct Diameter (Inches)	CFM					Connection Diameter (Duct Diameter)	Length	Weight	Upstream Distance - Minimum	Downstream Distance - Minimum	Upstream Distance - Ideal
SC4___	4	218	262	305	349	393	4	10	5	4	20	40
SC5___	5	341	406	477	545	614	5	13	6	5	25	50
SC6___	6	491	589	687	785	884	6	13	10	6	30	60
SC7___	7	668	802	935	1069	1203	7	23	21	7	35	70
SC8___	8	873	1047	1222	1396	1571	8	23	22	8	40	80
SC10___	10	1364	1636	1909	2182	2454	10	23	27	10	50	100
SC12___	12	1963	2356	2749	3142	3534	12	31	41	12	60	120
SC14___	14	2673	3207	3742	4276	4811	14	35	51	14	70	140
SC16___	16	3491	4189	4887	5585	6283	16	41	73	16	80	160
SC18___	18	4418	5301	6185	7069	7952	18	46	90	18	90	180
SC20___	20	5454	6545	7636	8727	9817	20	47	102	20	100	200
SC22___	22	6600	7919	9239	10559	11879	22	52	121	22	110	220
SC24___	24	7854	9425	10996	12566	14137	24	57	147	24	120	240
SC26___	26	9218	11061	12905	14748	16592	26	59	165	26	130	260
SC28___	28	10690	12828	14966	17104	19242	28	68	207	28	140	280
SC30___	30	12272	14726	17181	19635	22089	30	68	300	30	150	300
SC32___	32	13963	16755	19548	22340	25133	32	72	340	32	160	320
SC34___	34	15763	18915	22068	25220	28373	34	80	360	34	170	340
SC36___	36	17671	21206	24740	28274	31809	36	86	415	36	180	360
SC38___	38	19689	23627	27565	31503	35441	38	94	475	38	190	380
SC40___	40	21817	26180	30543	34907	39270	40	99	550	40	200	400
SC42___	42	24053	28863	33674	38485	43295	42	99	575	42	210	420
SC___	44-66	2600 - 106910					-	-	-	-	-	-
	Velocity	2500	3000	3500	4000	4500						
	Pressure Loss (w.g.)	.32	.46	.63	.82	1.04						

** We recommend as long of distance as possible between the Spark Cooler® and the dust collector with 10 or more duct diameters being ideal, and 5 diameters as the very minimum (this can include elbows). At least one (1) duct diameter of straight duct immediately upstream and downstream of the Spark Cooler®. It can be placed in horizontal or vertical ducts.*

*** Sizes available over 100,000 CFM. Please contact a Blender Products application engineer for specifications of larger or alternate sizes.*

Optional Features

Inspection Door

Available on sizes SC10 and above.

Allows access for inspection and cleaning potential build-up or foreign material.

Inspection Door is hinged and clamped to the upstream cone for easy removal while holding a tight seal.

Gasket material is flame-retardant and meets UL 94HB.

Caution should be exercised to not open the inspection door when the duct system is operational.

Cleanable Screen

Available on sizes SC12 – SC26.

For systems where foreign material or larger objects are an issue. Gloves, rags, cigarette butts, paper, stickers, etc. can become entrained in the dust collecting system and make it to the dust collector where a spark may easily ignite the material.

The screen mesh size is large enough to allow the metal sparks to travel past the screen, through the Spark Cooler and to the dust collector as normal but will capture potentially harmful foreign material.

The screen can be removed for inspection and cleaning as needed.

The inspection door is provided on Spark Coolers with the screen option.

Can include a fitting or connection on the inlet cone of the Spark Cooler for an extinguishing or water nozzle. The end user, or appropriate responsibly party acting for the end user is responsible for determining the need for an extinguishing system and for the design of such system.

Two screen mesh sizes available: 1. 4-Mesh Screen, 0.215" openings (adds 12% additional pressure drop). 2. 14-Mesh Screen, 0.051" openings (adds 35% additional pressured drop).

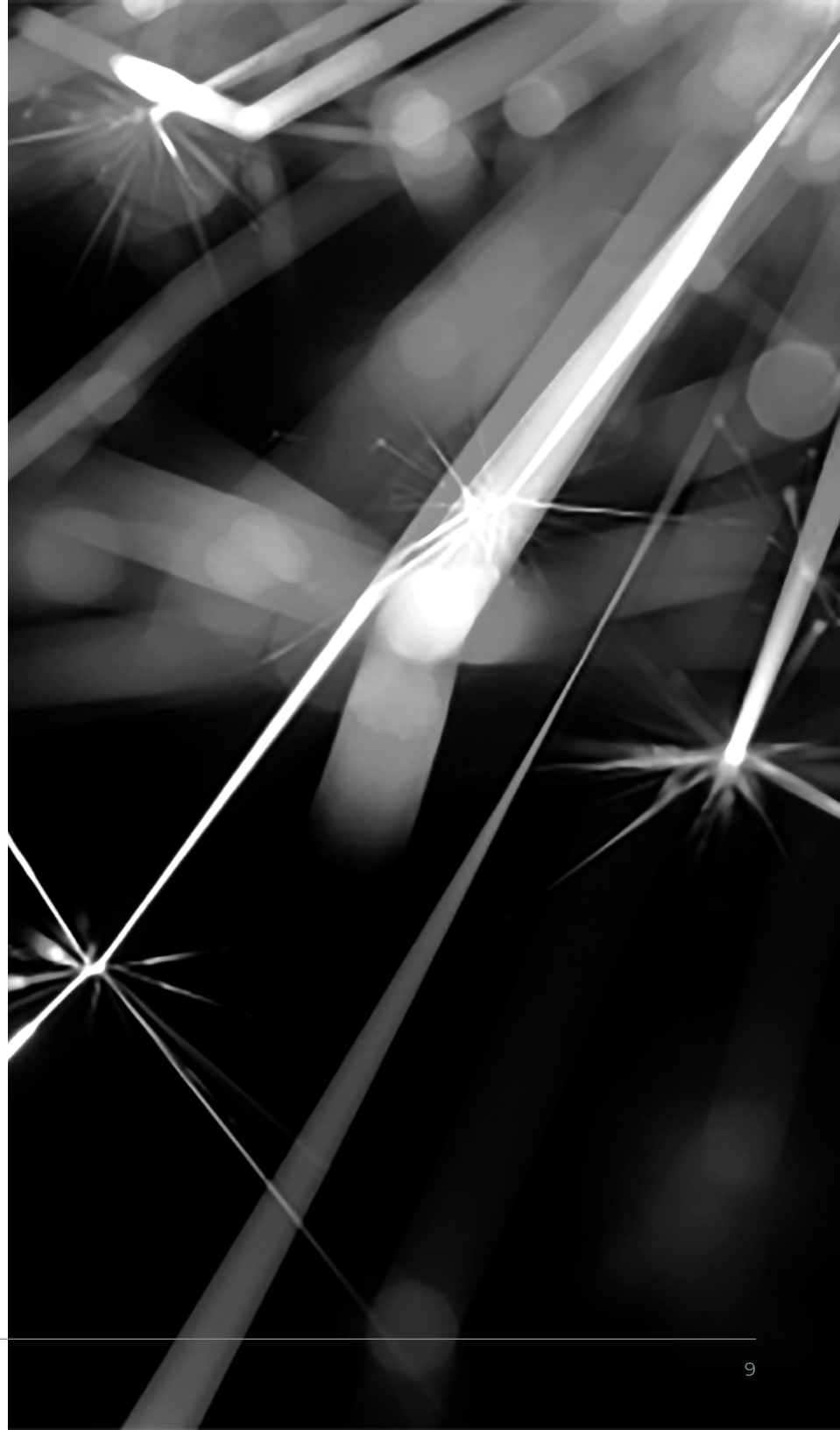
Caution should be exercised to not open the inspection door or remove the screen when the duct system is operational.

Material and Coating Options

- Abrasion Resistant Steel
- Corrosion Resistant Coatings
- Paint rated to 600°F (and higher if needed)
- Custom paint colors upon request
- Stainless steel (304L, 316L SS)
- Contact a Blender Products application engineer if other materials are required

Performance

The **Spark Cooler** mitigates sparks generated in metal and other low-load material processing applications, under non-explosive conditions. The Spark Cooler has been installed in thousands of applications successfully mitigating the ignition source (sparks) and reducing the chances of a fire in the dust collector. The Spark Cooler is not an extinguishing system and should never be relied upon to achieve spark eradication in processes where suppression requirements are absolute. The Spark Cooler does not guarantee complete elimination of sparks and does not preclude the possibility of fire and explosion. Therefore, system redundancy and complementary measures should be taken in conjunction with the Spark Cooler to further reduce the risk of fire and explosion from sparks in applications in which there is potential for catastrophic combustion.



Cost Savings

A fire event in the dust collector can shut down a production line costing missed revenue, increased maintenance costs and increased filter replacement costs. The Spark Cooler will help you maintain profitability. The payback on the Spark Cooler is typically 1 line shut down or 2-3 filter damage incidents.

Operating costs should be considered when comparing spark mitigation devices. The Spark Coolers' industry leading minimal pressure drop allows the use of a lower horse-power dust collector fan and will save energy cost compared to higher pressure drop spark arrestors or spark traps.

	Spark Cooler®	Dropout Box	Extinguishing Systems	Turbine Blade-Style Arrestor (Quencher/KB Duct)	Centrifugal Style (RoboVent)	Spark Traps (US Duct Plymovent®/ Imperial®/Nordfab®)
Low Pressure Drop (≤1.5"wc at 4,500 fpm)	**X**		X			
High Pressure Drop (>2.5"wc at 4,500 fpm)		X		X	X	X
Minimal shop floor footprint	**X**		X	X	X	Some
Ability to make any size and for any flow rate	**X**	X	X	X		
Virtually maintenance-free	**X**			X	X	Some
Limited secondary dust accumulation	**X**	X		X	X	
Simple design, installation, and configuration	**X**			X		Some

Why pressure drop is key:

High pressure drop (e.g. >2.0"wc) increases operating costs, increased maintenance, and increased equipment costs.

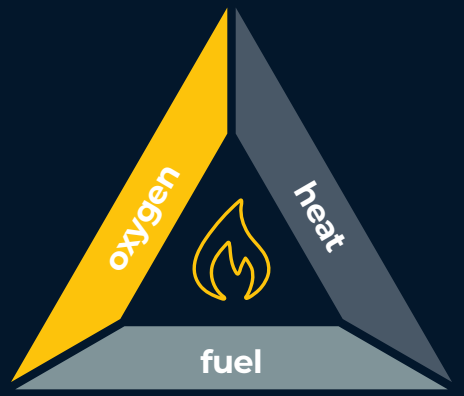
NFPA Importance

The NFPA, OSHA, and other regulatory and industry groups are focused, increasingly, on fire prevention and safety related to dust fires and explosive dust. Mitigating the ignition source is an important consideration as it addresses one of the primary elements (heat) required in both fires and explosions. While thorough safety programs, dust management procedures, and extinguishing systems are indispensable components of effectively managing the explosion exposure, fire prevention and ignition-source mitigation are important as well.

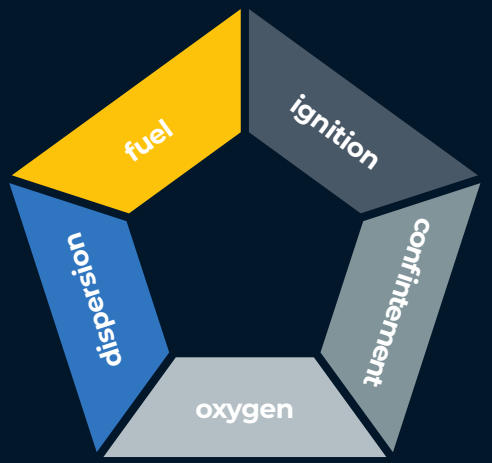
Extinguishing, isolation, and containment systems seek to minimize the consequences of a fire or explosion but do nothing to address the existence or frequency of deflagration (fire events). The Spark Cooler is an option that can be considered primarily for metal-dust applications, as part of a fire-protection program, and as an adjunct to explosion-control systems. Properly applied, it functions to mitigate the frequency of fire-events for a specific application, and therefore warrants consideration for inclusion in protection efforts in non- explosive process environments. In addition, provided extensive extinguishing, isolation and containment systems are in place, it also warrants consideration for inclusion alongside such systems in explosive process environments. In short, in specific applications where the Spark Cooler reduces sparks, it is a simple, low-cost tool that can reduce incidents, and fewer incidents means improved safety and reduced cost and disruption.

Finally, because 1) NFPA guidelines require additional isolation equipment for secondary dust accumulation points, and 2) the Spark Cooler, properly applied, is unique among spark mitigation devices in that it does not create a secondary dust collection point, the Spark Cooler is a tool worthy of serious consideration, provided it is otherwise a fit for a specific application.

Fire Triangle



Explosion Pentagon



Blender Products INC.®

About Blender Products

Blender Products, Inc. was founded in 1962 with a unique focus on air and gas mixing through the application of static mixing technology. The company's patented products and services have been applied on tens of thousands of processes worldwide.

We are a Denver-based, privately-owned business, and 100% of our manufacturing is completed in the U.S.A. We are engineering-driven, and we exist to serve customers by providing truly valuable products and systems to our customers.

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