

TECHNICAL APPLICATION GUIDE

MKTECH INDUSTRY SDN BHD

DRY OVERSPRAY FILTRATION WITH ANDREAE

Evaluating a water-curtain conversion

Filter selection, airflow verification, installation and change-out. Includes a worked cost comparison and two printable worksheets.

For paint-shop supervisors, production engineers, maintenance and EHS teams.

MKTECH-TA-FILT / 2026 EDITION

NOVEMBER 2026

01 / PURPOSE AND NAVIGATION

Start with the booth duty

A dry filter bank changes how overspray is collected and how much resistance the exhaust fan sees. Use this guide to scope a conversion, plan measurements and compare the results on real production duty.

Survey the existing booth

Record the coating mix, peak load, airflow, wet-system condition, maintenance time and waste costs.

Specify the dry system

Check net filter area, media, frame and fan duty. Have the responsible team review safety and environmental requirements.

Verify under load

Check containment, airflow and filter condition from clean start through the permitted loading range. Record change-out and costs.

Find the right section

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Define who can approve the change

Treat conversion as an engineered change

Use the booth design, model-specific filter documentation, coating safety data, and site acceptance criteria. The responsible engineer and site safety and environmental teams establish the design and operating limits, applicable approvals, and conditions for returning to service. [3-7]

EHS = environment, health and safety. SDS = safety data sheet. LEV = local exhaust ventilation. VOC = volatile organic compound. Pa = pascal.

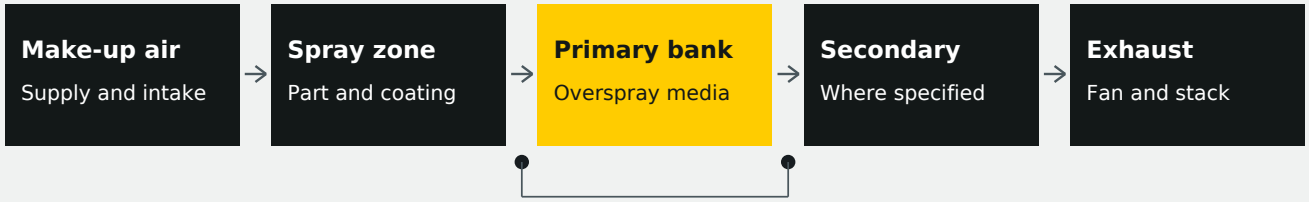
02 / SYSTEM FUNDAMENTALS

Follow the air and the overspray

Andreae's perforated, pleated media redirects the exhaust stream. Overspray droplets separate by inertia and collect in pockets. The High Efficiency construction adds a polyester layer downstream of the paper. [1, 2, 4]

Typical flow path through a dry exhaust bank

SCHEMATIC / EQUIPMENT ARRANGEMENT VARIES BY BOOTH



Primary-bank pressure drop uses measurement points on both sides of that bank.

Particles

Wet overspray and paint particles are the duty of the arrestor. Check loading, seal condition and deposits beyond the bank.

Airflow

Supply, booth geometry, filter resistance, fan and duct losses determine the operating condition together.

Vapours

Assess solvent vapours and exposure separately. Paint arrestor data describe particle capture. [5, 6, 8]

Separate media performance from system performance

A published arrestance figure describes a test of the medium for a stated coating. Actual emissions and exposure depend on the coating, process, containment, sealing and exhaust controls. Check them against the site criteria. [1, 2, 5, 6, 8]

Confirm how the new collector changes the duty

A water curtain collects overspray into a wet system. A dry bank accumulates it in replaceable media. Plan for changing filter resistance as the bank loads and track the new residue handling route. [4-7, 10]

03 / EXISTING BOOTH SURVEY

Measure the water-curtain baseline

Collect readings while the current booth is in its authorised spray mode. Include typical and peak production periods, with the workpiece and booth configuration recorded.

WHAT TO CAPTURE	MEASURE OR DOCUMENT	WHY IT MATTERS
Coating duty	Product names and SDS, coating and solids data, mixed quantity sprayed, spray equipment, shifts, part types and peak simultaneous use.	Coating behaviour and local overspray load influence media choice and loading.
Existing airflow	Fan and motor data, speed/control mode, measured flow, work-zone velocity map, make-up air and booth-to-room pressure where specified.	Establishes the current operating point and the criteria for the revised system.
Geometry and access	Internal bay dimensions, clear openings, obstructions, exhaust plenum, ducts, access and service clearances.	Allows assessment of effective area, supports, seal paths and safe maintenance access.
Water-system records	Pump runtime and energy, water and chemicals, cleaning hours, sludge and wastewater handling, repair history and lost production.	Provides comparable operating costs and identifies work needed to retire the wet equipment.
Acceptance and constraints	Approved airflow, containment, emissions and exposure criteria, interlocks, fire protection, current notices and relevant authority or insurer conditions.	Defines what the new installation must demonstrate before routine use.

Record output on the same basis

Log accepted parts, rework and coating quantities for the same period as the booth readings. Account for clean-out or unused mix separately when estimating litres actually sprayed. Choose a consistent measure for both trial conditions.

Use the authorised operating condition

Have the site team resolve degraded airflow or a failed control before using the measurements as a comparison baseline. See the site survey worksheet on page 13. [5, 6]

04 / MEDIA AND DUTY

Select Andreae media by coating

The Original uses perforated, pleated kraft paper. The High Efficiency (HE) model adds a polyester backing layer. Compare actual coating behaviour, capture needs and the bank's allowable resistance. [1, 2, 4]

SELECTION CONSIDERATION	ANDREAE ORIGINAL	ANDREAE HIGH EFFICIENCY
Construction	Pleated paper labyrinth with built-in extension limiters.	Pleated paper labyrinth with a polyester backing layer.
Duty to review	Review for tacky or slower-drying overspray where the product and booth criteria permit it.	Evaluate where greater particulate capture is needed. Check the backing for loading with the actual coating.
Published capture of lacquer	93.10%	97.90%
Published capture of high-solids coating	98.20%	99.00%
Published capture of two-component polyester	97.80%	99.40%

Capture values are Andreae's product-page results for the listed test coatings. Verify current test basis and technical data for the exact product. [1, 2, 4]

Confirm the order by model and dimensions

Andreae's history uses the name HE+. Its current product page lists High Efficiency. Confirm the full model code, construction, height, extended length, installed area and any specified fire-performance documentation for the exact supply. [1-3, 9]

Check the complete exhaust filter train

A downstream stage may be required by the booth design, capture objective or approval conditions. Include each stage's pressure drop, support and change-out access when selecting the primary filter. [4-6, 8]

05 / AIRFLOW AND RESISTANCE

Calculate the filter face velocity

Use measured exhaust volume for the operating mode and the clear frontal area available to the filter bank. For multiple parallel bays, confirm how airflow is distributed. [1, 2, 6]

Nominal face velocity = exhaust flow ÷ net filter-bank frontal area

Illustrative calculation. 21,600 m^3/h ÷ 3,600 = 6.00 m^3/s. With 8.00 m^2 of clear frontal area, 6.00 ÷ 8.00 = 0.75 m/s. Use the projected opening after allowing for solid obstructions, independent of the unfolded paper area.

MEASUREMENT	WHERE AND HOW IT IS USED	WHAT TO RECORD
Filter face velocity	Average velocity at the filter bank. Use the approved traverse or flow measurement to assess the distribution.	Measured flow, net area, face locations and representative loading.
Booth air velocity and containment	Measure at the designated booth plane or work zone in the approved mode. Use the design's required grid and acceptance method.	Positions, values and units, minimum or other specified criterion, doors and workpiece state.
Filter-bank pressure drop	Upstream static pressure minus downstream static pressure at the designated taps. A reading of -28 Pa upstream and -61 Pa downstream gives 33 Pa across that stage.	Stage and tap locations, instrument, fan mode and stable reading in Pa.
Booth-to-room pressure	Static pressure difference across the booth enclosure where the design requires it.	Reference location, sign convention and the approved operating band.

Use product data for the initial comparison

Andreae lists a recommended face-velocity range of 0.5 to 1.0 m/s for these two products and publishes 30 Pa for Original and 32 Pa for HE at 0.75 m/s. Verify the data for the exact model. Check clean and loaded fan duty across the whole system, including supply, filter stages, plenum and duct losses. Use the booth's approved limits. [1, 2, 6]

06 / ENGINEERING CHANGE

Design the complete conversion

Replacing a wet collector with dry media affects airflow resistance, residue handling, fire risk and access. Document the intended arrangement and obtain the site's engineering and EHS approval before work. [5-7, 10]

REVIEW AREA	WHAT THE PROJECT MUST RESOLVE	EVIDENCE FOR APPROVAL
Air path and fan	Check clean and loaded system resistance, fan and make-up air. Review duct condition and air distribution.	Design basis, fan duty assessment, airflow and pressure measurement plan.
Dry bank and wet equipment	Define frame, openings and media stages. Plan safe wet-system isolation or removal, residue clean-out and access.	Layout, approved scope of work, isolation plan and acceptance checklist.
Fire, explosion and exposure	Review coating hazards and accumulated dry residues, ignition controls, ventilation, interlocks, fire protection and personnel exposure.	Approved hazard review, required safeguards and commissioning test records.
Environmental and waste controls	Determine applicable notifications and approvals. Confirm emission monitoring, waste classification and the authorised handling route for removed sludge and used filters.	Site conditions and regulatory determinations, waste route and required records.
Trial and handover	Approve trial duty, instrument locations, loading checks, stop conditions and a contingency if the dry system cannot meet the acceptance criteria.	Signed test plan and release record with operating and maintenance instructions.

Confirm Malaysian notification and approval duties

Review the Clean Air Regulations' prior-notification provisions for changes to air pollution control systems and the applicable design and monitoring duties. Review LEV and exposure requirements with EHS. [5, 6]

Classify the residues at the site

The waste generator determines the correct classification for spent media, paint residue and wet sludge. Review the captured material and applicable schedule before selecting storage and disposal arrangements. [7]

07 / INSTALLATION QUALITY

Fit, support and seal the bank

Install the approved model in the approved frame. Follow the filter and booth instructions and the site's isolation, access and handling procedure. [3, 4, 6]

01 **Confirm the frame and net opening**
Identify each bay and compare its clear width and height with the approved layout. Check the top and bottom channels, end clips or specified support for damage, distortion and gaps.

02 **Check the media before fitting**
Match the model, height, extended length and lot to the work order. Check the paper, seams, extension limiters and backing where fitted. Set damaged or wet stock aside for review.

03 **Fit in the specified direction and extension**
The manufacturer's illustrated channel method puts the white side toward the spray gun. Confirm orientation and how to cut and extend the exact model. Apply the supplied limiter where fitted.

04 **Secure the full perimeter and joints**
Seat the ends, channels and supports as specified. Inspect joints, corners and unused openings for paths that would let air bypass the media. Verify retention with the booth in its approved test mode.

05 **Record the installation and its first readings**
Log model, batch, bay and date. Record the configuration with photographs where required and establish the clean-bank airflow and pressure readings before production.

Check pleat density for the actual model

Andreae's Original guidance gives 26 pleats per linear metre. Apply the current instructions for the supplied model and frame. Check the extended layout across each bay to avoid uneven spacing or overstretching. [3, 4]

Bypass checks belong in the handover

A gap at a corner or joint can allow untreated exhaust past the media. Record how the bank was inspected and resolve gaps, torn media and loose supports before release. [3, 8]

08 / COMMISSIONING

Establish the clean-bank baseline

The new bank needs its own reference readings. Use the approved test plan and compare results with the specified design values in each applicable operating mode. [5, 6]

CHECKPOINT	RECORD THE CONDITION	DECISION BEFORE PROCEEDING
Pre-start inspection	Frame, filter model, orientation and seals. Confirm access panels, approved wet-system isolation, instrument checks and documentation.	The installation matches the authorised scope and is ready for testing.
Airflow and pressure	Clean primary and secondary pressure drops where taps are provided. Record airflow at the required locations, velocity map and booth pressure where specified.	Air distribution, airflow and containment meet the approved criteria in each required mode.
Protective functions	Run the authorised functional checks for airflow indication, alarms, spray permissives and other required safeguards.	Results are recorded and accepted by the responsible team before coating.
Representative spray trial	Log coating, workpiece, volume, condition and filter loading. Check finish, deposits and any required environmental or exposure measurements.	The system performs within approved limits at representative duty through the trial window.

Record the conditions behind the numbers

Use consistent instrument locations and units. Record fan setting or control mode, door position, supply condition, fitted filter stages, production state and instrument identification. Keep the clean and loaded observations with the test report.

Release criteria

The authorised team confirms all required measurements, records and safeguards.

Out-of-limit result

Follow the trial stop procedure, log the deviation and obtain a disposition before restarting.

The operating and change-out log on page 14 supplements the controlled commissioning record.

09 / LOADING AND MAINTENANCE

Set measured change-out triggers

Agree inspection frequency, warning triggers and change criteria during commissioning. Set intervention points that preserve the booth's approved operating envelope as filters load. [3-6]

Track loading against work done

At each approved check, record primary and secondary pressure drop where measured, airflow or work-zone readings, and filter condition. Compare like-for-like fan, make-up air, door and production settings. Track litres sprayed or equivalent production since installation and note material changes.

TRIGGER	WHAT TO REVIEW	RESPONSE UNDER THE SITE PROCEDURE
Pressure trending up	Compare stage pressure with the clean baseline and approved warning or change threshold.	Plan a change within the approved operating window. Check other stages when the increase is unexpected.
Airflow or containment falling	Check actual airflow, fan and supply mode, and whether the booth is approaching its required minimum.	Follow the approved intervention or stop procedure. Review the complete air path.
Tears, gaps or breakthrough	Inspect media, supports and downstream evidence using the approved safe inspection method.	Escalate and correct the defect. Verify airflow and containment before returning to production.
Sudden pressure drop	Check for bypass or damage, changed fan mode, and tap, tube or instrument issues.	Verify instrument condition and the bank before interpreting the result as a serviceable filter.

With variable-speed control, fan demand may rise while measured airflow holds. Record the control mode and speed or demand alongside pressure readings to make the trend interpretable.

Act on the earliest applicable site trigger

Use the authorised airflow, filter pressure and condition limits together. Follow the site isolation and waste procedure for removal. After replacement, verify the clean baseline and log the reason, service duty, waste route and return-to-service check. [3-7]

10 / FAULT ISOLATION

Diagnose the booth by symptom

Start with comparable readings and preserve the affected condition. Inspect safely and use the approved stop and release procedure when a control is compromised. [3-6]

SYMPTOM	POSSIBLE CAUSES TO CHECK	EVIDENCE AND NEXT ACTION
High pressure soon after fitting	Wrong media, uneven or overstretched pleats, obstructed area, another loaded stage, changed fan speed or pressure tap fault.	Compare stage-by-stage readings, configuration and fit with the clean baseline.
Low pressure and downstream paint	Bypass at joints, a torn filter, wrong orientation, or taps spanning the wrong area.	Record deposit location, check seating and integrity, and verify measurement points.
Normal bank pressure with weak extraction	Restricted intake, changes to make-up air or doors, fan or drive issue, duct obstruction.	Check supply, measured velocity and fan condition before attributing the issue to the filter.
One bay loads before the others	Part position, spray pattern, unequal clear openings or an uneven airflow profile.	Map velocity and deposits across bays. Have the responsible team review duty and layout.
Secondary stage loads rapidly	Primary bypass, damaged media, altered coating duty or a mismatch between the stages.	Inspect both stages and compare coating data and pressure trends before changing grade.
Finish contamination increases	Coating, prep, supply-air filtration, housekeeping or changed booth airflow.	Compare defect location and run conditions. Verify the cause before changing the exhaust media.

Investigate patterns across shifts

Review when the change began, the coating and product lot, which banks were affected and the last accepted airflow checks. Keep the photographs and logs with the repair record.

Use the site's authority for corrective work

Changes to fan settings, media stages, frame openings and interlocks can alter the approved operating condition. Route such changes through the responsible team and verify the result.

11 / TRIAL ECONOMICS

Compare costs on accepted output

Compare the water curtain and dry bank on matched coating duty and accepted production. Verify required airflow, containment, finish and compliance criteria before using cost to choose.

01 **Define matched trial windows**
Use representative coating, shifts, part mix and production load. Record accepted and reworked parts, litres sprayed and the operating conditions for each window.

02 **Include the relevant running costs**
Record utilities, consumables, change labour, cleaning, waste transport and treatment, and agreed downtime or rework costs. Use the same accounting basis and avoid double-counting.

03 **Keep capital and recurring costs distinct**
Record installed capital, including required design, controls and commissioning. Identify any recurring monitoring and maintenance costs before estimating savings.

Illustrative monthly comparison at 2,000 accepted parts

INCLUDED MONTHLY COST	WATER CURTAIN	DRY BANK
Water, treatment chemicals and filter media	RM1,700	RM2,100
Energy	RM900	RM950
Maintenance labour and downtime	RM1,600	RM850
Waste transport and treatment	RM1,700	RM1,100
Total included operating cost	RM5,900	RM5,000
Included cost per accepted part	RM2.95	RM2.50

Worked simple payback

Illustrative monthly saving is RM900. If installed capital is RM18,000 and that saving continues, simple payback is 20 months. These inputs demonstrate the calculation. Confirm actual duty, disposal rates, omitted costs and investment assumptions before committing.

Document the decision and its scope

Record the booth, coating mix, operating range and trial period for which the conclusion applies. If loading or quality varies between shifts, extend the comparison under the authorised trial plan.

12 / REUSABLE WORKSHEET A

Survey the booth and plan the trial

Print one copy per booth. Enter the current wet baseline, proposed configuration and who approves each acceptance criterion. Attach the layout, SDS and test protocol.

SITE / BOOTH ID / DATE

ENGINEER / PRODUCTION / EHS CONTACT

COATING AND SDS REVISION / SPRAY EQUIPMENT / USUAL AND PEAK DUTY

BOOTH TYPE / FAN AND MOTOR / MODE / MAKE-UP AIR / DRAWING OR PHOTO REFS.

CLEAR FRAME OPENINGS / NET AREA / SUPPORT AND SECONDARY STAGE

ITEM TO VERIFY	EXISTING WET BASELINE	DRY REQUIREMENT / EVIDENCE
Airflow and containment		
Pressure and fan duty		
Safety and monitoring checks		
Residue and disposal route		
Cost and accepted output		

CANDIDATE MODEL / HEIGHT / EXTENDED LENGTH / FRAME AND SEALING SCOPE

TRIAL PERIOD / LOADING BASIS / STOP CRITERIA / AUTHORISING PERSON

APPLICABLE APPROVALS OR NOTICES / EVIDENCE REQUIRED FOR RETURN TO SERVICE

Enter site-approved thresholds and references. Log the operating readings on worksheet B or in the approved site record.

13 / REUSABLE WORKSHEET B

Record airflow and change-out

Use one copy per filter installation or controlled trial period. Compare readings at the same approved locations and operating conditions. Enter units and criterion references.

SITE / BOOTH / BANK / SHIFT

MODEL / LOT / INSTALLED DATE

FAN MODE / DOOR STATE / SUPPLY / COATING / INSTRUMENT IDS AND TAP REFS.

APPROVED PRESSURE AND AIRFLOW WARNING / CHANGE CRITERIA / SOURCE

CHECK / UNITS	CLEAN BASELINE	IN SERVICE	AFTER CHANGE
Primary drop (Pa)			
Secondary drop (Pa)			
Airflow / velocity per plan			
Booth-to-room pressure			
Duty since fitting (L or parts)			

IN-SERVICE READING DATE / TIME

REPLACEMENT AND RETEST DATE / TIME

Confirm the condition and disposition

- ☐ Media, end supports, joints and perimeter checked as required.
- ☐ Required airflow, pressure and containment results recorded.
- ☐ Change-out or hold reason, used-media route and any deviations recorded.

OBSERVED CONDITION / CHANGE OR HOLD REASON / WASTE RECORD REFERENCE

CHECKED BY / DATE / TIME

RETURN-TO-SERVICE APPROVAL OR HOLD REF.

Attach the required velocity map, alarm or interlock record, and any corrective work.

14 / TECHNICAL REFERENCES

Source notes and further reading

Check the current revision of the manufacturer and site documents for each job. Select any source below to open it.

[1] Andreae | The Original OPEN
Construction, coating-specific capture results and pressure data.

[2] Andreae | High Efficiency OPEN
Polyester-backed construction, capture results and pressure data.

[3] Andreae | Installation instructions OPEN
Channel frame, orientation, extension and end support.

[4] Andreae | Frequently asked questions OPEN
Inertial separation, coating behaviour, test method and change-out.

[5] Malaysia DOE | Environmental Quality (Clean Air) Regulations 2014 OPEN
Review applicable notification, design, operation and monitoring duties.

[6] Malaysia DOSH | Local exhaust ventilation guidelines OPEN
Design, commissioning, inspection and examination of LEV systems.

[7] Malaysia DOE | Scheduled waste information OPEN
Classification by the waste generator and the applicable regulations.

[8] U.S. EPA | Spray booth filters OPEN
Technical background on paint arrestors, bypass and vapours.

[9] Andreae | Company and product history OPEN
Historical use of the HE+ designation.

[10] U.S. OSHA | Spray finishing safety OPEN
Technical background on fire, residue and ventilation in spray finishing.

MKTECH Industrial Abrasives Handbook

032 Booth airflow →
033 Paint-stop filters →
034 Filter selection →
036 Booth troubleshooting →

Developed from MKTECH-TA-FILT-008. Booth images are illustrative and supplied in the original guide. Web references accessed November 2026.

15 / MKTECH APPLICATION SUPPORT

Share the booth details

MKTech Industry Sdn Bhd supports paint booth filter selection and supply enquiries from Petaling Jaya, Malaysia. The information below helps identify the product and frame requirements.



DEFINE THE APPLICATION

What is the booth capturing?

Share the coating and duty, the current bank, and the measurements behind the change. For a conversion, include the layout and your site engineer's acceptance criteria.

Include these details with the request

Coating and load

Coating names and SDS, litres sprayed, workpiece mix, peak duty and the current filter life.

Bank and measurements

Clear frame size, existing media code, photos, airflow and pressure readings with units.

Supply and trial

Required model or comparison, quantity, delivery site, trial duration and authorised contact.

Contact MKTECH →

Browse products →

Open handbook →

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Keep the acceptance criteria with the site team

MKTECH can discuss filter specifications and supply. The responsible site team approves the booth design, monitoring plan, trial and return to service.