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CNC SETTER · ON-MACHINE PROGRAMMING

CNC EXPERIENCE PROFILE



FOR Recruitment partners and hiring managers — Birmingham, UK

RE My CNC setting experience — Mecal 4-axis setting and programming, now conventional VMCs — 5 November 2026

In short. I am a CNC setter. I have more than 12 years in UK manufacturing — including Tier 1 automotive work for Jaguar Land Rover — and CNC machining experience since 2022. My setting and programming background is from ABL Aluminium Components, where I progressed from operating to setting and programming Mecal MC307 Falcon and MC304 Ariel 4-axis machining centres for aluminium extrusions. Conventional CNC machines are not new to me: as a CNC machinist at Dana Axle UK (Chiron Magnum, Mori Seiki) and Mettis Aerospace (Mazak, Mazatrol M-32) I adjusted wear and work offsets at the control. I now set conventional VMCs at Newby Foundries, Wednesbury.

12+	2022	2	±0.2 mm	18
years in UK manufacturing	CNC machining since	Mecal 4-axis models set and programmed	typical drawing tolerance, Mecal jobs	courses & credentials (p. 14)

01 SETTING

Independently, on Mecal: full changeovers, job pack to release — tool data, workholding, A-axis clearance, prove-out, first-off, corrections.

02 ON-MACHINE PROGRAMMING

In Mecal 3D CAD/CAM: corrections back to the drawing, changes to existing programmes, and simple programmes from the drawing — simulated before running.

03 DIAGNOSIS

Physical cause first — seating, reference, tool data, clamping, material — then one correction, at the source.

WHERE I AM ON VMCS — NEWBY FOUNDRIES

I am extending my setting background into conventional VMC setup and already carry out the manual datum routine myself: clocking vices and fixtures with a DTI, centring on bores, establishing the work datum, and entering and verifying G54. It is becoming familiar through repetition; on a setup that is new to me, or where I am not certain, I ask for a check before the first cut.

- **DTI clocking and alignment** · doing it
- **Bore centring** · doing it
- **Work datum and G54** · doing it
- **Speed and independent fluency** · building

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WHAT'S IN THIS PROFILE

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CAREER ROUTE

FROM THE PRODUCTION LINE TO CNC SETTING

My experience has four layers, and this profile keeps them separate. Twelve years in manufacturing are not twelve years of CNC setting. Dates as in my CV; orange marks the CNC years.

12+ years	Since 2022	Mecal setting	VMC now
UK manufacturing, since 2014 — including Tier 1 automotive for JLR	CNC machining — Dana Axle UK, ABL, Mettis Aerospace, Newby Foundries	Setting and on-machine programming at ABL; setter / programmer from January 2026	Conventional VMC setting at Newby Foundries, Wednesbury

2014 — **IAC Group**
Tier 1 automotive manufacturing for Jaguar Land Rover.

2016 — **Carter Retail Equipment** · Machine operator

2018 — **Dual Metallising** · Vacuum metallising
Process and quality.

2022 — **Dana Axle UK** · CNC machinist
Chiron Magnum and Mori Seiki machines; components for JLR axles. Wear and work offsets adjusted at the control.

Sep 2024 — **ABL Aluminium Components** · via an agency
Operating the Mecal machining centres, and learning setup on the job from the start.

May 2025 — **ABL Aluminium Components** · CNC operator
Direct employment.

Jan 2026 — **ABL Aluminium Components** · CNC setter / programmer
Mecal MC307 Falcon and MC304 Ariel, Mecal 3D CAD/CAM. Full changeovers from job pack to release.

Aug 2026 — **Mettis Aerospace, Redditch** · CNC machinist
Mazak machines with Mazatrol M-32 control. Wear and work offsets adjusted at the control.

Now — **Newby Foundries, Wednesbury** · CNC setter, conventional VMCs
Establishing work datums myself — DTI clocking, bore centring, setting and verifying G54 — and building speed and fluency.

CONVENTIONAL MACHINES ARE NOT NEW TO ME

At Dana Axle and Mettis Aerospace I ran conventional CNC machining centres and adjusted wear and work offsets at the control. ABL added full responsibility for setting and programming. Newby adds the part the Mecal system did not require: establishing the work datum myself.

MACHINES AND CONTROLS

- Mecal MC307 Falcon (×2) and MC304 Ariel — Mecal control, Mecal 3D CAD/CAM
- Chiron Magnum · Mori Seiki
- Mazak — Mazatrol M-32
- Conventional VMCs at Newby Foundries

MEASURING AND INSPECTION

- Micrometer, vernier caliper, height gauge
- First-off and in-process inspection to the drawing
- Typical drawing tolerance on my Mecal jobs: ±0.2 mm (job requirement, not a machine claim)

COURSES & CREDENTIALS (P. 14)

- 6 manufacturing — University at Buffalo, Starweaver
- 3 leadership and change — Cambridge, Illinois, Google
- 8 AI and digital tools — Google, Vanderbilt, Microsoft, IBM, Meta
- English — CEFR B2 (Upper Intermediate), British Council

THE MACHINES I SET AND PROGRAMMED

SPECIALIST CNC FOR ALUMINIUM PROFILES

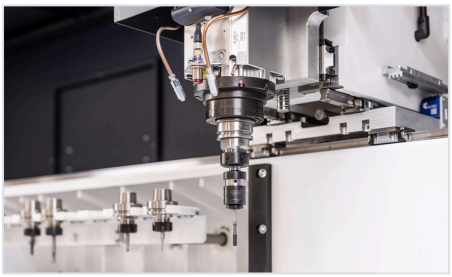
At ABL I set and programmed the Mecal MC307 Falcon (two machines) and MC304 Ariel: 4-axis, long-bed centres for aluminium extrusions that share a control and software but differ in kinematics, clamping and working length.

MC307 FALCON

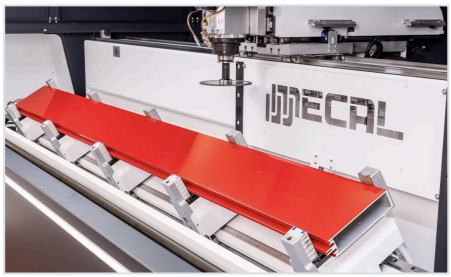
4-axis · floor type · two machines · A-axis in the clamp beam



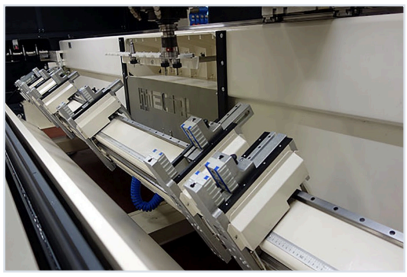
KINEMATICS	The clamp beam rotates the profile on the A-axis, ±125°; the spindle stays vertical
WORKING LENGTH	4,000 mm; up to 8,000 mm with re-gripping
SPINDLE	8.5 kW, up to 24,000 rpm, HSK-F63
RAPID	X 150 m/min
TOOLS	11 — 8 central + 3 left
CLAMPING	6 pneumatic MMI clamps — positioned by the CNC on one machine, by hand from the drawing on the other
STOPS	Two retractable reference stops, left and right



SPINDLE AND TOOLS HSK-F63; length measured offline with a height gauge, length and Ø entered in the tool data.



PROFILE ON THE CLAMPS Seated against the stop and back fence; clamps clear of the features.



A-AXIS IN THE CLAMP BEAM The beam rotates the whole profile: side faces in one clamping.

MC304 ARIEL

4-axis · gantry · A-axis in the spindle head





GANTRY LAYOUT (above) The machining unit travels along a long bed with clamps along its length.

A-AXIS IN THE HEAD (left) The spindle head tilts; the profile stays clamped.

KINEMATICS	The spindle head tilts on the A-axis, ±90°; the profile stays clamped
WORKING LENGTH	7.4 m
SPINDLE	8.5 kW, up to 20,000 rpm, HSK-F63
RAPIDS	X 80 / Y 60 / Z 40 m/min
TOOLS	12 on the carriage
CLAMPING	8 pneumatic clamps; single-field or pendulum mode
STOPS	Pneumatic hinged length stops

ⓘ Specifications are those of the configurations I operated (“as run”), not catalogue values for every machine of the model. Photos are publicly available images of the Mecal MC307 Falcon and of a gantry-type Mecal, not taken at my former workplace; the spindle-head photo illustrates the Ariel's type of A-axis.

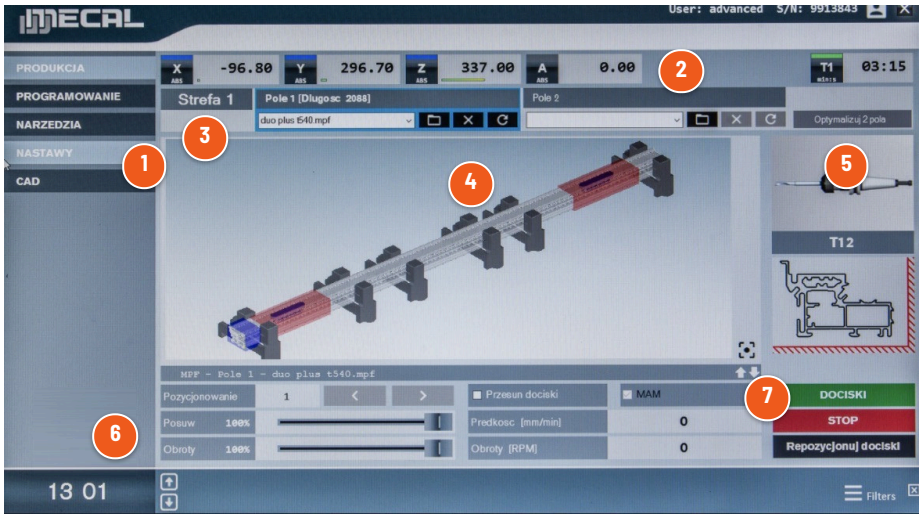
MECAL CONTROL AND MECAL 3D CAD/CAM

ONE CONTROL, ONE SOFTWARE — ON BOTH MODELS

The Falcon and the Ariel differ as machines, not in the way programmes are written, corrected or run. My programming was done on the machine, in Mecal 3D CAD/CAM, on the machine's own PC.



OPERATOR CONSOLE A PC with keyboard and mouse runs the Mecal control; start, stop, feed override, reset and emergency stop sit on the panel. There is no Fanuc-style control panel.



PRODUCTION SCREEN Polish-language interface — the menu reads Production · Programming · Tools · Settings · CAD.

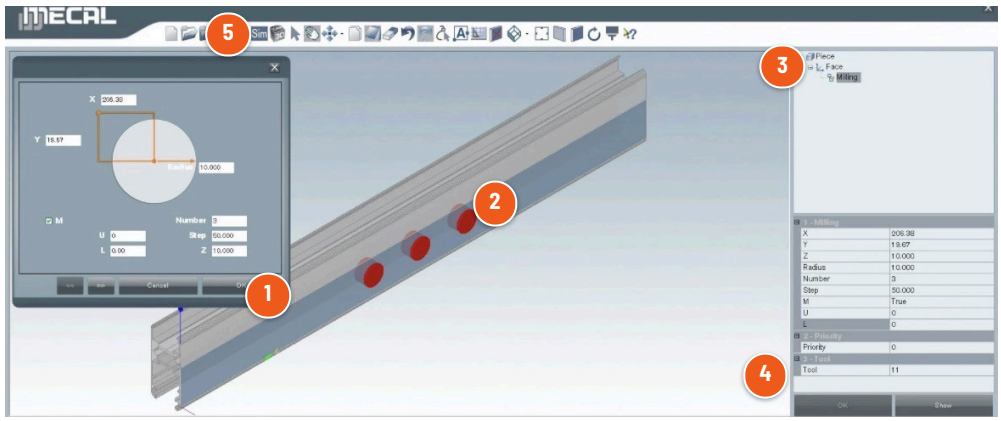
1. Menu — production, programming, tools, settings, CAD
2. Axis positions — X, Y, Z and A
3. Programme loaded per field on the bed
4. Clamp positions shown on the 3D profile
5. Active tool and the profile section
6. Feed and speed override
7. Clamps, stop and clamp repositioning

MECAL 3D CAD/CAM

A SIMPLE PROGRAMME FROM THE DRAWING

Select the profile face, place the feature by its dimensions, assign the tool, simulate — then send it to the machine.

1. Feature dialog — X/Y, radius, number, step
2. Result on the profile face
3. Feature tree — piece › face › milling
4. Properties, incl. the tool
5. Simulation before sending



SAME ON BOTH MODELS	CONTROL	SOFTWARE	MATERIAL	COOLING
	Mecal PC-based control (Windows)	Mecal 3D CAD/CAM	Aluminium extrusions	MQL — air and oil mist, no flood coolant

Publicly available photos and screenshots of the Mecal control and Mecal 3D CAD/CAM — the same software I used; not taken at my former workplace. Numbered markers added for this profile.

WHAT I ACTUALLY CONTROLLED

THE SETTER'S JOB, AREA BY AREA

Eight areas I was responsible for on every changeover, on the Falcon and the Ariel. The next page puts them in the order I ran them — from job pack to release.



Illustrative infographic summarising my own setting practice on the Falcon and the Ariel; machine and part imagery is illustrative.

WHERE EACH AREA SITS IN THE CHANGEOVER — PAGE 6

01	02	03	04	05	06	07	08
DRAWING step 01	**PROGRAMMING** step 02	**TOOLING** steps 03, 05	**CUTTING DATA** step 02	**WORKHOLDING** steps 04, 06	**A-AXIS, COLLISION** steps 07, 08	**FIRST-OFF** step 09	**CORRECTIONS** steps 10, 11

PROGRAMMING SCOPE

MECAL 3D CAD/CAM · ON THE MACHINE

01 CORRECTIONS
± X/Y/Z Counterblock on the control; feature position, Ø or depth edited in the programme; tool length in the tool data.

02 MODIFICATIONS
Changes to existing programmes — features, positions, machining sequence, and feeds and speeds for high-speed aluminium milling.

03 SIMPLE PROGRAMMES
Built from the drawing from scratch — holes, slots, pockets, end machining — then simulated before running.

OFFLINE — WHILE THE PREVIOUS JOB RUNS
Drawings and job pack, programme review, tool preparation away from the machine, the workholding plan and supporting equipment. No access to the guarded machining area during cutting.

ON THE MACHINE — ONLY WHEN STOPPED AND SAFE
Clamps, stops, loading and tool data at the control — following the machine's safe working procedure and the site's rules for changing active data.

MY CHANGEOVER ON THE FALCON AND THE ARIEL

FROM JOB PACK TO RELEASE

The sequence I ran on every Mecal changeover. The detail changed with the machine and the job; the logic did not. Orange tags link each step to the areas on the previous page.

PREPARE

Offline, while the previous job is still running. Nothing is done inside the guarding.

01
JOB PACK AND DRAWING
Dimensions, tolerances, cutting list, quantities, left/right-hand pieces; profile section and material checked against the job.

AREA 01

02
PROGRAMME
Reviewed, modified or built from the drawing in Mecal 3D CAD/CAM; feeds and speeds set; every A-axis angle simulated.

AREA 02 · 04

03
TOOLS
Selected and prepared away from the machine; length measured with a height gauge; holder and runout checked.

AREA 03

04
WORKHOLDING PLAN
Clamp positions planned clear of features; jaw pads, supports and clamp pressure for thin walls prepared.

AREA 05

SET UP

Machine stopped and made safe, following its safe working procedure and site rules.

05
TOOLS AND DATA
Tools loaded; length and Ø entered in the tool data at the control, then checked against the measurements.

AREA 03

06
CLAMPS AND STOPS
Clamps positioned — by the CNC or by hand from the drawing; correct stop raised; reference faces and supports clean; clamp pressure checked.

AREA 05

07
LOAD AND CLEARANCE
Profile checked for bow and twist; seated against stop and fence, flat on the clamp base; clearance confirmed at every A-axis angle used.

AREA 06

08
PROVE-OUT
Guarding closed; reduced rapid and feed; each new tool watched on its first cut, ready to stop the cycle.

AREA 06

CONFIRM

Quality gate before release — and during the run.

09
FIRST-OFF
Positions, sizes, depths and burrs measured to the drawing — typically ±0.2 mm on these jobs.

AREA 07

10
DIAGNOSE
Find the physical cause before any number is changed — see page 13.

AREA 08

11
CORRECT
At the source: Counterblock X/Y/Z, the feature in the programme, or tool length.

AREA 08

12
RECHECK AND RELEASE
Corrected part re-measured; job signed off; periodic checks during the production run.

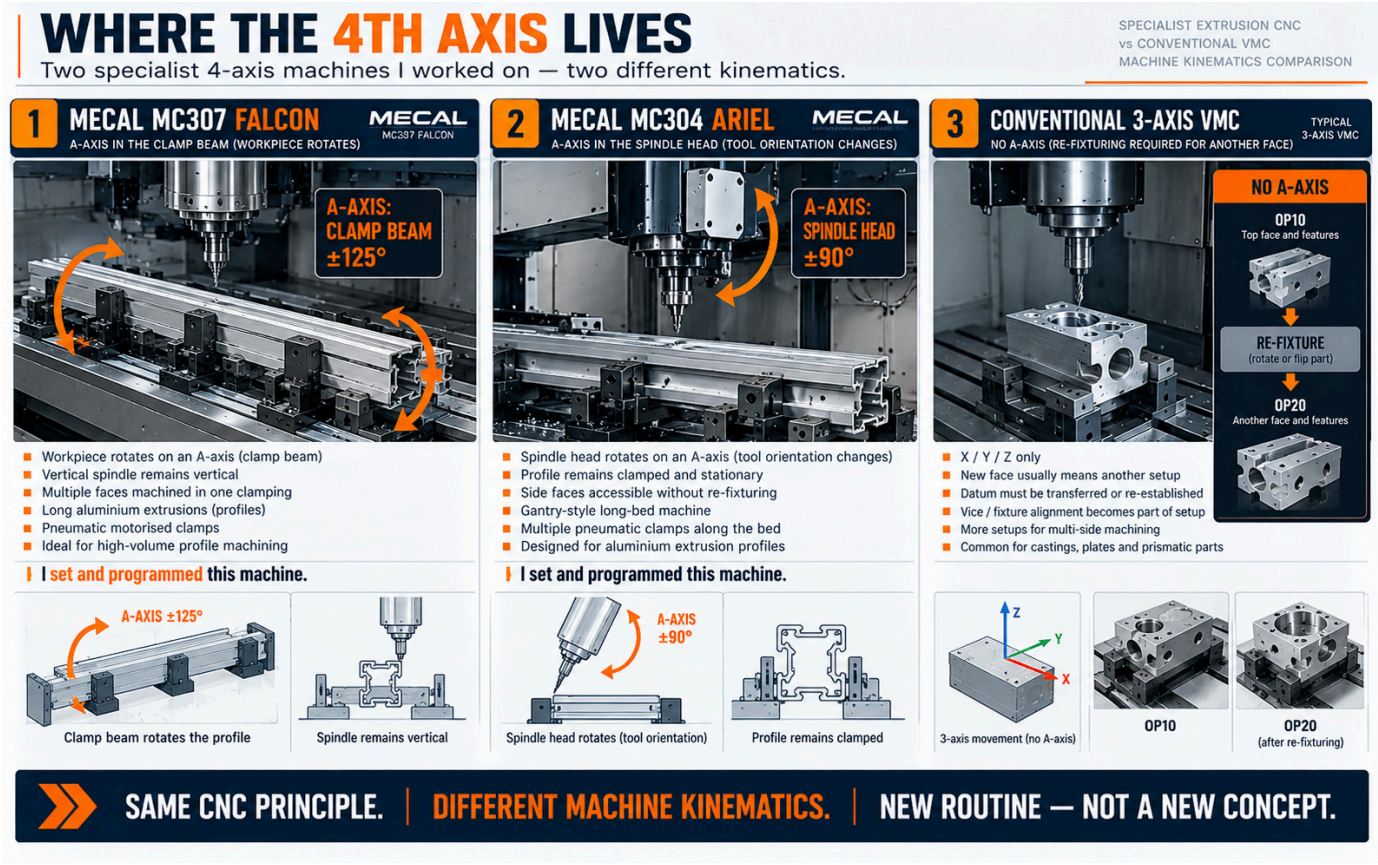
RUN

Simulation supports the setup — it does not replace it. A clean simulation is followed by a physical clearance check at every A-axis angle, a controlled prove-out at reduced rapid and feed, and the site's procedures. Being ready to stop the cycle is one layer of that, not the safety method on its own.

SAME CNC PRINCIPLE — DIFFERENT KINEMATICS

WHERE THE 4TH AXIS LIVES

On the Falcon the workpiece rotates; on the Ariel the tool tilts; on a 3-axis VMC there is no A-axis, so another face normally means another operation. Each changes what the setter has to check.



Illustrative infographic; A-axis ranges are those of the configurations I operated.

WHAT THE KINEMATICS MEAN FOR THE SETTER

	MC307 FALCON	MC304 ARIEL	CONVENTIONAL 3-AXIS VMC
WHAT MOVES	A-axis in the clamp beam: the clamped profile rotates (±125° as run); the spindle stays vertical	A-axis in the spindle head: the tool tilts (±90° as run); the profile stays clamped	X, Y and Z only — no rotary axis unless one is fitted
OTHER FACES	Machined in the same clamping by rotating the profile	Machined in the same clamping by tilting the tool	Usually a new operation (Op10 → Op20) after re-fixturing
COLLISION ENVELOPE	Rotating profile, clamps and beam against spindle and tool	Tilted head, holder and tool against clamps, stops and profile	Tool, holder and spindle nose against vice, fixture and clamps
SETTER'S CHECK	Clamps clear of features; clearance at every A-axis angle used	Clearance at every head angle used	Fixture alignment and work offset for each operation; datum transferred or re-established

» **I SET BOTH MECAL KINEMATIC TYPES. AT NEWBY I NOW SET UP THE THIRD: FIXTURE, DATUM AND WORK OFFSET FOR EACH OPERATION.**

DIFFERENT SETUP — SAME LOGIC

THE SETTER'S QUESTIONS DO NOT CHANGE

Moving from a Falcon or an Ariel to a VMC changes the kinematics and the setup system, not the questions a setter must answer before a job is released. What changes is where each answer lives — and the physical routine used to find it.

1 Where is the part? **2** How is it held? **3** Where is the datum? **4** Is the tool correct? **5** How do I prove the programme? **6** How do I measure the first-off? **7** If something is wrong, what physically caused it?

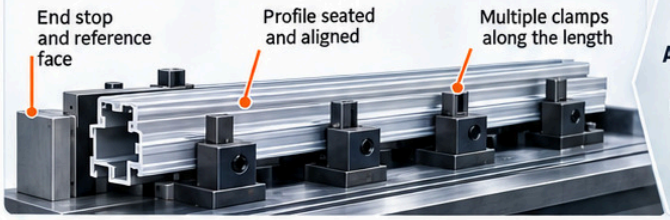
SAME SETTER LOGIC. DIFFERENT SETUP SYSTEM.

WHAT REALLY CHANGES WHEN MOVING FROM SPECIALIST EXTRUSION CNCS TO CONVENTIONAL VMCS

SPECIALIST EXTRUSION CNC	CONVENTIONAL VMC
e.g. Mecal MC304 Ariel / MC307 Falcon (configurations vary)	e.g. FANUC, Hurco WinMax, MAZATROL (configurations vary)

01 REFERENCE (PART LOCATION & ZERO)

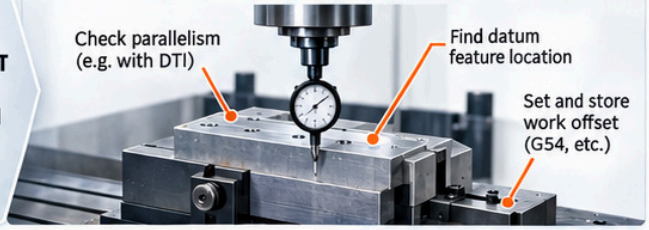
Orientation • reference end • stop • seating



ALIGNMENT ≠ LOCATION ≠ STORED ZERO

CONVENTIONAL VMC

Fixture alignment • datum feature • work offset



02 WORKHOLDING (CLAMPING & SUPPORT)

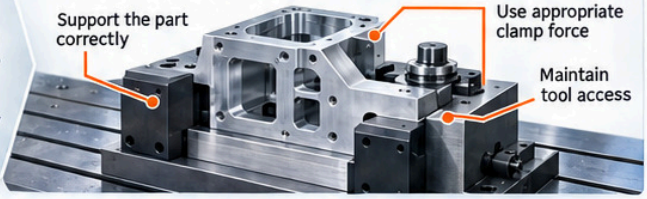
Clamp spacing • support • thin-wall distortion • twist



SUPPORT & RIGIDITY

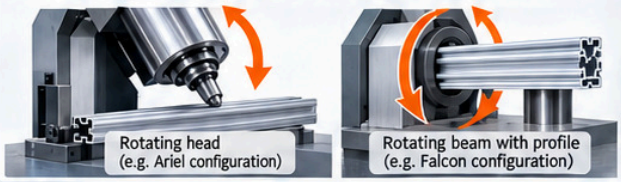
CONVENTIONAL VMC

Vise/fixture location • support • clamp force • tool access



03 KINEMATICS (AXES & MOTION)

Rotating head or rotating beam changes the collision envelope



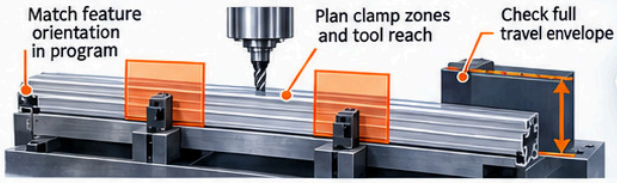
AXES & MOTION

3-axis motion • optional rotary axis • re-clamping when required



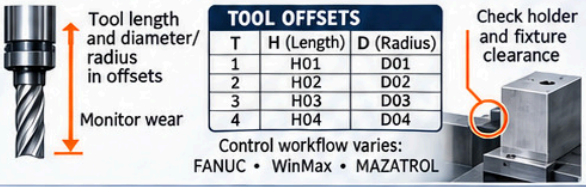
04 DATA & PROOF-OUT (PROGRAMME & RISK CHECKS)

Feature orientation • clamp zones • tool reach • full travel envelope



PROGRAMME & VERIFICATION

WCS • tool length • radius/diameter • wear • holder/fixture clearance



Control workflow varies: FANUC • WinMax • MAZATROL

WHAT TRANSFERS? | Understand the physical chain before changing the numbers.

ALIGN → LOCATE → RECORD ZERO → VERIFY

MACHINE → FIXTURE → DATUM → PART → TOOL → PROGRAM

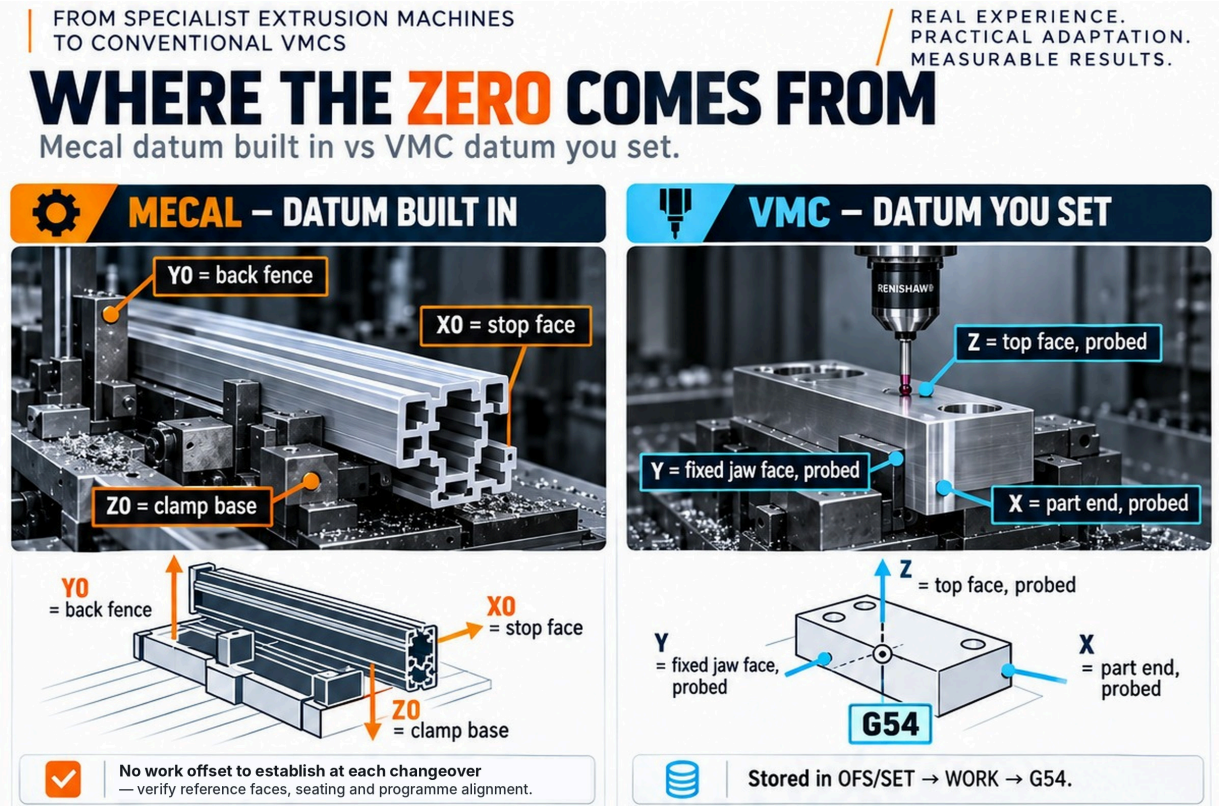
MZ | Mateusz Żuławski | Practical Manufacturing AI

Illustrative infographic. Machine configurations vary; VMC control workflows differ between Fanuc, Hurco WinMax and Mazatrol.

WHERE THE ZERO COMES FROM

BUILT-IN MACHINE REFERENCE — OR SETTER-ESTABLISHED WORK OFFSET

This is where the two systems differ most. On the Mecal a reference arrangement fixed the part's position and the setter verified it; on a VMC the setter establishes the work coordinate system — or verifies the stored one on a proven repeat setup. This is the routine I now carry out at Newby Foundries.



MECAL On the machines I operated: position fixed by the reference arrangement	VERIFY **CLEAN THE REFERENCE FACES** Stop, back fence and clamp base free of swarf and burrs.	VERIFY **RAISE THE CORRECT STOP** The stop side the programme expects.	VERIFY **SEAT THE PROFILE** Against the stop and back fence, flat on the clamp base.	VERIFY **PROFILE = PROGRAMME** The real bar matches the profile defined in Mecal 3D CAD/CAM.
VMC Typically: the work coordinate system is established by the setter	ESTABLISH **ALIGN THE VICE OR FIXTURE** Square to the machine axes where the job needs it — often clocked with a DTI.	ESTABLISH **FIND THE DATUM FEATURE** The face, edge or bore named on the drawing — DTI, edge finder or probe.	ESTABLISH **ENTER THE WORK OFFSET** G54, or the work offset the job uses.	VERIFY **CHECK BEFORE CUTTING** Confirm the zero before the first cut.

Mecal: no manual work-offset establishment at each changeover — the stop, back fence, clamp base and the programme's profile definition fix the part's position. VMC: typical practice for a new setup — on a repeat job with a validated fixture and stored offset, the offset is verified rather than re-established. The graphic shows probing, but a DTI or edge finder is equally common, depending on the drawing's datums, the fixture, the part and the shop's procedure.

» **ON THE MECAL I VERIFIED A BUILT-IN REFERENCE SYSTEM. ON A VMC THE SETTER ESTABLISHES THE WORK REFERENCE — AND AT NEWBY I NOW DO THAT MYSELF.**

OFFSETS, TOOL DATA AND PROGRAMME EDITS

WHERE THE NUMBERS LIVE — MECAL VS A CONVENTIONAL VMC

The same correction can sit in very different places. Fanuc terms are the VMC reference here; Hurco WinMax and Mazatrol hold comparable data on different screens and do not always behave identically. This is a map of where to look, not a one-to-one equivalence.

WHAT IS BEING SET OR CORRECTED	MECAL — AS I USED IT	CONVENTIONAL VMC — FANUC REFERENCE
PART DATUM / WORK ZERO	Fixed by the reference arrangement — stop (X), back fence (Y), clamp base (Z) — with the profile defined in the programme. **Verified**, not established, at each changeover.	Work coordinate system `G54–G59` (or extended work offsets), **established** by the setter with a DTI, edge finder or probe, then verified before cutting — or, on a proven repeat setup, verified.
COMMON SHIFT OF THE WHOLE PROGRAMME	± X / Y / Z **Counterblock** on the control, applied when the programme is re-run — moves every feature in that programme.	Work-offset adjustment, e.g. `G54` X/Y/Z — shifts every position programmed in that coordinate system.
TOOL LENGTH	Measured offline with a height gauge and entered in the tool data. A change moves every depth cut by that tool.	Tool length compensation — `G43` with an `H` register (geometry + wear), where the programme calls it. Set with a tool setter, presetter or touch-off. Affects operations that use that H value.
FEATURE SIZE hole, slot or pocket Ø	Feature Ø edited in the programme in Mecal 3D CAD/CAM — for the feature that is out, or for selected features.	`D` register (geometry + wear) changes size **only** on contours cut with active `G41/G42` cutter radius compensation. Drilled, reamed or bored holes, and features programmed on the tool centreline, need a tool or programme change.
ONE FEATURE'S POSITION OR DEPTH	Position or Z edited feature by feature in Mecal 3D CAD/CAM.	Programme edit at the control or in CAM.
FEEDS AND SPEEDS	Set and adjusted in the programme in Mecal 3D CAD/CAM — high-speed aluminium milling with MQL.	`F` and `S` in the programme; feed and spindle override at the control during prove-out.

RULES I WORK TO ON EITHER SYSTEM

1. A work-offset change moves everything in that coordinate system — right for a common shift, wrong for one bad feature.
2. A D-offset change does not resize every hole or pocket: it acts only where the programme uses G41/G42.
3. A tool-length change affects every operation using that tool's length data — so it comes only after a tool-length cause is confirmed.
4. One feature out on its own usually needs a programme or CAM change, not an offset.
5. Not every deviation is an offset problem: seating, clamping, tool condition or material may be the real cause (p. 13).
6. Active offsets and tool data are changed only through the control's procedure and the site's rules.

ⓘ "Counterblock" is the name of the X/Y/Z correction on the Mecal control I used; its exact behaviour is specific to that control.

WHAT TRANSFERS — AND AT WHAT LEVEL

MY EXPERIENCE, SORTED BY HOW I HAVE DONE IT

Most of my setting experience transfers directly to a VMC. To make it easy to judge, it is grouped by the level at which I have actually done it.

LEVEL A

PERFORMED INDEPENDENTLY

Mecal Falcon and Ariel · ABL Aluminium Components

- Full changeovers, job pack to release
- Drawings — dimensions, tolerances, datums, feature requirements
- Tooling — selection, holders, runout, length and Ø data
- Feeds and speeds for high-speed aluminium milling with MQL
- Workholding — support, clamp position and pressure, thin-wall distortion
- A-axis clearance, simulation and safe prove-out
- First-off inspection to the drawing — micrometer, vernier, height gauge
- Dimensional correction — Counterblock, programme edits, tool data
- On-machine programming — corrections, modifications, simple programmes
- Troubleshooting — physical cause before any correction

LEVEL B

AT THE CONTROL, AS A CNC MACHINIST

Dana Axle UK · Mettis Aerospace

- Running conventional CNC machining centres — Chiron Magnum, Mori Seiki; Mazak with Mazatrol M-32
- Adjusting wear and work offsets at the control
- Production of components for JLR axles (Dana Axle UK)
- Aerospace manufacturing environment (Mettis Aerospace)

LEVEL C · CURRENT

DOING NOW ON VMCS

Newby Foundries · with a check before cutting when a setup is new to me or I am not certain

- DTI clocking — checking alignment
- Aligning a vice or fixture to the machine axes
- Centring on a bore with an indicator
- Establishing the work datum from the drawing
- Entering and verifying G54
- Asking for verification before the first cut when needed

DEVELOPING

THROUGH REPETITION

What practice is building now

- Speed of the datum routine
- Consistency from one setup to the next
- Independent fluency across the shop's full range of fixtures and parts

SHOP-SPECIFIC

WITH ANY NEW EMPLOYER

What every setter learns in a new shop

- The shop's fixtures, machines and controls
- Its offset pages and tool-setting conventions
- How setups are proved out and signed off

WHAT THIS MEANS ON THE SHOP FLOOR

→ STRUCTURED CHANGEOVERS

I read the job pack and drawing, prepare tools and workholding offline, and run the setup in a fixed order through to release (pp. 5–6).

→ MEASURED, NOT GUESSED

I measure first-offs with micrometer, vernier and height gauge, and correct at the source rather than chasing offsets (pp. 10, 13).

→ VMC DATUM ROUTINE IN USE

I already clock, centre and set G54 on VMCs, and ask for a check where a setup is new to me (p. 12).

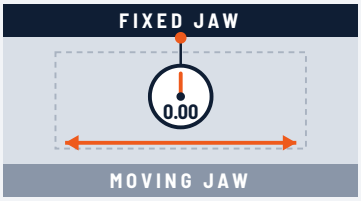
» **A SETTER WITH FULL CHANGEOVER EXPERIENCE WHO ALREADY DOES THE VMC DATUM ROUTINE — BUILDING SPEED, NOT LEARNING CNC FROM SCRATCH.**

WHAT I AM DOING ON VMCS NOW

THE DATUM ROUTINE — IN PRACTICE, BUILDING FLUENCY

At Newby Foundries I carry out the manual datum-setting routine myself. It is becoming familiar through repetition; where a setup is new to me or I am not certain, I ask for a check before the first cut — the setup is right before it is fast.

SWEEP ALONG THE FIXED JAW



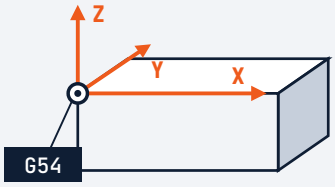
Needle steady along the sweep

EQUAL READING ALL ROUND



Rotate the indicator · adjust X and Y

STORED, THEN VERIFIED



Datum from the drawing

1 CLOCK THE VICE OR FIXTURE

Sweep the fixed jaw or locating face along the axis; adjust until the reading stays within the tolerance the job needs.

2 CENTRE ON A BORE

Rotate the indicator around the bore wall; adjust X and Y until the readings match all round, then record the position.

3 SET AND VERIFY G54

Store the datum position in the work offset the job uses, then verify it before the first cut.

NOT EVERY SETUP USES ALL THREE

The right method depends on the **drawing and its datum requirements**, the **fixture and workholding**, the **part geometry**, the **shop's procedures**, the **control** and the **measuring equipment** available — DTI, edge finder or probe. On a repeat job with a proven fixture, the stored offset may only need verifying. The diagrams show a typical sequence, not a fixed recipe.

A FLEXIBLE PROGRESSION — STARTING FROM WHERE I AM

01 — AS NEEDED

DEMONSTRATION

For each new fixture, machine or control: one complete setup alongside an experienced setter, to learn how this shop does it.

02 — NOW

SUPERVISED REPETITION

I carry out the routine myself; results are verified when the setup is new to me or I am not certain. This is where I am on the datum routine at Newby.

03 — NEXT

INDEPENDENT SETUP WITH INITIAL CHECKS

Complete setups on my own — spot checks at first, then the shop's normal sign-off. The aim: consistent, independent setups.

Learning a particular shop's fixtures, machines, controls and sign-off procedures is a normal part of starting anywhere — for any setter, however experienced.

» **DOING THE ROUTINE NOW — BUILDING THE REPETITION, NOT LEARNING CNC FROM SCRATCH.**

DIAGNOSTIC THINKING

THE HABIT TRANSFERS — THE FIRST CHECK OFTEN SHIFTS

Find the physical cause, then correct it once, at the source. The checks below are a reasoned starting point driven by the error pattern — not a fixed checklist.

ON LONG ALUMINIUM EXTRUSIONS
ON THE MECAL I OFTEN STARTED HERE

1. **Swarf under the stop, fence or jaws** → profile not seated → features shifted, depths uneven
2. **Wrong or dirty reference stop** → the whole programme displaced along X
3. **Profile bow or twist, or section not matching the programme** → positions and depths vary along the length
4. **Clamp position or pressure** → thin walls deform → size or form out after unclamping
5. **Tool data as entered at setup** → depth or size error on that tool's features
6. **Then the correction** — Counterblock, programme or tool data

ON A CONVENTIONAL VMC
DEPENDING ON THE ERROR PATTERN

- **Part not down on its locations, fixture misaligned** → position or parallelism errors
- **Work offset set or entered wrongly** → everything in that offset shifted
- **H or D value, geometry or wear** → depth or contour size wrong on that tool
- **Tool wear, runout or deflection** → size drift, finish, taper
- **Raw material or casting variation** → stock, skin or location points move the part
- **Clamp force** → distortion that springs back after unclamping
- **Thermal and process effects** → gradual drift over a run

FROM MY OWN PRACTICE — WHERE EACH CORRECTION WENT

WHAT THE FIRST-OFF SHOWED	RULED OUT FIRST	ON THE MECAL I CORRECTED IT BY	VMC EQUIVALENT — FANUC REFERENCE
ALL AFFECTED FEATURES DISPLACED TOGETHER	Swarf, seating, the wrong stop raised	Re-running the programme with ± X/Y/Z Counterblock values — this moves every feature	Work offset — G54 X, Y or Z, once seating and fixture are confirmed
HOLES OUT OF POSITION, EACH BY A DIFFERENT AMOUNT	Profile bow or twist; clamping	Editing each feature separately in Mecal 3D CAD/CAM	Programme edit — each position
HOLE OR POCKET Ø TOO SMALL OR TOO LARGE	Tool wear, runout, tool data	Changing the Ø of that feature, or of the selected ones, in the programme	D offset only where G41/G42 is used; otherwise a tool or programme change
ONE FEATURE WITH THE WRONG DEPTH e.g. a hole not through	Seating at that point; chips	Changing Z for that feature in the programme	Programme depth for that feature
ALL RELEVANT DEPTHS MACHINED BY THE SAME TOOL ARE INCORRECT	Tool seating in the holder; tool data as entered	Changing that tool's length in the tool data — only after confirming a tool-length cause	H offset — tool length, geometry or wear — after confirming the cause

ⓘ If several different tools show the same Z error, the common factor is more likely the reference — clamp base or seating on the Mecal, the work offset Z or the fixture on a VMC — than every tool's length.

Size drifting gradually over a run → tool wear, thermal effects, swarf packing

Sudden jump between two parts → what changed: reclamp, tool change, swarf, new batch of material

THE UNIVERSAL RULE — ON ANY MACHINE

DO NOT CHANGE A NUMBER UNTIL YOU UNDERSTAND WHAT PHYSICALLY CAUSED THE ERROR.

REFERENCE → TOOL → WORKHOLDING → MACHINE STATE → PROCESS FORCE → MEASUREMENT → CORRECTION

· a typical line of enquiry, not a fixed order

ONLINE COURSES AND CREDENTIALS

COURSES & CREDENTIALS — MANUFACTURING FIRST

Online courses, specialisations and professional certificates, plus one English-language credential — 18 entries. Titles, issuers and dates as listed in my LinkedIn Licences & certifications section.

6 manufacturing and digital manufacturing	**3** leadership, people and change	**8** AI and digital tools	**B2** English — British Council, CEFR

GROUP 1 MANUFACTURING & DIGITAL MANUFACTURING

Machining, process analysis, digital thread and production

Intelligent Machining Course	University at Buffalo	Mar 2026
Advanced Manufacturing Process Analysis Course	University at Buffalo	Feb 2026
Digital Thread: Implementation Course	University at Buffalo	Feb 2026
Digital Thread: Components Course	University at Buffalo	Aug 2025
Digital Manufacturing & Design Course	University at Buffalo	Jul 2025
Future of Production Course	Starweaver	Jul 2025

GROUP 2 LEADERSHIP, PEOPLE & CHANGE

Team leadership, people management, change

Introduction to Change Management: Practical Strategies Course	University of Cambridge	Mar 2026
Leading Teams: Developing as a Leader – Build Toward to Degree Course	University of Illinois Urbana-Champaign	Mar 2026
Google People Management Essentials Specialization Certificate – 4 Courses	Google	Mar 2026

GROUP 3 AI & DIGITAL TOOLS

The background to my Practical Manufacturing AI writing

Google AI Professional Certificate – 7 Courses	Google	Mar 2026
Microsoft 365 Copilot for Leaders Specialization – 3 Courses	Vanderbilt University	Mar 2026
Microsoft Gen AI for Executives Course – Gen AI Adoption	Microsoft	Mar 2026
Generative AI: Prompt Engineering	IBM	Jun 2026
Artificial Intelligence Essentials V2	IBM	Jun 2026
Introduction to Artificial Intelligence (AI)	IBM	Jun 2026
Generative AI: Introduction and Applications Course	IBM	Jun 2025
Introduction to Social Media Marketing Course	Meta	Dec 2022

GROUP 4 ENGLISH

Language credential

CEFR B2 – Upper Intermediate	British Council	Sep 2024

ⓘ Online courses and programmes, not degrees or professional licences. They complement — they do not replace — the hands-on machining experience on pages 2–13. Credential links: **LinkedIn → Licences & certifications**.

FOR ANYONE WHO WANTS THE DETAIL

MY TECHNICAL ARTICLES

Both are published on LinkedIn. They are not needed to follow this profile — they go further into the technical background behind it.



01

SCAN OR CLICK

LINKEDIN ARTICLE · 20 SEPTEMBER 2026

SPECIALIST CNC FOR ALUMINIUM EXTRUSIONS VS A CONVENTIONAL VMC

Why datum, clamping, vibration and corrections work differently on long-profile extrusion machines than on a conventional VMC.



02

SCAN OR CLICK

LINKEDIN ARTICLE

SOFT METAL, HARD LESSONS

What machining aluminium extrusions really takes — datums, support, deformation, measurement and finishing treated as one process.

MZ

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SCAN OR CLICK TO OPEN

NOTES AND SOURCES

Experience and typical practice. First-person statements describe my own work. Methods labelled as typical VMC practice are general practice; the actual method depends on the drawing, fixture, job and shop procedure.

Machines. Specifications for the Mecal MC307 Falcon and MC304 Ariel describe the configurations I operated, as given in my article of 20 September 2026; machines of the same model may differ. Background: SCM Group product pages for the Mecal MC 307 Falcon and MC 304 Ariel; dealer specifications (int-machinery.com).

Courses & credentials. Titles, issuers and dates as listed in the Licences & certifications section of my LinkedIn profile, checked against it for this edition. Online courses and programmes, not degrees or professional licences.

VMC terms. Fanuc names are used as the reference; Hurco WinMax and Mazatrol screens and behaviour differ.

Images. Photos on pages 1, 3 and 4 are publicly available images of Mecal machines and of the Mecal control and CAD/CAM software I used; they were not taken at my former workplace. Rights remain with their owners; no licence, affiliation or endorsement by Mecal, SCM Group or any other organisation named in this profile is implied. Infographics on pages 5 and 7–9 are illustrative graphics prepared for this profile; the diagrams on page 12 are schematic.