DES-CASE®
BY TIMKEN

GLOBAL

PRODUCT CATALOG

DRY. CLEAN. RELIABLE.™

About Des-Case®

Des-Case serves its customers with leading, innovative products and services that enhance equipment reliability and increase profitability.

Our products extend the life of industrial lubricants by preventing contamination with desiccant breathers, removing contaminants with filtration systems, and detecting lubricant problems with condition monitoring and visual oil analysis to keep lubricants healthy and clean for maximum performance.

Our portfolio includes a variety of Des-Case and RMF Systems® branded products to benefit diverse industries and applications worldwide, providing comprehensive solutions for lubrication management.

Since 2023, Des-Case has been part of The Timken Company and sits under the Filtration unit within Timken's Industrial Motion division.

Our Solutions

Des-Case's broad portfolio of engineered contamination control solutions enhance lubricant oil cleanliness and address every critical point in the lifecycle of industrial lubricants.

01. SEAL & PROTECT

02. FILTER & PURIFY

03. STORE & TRANSFER

04. VIEW & ASSESS

05. MONITOR & DIAGNOSE

06. TRAIN & CONSULT

Markets Served

Food & Beverage • Steel & Aluminum • Wind • Pulp & Paper • Marine & Offshore • Manufacturing • Mining • Petrochemical • Off-Road / Mobile Equipment • Power Generation • Cement • Others

Contents

Contamination: The Problem

Contamination is widely recognized as the leading cause of failure in rotating and reciprocating equipment. Contamination comes from two sources, ingested (from the outside) and internally generated from oil degradation and machine wear.

But no matter the source, aggressive contamination control is the key for maintaining the reliability, efficiency, and longevity of equipment. By proactively preventing contamination, businesses can ensure their systems operate optimally, reduce costs, and maintain a competitive edge in their industry. Des-Case products are specifically designed to help achieve these goals by maintaining lubricant and system cleanliness. Two primary types of contamination include particles and water.

If the atmosphere is contaminated (and most are to some degree), the oil is probably dirty and lubricant quality is compromised. Particulate contamination, once inside an operating system, will accelerate the generation of new contaminants. These contaminants damage critical components and act as a catalyst for the oil to oxidate, creating premature loss of oil life. If the atmosphere is particularly humid or has frequent temperature fluctuations, the oil is probably moisture-laden and lubricant quality is compromised. Oftentimes, plant wash down activities are responsible for inducing conditions that lead to moisture ingression and corrosion. The good news is that these factors, which work together to threaten equipment reliability, can be effectively controlled with some preventative maintenance techniques. The best and easiest way to exclude contaminants is to avoid practices that risk exposing lubes to contaminants.

The Goal: Achieving Clean Oil

Maintaining clean oil is one of the best investments a company can make, yet contamination often remains an overlooked factor behind premature machinery failure and diminished lubricant life.

With the cost of oil, increased desire to minimize usage and waste, and the need to prolong the life of equipment, the economic case for protection—from the time oil enters a facility until it leaves—is stronger than ever. Before a lubrication best practices program can be created, it is important to consider the industry you're in and your applications.

Every industry and application is unique—and what's right for someone in one environment isn't what's needed for someone else with finer tolerances, a more critical application, or a different type of equipment. It has been said that the best cure is prevention. Ideally, all of us would have a brand new plant and machinery and begin with a solid program of preventative measures that would ensure the longest life for our equipment and oil. That, of course, never happens. Once you know how big the problem is, you can combine several options to help bring the current situation in line with your cleanliness targets, and add components that will help keep your oil clean and dry.

Improperly sealed equipment lets water and contamination into your oil. Water and particles are among the most common and damaging contaminants in industrial systems. Water in the oil leads to sludge and varnish and decreases oil life.

As much as **60-80%** of active machine wear can be tied to lubricant contamination.

It costs **10x** as much to remove contamination than to exclude it.

Particle and moisture contamination can reduce bearing life by **50%** or more.

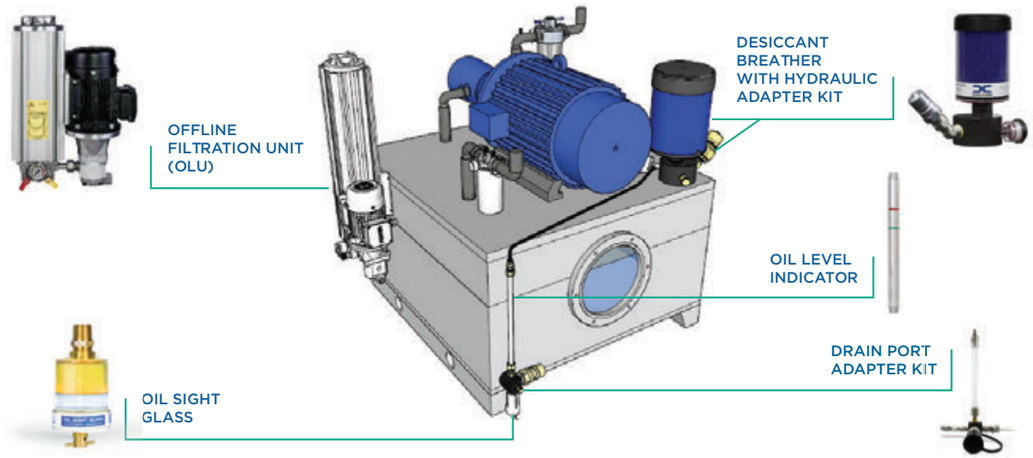
How To: Extend Equipment Life

At Des-Case, we take a comprehensive approach to contamination control by combining best-in-class products, equipment modifications, and lubrication best practices to help customers achieve optimal equipment reliability.

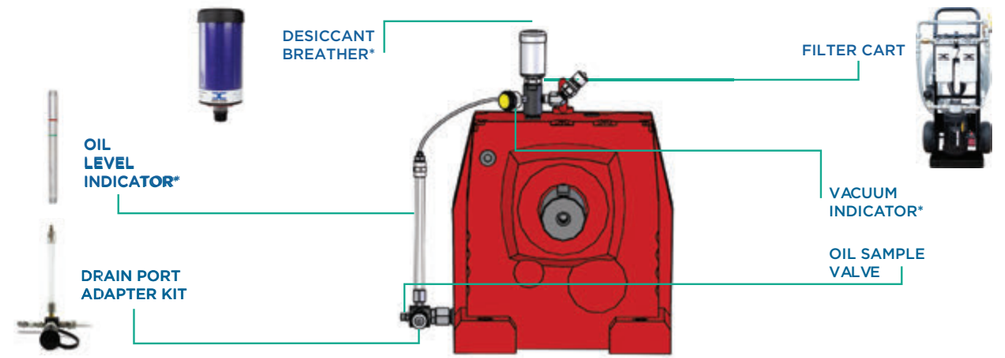
Our first step is to stop ingress from the environment by implementing proactive solutions, such as equipment modifications—including better sealing, filtration upgrades, and breather installations—to prevent contamination at the source. Step two is to clean the oil you are using in the equipment by deploying one of Des-Case's filtration technologies and improving cleanliness levels. From there, we work with customers to develop customized lubrication best practices that integrate proper storage, handling, and conditioning of lubricants, ensuring contamination risks are minimized throughout the entire lubrication lifecycle. Our broad portfolio of filtration, dehydration, and breather solutions, combined with our expert services, enable businesses to not only achieve clean, dry oil but also maintain it over time. By addressing contamination holistically, Des-Case helps customers extend equipment life, reduce maintenance costs, and improve overall operational efficiency—because clean oil isn't just a goal, it's a strategy for long-term success.

Mod Plans

Hydraulic Power Unit



Gearbox Modification



Benefits of Using Des-Case Products

With decades of expertise in contamination control, Des-Case products are engineered to address the exact issues caused by water and particle contamination, offering tailored solutions to ensure clean, reliable, and efficient system operation. Our services and products are versatile and can be applied in many industries, markets, and equipment. Des-Case products are not just tools; they are investments in protecting systems, ensuring efficiency, and driving long-term success for your operations.

01.
Protect Equipment Investment

Des-Case products protect expensive machinery by keeping lubricants and hydraulic fluids free from water and particles. This extends the life of components, reduces unplanned downtime, and lowers repair costs.

02.
Maintain Operational Efficiency

Clean fluids ensure smooth operation, reducing friction, energy loss, and overheating. Des-Case filtration and breather solutions prevent contamination before it causes performance inefficiencies.

03.
Enhance Lubricant Performance

By removing and blocking water and particles, Des-Case products allow lubricants to perform at their peak, providing the protection and lubrication required for optimal equipment function.

04.
Reduce Costs and Downtime

Contamination is a leading cause of equipment failure and unplanned downtime. Des-Case solutions prevent these issues, minimizing costly interruptions and maximizing uptime.

05.
Regulatory Compliance and Product Quality

Clean systems produce consistent, high-quality output and meet stringent industry regulations. Des-Case contamination control solutions boost customer trust and product integrity.

06.
Sustainability

Des-Case products support sustainability by extending the life of lubricants, reducing waste, and minimizing equipment failures, which decreases the need for oil changes, lowers environmental impact, and promotes efficient resource use in industrial operations.

Did You Know?

3 grams of contaminant in a **100 gallon (378 L)** reservoir circulating at 50 gpm = running **1,500 lbs. (680 kg)** of contaminant through your system **annually.**

Seal & Protect

Preventing contamination starts by properly sealing and protecting your equipment.

A desiccant breather is a filtration device designed to protect industrial equipment by preventing moisture and contaminants from entering lubricants, hydraulic fluids, and other systems. It's commonly used on reservoirs, gearboxes, and storage tanks to maintain clean, dry air during operation and storage. Desiccant breathers contain silica gel beads that absorb moisture from incoming air, preventing water vapor from contaminating the system.

The silica gel changes color when saturated, signaling the need for replacement. A high-efficiency filter (often rated at 2-3 microns) traps dust, dirt, and other airborne particulates, ensuring only clean, dry air enters the equipment. When the system heats up or cools down, air expands or contracts. The desiccant breather allows air to pass through while filtering moisture and particles, maintaining system pressure and preventing vacuum formation.

Benefits

Prevents Moisture-Related Damage

Reduces condensation and the risk of corrosion, oxidation, and water contamination in lubricants and hydraulic fluids.

Extends Equipment Life

Protects seals, bearings, and internal components from damage caused by water and particulates.

Improves Oil Quality

Helps maintain the integrity of oils and fluids, reducing degradation and extending oil change intervals.

Reduces Maintenance Costs

Decreases the frequency of repairs, replacements, and fluid changes, resulting in cost savings and less downtime.

Easy to Install and Maintain

Desiccant breathers are simple to install and replace, making them an efficient solution for preventive maintenance programs.

Enhances Equipment Reliability

By ensuring that only clean, dry air enters systems, desiccant breathers help avoid unexpected failures and improve operational efficiency.

Desiccant Breathers

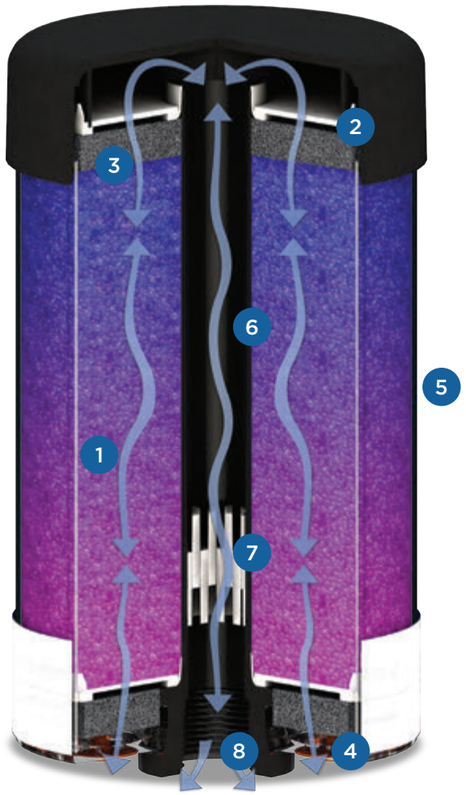
01. WATER VAPOR ADSORBENT
Silica gel adsorbs water from incoming air, indicating condition with a color change.

02. FILTER ELEMENTS
Filter elements at the top and bottom of the breather remove airborne contamination from disposable desiccant breathers. Serviceable and non-desiccant breathers include a pleated filter element.

03. FOAM PADS
Foam filters at the top and bottom of the breather capture oil mist and disperse incoming air evenly over filtration and drying areas.

04. CHECK VALVES
High-quality umbrella check valves that won't clog or stick are located underneath the unit for added protection from wash down environments. Check valves isolate equipment from ambient condition, prolonging breather life and protecting system integrity. Standard in VentGuard, Extended, HydroGuard and Extreme Duty Series. Optional in ACM, TDB and KL Series.

05. RUGGED HOUSING
Shock-absorbing polycarbonate casing provides reliable service and easy maintenance on most breathers.



06. INTEGRATED STANDPIPE
The integrated standpipe design allows even airflow distribution throughout the unit, eliminating inaccurate readings of desiccant saturation. It also provides excellent vibration resistance and dissipates weak points.

07. OIL MIST AND ANTI-SPLASH REDUCER
The oil mist reducer is situated inside the standpipe, made from polypropylene for maximum chemical compatibility. Mimicking nature's intricate honeycomb design, this feature allows oil mist to coalesce and drain back into the reservoir, rather than compromising the desiccant. Standard in Extended Series breathers. TDB Series features an anti-splash reducer to provider oil particles to reach the silica gel and foam.

08. THREADED MOUNTING
Internal or external threaded mount allows for durability and stability and easily replaces standard breather caps with one of several adapters.

09. EXPANSION CHAMBER
The expansion chamber and internal diaphragm allows for expansion and contraction of air within the casing as a result of temperature variations during steady-state operations. Standard in HydroGuard breathers.

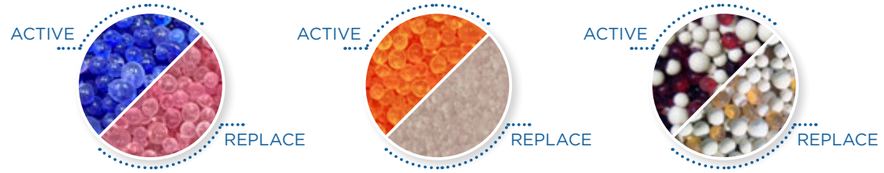
Rebuildable Steel

RMF Systems Breather Series

Hydroguard Series®

Desiccant Options

Desiccant gels are materials designed to absorb significant amounts of moisture from their surroundings, thereby maintaining dryness and preventing damage to equipment. Des-Case offers multiple standard options of gel alongside customized layered options such as active charcoal and molecular sieve.



At Des-Case we offer 2 options of desiccant breathers:

Disposable Breathers:
Pre-filled and ready to use, these breathers are designed for single-use. They combine desiccant and filtration media in a compact, maintenance-free unit. Once saturated or clogged, the entire breather is replaced. (Includes: Standard, VentGuard, Extended, HydroGuard, and Non-Desiccant Series Breathers)

Serviceable Breathers:
Designed for reusability, serviceable breathers can be disassembled, serviced, and refilled with fresh desiccant and filtration media. They are built to withstand extended use with robust materials and higher capacity for contamination control. (Includes: ACM, TDB, KL and Rebuildable Steel Series Breathers)

Pro-Tip

BREATHERS PREVENT MOISTURE AND PARTICLE INGRESS

Problem: Contamination leads to machinery failure by directly impairing the lubricant's ability to control friction, wear and corrosion.

Improperly sealed equipment lets water and contamination into your oil.

Water in the oil leads to sludge and varnish and decreases oil life.

It costs 10X as much to remove contamination than to exclude it.

Solution: Replacing the standard dust cap or OEM breather cap with a desiccant breather will reduce contamination by eliminating moisture and particles for longer oil and equipment life.

Making the Right Selection

Breather Sizing Tip

When selecting a breather based on airflow, always apply a safety factor. A breather's airflow rating is based on a new unit, but as it accumulates dust and moisture, its efficiency decreases. To ensure consistent performance and protect your equipment, Des-Case recommends a 1.25 minimum safety factor to your required airflow.

EXAMPLE: If your application requires a maximum airflow of 16 cfm, select a breather with an airflow rating of at least 20 cfm.

Rebuild Kits

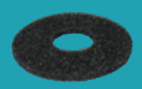
Des-Case offers for its serviceable breather rebuildable kits that are designed to extend the life of desiccant breathers, reducing waste and lowering the total cost of ownership. Instead of replacing an entire breather when the desiccant is spent, users can simply replace the key components, making it a more sustainable, cost-effective, and efficient solution.


Replacement Filter Element


Desiccant Bag Filter


Sight Glass Indicator


Gasket


Foam Pad

RMF Systems Spare Kits


Foam Pad


Spin-On Filter


Desiccant Replacement


Sealing Label


Sealing Cap

Best Practice

Adapter kits function as the connection between your application and filtration system. Pairing fluid handling filtration with breather protection allows for maximum system integrity, requiring less equipment and labor while reducing system contamination.

Desiccant type key	
Blue Silica Gel	●
Orange Silica Gel	●
ZR-Gel	●
High Capacity	○
Activated Carbon	●
Molecular Sieve	●









PRODUCT ATTRIBUTES

			Standard	VentGuard™	Extended Series®	Extreme Duty	HydroGuard®	ACM & TDB	KL	Rebuildable Steel	Non-Desiccant
Des-Case Standard Performance Features	Filter Efficiency		3 µm	3 µm	3 µm	0.3 µm	3 µm	3 µm	3 µm	1 µm	0.3 µm
	Integrated Standpipe		✓	✓	✓	✓	✓	✓	✓	✓	
	Impact Resistance		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Temperature Resistance		✓	✓	✓	✓	✓	✓	✓	✓	✓
Service Life	Check Valves (Extended Life)			✓	✓	✓	✓	BOTH OPTIONS AVAILABLE	BOTH OPTIONS AVAILABLE		
	Expansion Bladder						✓				
	Integrated Oil Mist/Splash Reducer				✓			TDB SERIES			
	Pleated Particulate Filter							✓	✓	✓	✓
Durability	Vibration Resistance (Female Thread or Steel Standpipe)				✓	✓		ACM SERIES	✓		ND-35
	Caustic Chemical & Extreme Temperature Resistance					✓		✓	✓	✓	✓
Desiccant			● ● ●	● ● ●	● ● ● ○	● ● ●	● ● ●	●	●	● ●	
Optional Secondary Desiccant (layered only)			● ●	● ●	● ●	● ●	● ●	● ●	● ●		
Disposable			✓	✓	✓	✓	✓				✓
Serviceable								✓	✓	✓	
Reservoir Volume Range Suggestion	Gearbox/ Storage Tank		15-500 gal (57-1,893 L)	15-500 gal (57-1,893 L)	400-1000 gal (1,514-3,785 L)	500 gal (1,893 L)	50-400 gal (189-1,514 L)	15-1320 gal (57-4,997 L)	130-1320 gal (492-4,997 L)	800-75,000 gal (3,028-283,906 L)	15-400 gal (57- 1514 L)
	Hydraulic Reservoir		2-200 gal (8-757 L)	2-200 gal (8-757 L)	100-400 gal (379-1,514 L)	200 gal (757 L)	0-55 gal (0-208 L)	2-200 gal (8-757 L)	30-200 gal (114-757 L)	400-1800 gal (1,514-6,814 L)	15-55 gal (57-200 L)
High Capacity Technology					EX-4						
IsoLogic Technology				VG-1, VG-4	EX-4						

Standard Series

Des-Case Standard breathers provide reliable, cost effective protection against moisture and particulate contamination in lubricants and equipment.

Designed as an economical upgrade from non-desiccant or OEM breathers, they enhance equipment reliability with a straightforward, effective design.

Desiccant Options:

● Blue ● Orange ● ZR Gel

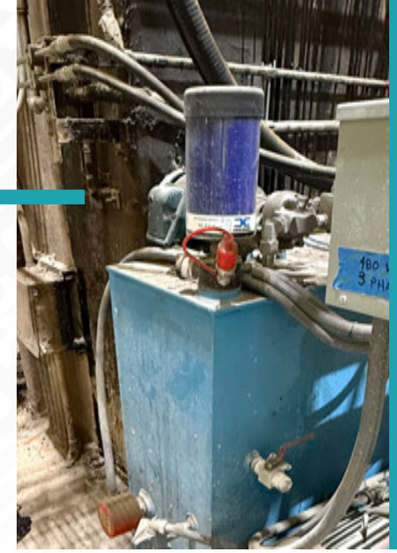
Scan for more details

PRODUCT CODE	DC-BB	DC-1	DC-2	DC-3	DC-4
Temperature Range	-20°F to 200°F (-29°C to 93°C)				
Filter Efficiency	3µm absolute				
Amount of Desiccant	.1 lbs (59 g)	.3 lbs. (127 g)	.8 lbs (365 g)	1.4 lbs (643 g)	2.0 lbs (913 g)
Water Adsorption Capacity (Maximum Water Retention)	.8 fl oz (23 ml)	1.7 fl oz (50 ml)	5 fl oz (142 ml)	9 fl oz (251 ml)	12 fl oz (356 ml)
Color Indication	Blue to Pink				
Max Airflow at ΔP 1 psi [.07 bar]	5 cfm (141 l/min)	4 cfm (113 l/min)	16 cfm (453 l/min)	16 cfm (453 l/min)	16 cfm (453 l/min)
Dimensions (H x W)	3.9 in x 2.5 in (98 mm x 64 mm)	5.4 in x 2.5 in (136 mm x 64 mm)	6.0 in x 4.1 in (152 mm x 104 mm)	8.0 in x 4.1 in (203 mm x 104 mm)	10.0 x 4.1 in (254 mm x 104 mm)

Ventguard™ Series

Des-Case VentGuard breathers incorporate check valve technology to minimize desiccant saturation by only 'breathing' when needed. This innovation significantly extends breather life, making it more effective in moisture-prone environments than standard desiccant breathers.

Ideal for low-flow, intermittent operations such as gearboxes, pumps, and storage tanks, where controlled airflow is essential for prolonged breather performance.



Desiccant Options:

● Blue ● Orange ● ZR Gel

Scan for more details

PRODUCT CODE	DC-VG-BB	DC-VG-1	DC-VG-2	DC-VG-3	DC-VG-4
Temperature Range	-20°F to 200°F (-29°C to 93°C)				
Filter Efficiency	3µm absolute				
Check Valve Cracking Pressure	.1 psi (.007 bar)				
Amount of Desiccant	.1 lbs (59 g)	.3 lbs. (127 g)	.8 lbs (365 g)	1.4 lbs (643 g)	2.0 lbs (913 g)
Water Adsorption Capacity (Maximum Water Retention)	.8 fl oz (23 ml)	1.7 fl oz (50 ml)	5 fl oz (142 ml)	9 fl oz (251 ml)	12 fl oz (356 ml)
Color Indication	Blue to Pink				
Max Airflow at ΔP 1 psi [.07 bar]	1 cfm (41 l/min)	1 cfm (41 l/min)	12 cfm (340 l/min)	11 cfm (311 l/min)	11 cfm (311 l/min)
Dimensions (H x W)	3.9 in x 2.5 in (98 mm x 64 mm)	5.4 in x 2.5 in (136 mm x 64 mm)	6.0 in x 4.1 in (152 mm x 104 mm)	8.0 in x 4.1 in (203 mm x 104 mm)	10.0 x 4.1 in (254 mm x 104 mm)

Extended Series

Des-Case Extended Series® breathers integrate trusted Standard Series materials with VentGuard™ check valves while adding an oil mist-reducing feature, higher airflow capacity, and more than double the desiccant. These breathers maximize contamination control in demanding applications.

Ideal for high-flow systems such as hydraulic reservoirs, wind turbines, and remote operations requiring extended service life and superior moisture control.

Desiccant Options:

● Blue ● Orange ● ZR Gel

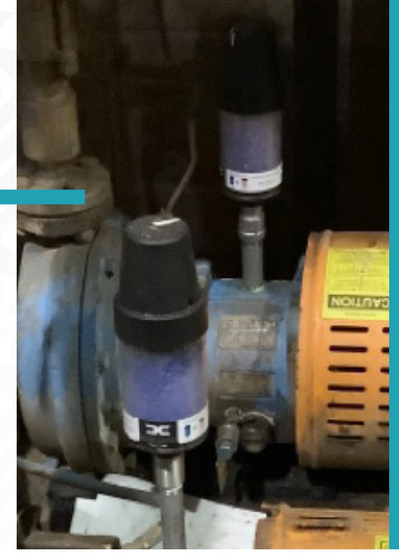
Scan for more details

PRODUCT CODE	DC-EX-1	DC-EX-2	DC-EX-3	DC-EX-4
Temperature Range	-20˚F to 200˚F (-29˚C to 93˚C)			
Filter Efficiency	3µm absolute			
Check Valve Cracking Pressure	.1 psi (.007 bar)			
Amount of Desiccant	1.2 lbs (544 g)	2.2 lbs (998 g)	3.2 lbs (1452 g)	4.2 lbs (1905 g)
Water Adsorption Capacity (Maximum Water Retention)	7.7 fl oz (228 ml)	14.1 fl oz (417 ml)	20.5 fl oz (606 ml)	27.0 fl oz (798 ml)
Color Indication	Blue to Pink			
Max Airflow at ΔP 1 psi [.07 bar]	27 cfm (765 l/min)	26 cfm (736 l/min)	25 cfm (708 l/min)	24 cfm (680 l/min)
Dimensions (H x W)	4.7 in x 5.7 in (119 mm x 143 mm)	6.4 in x 5.7 in (163 mm x 143 mm)	8.2 in x 5.7 in (208 mm x 143 mm)	10.0 in x 5.7 in (254 mm x 143 mm)

HydroGuard® Series

Des-Case HydroGuard® breathers uniquely feature an expansion chamber and internal check valves that create a nearly sealed system. The cap includes a diaphragm that expands and contracts to accommodate pressure changes, only opening when necessary. This design significantly extends breather life by reducing desiccant exposure to ambient air.

Engineered for continuous-duty applications with minimal temperature fluctuations, HydroGuard breathers provide unmatched protection in steady-state operations such as compressors, transformers, and industrial process equipment.



Desiccant Options:

● Blue ● Orange ● ZR Gel

Scan for more details

PRODUCT CODE	DC-HG-1	DC-HG-8
Temperature Range	-20°F to 200°F (-29°C to 93°C)	
Filter Efficiency	3µm absolute	
Amount of Desiccant	.3 lbs (127 g)	.8 lbs (365 g)
Water Adsorption Capacity (Maximum Water Retention)	1.7 fl oz (50 ml)	5.0 fl oz (144 ml)
Color Indication	Blue to Pink	
Max Airflow at ΔP 1 psi [.07 bar]	1 cfm (40 l/min)	14 cfm (396 l/min)
Dimensions (H x W)	7.2 in x 2.5 in (182 mm x 64 mm)	9.7 in x 4.1 in (247 mm x 104 mm)

Extreme Duty Series

The Des-Case Extreme Duty (XD) desiccant breather is built for the harshest environments, featuring exceptional vibration and impact resistance, broad temperature tolerance, and expansive chemical compatibility. Advanced check valve technology supports high airflow while achieving efficient filtration down to 0.3**µm** absolute ($ß_{0.3}$≥200).

Designed for extreme environments, including high-vibration mobile equipment, off-road machinery, and applications with severe contamination exposure.

Desiccant Options:

● Blue ● Orange ● ZR Gel

Scan for more details

PRODUCT CODE	DC-XD-6
Temperature Range	-40°F to 300°F (-40°C to 149°C)
Filter Efficiency	0.3µm absolute
Amount of Desiccant	1.8lbs (794 g)
Water Adsorption Capacity (Maximum Water Retention)	10.7 fl oz (315 ml)
Color Indication	Blue to Pink
Max Airflow at ΔP 1 psi [.07 bar]	16 cfm (456 l/min)
Dimensions (H x W)	6.5 in x 5.1 in (165 mm x 130 mm)

ACM Series

The RMF Systems® ACM breather features a serviceable design with a high-capacity pleated spin-on filter. Optional check valves extend breather life by reducing desiccant exposure.

Ideal for small, dusty applications, where easy serviceability is preferred.

Desiccant Options:

● ZR Gel

Scan for more details

PRODUCT CODE	61
Temperature Range	-40˚F to 194˚F (-40˚C to 90˚C)
Filter Efficiency	3µm absolute ($ß_3$ ≥ 200)
Check Valve Cracking Pressure	.05 psi (.003 bar)
Amount of Desiccant	0.2 lbs (80 g)
Water Adsorption Capacity (Maximum Water Retention)	0.9 fl. oz (29 ml)
Color Indication	Red to Yellow
Max. Airflow without Check Valves	9 cfm (260 l/min)
Max. Airflow with Check Valves	2 cfm (50 l/min)
Dimensions (H x W)	5.4 in x 2.8 in (137 mm x 71 mm)

TDB Series

The RMF Systems® TDB breather features a unique splash guard built into the standpipe that keeps oil splashing away from the desiccant without compromising airflow. Fully serviceable, these breathers feature a pleated spin-on filter for high dirt-holding capacity and optional check valves for extended life.

Best suited for, dusty environments with potential oil splashing, such as hydraulics, where serviceability is preferred.

Desiccant Options:

- ZR Gel

Scan for more details

PRODUCT CODE	93	96	121
Temperature Range	-40˚F to 194˚F (-40˚C to 90˚C)		
Filter Efficiency	3µm absolute ($ß_3 \geq 200$)		
Check Valve Cracking Pressure	.05 psi (.003 bar)		
Amount of Desiccant	0.6 lbs (250 g)	1 lbs (460 g)	1.8 lbs (800 g)
Water Adsorption Capacity (Maximum Water Retention)	3 fl. oz (94 ml)	5.5 fl. oz (172 ml)	10 fl. oz (300 ml)
Color Indication	Red to Yellow		
Max. Airflow without Check Valves	25 cfm (700 l/min)	25 cfm (700 l/min)	53 cfm (1500 l/min)
Max. Airflow with Check Valves	11 cfm (300 l/min)	11 cfm (300 l/min)	14 cfm (400 l/min)
Dimensions (H x W)	Varies by Part Code - See Technical Data Sheet for more details		

KL Series

The RMF Systems KL desiccant breathers are built around a robust steel standpipe making them highly resistant to vibration and extreme operating conditions. Fully serviceable, these breathers feature a pleated spin-on filter for high dirt-holding capacity and optional check valves for extended life.

Ideal for harsh, environments with heavy dust exposure, where durability and serviceability are essential.

Desiccant Options:

- ZR Gel

Scan for more details

PRODUCT CODE	93	96	121
Temperature Range	-40˚F to 194˚F (-40˚C to 90˚C)		
Filter Efficiency	3µm absolute ($ß_3 \geq 200$)		
Check Valve Cracking Pressure	.05 psi (.003 bar)		
Amount of Desiccant	0.6 lbs (250 g)	1 lbs (460 g)	1.8 lbs (800 g)
Water Adsorption Capacity (Maximum Water Retention)	3 fl. oz (94 ml)	5.5 fl. oz (172 ml)	10 fl. oz (300 ml)
Color Indication	Red to Yellow		
Max. Airflow without Check Valves	25 cfm (700 l/min)	25 cfm (700 l/min)	53 cfm (1500 l/min)
Max. Airflow with Check Valves	11 cfm (300 l/min)	11 cfm (300 l/min)	14 cfm (400 l/min)
Dimensions (H x W)	7.1 in x 3.9 in (180 mm x 98 mm)	9.4 in x 3.9 in (240 mm x 98 mm)	11 in x 5.1 in (280 mm x 130 mm)

Rebuildable Steel

Des-Case Rebuildable Steel (RS) breathers are ruggedly designed, with housings of powder-coated carbon steel or stainless steel. Both the desiccant bags and pleated particulate filter are easily replaced when it is time to service the unit. These breathers accommodate large air flow rates with minimal pressure drops.

Designed for bulk storage tanks, large circulating lube oil systems, and other high-volume applications exposed to extreme temperatures, heavy contamination, or corrosive conditions.

Desiccant Options:

● Blue ● Orange

Scan for more details

PRODUCT CODE	DC-RS-3	DC-RS-5	DC-RS-9	DC-RS-15	DC-RS-25	DC-RS-50	DC-RS-75	DC-RS-100	DC-RS-150	DC-RS-200
Temperature Range	-20°F to 220°F (-29°C to 104°C)									
Filter Efficiency	1µm absolute									
Amount of Desiccant	3 lbs (1.4 kg)	5 lbs (2.3 kg)	9 lbs (4.1 kg)	15 lbs (6.8 kg)	25 lbs (11 kg)	50 lbs (23 kg)	75 lbs (34 kg)	100 lbs (45 kg)	150 lbs (68 kg)	200 lbs (91 kg)
Water Adsorption Capacity (Maximum Water Retention)	.14 gal (.5 l)	.24 gal (.9 l)	.43 gal (1.6 l)	.71 gal (2.7 l)	1.2 gal (4.5 l)	2.4 gal (9 l)	3.6 gal (13.5 l)	4.8 gal (18 l)	7.1 gal (27 l)	9.5 gal (36 l)
Color Indication	Blue to Pink									
Max Airflow at ΔP 1 psi [.07 bar]	85 cfm (2407 l/min)	85 cfm (2407 l/min)	80 cfm (2265 l/min)	205 cfm (5805 l/min)	140 cfm (3964 l/min)	115 cfm (3256 l/min)	80 cfm (2265 l/min)	270 cfm (7645 l/min)	250 cfm (7079 l/min)	240 cfm (6796 l/min)
Dimensions (H x W)	11.5 in x 10.1 in (292 mm x 257 mm)	13.8 in x 10.1 in (349 mm x 257 mm)	18.3 in x 10.1 in (464 mm x 257 mm)	19.3 in x 15.5 in (489 mm x 394 mm)	22.5 in x 15.5 in (572 mm x 394 mm)	31.3 in x 15.5 in (794 mm x 394 mm)	39.8 in x 15.5 in (1010 mm x 394mm)	31 in x 23.5 in (787 mm x 597 mm)	36.8 in x 23.5 in (933 mm x 597 mm)	42.8 in x 23.5 in (1086 mm x 597 mm)

Non-Desiccant

Des-Case Non-Desiccant (ND) breathers provide contamination protection in applications where desiccant is unnecessary, such as low-humidity environments or systems using water-based fluids. These breathers effectively prevent particle ingress down to 0.3 micron while minimizing free water contamination.

The ND breathers are ideal when a desiccant breather is not a viable option, such as applications using water glycol hydraulic fluid.

Scan for more details

PRODUCT CODE	DC-ND-2	DC-ND-35
Temperature Range	-40°F to 300°F (-40°C to 149°C)	
Filter Efficiency	0.3µm absolute	
Max Airflow at ΔP 1 psi [.07 bar]	.67 cfm (19 l/min)	40 cfm (1132 l/min)
Dimensions (H x W)	1.34 in x 1.78 in (34 mm x 45 mm)	5.5 in x 5.0 in (140 mm x 128 mm)

COLORASSIST™

The Des-Case High-Capacity Breather made possible by COLORASSIST™ Technology uses the highest capacity desiccant available to deliver the longest-lasting breather, extending service life by 30 percent and lowering the cost of ownership. Its proprietary COLORASSIST™ enhanced color indicator is located on the breather wall versus the silica itself for improved in-use visibility to accurate gauge remaining life and diagnose the source of moisture more clearly.

Currently available in the Extended Series DC-EX-4 featuring check-valves, an oil mist reducing feature, higher air flows and more than double the desiccant than the Standard Series breather, making them ideal for tank farms and large or remote applications.

Scan for more details

IsoLogic® Sensor Technology

Unlike any breather on the market, the Des-Case IsoLogic has eliminated the subjectivity of color-changing desiccant media, allowing you to know the exact moment your breather is fully spent and should be replaced. Shorten time-consuming, scheduled lube routes by using RFID and Bluetooth technology to collect data on multiple breathers at the same time when syncing them with the IsoLogic app.

- Available in 3 sizes: EX-4, VG-1, VG-4 and in wired and wireless modules
- Shorten time-consuming, scheduled lube routes by collecting data on multiple breathers at the same time
- Decrease the risk of workplace injuries by monitoring breathers installed on remote or hard-to-access equipment
- View all breather statuses and trend data on the web platform from anywhere, anytime. All you need is the internet
- Only available in EU, Canada and USA

Scan for more details

Accessories

Des-Case's breather accessory and adapter products offer optimum solutions for various equipment connection needs.

Choose from a variety of materials, connection port size and thread requirements in order to properly outfit your equipment application. For more detailed descriptions and entire list, scan the QR code or click on this link.

Scan for more details

Thread Adapters

Des-Case offers a comprehensive selection of thread adapters, ensuring seamless compatibility between our various breather series and your equipment's unique thread requirements.

Vacuum Indicator Adapters

Des- Case Vacuum Indicating (VI) Adapters provide an added layer of protection by monitoring particulate filter life alongside the desiccant's saturation color-change indicator. As dust and debris accumulate in the filter media, the vacuum indicator signals when replacement is needed to maintain proper airflow—ensuring continuous equipment protection and optimal breather performance. This solution is especially valuable in high-dust environments where filters may clog before the desiccant fully changes color.

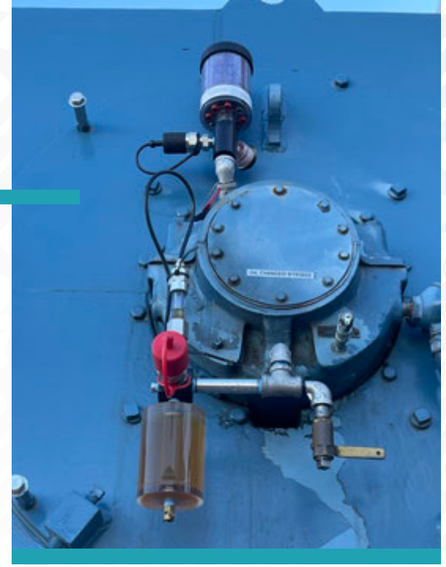
Oil Demister Adapters

For applications with excessive oil mist or vapor, our oil demister adapters provide critical protection. These adapters effectively trap oil mist before it reaches and compromises the desiccant breather, while returning valuable oil back to the equipment.

Adapter Kits

Adapter kits function as the connection between your application and filtration system.

Pairing fluid handling filtration with breather protection allows for maximum system integrity – requiring less equipment and labor while reducing system contamination.



Gearbox Adapter Kit

Modify the fill port of your gearbox with one easy kit to connect to filtration systems and protect during operation and fluid transfer.

- Desiccant breather
- Quick connect plug
- Vacuum Indicator

Scan for more details

Hydraulic Adapter Kit

Prevent and remove contamination in your hydraulics when you connect this kit to your filtration system.

- Desiccant breather
- Sample Valve
- Quick Connect Plug
- Flange Connection

Scan for more details

Adapter Kits

Drain Port Adapter

Provides multiple useful components such as level indicators, sample ports and a free water sight glass when port locations are limited.

Scan for more details

Drum Adapter Kit

Protect and filter your drums right as they enter your plant and during storage with the easy-to-use drum adapter kit.

Scan for more details

Tote Adapter Kit

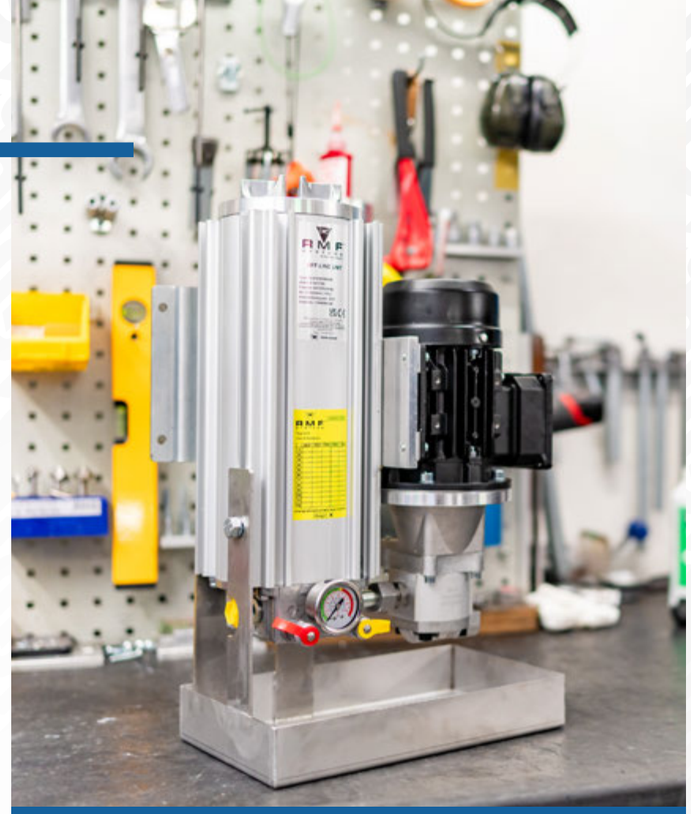
Protect and filter your storage totes to prevent dirt and water contamination.

Scan for more details

Filter & Purify

Why Filtration?

Actively filtering lubricants to acceptable cleanliness levels can dramatically improve industrial equipment performance and lubricant life, preventing production downtime and high machinery repair costs. Effective contamination control helps protect critical equipment by ensuring that lubricants and hydraulic fluids remain clean and dry.



Pro-Tip

Off-Line Filtration Keep Fluid Clean and Dry

Problem: The OEM-supplied filtration, or lack thereof, is often not capable of achieving optimum particle and moisture cleanliness targets.

60-80% of mechanical failures are caused by contaminants in the lubricants that only off-line filtration can effectively remove.

The ***capture efficiency*** of supply and return line filters often cannot achieve or maintain the set ISO fluid cleanliness targets without dramatically impacting oil flow rates.

A single ***tablespoon*** of contaminants in a 55-gallon (208 L) drum of oil is like dumping a 5-gallon (19 L) bucket of dirt into your system over a year.

Solution: Actively filtering lubricants using either dedicated or portable solutions to acceptable cleanliness levels can dramatically improve industrial equipment performace and lubricant life, preventing production downtime and high machinery repair costs.

Bypass, Dedicated, Portable Filtration and Vacuum Dehydration

Bypass Unit

Bypass Filtration

Bypass filters are designed to remove “ultra-fine” contamination and water that is normally missed by existing filters, dramatically extending the life of oil and the component it lubricates. Bypass filters operate by filtering oil on a “partial-flow” basis and draw approximately 10 percent of the oil pump’s capacity, only filtering a small percentage of the system’s oil at any given time. This continual process eventually makes all the oil analytically clean by eliminating extremely small particles.

Dedicated Filtration

For critical applications that need regular filtration, or a maintenance location that is hard to access, permanently mounted off-line filtration systems improves equipment reliability with continuous filtration that cleans oil and keeps it clean.

Offline Unit

Panel Unit

Giant Offline Filtration Unit

Appropriately sized off-line filtration system can turn over the entire volume of a reservoir several times a day, maintaining ISO fluid cleanliness codes well below the upper limit. Implementing dedicated off-line filtration will yield longer bearing and hydraulic component life and longer useful fluid life.

Drum Topper

Filter Cart

TC Series Filter Cart

Portable Filtration

With easy mobility around plant floors, Des-Case portable off-line filtration products are the ideal tools to remediate contaminated systems, flush new equipment during commissioning, or periodically decontaminate systems that have inadequate on-board filtration to meet target cleanliness levels. Staged filtration — two filters in series — allows for combined water removal and particulate filtration in one pass to get you on to the next job more quickly.

Vacuum Dehydration

Actively filtering moisture from lubricants can prevent contamination-related problems such as oxidation, degradation, and corrosion. RMF Systems branded vacuum dehydration systems remove large quantities of free, emulsified and dissolved water, particulate, and gaseous contamination from petroleum and synthetic-based fluids.

Mini VAC

Maxi VAC

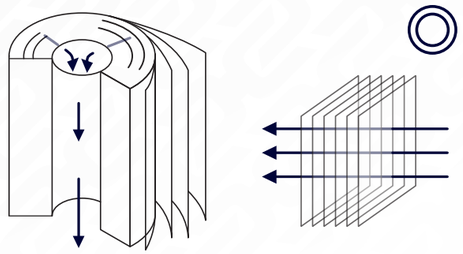
Filtration Principles

Comprehensive Filtration Solutions for Every Application

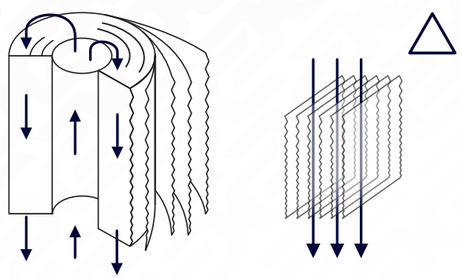
Des-Case provides a comprehensive range of advanced filtration solutions designed to combat contamination from particulates, water, and varnish—key threats to lubrication systems. Our high-performance technologies help extend oil life, enhance equipment reliability, and reduce maintenance costs across various industrial applications.

Radial Depth Wound Cellulose Filtration

Designed for low flow high-efficiency filtration in light-viscosity oils, radial depth filtration technology utilizes precision-wound cellulose media to deliver superior contaminant removal. Its unique multi-layer construction creates a tortuous path, effectively trapping particles within the filter's structure and preventing them from bypassing. The irregular pore distribution further enhances filtration efficiency, capturing fine contaminants as small as sub-micron levels. The cellulose media naturally absorbs water while adsorbing polar oil degradation byproducts and soft contaminants. The radial flow design maximizes surface area, preventing channeling and ensuring consistent contaminant capture lending to a higher dirt-holding capacity than conventional filters.



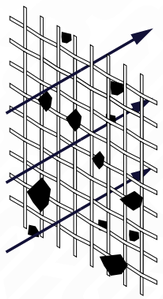
Axial Depth Wound Cellulose Filtration



Axial depth filtration offers a highly effective method for removing contaminants from oil by leveraging a wound-media design similar to radial depth filtration but with a crucial distinction in flow direction. Instead of moving radially, oil flows axially along the layers of tightly wound, high-strength cellulose media, significantly extending the flow path. This extended path enhances contaminant capture by increasing dwell time and filtration efficiency. Additionally, the cellulose media is creped, creating an interlocked, jagged flow structure that promotes the dislodging and retention of particulates from the oil. With multiple filtration layers and increased flow depth, axial depth filters provide an expanded surface area and greater media volume, enabling them to hold substantially larger amounts of contamination compared to traditional filtration methods.

Pleated Microglass Filtration

Des-Case pleated microglass filters are engineered with advanced synthetic microglass fibers, a highly efficient filtration media composed of ultra-fine glass fibers bonded together to form a uniform, multi-layered matrix. This dense yet permeable structure allows for superior contaminant capture while maintaining optimal fluid flow. By precisely adjusting fiber arrangement, thickness, and layering, our filters are available in a range of micron ratings from 1 to 40 microns. Designed for full-flow filtration, these pleated elements provide a short, direct flow path through the media, resulting in high filtration efficiency with minimal pressure drop. In full-flow (or pass-through) filtration, 100% of the incoming fluid is directed through the filter element, ensuring comprehensive contaminant removal. As fluid moves through the media, particles larger than the designated pore size are efficiently captured on the surface, while clean oil continues to flow downstream.



Pleated Multi-Stage Microglass Filtration

Designed to deliver superior fluid cleanliness and extended element life, our Multi-Stage Microglass Filtration technology builds upon the foundation of standard pleated microglass with an advanced progressive density structure. This innovative design incorporates multiple media layers, each serving a distinct role to optimize filtration efficiency and performance. At the forefront of this structure is the capacity layer, engineered for maximum flow and minimal restriction. This initial stage acts as a coarse filter, capturing larger contaminants while maintaining optimal fluid dynamics. As the fluid moves deeper into the element, the efficiency layer takes over—this finer, precision-engineered media ensures the removal of the smallest particles, delivering enhanced fluid purity. By integrating these layers, our Multi-Stage Microglass Filtration achieves lower pressure drop, higher dirt-holding capacity, and improved filtration efficiency.

Pleated Super Absorbent Polymer (SAP) Filtration

Pleated Super Absorbent Polymer (SAP) Technology offers a highly effective solution for removing water contamination from fluids. This advanced filtration method utilizes SAP media, engineered with specialized polymers that react with water through a physical-chemical process, effectively capturing and retaining significant amounts of free and emulsified water. Once absorbed, water molecules are securely trapped within a gel-like structure formed by hydrogen bonding, preventing re-release into the fluid. Designed for optimal performance, this technology is always combined with Microglass media to provide dual protection—efficient water removal and superior solid particulate filtration. Once the media reaches full saturation and gel formation is complete, water removal ceases, ensuring reliable and controlled filtration performance.

Vacuum Dehydration

Vacuum Dehydration Technology is utilizing low-temperature vacuum distillation by reducing the pressure to create a vacuum, lowering the boiling point of water and facilitating its evaporation at lower temperatures. An industry-leading solution designed to efficiently remove water (free, emulsified, and dissolved), gases, and Integrated high-efficiency particulate filter that removes solid contaminants.

What is Filter Efficiency?

Filter efficiency refers to a filter's ability to capture and remove contaminants from a fluid or air stream. It is typically expressed as a percentage and indicates how effectively the filter traps particles of a specific size. In lubrication and hydraulic systems, high filter efficiency helps extend equipment life, reduce wear, and improve system reliability by preventing harmful contaminants from circulating.

Beta Ratio (ß-Rating): Defined by the ISO 16889 standard, it measures how well a filter removes particles of a specific size. For example, a $ß_{10}$ = 200 means the filter captures 99.5% of particles ≥10 microns. The Beta Ratio is determined by the formula:

$$\beta_x = \frac{\text{Number of particles } \geq x \text{ microns upstream}}{\text{Number of particles } \geq x \text{ microns downstream}}$$

A higher Beta Ratio means better filtration efficiency. The efficiency can be calculated using the formula:

$$\text{Efficiency}(\%) = \left(1 - \frac{1}{\beta_x}\right) \times 100$$

Making the Right Selection

Scan for more details

Family Element Filter	Radial Depth	Axial Depth	Spin on		Cartridge		
							
Media Designation	Wound Cellulose	Wound Cellulose	Standard Microglass	Standard Microglass with SAP	Standard Microglass	Standard Microglass with SAP	Multistage Microglass
Element Designation	30H | 60H	D1000C | 50N	S10000S	S10000W | H2OSorb	30G | 60G | C12000S	30A | 60A | 46 & 92A | C12000W	46 & 92G | C12500S
Filtration Rating (µm)	2	3	2.5 | 5 | 7 | 12 | 22	3 | 7 | 22	2.5 | 5 | 7 | 12 | 22	3 | 7 | 22	2.5 | 5 | 7
Filtration Efficiency (per ISO 16889):	$ß_{x(c)}$≥2331	$ß_{x(c)}$≥200	$ß_{x(c)}$≥1000	$ß_{x(c)}$≥1000	$ß_{x(c)}$≥1000	$ß_{x(c)}$≥1000	$ß_{x(c)}$≥1000
Material Seals	NBR | FKM	NBR | FKM	NBR | FKM	NBR | FKM	NBR | FKM	NBR | FKM	NBR | FKM
Max Working Temp	176° F | 80° C	176° F | 80° C	230° F | 110° C	230° F | 110° C	230° F | 110° C	230° F | 110° C	230° F | 110° C
Oil Contamination Addressed	Particulate, Water, Oil degradation products	Particulate, Water, Oil degradation products	Particulate	Particulate Water	Particulate	Particulate Water	Particulate
Filtration Unit Types							
Offline Filtration Unit	✓	✓		✓	✓	✓	
Panel Unit			✓	✓			
Giant Offline Filtration Unit						✓	✓
TC Stand					✓	✓	✓
Drum Topper			✓	✓			
Filter Cart				✓			
TC Cart					✓	✓	
Vacuum Dehydration Unit					✓		
Bypass Filtration Unit	✓			✓	✓	✓	

Bypass Filtration Units

The Bypass Unit (BPU) is a highly efficient filtration solution designed to maintain the cleanliness of hydraulic and transmission systems in mobile applications. The integrated pressure-compensated flow control valve ensures minimal impact on the main system, making it ideal for mobile heavy industries such as construction, mining, and agriculture. Its engineered mounting ribs provide modularity and stacking options, allowing for easy retrofitting.

The BPU fits various filter types and micron ratings without modification and offers optional add-ons for increased water absorption capacity, indicators, and condition monitoring.

Scan for more details

BPU A&B	BPU
Nominal Flow Rate	0.4 gpm - 2.2 gpm (1.4 l/min - 8.4 l/min)
Viscosity Range	10 - 500 cSt - Filter element dependent
Suitable filter elements	20 series H | 30 series H, G & A | 60 series H, G & A
Max. Recommended Reservoir Volume	± 198 gal - 792 gal (± 750 l - 3,000 l)
Dry Weight	± 11 lbs - 40 lbs (± 5 kg - 13 kg)

Offline Filtration Units

Designed with a compact footprint and modularity, the Offline Filtration Unit (OLU) integrates seamlessly into existing systems, offering easy installation and reliable 24/7 operation without interfering with the main system. With optional add-ons for water absorption, heating, condition monitoring, and on/off control, the OLU ensures that even the smallest contaminants are effectively removed, extending equipment life, reducing maintenance costs, and enhancing overall system reliability,

The OLU is engineered to deliver efficient contamination control across a wide range of demanding applications, including production plants, mining operations, pulp and paper facilities, marine, offshore environments, and power generation. Thanks to its modular design, the OLU can be mounted in a variety of configurations, making it a flexible and reliable solution for your filtration needs.

ATEX certified units available.

Scan for more details

OLU A&B	OLU A&B
Nominal Flow Rate	0.5 gpm - 4 gpm (2l/min - 16l/min)
Viscosity Range	10 - 500 cSt- Filter element dependent (Contact Des-Case representative for higher viscosities compatibility)
Power Supply	Scan QR code or contact Des-Case representative for more details
Suitable Filter Elements	30 series H, G & A | 60 series H, G & A
Max. Recommended Reservoir Volume	360 gal - 2,900 gal (1,350 l - 10,800 l)
Dimensions (HxWxD)	Varies by Part Code - See Technical Data Sheet for more details
Dry Weight	31 lbs - 86 lbs (14 kg - 39 kg)

Panel Units

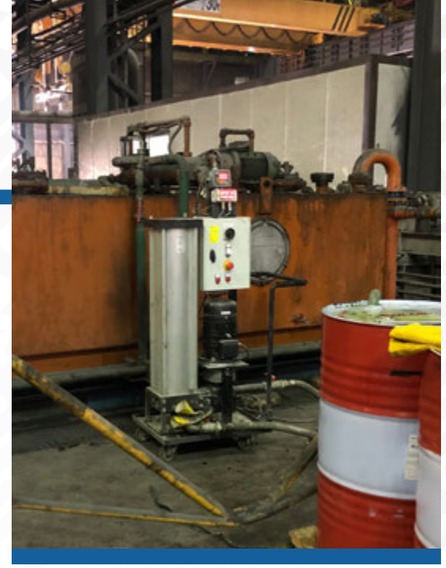
The Panel Unit is designed to deliver maximum filtration and reliability across a range of applications. Featuring non-bypass filter heads, the Panel Unit ensures that no particles bypass the filter when it reaches saturation, maintaining the cycle of the filtration process and preventing contaminants from circulating back into the system. The unit's durable frame and drip pan, supports easy, direct mounting and enhances long-term performance by containing any potential leaks, making it an ideal for the harshest environments.

The Panel Unit offers dual-stage filtration with multiple micron ratings to effectively remove particles and ensure clean fluids, extending the life of your equipment across various industries, including production plants, mining, pulp & paper, marine & offshore, and power generation.

Scan for more details

PANEL UNIT	P
Nominal Flow Rate	1.5 - 10 gpm (6 - 38 l/min)
Viscosity Range	10-648 cSt
Power Supply	Scan QR code or contact Des-Case representative for more details
Suitable Filter Elements	Spin-On Filter Element
Max. Recommended Reservoir Volume	1,029 gal (3,895 l)
Dimensions (HxWxD)	25.8 in x 23.4 in x 15.6 in (655 mm x 594 mm x 396 mm)
Dry Weight	± 100 lbs (± 45 kg)

Giant Offline Filtration Unit



The Giant Offline Unit (GOLU) is designed for easy installation and operation, offering a heavy-duty filter housing, pump motor, and electrical control box, suction, and return lines for a quick setup. Perfect for both new and existing hydraulic systems, the GOLU is compatible with various filter types and micron ratings without the need for modification, ensuring seamless integration into your setup. Its high dirt holding capacity and filtration efficiency significantly extends the life of both oil and components by 3 to 7 times.

With it's capacity to handle large flows of oil, the GOLU is the ideal solution for applications such as Hydraulic Power Units, lube & oil tanks, large gearboxes, and storage tanks for biodegradable fluids.

Scan for more details

GOLU	GOLU 1A&1B
Nominal Flow Rate	10.6 gpm - 21 gpm (40 l/min - 80 l/min)
Viscosity Range	10-500 cSt Filter element dependent (Contact a Des-Case representative for higher viscosities compatibility)
Power Supply	Scan QR code or contact Des-Case representative for more details
Suitable Filter Elements	46 Series G, A | 92 G, A
Max. Recommended Reservoir Volume	3,963 gal - 7,925 gal (15,000 - 30,000 Liters)
Dimensions (HxWxD)	Varies by Part Code - See Technical Data Sheet for more details
Dry Weight	220 lbs - 253 lbs (100 kg - 115 kg)

TC Stands

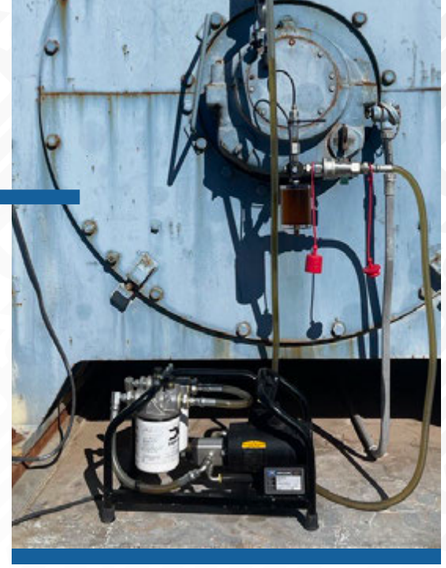
The TC Series T-Stands are the most rugged and reliable filtration systems available, specifically designed for the dedicated filtration of all types of industrial oils. These heavy-duty systems excel in removing particles, free water, and even contaminants from high-viscosity gear oils, offering years of dependable service.

Ideal for large reservoirs with high flow rates, the TC Series T-Stands feature canisters that accommodate various filter types, including microfiberglass drop-in filters, depth filters, and bag filters. This versatility enables the removal of large particles, debris, sludge, varnish, and water contamination. The heavy-duty, industrial-grade canisters are built with bolt-down lids and thick cylinder walls for durability. A continuous-duty gear pump with flow rates ranging from 1 to 40 GPM ensures efficient filtration, while pump pressure and differential pressure gauges provide monitoring for optimal performance. Additionally, a manual bypass allows for easy maintenance without system disruption, making the TC Series T-Stands a reliable, high-performance solution for industries requiring robust oil filtration systems.

Scan for more details

TC SERIES	TC-FC
Nominal Flow Rate	1-40 gpm (3.8-151 l/min)
Viscosity Range	3-648 cSt (Contact a Des-Case representative for higher viscosities compatibility)
Power Supply	Scan QR code or contact Des-Case representative for more details
Suitable Filter Elements	Axial flow elements | 6x18 or 6x36 Microglass Filter Elements
Max. Recommended Reservoir Volume	4,114 Gallons (15,573 Liters)
Dimensions (HxWxD)	2-Wheel: 48.1 in x 31.5 in x 34.9 in (1222 mm x 800 mm x 887 mm) 4-Wheel: 62.8 in x 33.5 in x 44.1 in (1595 mm x 851 mm x 1120 mm)
Dry Weight	± 260 lbs (118 kg)

Drum Topper



The Drum Topper is a compact and efficient filtration solution designed to ensure clean hydraulic fluids right from the source. Ideal for industries that use bulk oil or fluids stored in drums, this easy-to-use system filters fluids as they are dispensed, preventing contamination and ensuring only clean oil enters your equipment. With non-bypass filter heads, it prevents particles from bypassing when the filters reach saturation, maintaining optimal filtration.

The Drum Topper comes with 6′ hose assemblies and quick-connect options for easy setup, along with a range of flow rates and power supply options. This low-maintenance system is perfect for hard to reach areas.

CE version available.

Scan for more details

PORTABLE FILTRATION	DT
Nominal Flow Rate	0.75 - 8 gpm (1.8 - 30 l/min)
Viscosity Range	9-431 cSt (Contact a Des-Case representative for higher viscosities compatibility)
Power Supply	Scan QR code or contact Des-Case representative for more details
Suitable Filter Elements	Spin-On Filter Element
Max. Recommended Reservoir Volume	360 Gallons (1,362 Liters) (LV) 103 Gallons (390 Liters) (HV) 823 Gallons (3,115 Liters) (Pneumatic)
Dimensions (HxWxD)	15.4 in x 13.5 in x 24.5 in (391 mm x 343 mm x 622 mm)
Dry Weight	± 53 lbs (± 24 kg)

Filter Cart

The Filter Cart is a portable, cost effective solution to maintain cleanliness in multiple applications with the same lubricant. Featuring an automatic pressure relief valve and non-bypass filter heads, the Filter Cart prevents particles from bypassing when filters reach saturation, ensuring effective filtration at all times. Dual-stage filtration with multiple micron ratings allows for customizable filtration based on your needs.

With its compact size, the Des-Case Filter Cart provides a convenient solution for small to medium-sized reservoirs with low flow rates. Whether you're filtering or transferring oil, the filter cart is adaptable to any plant or manufacturer's specifications and uses high-efficiency filtration elements to ensure optimal equipment performance.

Scan for more details

PORTABLE FILTRATION	FC
Nominal Flow Rate	1.5 - 8 gpm (5.7 - 38 l/min)
Viscosity Range	10 - 648 cSt (Contact a Des-Case representative for higher viscosities compatibility)
Power Supply	Scan QR code or contact Des-Case representative for more details
Suitable Filter Elements	Spin-On Filter Element
Max. Recommended Reservoir Volume	1,029 Gallons (3,895 Liters)
Dimensions (HxWxD)	46.4 in x 21.5 in x 18.8 in (1179 mm x 546 mm x 478mm)
Dry Weight	± 100 lbs (± 45 kg)

TC Series Filter Cart

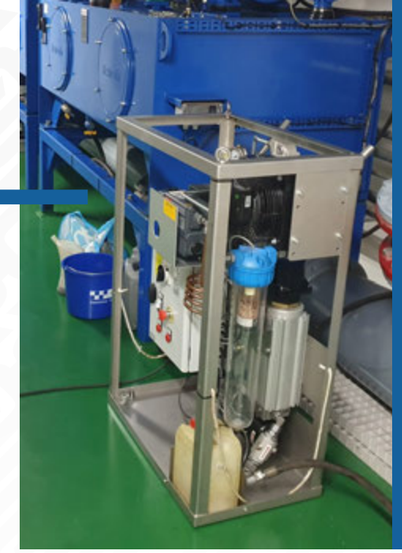
Featuring industrial-grade canisters with bolt-down lids and heavy-gauge cylinder walls, the TC Series ensures durability and long-lasting performance. It is equipped with a continuous-duty gear pump, offering flow rates from 1 to 40 GPM, and includes a NEMA 4 industrial-duty switch for reliable operation. Monitoring is made easy with pump pressure and differential pressure gauges, while the manual bypass allows for efficient maintenance.

The TC Series represents the highest quality and most rugged systems available for purifying industrial oils. This heavy-duty, high-capacity portable system is designed to efficiently remove particles and free water from all types of industrial oils and can be customized to meet the unique needs of most application.

Scan for more details

TC SERIES	TC-FC
Nominal Flow Rate	1-40 gpm (3.8-151 l/min)
Viscosity Range	3-648 cSt (Contact a Des-Case representative for higher viscosities compatibility)
Power Supply	Scan QR code or contact Des-Case representative for more details
Suitable Filter Elements	Axial flow elements | 6x18 or 6x36 Microglass Filter Elements
Max. Recommended Reservoir Volume	4,114 Gallons (15,573 Liters)
Dimensions (HxWxD)	2-Wheel: 48.1 in x 31.5 in x 34.9 in (1222 mm x 800 mm x 887 mm) 4-Wheel: 62.8 in x 33.5 in x 44.1 in (1595 mm x 851 mm x 1120 mm)
Dry Weight	± 260 lbs (± 118 kg)

Vacuum Dehydration Units



The Vacuum Dehydration Unit is an advanced solution designed to efficiently remove water and other contaminants from industrial oils, lubricants, and hydraulic fluids. This unit quickly separates moisture and particulates, improving fluid quality and extending equipment life. Available in two different sizes (Mini and Maxi) the Vacuum Dehydration Unit is suitable in a variety of conditions making it the perfect solution for a range of industries including, pulp & paper, steel, mining, offshore & marine..

Its compact, user-friendly design allows for easy integration into existing systems, offering reliable, high-performance dehydration without the need for expensive fluid replacements.

Scan for more details

MWV

MXWV

VDU	MWV	MXWV
Nominal Flow Rate	0.58 - 0.69 gpm (2.2 - 2.6 l/min)	0.66 - 2.67 gpm (2.5- 10.1l/min)
Viscosity Range	10 cSt to 500 cSt - element dependent	
Power Supply	Scan QR code or contact Des-Case representative for more details	
Suitable Filter Elements	30G Series	
Max Oil Temp.	140° F (60° C)	
Dimensions (HxWxD)	43.3 in x 29.1 in x 17.2 in (1100 mm x 740 mm x 450 mm)	63 in x 29.5 in x 25.6 in (1600 mm x 750 mm x 650 mm)
Dry Weight	± 287 lbs (± 130 kg)	± 606 lbs (± 275 kg)

Store & Transfer

Store and transfer products play a critical role in equipment reliability by ensuring that lubricants, oils, and fluids are properly handled, protected, and transported within industrial maintenance processes. Proper storage and transfer practices reduce the risk of contamination, degradation, and misapplication, all of which can lead to equipment failures.

Benefits

Contamination Control

Reduces the risk of dirt, moisture, and particles entering lubricants.

Efficiency

Simplifies and streamlines lubricant handling processes.

Reliability

Protects the integrity of lubricants, improving machine life.

Error Reduction

Color-coding and labeling help prevent cross-contamination and misapplication.

Cost Savings

Reduces downtime and maintenance costs by protecting equipment from failures related to contamination.

Oil Transfer Containers

The first best practice solution to keep oil clean and dry during oil transfer.

With non-desiccant and desiccant breather options, as well as quick connects for clean filling, Oil Transfer Containers isolate oil from the environment providing the ultimate in best practice contamination control.

Scan for more details

LT-LMS

The LT-LMS is a heavy-duty, highly efficient, and versatile filtration system designed to provide maximum contamination control for industrial fluids. Its unique stackable design combines high-density polyethylene (HDPE) with dedicated filtration systems, ensuring precise fluid management with no risk of cross-contamination. Each container features a dedicated pump, motor, filter, and desiccant breather, preventing dirt and water ingress while maintaining optimal fluid quality.

The LT-LMS is designed for maximum durability with heavy-duty stands that can withstand tank stacking, making it ideal for operations with limited space. With customizable power supply and hose assembly and steel tank options, the LT-LMS is a perfect solution for industries seeking reliable and simple lubricant storage solution for their lube rooms.

CE version available.

Scan for more details

Mobile Utility Cart

The Mobile Utility Cart is a versatile 3-in-1 solution designed to improve fluid storage, handling, and filtration, ensuring the reliability of process equipment and extending lubricant life. This mobile system combines filtration, storage, and handling in one compact design, allowing you to keep lubricants clean and dry while delivering multiple oil types to various assets.

The heavy-duty cart features industrial powder-coated paint for durability and offers the flexibility to push, pull with a heavy-duty hitch, or lift with forklift pockets for easy mobility.

Scan for more details

Drum Filter Cart

The Drum Filter Cart is a customizable, all-in-one solution designed for pre-cleaning, protecting, and transferring oil from securely attached drums. This versatile cart includes a drum adapter kit with a desiccant breather for comprehensive contamination control, ensuring the cleanliness of your oil throughout the filtration process. Featuring dual-stage filtration with multiple micron ratings, the Drum Filter Cart efficiently removes contaminants to maintain fluid quality.

Equipped with casters for easy mobility, the Drum Filter Cart is a practical and efficient solution for fluid transfer and contamination control across various industrial applications.

Scan for more details

View & Assess

Visual oil analysis products are tools designed to help monitor and assess the condition of lubricants, oils, and machinery by offering visual inspection capabilities. These products are commonly used in industrial settings to enhance predictive maintenance and ensure equipment reliability.

	3-D BullsEye®	Oil Sight Glass	Oil Level Indicator	Oil Sight Glass Level Monitor
				
360° View	✓	✓	✓	✓
Installs on Drain Port		✓	✓	✓
Collect and Drain Water and Sediment		✓		✓
Stainless Steel Fittings Available		✓		✓
Monitor Oil Level	✓		✓	✓
View Clarity and Color	✓	✓	✓	✓
Additional Benefits	• See foaming in oil	• Various volumes available • Can be installed horizontally for applications with limited space	• Filtered or close-looped installation • Optional ND-2 breather	• Dual port available for sampling oil • Filtered or close-looped installation

Benefits

Immediate Insights

Quickly detect contamination, oil level changes, and quality issues.

Preventive Maintenance

Identify potential problems before they lead to equipment failure.

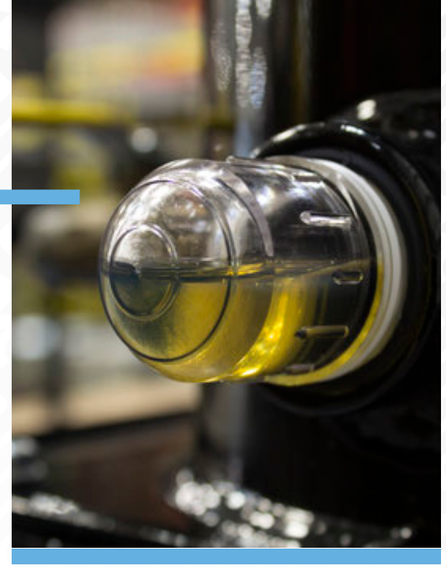
Ease of Use

Simple, non-invasive, and cost-effective solutions for routine maintenance.

Versatility

Applicable to a range of machinery and industries, including manufacturing, mining, and transportation.

3-D BullsEye®



The 3-D BullsEye®, made of a high performance transparent polyamide, allows immediate and accurate visual oil level monitoring from virtually any angle.

Engineered to outperform and outlast traditional viewports, the inherently strong material provides excellent impact, chemical and UV resistance.

Available in a range of NPT, Metric and BSPP sizes.

Scan for more details

Oil Level Indicator

The Oil Level Indicator (OLI) was developed in response to the need of maintenance professionals to quickly gauge the condition and level of oil inside large tanks, gearboxes and reservoirs.

The OLI is a clear high performance polyamide column with 1/2" NPT threads at each end. Red and green level marker stickers are included with the OLI to mark upper and lower limits, or to designate running oil level and idle oil level. Utilizing the drain port, operators can visually monitor the fluid level within reservoirs. Available in a range of heights from 3–30 in (76 – 762 mm).

Scan for more details

Oil Sight Glass

Often referred to as BS&W bowl (bottom sediment and water bowl), our Oil Sight Glass (OSG) can play a critical role in early detection of contamination and allow for constant monitoring of what's in your oil that can decrease equipment life.

Users have an immediate, crystal-clear visual inspection of the oil and a magnified view of the presence of sediment, thanks to an innovative white bottom design. The OSG has the versatility to be installed vertically or horizontally to a drain port depending on space needs for the application. With the addition of indication marks on the side of the bottle, you can quickly and easily monitor the rate of water accumulation.

Scan for more details

Oil Sight Glass Level Monitor

The Oil Sight Glass Level Monitor (OSGL) allows you to view oil color, clarity and accumulation of water or other contaminants while monitoring the level of the oil in the reservoir.

The secondary 3/8" NPT port opposite the installation nipple allows for the connection of a sampling tube to draw representative oil samples without pulling outside contaminants.

Scan for more details

Monitor & Diagnose

Oil Condition monitoring is a vital component of any condition-based maintenance strategy because it provides the data for early failure prediction or prevention, allowing for timely action to avoid a catastrophic equipment failure ensuring longevity and smooth operation of the equipment.

Connected Solutions:

Integrate sensors into select Des-Case products for real-time monitoring of your oil providing a predictive look into your equipment. When tied to contamination control and the role of Des-Case products, the synergy becomes even clearer. Connected solutions in reliability, such as IoT-enabled sensors and advanced monitoring systems, and contamination control work hand-in-hand to protect critical assets. Des-Case products provide the physical barriers and filtration systems necessary to keep lubricants clean, while connected solutions provide the data-driven insights to ensure these systems are functioning optimally. Together, they deliver a comprehensive approach to reliability, reducing downtime, extending equipment life, and saving costs—all while supporting sustainability efforts. Des-Case is not just about solving contamination problems but about empowering smarter, data-driven reliability practices.

Condition Monitoring Center

Smart Offline Unit

Giant Offline Unit

Condition Monitoring Center

The Condition Monitoring Center (CMC) combines sensor technology to enable accurate sampling in low-pressure hydraulic and lubrication systems.

Designed to address aeration challenges, it removes air bubbles from particle counts for precise contamination data. The CMC also provides continuous, reliable monitoring in systems without oil pressure, ensuring optimal fluid cleanliness in demanding applications such as offshore and marine, automotive and paper industries. It is easy to retro-fit and a must for an pro-active maintenance approach.

Scan for more details

Benefits of Condition-based Asset Monitoring

Better understand asset health:

Monitoring assets provides more data, and therefore a better understanding of their performance and health. Having real-time data available, one can take the right actions based on insights and specific operating conditions, and continuously optimize the assets' health in a proactive way.

Drastic reductions in downtime and lower maintenance costs:

Monitoring for early indicators of failure is crucial in diagnosing and addressing problems before they lead to downtime. It also eliminates the need for many calendar-based preventive maintenance tasks, thereby reducing labor costs and driving down the cost of spare parts.

Reliable Data and faster decision making:

Condition monitoring products provide reliable data, meaning the true source of an issue can be determined quickly and then improved on with the correct maintenance approach. Automatically generated reports, better visual representation of data, and benchmarking capabilities enable richer, deeper asset insights that aid decision-making.

Enhancing Maintenance Team Efficiency and Safety:

CBM improves the work of maintenance teams by focusing on equipment that truly needs attention rather than following fixed schedules. This targeted approach saves time, effort resources. It helps technicians prepare better for repairs. They know what's wrong before they start work, which means they can bring the right tools and parts and finish jobs faster and more effectively.

Contamination Monitoring Sensor

The Condition Monitoring Sensor (CMS) 2 in-line particle monitor automatically measures and displays particulate contamination, moisture and temperature levels in various hydraulic fluids.

It is designed specifically to be mounted directly to systems, where ongoing measurement or analysis is required, and where space and costs are limited.

Scan for more details

Oil Quality Sensor

The Oil Quality Sensor (OQS) is the world's most advanced real-time oil condition sensor delivering a unique insight into the current status of your equipment.

It works with any oil type, mineral/synthetic, and can be fitted to any engine, gearbox, hydraulic or electrical transformer system while in full operation. Simple to install and use, the OQS provides unique insight into the condition of your equipment, helping you prevent unnecessary breakdowns, eliminate unnecessary maintenance and reduce your operating costs.

Scan for more details

Oil Quality Display (OQD)

When OQS is used with the Oil Quality Display, read the oil condition and temperature of the oil from a sensor without a PC.

Moisture Content Sensor

Water in hydraulic and lubrication fluids causes oxidation, additive depletion, corrosion, and reduced lubricating film thickness.

Monitoring moisture levels early helps prevent these costly issues. The MCS offers high-accuracy, stable online moisture monitoring, even in environments above 90% relative humidity, making it ideal for gearboxes, thrusters, and other applications at risk from free water. Using the MCS alongside Des-Case solutions like the Condition Monitoring Center and Vacuum Dehydration Units ensures effective water contamination management.

Scan for more details

Portable Particle Counters

Portable particle counters are compact, accurate tools designed for on-site fluid analysis.

They automatically measures particulate contamination, moisture, and temperature levels in a wide range of fluids. With its portable design and immediate analysis capabilities, the portable counters deliver reliable results without the need for additional equipment, making it an efficient solution for maintaining fluid cleanliness and system performance.

Scan for more details

Train & Consult

We understand textbook best practices aren't always possible, so that's why we are dedicated to helping people develop more practical solutions for their lubrication process.

Our team of lubrication experts has more than 85 years of combined experience in the field, enabling them to provide real world advice that can be implemented quickly and realistically.

With a detailed roadmap, assigned project manager, practical advice, and local distributor support, Des-Case can help with everything from implementation to execution of a lubrication program.

Consulting

Our consulting services are designed to help organizations maximize their equipment's reliability by ensuring proper lubrication, minimizing contamination, and improving maintenance practices. This leads to more efficient operations, reduced downtime, and cost savings.

Lube Room Design

Proper lubricant storage impacts every aspect of lubrication. Provide us with your room dimensions and lubricant list, and we'll design an ergonomic storage solution, including a 3D virtual fly-through, bill of materials, and setup instructions.

Plant Assessments

Our comprehensive assessments and holistic solutions help businesses improve maintenance and reliability. With expert services, top-tier products, and dedicated support, we help increase uptime, reduce costs, and improve efficiency.

Equipment Modification Plan

Our engineers develop custom modification plans for oil-lubricated assets, integrating quick connects, level gauges, breathers, and sample ports to facilitate best practices while protecting equipment from contamination.

Mobile Reliability Experience

Our state-of-the-art reliability truck brings hands-on training to your team, demonstrating lubrication best practices, contamination control, and asset assessments—plus, we provide product samples to showcase ROI.

Lubrication Training

Our lubrication training courses are designed to help companies develop and deploy an executable plan to achieve lubrication best practices.

We offer in-person training classes, virtual options as well as a digital learning management system.

1-Day Workshop

Our 1-day workshops are designed to teach you the basics of implementing lubrication best practices. In addition to 8-hours of professional instruction, you will receive access to our benchmark assessment tools and a customized action item list, detailing the specific activities you need to work on to achieve precision lubrication performance.

Certification Training

We offer practical solutions and advice that teach you how to execute on precision lubrication. Our intensive, 3-day educational course are an International Council for Machinery prep class ranging from MLT I/ MLA I to MLA II and MLT II and are ideal for anyone who wants an indepth understanding of what it takes to achieve precision lubrication. Available for private and public classes.

Custom Lubrication Training

Want a lubrication training course tailored specifically to your industry or learning objectives? Let Des-Case create a custom syllabus that addresses your unique goals. Whether you're looking to educate site managers on the value proposition for precision lubrication or trying to learn more about electric motor regreasing, Des-Case has a vast library of lubrication training resources.

Digital Learning Management System

Our interactive LMS provides flexible online training, offering courses from introductory ½-day sessions to 1-day workshops and advanced Machinery Lubrication Certification Courses.

Scan for more details

Experience a new way to learn and observe lubrication best practices in a state-of-the-art reliability truck!

Des-Case will come to you and your team to demonstrate how to protect and clean your lubricants throughout their lifecycle.

Reference Guide

What is Cleanliness?

When we speak in terms of cleanliness, we often refer to the ISO particle count of the oil.

According to the ISO 4406 standard, the ISO particle count is a measure of the number of particles greater than 4, 6, and 14 microns in every milliliter of fluid. The number of particles is then converted to what is referred to as the ISO Code or Range Code. The range code represents the number of particles of a given size in one milliliter of sample. Results from an oil cleanliness testing are typically reported in a three number format such as 18/16/13, where 18 represents the range code representing the number of particles that are 4 microns and larger, 16 the range of particles that are 6 microns and larger, and 13 represents particles 14 microns and larger.

HOW CAN WE MEASURE HOW MUCH PARTICLE CONTAMINATION IS IN AN OIL?

Particle contamination is measured using the ISO 4406 standard.

Particle Count Data	
Size in Microns	**Number of Particles Larger Than Size per ml**
4	1,654
6	495
10	122
14	52
20	21
50	1.3
75	0.22
100	0.05

Number of Particles / ml		Range Number
More Than	**Less Than or Equal to**	
80,000	160,000	24
40,000	80,000	23
20,000	40,000	22
10,000	20,000	21
5,000	10,000	20
2,500	5,000	19
1,300	2,500	18
640	1,300	17
320	640	16
160	320	15
80	160	14
40	80	13
20	40	12
10	20	11
5	10	10

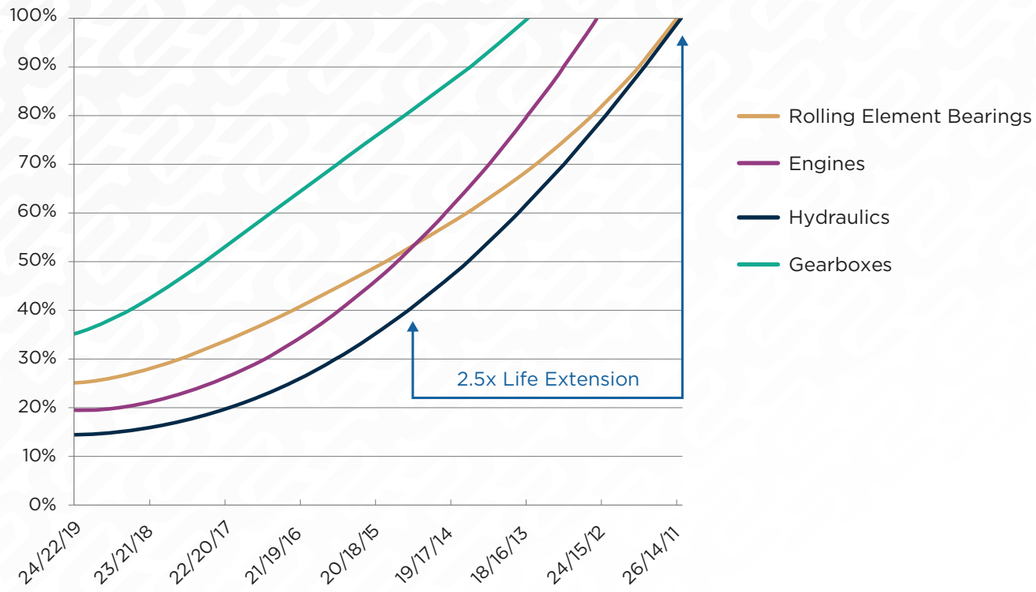
R4/R6/R14
ISO 18/16/13

The ISO 4406 standard gives a range code corresponding to the number of particles per milliliter in three difference size ranges:

particles > 4 micron | particles > 6 micron | particles >14 micron

Life Extension Table:

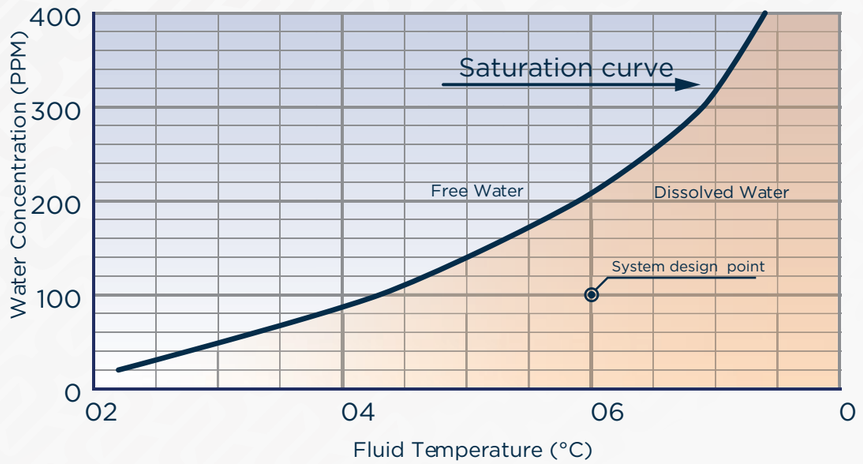
An Equipment Life Extension Table helps quantify how improving fluid cleanliness can extend the lifespan of machinery components, particularly in hydraulic and lubrication systems. It is based on the principle that contaminant reduction significantly decreases wear and increases component longevity. This table typically correlates ISO cleanliness codes (as per ISO 4406) with the expected lifespan of critical components, such as pumps, bearings, and valves. By lowering contamination levels, the table shows how much longer equipment can operate before failure due to wear.



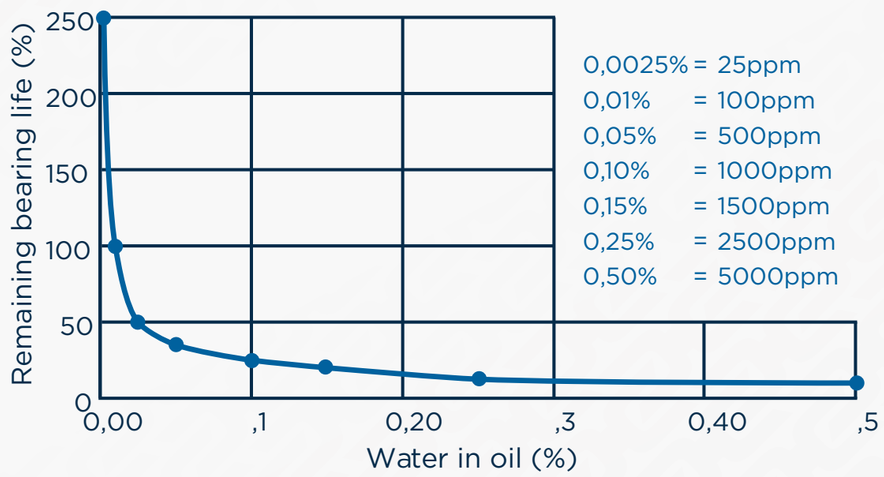
MACHINE TYPE		PARTICLE LEVEL TARGET	MOISTURE LEVEL TARGET
Hydraulics 1500 - 2500 psi	With servo valves	15 / 13 / 11	125 ppm
	With proportional valves	16 / 14 / 12	150 ppm
	Variable Volume Piston Pump	17 / 15 / 12	150 ppm
	With cartridge valves or fixed piston pump	17 / 16 / 13	150 ppm
	With vane pump	18 / 16 / 14	150 ppm
Gearbox		19 / 16 / 13	300 ppm
Paper Machine		18 / 14 / 11	200 ppm
Steam Turbine		18 / 14 / 11	100 ppm
Pumps		17 / 14 / 12	150 ppm

Water Contamination

Water in hydraulic and lubricating oils is a major contaminant that can cause serious equipment damage and reduced lubricant performance. It can enter the system through condensation, leaks, or improper storage. Even small amounts of water can lead to oxidation, corrosion, reduced load-carrying capacity, and increased wear due to loss of film strength. Water contamination can exist in three forms: dissolved (invisible at low concentrations), emulsified (milky appearance), and free water (separates at the bottom). Effective filtration, dehydration, and proper oil storage are essential to minimizing water contamination and maintaining optimal equipment performance. The water concentration in a hydraulic fluid is marked as RH percentage (relative humidity), ppm (parts per million) or % (percentage weight or volume). Most common saturation points will be between 200 and 600 ppm (0,02– 0,06 percent) depending on the temperature of the oil. At a higher temperature the oil will be able to hold more water.



Effects of water contamination on life cycle of bearings.



SO/Temperature Viscosity Reference

The table below provides approximate viscosity values (in centistokes, cSt) for common ISO VG fluids at various temperatures, based on the kinematic midpoint of each classification according to ISO 3448. These values serve as a reference and may vary by ±10% from the midpoint value used in the calculations.

How to Use This Chart:

1. Find the ISO VG of your fluid along the top row.
2. Locate your fluid's storage or operating temperature in the left-hand column.
3. The intersection of the selected column and row provides the estimated viscosity at that temperature.

This reference is intended to assist in viscosity identification and should be used for guidance only.

Temp °F	Temp °C	ISO 22	ISO 32	ISO 46	ISO 68	ISO 100	ISO 150	ISO 220	ISO 320	ISO 460	ISO 680	ISO 1000	ISO 1500
14	-10	315	610	1,130	2,285	4,493	9,277	18,565	36,300	69,775	141,088	283,473	593,291
23	-5	218	405	724	1,401	2,646	5,225	10,013	18,790	34,687	67,151	129,188	258,112
32	0	155	278	481	893	1,625	3,081	5,672	10,249	18,228	33,901	62,665	119,962
41	5	113	196	330	590	1,037	1,893	3,359	5,861	10,072	18,052	32,160	59,188
50	10	85	142	233	402	685	1,207	2,071	3,498	5,825	10,088	17,371	30,828
59	15	65	106	168	282	467	797	1,324	2,171	3,510	5,890	9,828	16,865
68	20	51	80	125	203	327	542	875	1,396	2,196	3,579	5,800	9,648
77	25	40	62	95	150	235	379	596	927	1,422	2,255	3,557	5,748
86	30	32	49	73	113	173	272	417	633	950	1,468	2,259	3,554
95	35	27	39	58	87	130	200	300	445	652	986	1,481	2,274
104	40	22	32	46	68	100	150	220	320	460	680	1,000	1,500
113	45	19	26	37	54	78	115	165	235	332	481	694	1,018
122	50	16	22	31	44	62	89	126	177	245	348	493	709
131	55	13	19	26	36	50	71	98	135	185	258	358	506
140	60	12	16	22	30	41	57	78	105	142	194	266	369
149	65	10	14	18	25	34	46	62	83	110	149	201	275
158	70	9	12	16	21	28	38	51	67	87	117	155	208
167	75	8	10	14	18	24	32	42	54	70	92	121	161
176	80	7	9	12	16	20	27	35	45	57	74	96	126
185	85	6	8	11	14	18	23	29	37	47	60	77	100
194	90	6	7	9	12	15	120	25	31	39	50	63	81
203	95	5	7	8	11	13	17	21	27	33	42	52	66
212	100	5	6	7	9	12	15	18	23	28	35	43	54
221	105	4	5	7	8	10	13	16	20	24	30	37	45
230	110	4	5	6	8	9	12	14	17	21	25	31	38
239	115	4	5	6	7	8	10	12	15	18	22	27	32
248	120	3	4	5	6	8	9	11	13	16	19	23	28
257	125	3	4	5	6	7	8	10	12	14	17	20	24

*assumes a viscosity index of 95, which is typical of a mineral-oil based lubricant

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ISO 14001