How to write a usable dust collector spec

How can you get the best dust collector for your needs at the best price? Experts say that properly specifying your equipment is the key. Read this tip for advice on avoiding common mistakes when writing your dust collector specification.

If you compile a dust collector specification that contains too much vague information and not enough data about your basic requirements, the dust collector manufacturer may submit an overly high bid or supply a bid for equipment that falls short of your needs. To ensure you get the right dust collector for your application at the best price, you need to provide a clear spec in the shortest possible format.

Consider this example. A plant engineer in a large processing plant compiled a dust collector spec that more than filled a 2-inch-thick ring binder. The spec included a few hundred pages on complying with requirements of obscure engineering trade organizations and technical details that really had nothing to do with dust collection. But there was nothing in the entire spec explaining the number of cubic feet of air (or gas) per minute or the external static pressure the collector would have to handle. Simple facts about the application were omitted, too, including whether the collector would be located indoors or outdoors, how much floor space and headroom were available, and what kind of dust the unit would collect.

While writing a spec of such global proportions may seem like a good way to cover all your bases, think again. A lengthy, unfocused, incomplete spec handicaps the dust collector manufacturer. The spec takes too long to read and raises many questions that will be directed back to you, taking perhaps days or weeks to answer. In many cases, deciphering the spec is so difficult that the manufacturer has to guess at your needs simply to meet your bid deadline.

The result? The manufacturer can end up adding dollars to the bid just to cover surprises buried in or omitted from your spec. Or, worst case, the manufacturer may decide to save time and trouble by forgoing the bid altogether.

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To avoid these problems and ensure the bids you receive from various manufacturers cover the same ground, write a spec that communicates exactly what you need from the dust collector. The information to include is shown on the data sheet in Figure 1. Such a sheet is used by many dust collector manufacturers to gather information before bidding on a job.

Follow these guidelines as you write your spec:

Keep it short. A dust collector is an expensive piece of equipment. When facing such an important and sizable investment, it's tempting to try to cover all your bases by including a lot of general information in the spec. But resist this impulse, because the equipment manufacturer will have to skim over the excess verbiage to dig for your critical requirements. When it comes to writing your dust collector spec, less really is more.

Spell out major facts and requirements. Specify the six major items the dust collector manufacturer has to know:

- How many cubic feet of air per minute the collector must handle.
- What external resistance to airflow the collector must provide.
- What airstream characteristics (such as moisture and temperature) and dust characteristics (such as particle size, particle shape, cohesiveness, and abrasiveness) the collector must handle.
- Where the dust collector will be located: indoors or outdoors.
- How much floor space and headroom are available for the unit.
- What materials of construction the collector must have.

Next, list these additional facts:

- What dust load you expect (in pounds per hour or gram load).
- What air quality regulations the dust collector must meet.
- What utilities (electrical, plant air, and water) are available at the site.
- How explosive the dust is ($K_{st}$ value).
- What seismic and wind loads the collector must withstand if it's located outdoors.
- What dust discharge method you prefer.

Hold some secondary details for a prebid conference. Let the dust collector manufacturer prepare a bid based on the basic facts you provide.
Figure 1

Typical dust collector data sheet

FIRM NAME ___________________________ Phone ___________________________
Street Address ___________________________ Fax ___________________________
City ___________________________ State ___________________________ Zip ___________________________
Contact ___________________________ Title ___________________________

A. SUMMARY OF PROJECT:

B. WHICH OF OUR PRODUCTS ARE REQUIRED:

C. DUST TO BE COLLECTED:

Bulk Density: #/cf Specific gravity Gma/cc Temp. °F
Abrasive: Corrosive: Toxic:
Hygroscopic: Sticky: Particle Shape:
Is Dust Explosive: Kst Electricals, Div., Class, Group:
Particle Size: Mesh or microns Weight %
Dust Loading: Grains/cf or Milligrams/cubic meter
Test Samples:

D. GAS TO BE CLEANED:

Volume: ACFM Temperature: °F
External pressure drop: in H2O Humidity:

E. INSTALLATION SITE DATA:

Electricals: Power—V Ph Hz: Control—V Ph Hz
Altitude: Ft. ASL Compressed Air Pressure Available: psig
Ambient Temp: °F

F. POLLUTION REGULATIONS:

Max. Particulate Emissions: By Process weight rate —#/hr.
By stack gas concentration — grains/SCF
By Efficiency — %
By Opacity — %

G. DESIGN DATA:

Coatings/Materials of Construction ___________________________ Metal Gauge

CONSIDER THESE OPTIONS: (Just circle those we should include)

1) Air Moving Equipment: High Pressure Vane Axials; Centrifugal Backwardly Inclined, Paddle Wheel, or Radial Tip; Pressure Blowers, Regenerative Blowers, Positive Displacement Rotary Lobe Blowers — and all with optional equipment such as access door, housing drain, outlet dampers, inlet vane control, spark resistant construction, various types of motors, v-belt drives, OSHA guards, vibration bases, flexible connections and inlet or outlet silencers.

2) Hopper unloading devices such as rotary airlocks, slide gates (manual and automatic), two-door discharges, trickle valves, screw conveyors, vacuum or pressure pot transfer to remote bins or silos, hopper clearing devices, magnetic grids and live bottoms.

3) Explosion protection, with calculations from NFPA-68 and -69, including friction or magnetic release doors, rupture disks and suppression systems — also explosion-proof electricals.

4) Leg structure, ladders, external platforms, internal catwalks in bag-free areas, bag catch grids and man support grids.

5) High inlets, cyclonic tangential inlets and decantation chambers.

6) High temperature design, insulation, special coatings, exotic metals and fiberglass construction, isolation dampers.

7) Inspection ports, test and instrumentation ports, vibrator pads, windows, man-ways and weather hoods.

8) Off-line pulsing and pressure-controlled pulse activation, and instrumentation: temperature, pressure and particulate monitors.
Hold other details — such as the model of exhaust fan you need, the bag filter type and size you want, the paint color you need — for a prebid conference with the manufacturer, if required. If you provide such details in the initial spec, chances are the manufacturer will be too busy to investigate them before your bid deadline and will just add dollars to the bid to cover these unknowns. Instead, you can call the manufacturer or meet to discuss your special needs. At this point, you’ll be surprised to learn that the manufacturer wants you to have a collector of the highest possible quality and so will base the bid on high-quality materials that go beyond your basic requirements, maybe even throwing in some of the special components you need at no extra charge.

Don’t include vague compliance requirements. Never ask for a dust collector that complies with general industry guidelines unless you refer to a specific paragraph and page number in a particular published guideline. Examples of such publications include Industrial Ventilation: A Manual of Recommended Practice (by The American Conference of Governmental Industrial Hygienists), the National Electrical Code, or National Fire Protection Association guidelines. Your plant’s location determines which of these regulations the collector must comply with, so it’s up to you to be familiar with your specific requirements and reflect them in the data you give to the manufacturer.

—Bruce A. Beckert, president, Beckert and Hiester, Saginaw, MI; 517/793-2420 (fax 517/791-4781).

For further reading