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# Emission Control Selection Guide

## for Illinois Contractors

*Information provided by DCL International*

DCL International Inc.

**This presentation is to provide an understanding of the Illinois Emission Controls Regulations for off-road equipment, as well as an understanding of the technology and important considerations for the contractor when deciding what emission control devices to purchase.**

# US EPA Off-Highway Emission Regulations Schedule

(For reference purposes)

DCL®

## NON-ROAD EMISSIONS REGULATIONS SCHEDULE

NOx / HC / CO / PM (g/kW-hr)
(NOx+HC) / CO / PM (g/kW-hr)

[Conversion: (g/kW-hr) x 0.7457 = g/bhp-hr)]

U.S. EPA

| kW | (hp) | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-7 | (0-10) | | | | | (10.5) / 8.0 / 1.0 | | | | | (7.5) / 8.0 / 0.80 | | | (7.5) / 6.6 / 0.40 | | | | | | | | | |
| 8-18 | (11-24) | | | | | (9.5) / 6.6 / 0.80 | | | | | (7.5) / 6.6 / 0.80 | | | | | | | | | | | | |
| 19-36 | (25-48) | | | | (9.5) / 5.5 / 0.60 | | | | | (7.5) / 5.5 / 0.60 | | | | (7.5) / 5.5 / 0.30 | | | | | (4.7) / 5.0 / 0.03 | | | | |
| 37-55 | (49-74) | | | 9.2 / -- / -- / -- | | | | | | (7.5) / 5.0 / 0.40 | | | | (4.7) / 5.0 / 0.30 | | | | | | | | | |
| 56-74 | (75-99) | | | | | | | | | | | | | (4.7) / 5.0 / 0.40 | | | | 3.4 / 0.19 / 5.0 / 0.02 | | 0.40 / 0.19 / 5.0 / 0.02 | | | |
| 75-129 | (100-173) | | 9.2 / -- / -- / -- | | | | | | (6.6) / 5.0 / 0.30 | | | | | (4.0) / 5.0 / 0.30 | | | | | | | | | |
| 130-224 | (174-301) | 9.2 / 1.3 / 11.4 / 0.54 | | | | | | | (6.6) / 3.5 / 0.20 | | | (4.0) / 3.5 / 0.20 | | | | | 2.0 / 0.19 / 3.5 / 0.02 | | 0.40 / 0.19 / 3.5 / 0.02 | | | | |
| 225-449 | (302-602) | 9.2 / 1.3 / 11.4 / 0.54 | | | | | (6.4) / 3.5 / 0.20 | | | | (4.0) / 3.5 / 0.20 | | | | | | | | | | | | |
| 450-560 | (603-751) | 9.2 / 1.3 / 11.4 / 0.54 | | | | | | (6.4) / 3.5 / 0.20 | | | (4.0) / 3.5 / 0.20 | | | | | | | | | | | | |
| >560* | (>751) | | | | 9.2 / 1.3 / 11.4 / 0.54 | | | | | | | (5.4) / 3.5 / 0.20 | | | | | 3.5 / 0.40 / 3.5 / 0.10 0.67 / 0.40 / 3.5 / 0.10[a] | | | | 3.5 / 0.19 / 3.5 / 0.04 0.67 / 0.19 / 3.5 / 0.03[b] | | |
| | | TIER 1 | | | | | TIER 2 | | | | | TIER 3 | | | | | TIER 4 INTERIM | | | | TIER 4 FINAL | | |

# Illinois Department of Transportation Regulation

| Effective Dates | Horsepower Range | Model Year (or newer) |
|---|---|---|
| | | |
| June 1, 2010 [a] | 600-749 | 2002 |
| | 750 and up | 2006 |
| | | |
| June 1, 2011 [b] | 100-299 | 2003 |
| | 300-599 | 2001 |
| | 600-749 | 2002 |
| | 750 and up | 2006 |
| | | |
| June 1, 2012 [b] | 50-99 | 2004 |
| | 100-299 | 2003 |
| | 300-599 | 2001 |
| | 600-749 | 2002 |
| | 750 and up | 2006 |

Equipment older than the model year shown must be retrofitted

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

a) Included on the U.S. Environmental Protection Agency (USEPA) or California Air Resources Boat (CARB) *Verified Retrofit Technology,* or

b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

# Illinois Tollway Regulation

Same requirements as IDOT
Proposed effective date TBD

# Cook County Green Construction Ordinance

| Ordinance Timeline | |
|---|---|
| Effective Immediately | Prime and subcontractors must use ultra-low sulfur diesel fuel (ULSD) for their on-road and non-road vehicles and equipment. |
| Within Two Years May 19, 2011 | Prime and subcontractors must install Level 2 controls (minimum 50% reduction) on their non-road equipment. |
| Effective January 1, 2014 | Prime contractors must install Level 3 controls (minimum 85% reduction) on their on-road and non-road equipment. |
| Effective January 1, 2016 | Subcontractors must install Level 3 controls (minimum 85% reduction) on their on-road and non-road equipment |

As defined by the California Air Resource Board (CARB)

- Level 2= A device which reduces 50% or more of particulate matter.
- Level 3= A device which reduces >85% by mass of particulate matter

**DCL Devices**

- **Level 2= MINE-X® Flow-Through filter diesel particulate filter**
- **Level 3= MINE-X SOOTFILTER® Diesel particulate filter**

The above after-treatment is required for any solicitation for a public works contract and any contract entered into as a result of such solicitation. Please refer to Ordinance 09-O-36 for more information.

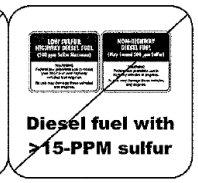
# City of Chicago (proposed)

## City of Chicago Proposed Clean Contracting Ordinance Summary
February 18, 2011

### Prohibited under contracts...

**Beginning in 2011**


Unnecessary engine idling



Diesel fuel with >15-PPM sulfur

**Beginning in 2014**

Pre-1998 trucks *

Pre-Tier 1 non-road units *

* Pre-1998 truck and pre-Tier 1 non-road equipment allowed if retrofitted. See next page.

### Clean Fleet Scores required under contracts beginning on...

| 2.1 | 3.0 | 4.0 |
|---|---|---|
| January 1, 2014 | January 1, 2017 | January 1, 2020 |

### Actions required by each *prime* contractor for applicable contracts beginning in 2014

**Compliance Plan**

After Notice to Proceed, submit a brief, written plan to comply with the Clean Fleet Score. Include planned subcontractor compliance.

**Self-reporting and Scoring**

Submit each reporting period a report showing all covered vehicles and equipment used in performance of the contract (by prime and all sub-contractors) and self score using the provided scoring system.

### Points can be earned by these qualifying vehicle and equipment types

| | |
|---|---|
| 0 | Pre-2003-emissions on-road diesel vehicles (not retrofitted)<br>Tier 1 non-road equipment (not retrofitted) |
| 1 | 2004-06-emissions on-road diesel vehicles (not retrofitted)<br>Any diesel units retrofitted with Level 1 exhaust retrofits |
| 2 | Tier 2 non-road equipment (not retrofitted) |
| 2¼ | Tier 3 non-road equipment (not retrofitted) |
| 3 | Any diesel units retrofitted with Level 2 exhaust retrofits<br>2004-06-emissions heavy-duty alternative-fuel vehicles |
| 4 | 2007-09-emissions on-road diesel or alternative-fuel vehicles (not retrofitted)<br>Tier 4 non-road equipment (not retrofitted)<br>Any diesel unit retrofitted with a Level 3 retrofit device |
| 5 | 2010-emissions or later on-road diesel or alternative-fuel vehicles<br>Any diesel unit retrofitted with a Level 3+ (2010 equivalent) retrofit device |

Tiers are emissions standards for on- and non-road diesel units established by the US Environmental Protection Agency

USE OF 20% BIODIESEL ADDS ½ POINT TO EACH OF THE ABOVE SCORES

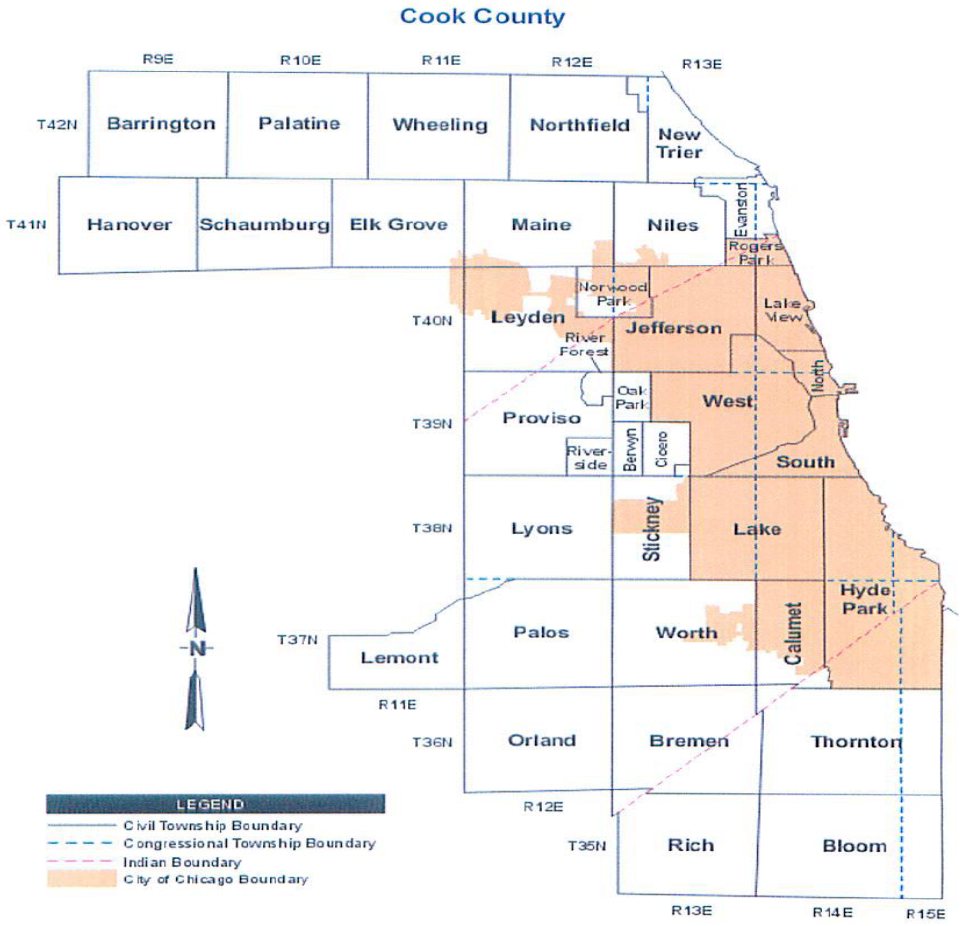
### Types of qualifying retrofit devices and approximate price estimates*

| Level 1 "DOC" | Level 2 | Level 3 "DPF" | Level 3+ |
|---|---|---|---|
| *$800 to $2,000* | *$1,000 to $5,000* | *$7,000 to $35,000* | *$10,000+* |
| Diesel oxidation catalysts | Partial diesel-particulate filters (passive) | Full diesel-particulate filters (usually active regen.) | DPF plus selective catalytic reduction |

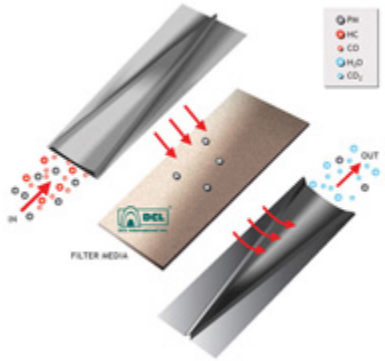
* *Based on previous quotes and EPA cost estimates*

# Illinois property boundary map

Where will I be operating???

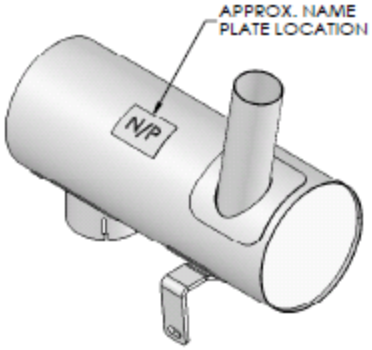


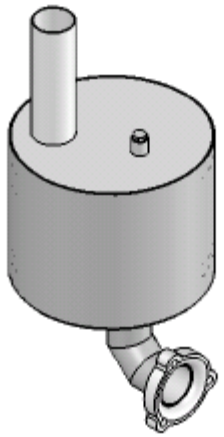
# MINE-X® Flow-Through Filter



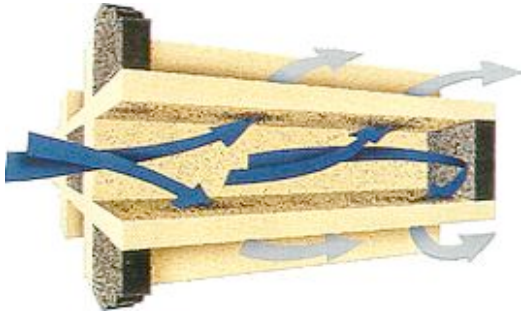

Product capable of achieving >95% reduction of CO, >80% reduction of HC, and >50% reduction of DPM

- Technology designed and produced in-house by DCL

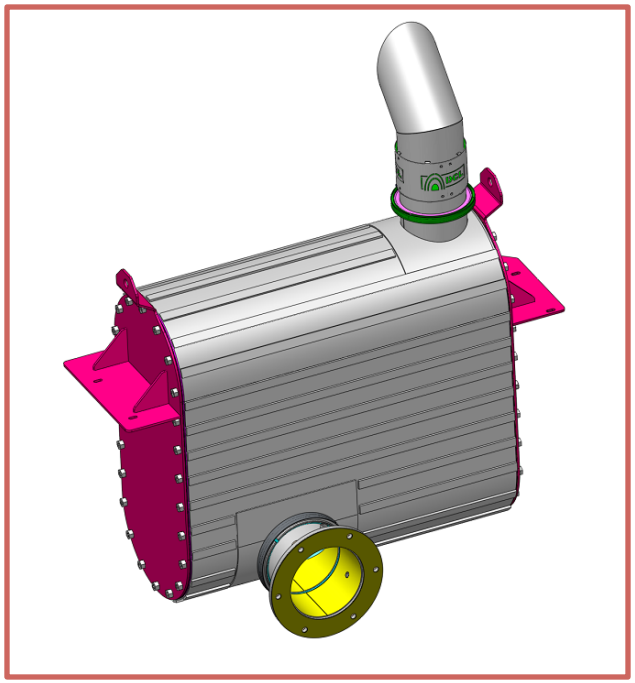


DCL Manufactures its MINE-X Flow through filters in direct fit muffler replacement form



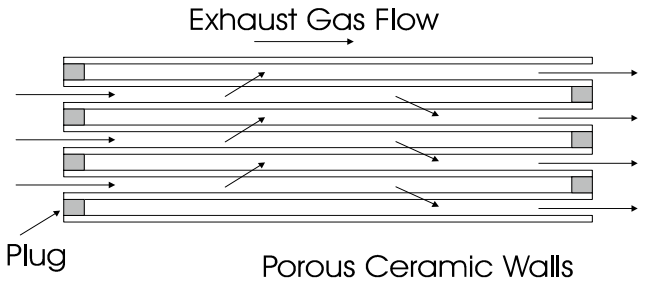
# MINE-X® SOOTFILTER



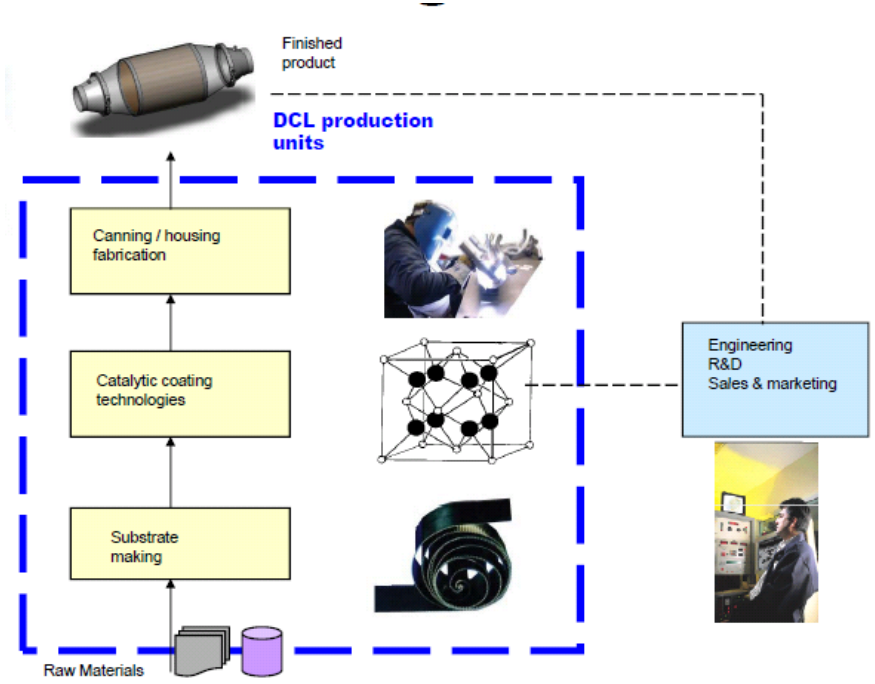
DCL Manufactures its MINE-X SOOTFILTERS in direct fit muffler replacement form

- **Carbon particles or soot is collected in the walls and face of the "Diesel Particulate Filter" (DPF)**
- **Honeycomb-like channels are alternately plugged to force exhaust through porous filter walls**
- **Regenerates with high exhaust gas temperatures**

**(300°C or 572°F for 30% of the time)**

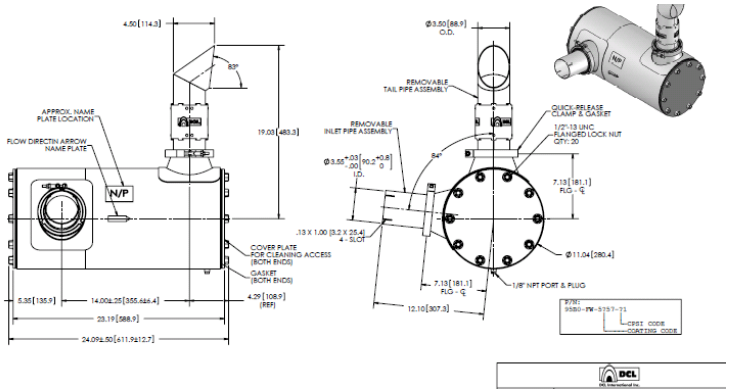


# DCL's Advantage




- In house catalyst manufacturing, coating, and packaging
- Custom manufactured designs
- Excellent lead times
- Excellent prices

Example of custom muffler replacement



# Checklist for quoting

- Make and model of machine
- Engine make/model/hp
- Original muffler number
- Engine family # (If Tier 3 engine)
- What properties will I be operating on?
- Am I a prime or subcontractor?

# Frequently Asked Questions

1. Who's regulations are going to rule? The enforcement of the regulations are covered by each respective area/agency. However, if you are a contractor who plans on working in all area's of Illinois, and more importantly Cook County in 2014 level three controls (when permissible) should be considered in order to make the vehicle ready for all area's.
2. I will be working on Cook County property. I want to purchase emission controls this year. What should I purchase? Much of this decision will depend on how long you plan on keeping your equipment. If you are a Prime contractor who plans on keeping the piece of equipment past 2014, level 3 controls could be purchased now to avoid upgrading later.
3. Does the Cook County Ordinance also require Tier 3 off-road vehicles to be retrofitted? Yes, Tier 3 off-road vehicles are required to comply. If however, the engine (ie. some Interim Tier 4 engines) is equipped with the required controls, it is exempt.
4. The Cook County Ordinance calls for verified level 2 controls. I do not see any verified devices for off-road on the CARB or EPA website. What am I supposed to use? An application is submitted to Cook County by the emission control manufacturer in order to gain acceptance to use non-verified level 2 controls.

# Definitions

**Level 1= A device which reduces particulates <25%** (MINE-X® DOC)
**Level 2= A device which reduces particulates >50%** (MINE-X® FLOW THROUGH FILTER)
**Level 3= A device which reduces particulates >85%** **or <0.01 g/bhp-hr** (MINE-X SOOTFITLER®)

- DPF= Diesel particulate filter (wall flow)
- FTF= Flow through filter
- PFTF= Partial Flow through filter (same as flow through filter)
- SCR= Selective catalytic reduction
- Verified= Device has undergone review from the agency providing verification
- Performance Certification= A letter from the emission control manufacturer stating the capabilities of the device.