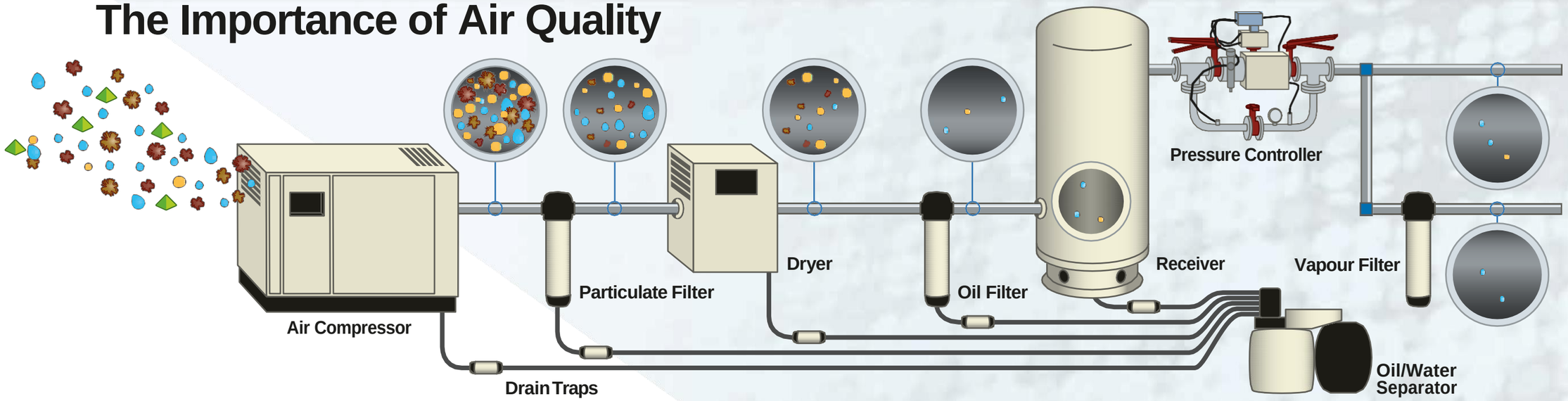
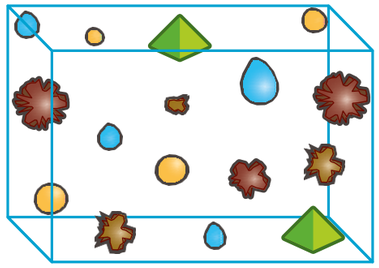
The Importance of Air Quality

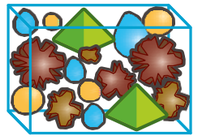


- *General Manufacturing*
- *Assembly*
- *Conveying*
- *Air Tool Use*

- *Advanced Pneumatics*
- *Instrument Quality*
- *Food Grade*



Atmospheric



Compressed to 7 bar(g)

The act of compressing atmospheric air to 7 bar(g) creates an 800% increase in the concentration of contaminants.

What Influences Your Compressed Air Quality?

Dirt, moisture and oil are everywhere. But they shouldn't be in your compressed air supply.

- Dust, dirt, pollen, microorganisms, smoke, exhaust emissions and other particulates
- Moisture in the form of water vapour
- Oil, unburned hydrocarbons from the ambient air and compressor coolant carryover
- Caustic gases such as sulfur oxides, nitrogen oxides and chlorine compounds

The Results of Contaminated Compressed Air

The problems created by contaminated compressed air in your system can range from annoyance to wreaking havoc on your equipment and your end products.

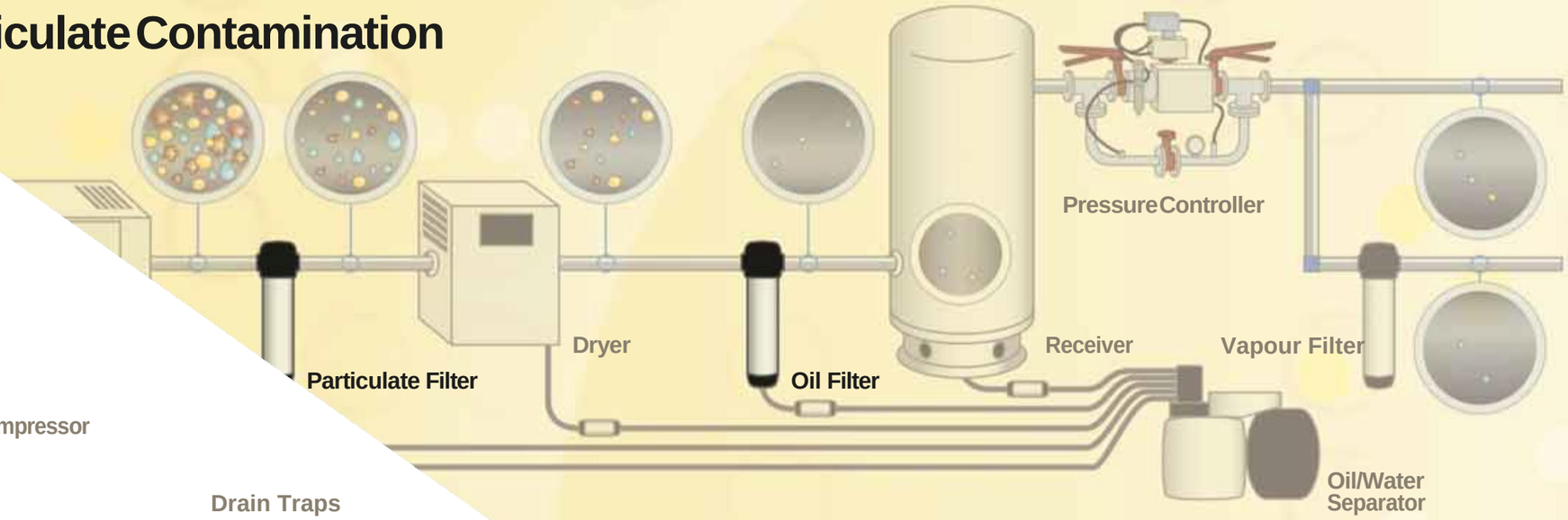
- Premature wearing and scoring of surfaces
- Rust and corrosion in tools, piping and equipment
- Damaged instruments
- Spoiled paint surfaces
- Increased scrap rate
- Unsafe or unpleasant work environment

ISO 8573.1 Air Quality Classes

Maintaining air quality is so important that the International Standards Organisation (ISO) developed six compressed air quality classes, as defined by ISO 8573.1. To determine which industry classification you require, ask yourself these simple questions:

- Does compressed air quality affect my production process and the quality of my end products?
- Will poor compressed air quality decrease my productivity, cost-savings and product quality standards?
- What internal and external ambient conditions affect the quality of my compressed air produced by my system?

Removing Particulate Contamination



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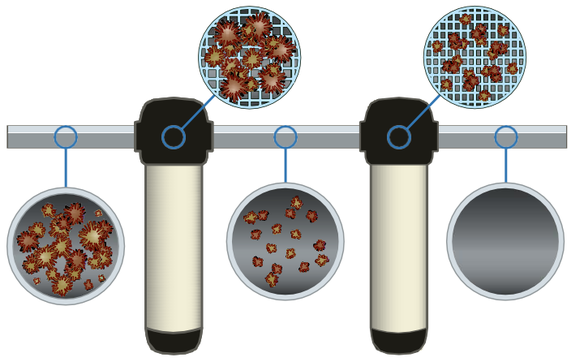


For sensitive or critical applications more than one set of filters may be required at the "point of use".

The first filter removes larger particles.

The second filter removes smaller particles.

Always precede fine filters with a coarser grade.

Compressed Air Quality ISO 8573.1

Class	Solid Particle Maximum number of particles per m³			Water Pressure Dewpoint (°C)	Oil (Incl. vapour) mg/m³
	0.1-0.5 micron	0.5-1.0 micron	1.0-5.0 micron		
1	**100**	**1**	**0**	-70	0.01
2	**100,000**	**1,000**	**10**	-40	0.1
3	**Not specified**	**10,000**	**500**	-20	1
4	**Not specified**	**Not specified**	**1,000**	3	5
5	**Not specified**	**Not specified**	**20,000**	7	Not specified
6	**Not specified**	**Not specified**	**Not specified**	10	Not specified

Contaminants Can Destroy a Compressed Air System

Think of it as a mini dust storm at 7 bar(g). The particulates scattered almost invisibly throughout the ambient air become a concentrated force for damage and destruction of your air-operated tools, equipment and instruments.

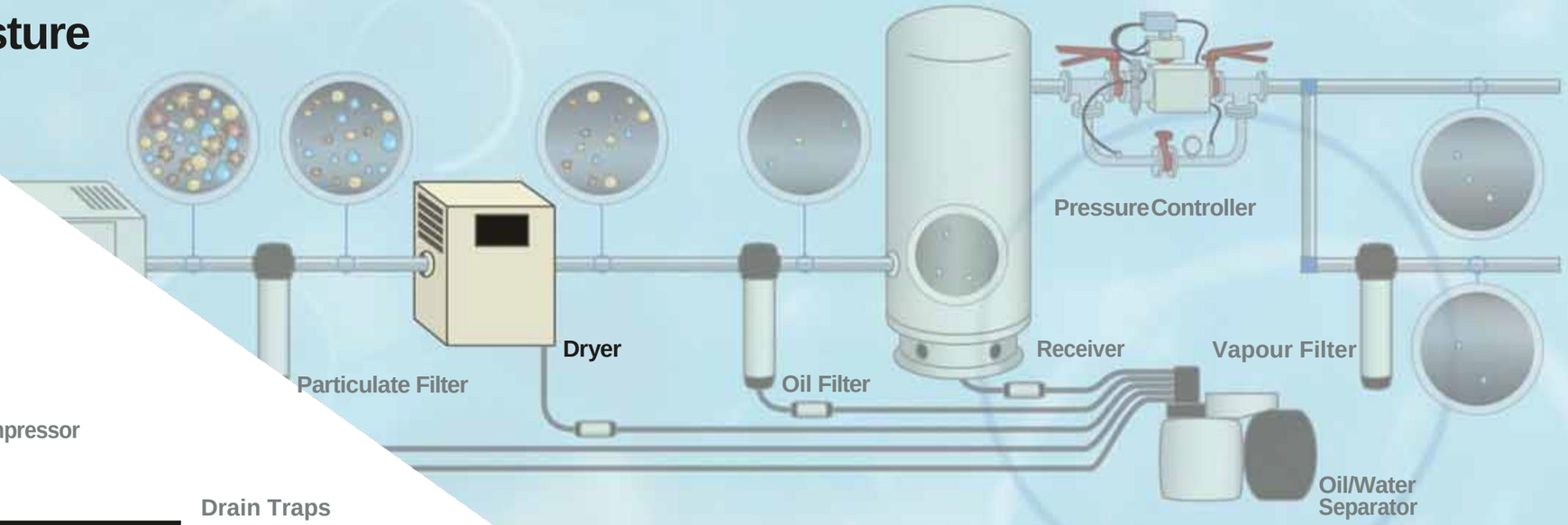
- Systems are damaged and products are spoiled
- Scoring and uneven wear patterns ruin tools and instruments
- Volatile, hazardous compounds are produced
- Production shuts down, productivity and quality suffer

Dual Filters Eliminate Dirt and Problems

Eliminating the "sandblast" effect of particulates in your compressed air stream gets rid of:

- Premature wear
- Scored surfaces
- Clogged orifices
- Ruined finishes and instruments

Removing Moisture



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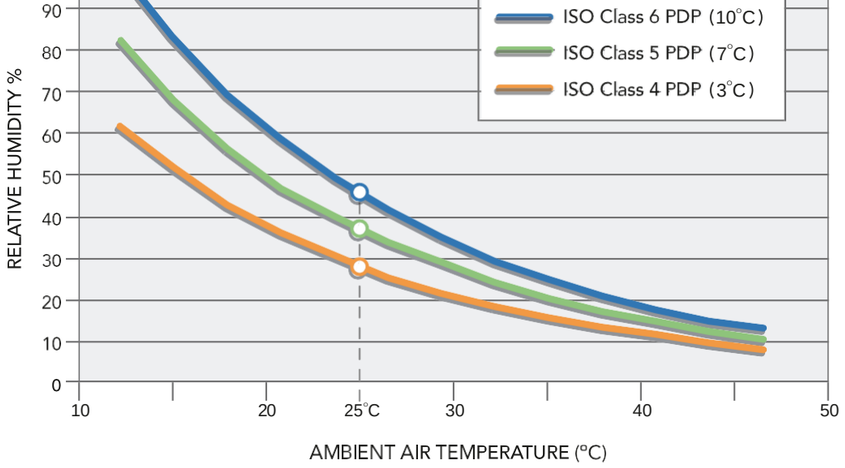
RH% vs Ambient Air Temperature



How To Compare Relative Humidity In ISO Standard?

- ISO classifies a constant Pressure Dewpoint at a specific ambient air temperature (25°C)
- As illustrated in the graph, when Pressure Dewpoint (PDP) is held constant (represented by the colour curves) and ambient air temperature changes, the Relative Humidity will increase or decrease
- When a constant Relative Humidity (RH) is maintained, your air system's performance will be consistent and reliable

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2	100,000	1,000	10	**-40**	0.1
3	Not specified	10,000	500	**-20**	1
4	Not specified	Not specified	1,000	**3**	5
5	Not specified	Not specified	20,000	**7**	Not specified
6	Not specified	Not specified	Not specified	**10**	Not specified

Why Is Relative Humidity Important?

Moisture Contamination Has The Following Effects:-

- Rust and corrosion in the air system piping
- Inadequate air tool lubrication
- Damage to labelling, packaging and the finished goods
- Productivity losses throughout your operation

Refrigerated air dryers are capable of maintaining less than 50% Relative Humidity in most industrial plant ambient environments.

Processes that require ultra-dry air (ISO Class 1, 2 or 3) will need an advanced solution using nonrefrigerated dryer technology.

Removing Oil

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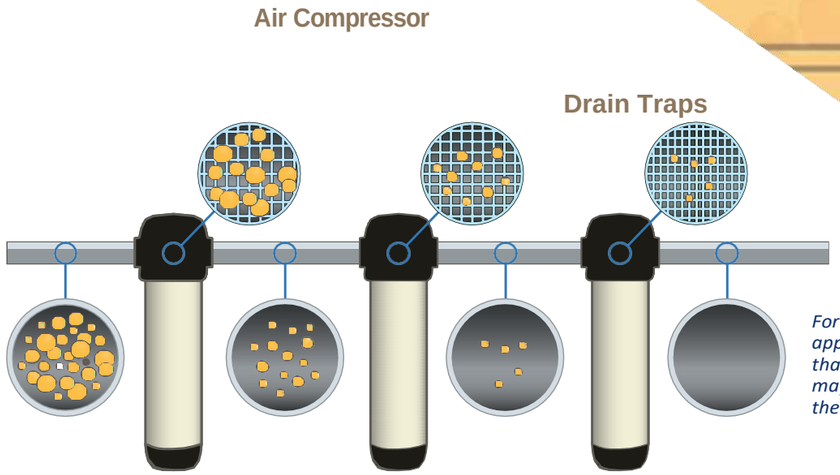

For sensitive or critical applications more than one set of filters may be required at the "point of use".

The first filter removes large oil droplets.

The second filter removes fine oil droplets.

The third filter removes oil vapours, providing odour-free air.

Always precede fine filters with a coarser grade.

Compressed Air Quality ISO 8573.1

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4	Not specified	Not specified	1,000	3	**5**
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Oil in Compressed Air Affects Products and the Work Environment

Oil, unburned hydrocarbons and compressor coolant become highly concentrated during compression.

- These contaminants enter the air flow as entrained droplets and will pass through the compressed air system into the production process unless they are removed
- The built-in air/oil separator on all rotary screw air compressors will remove a portion of the oil, but this is not sufficient for most applications
- Oil contamination will cause batch spoilage, poor quality in finished goods, unwanted colouring in finished goods and a messy or hazardous work environment

Proper Filtration Removes Unwanted Oil from the Air Stream

Removing oil from the compressed air stream provides some real benefits.

- Longer air tool life
- Ensures high quality of finished goods
- No unwanted odours
- Safer workplace

Inherent oil-free compressed air can only be achieved by installing an oil-free air compressor. However, particulate filtration and moisture removal are still necessary.

Guideline for Industry Classifications

Class	Description	Applications	
Clean Very Dry Instrument Grade Air: ISO Class 2.1.1	Efficient removal of solid particulates and oil. ISO Class 1 Pressure Dewpoint will be maintained.	Instrumentation, process, oil and gas, chemical, electronics.	
Odour Free Instrument Grade Air: ISO Class 2.1.1 odour free	Efficient removal of solid particulates and oil, and oil vapour. ISO Class 1 Pressure Dewpoint will be maintained.	Pharmaceutical, food and beverage, clean rooms.	
Clean & Dryer Instrument Grade Air: ISO Class 2.2.1	Efficient removal of solid particulates and oil. ISO Class 2 Pressure Dewpoint will be maintained.	Instrumentation, process, oil and gas, chemical, electronics.	
Odour Free 2 Instrument Grade Air: ISO Class 2.2.1 odour free	Efficient removal of solid particulates and oil, and oil vapour. ISO Class 2 Pressure Dewpoint will be maintained.	Pharmaceutical, food and beverage, clean rooms.	
Industry Grade Industrial Grade Air: ISO Class 2.4.1	Efficient removal of solid particulates and oil. ISO Class 4 Pressure Dewpoint or a 30% (or less) Relative Humidity (RH) will be maintained.	General manufacturing, metal stamping, air tool use, forging, assembly, painting and finishing.	
Food & BA Industrial Grade Air: ISO 2.4.1 odour free	Efficient removal of solid particulates and oil, and oil vapour. ISO Class 4 Pressure Dewpoint or a 30% (or less) Relative Humidity (RH) will be maintained.	Food and beverage, raw material mixing.	
General Industrial Grade Air: ISO 2.6.1	Efficient removal of solid particulates and oil. ISO Class 6 Pressure Dewpoint or a 50% (or less) Relative Humidity (RH) will be maintained.	Sand blasting, home use, construction.	

Contact us for site specific requirements

With an understanding of your industry classification requirements, CPS can provide the optimal air treatment equipment for your system. Also with CPS's AirCare extended warranty and preventive maintenance program, you'll continue to enjoy reduced costs and increased productivity.

AirCare

- You can extend the drivetrain or full-package warranty for a five year period
- Certified professional technicians will perform routine inspections and diagnostic service
- An all-inclusive fluid-analysis program monitors compressor lubricants for early detection of problems
- Vibration analysis and trending can pinpoint an impending component replacement
- Optional remote monitoring provides 24-hour, seven-day-a-week surveillance of your compressor installation for the utmost in peace of mind