



DIEMAKING CREDENTIALING PROGRAM

LEVEL II CREDENTIALING ACHIEVEMENT RECORD (CAR)

and

Official Performance Assessment CHECKLISTs (Skill Checks)

Please print

NAME:	NIMS Reg. No.	Job Title:
--------------	----------------------	-------------------

Site Name & Address:	Site No.
---------------------------------	-----------------

STATUS:	<i>Non-Completer</i> 0	<i>Candidate has Successfully Completed all NIMS Performance Requirements in the Following Credentialing Area:</i>
	Reason:	<p align="center">Duties & Standards for Diemaking Skills Level II</p> <p>Date Started: _____ Date Completed: _____</p>

Directions

This *Credentialing Achievement Record (CAR)* is the official training/performance document and personal skills portfolio for the above named NIMS credentialing candidate. The CAR is used by the trainer/supervisor and candidate as a record (or log book) of individual on-the-job performance. The CAR is the *vehicle* that will allow eligible candidates to take the NIMS written credentialing examination(s). Supervisors, trainers, and candidates should take care of this record and be sure that it is accurate, kept up to date, filled out correctly, and properly stored. All information recorded in the CAR should be considered **CONFIDENTIAL**.

The CAR opens with list of Critical Work Activities (or Work History & Competency Statements) that must be acknowledged and documented. However, actual performance is assessed two ways: **1)** by fulfilling these general competency and historical statements and **2)** by an examiner administering the *Skill Checks* (or performance assessments). Skill Checks are clearly marked with the title - **CAR SKILL CHECK**. Candidate performance is documented by a on the Examiner's CHECKLIST. All Skill Checks must be co-signed and dated by the trainer/supervisor and candidate. Critical Work Activity sign-offs also must be co-initialed by the trainer/supervisor or manager and candidate then dated. If a particular Skill Check element or standard does not apply at your facility, check-off the Not Applicable (*NA*) box and continue. Skill Checks may require the candidate to perform work a bit differently than your normal procedure or learn how to do something that may not be part of their typical day-to-day responsibilities. However, you may only check-off *NA* if the process-standard does not apply because the equipment or tooling is not available or the diemaking process itself does not require this activity. The final section is the *Affidavit of Successful Performance* that must be completed, signed and dated upon completion of the CAR and sent to NIMS.



DIEMAKING CREDENTIALING PROGRAM

LEVEL II CREDENTIALING ACHIEVEMENT RECORD (CAR)

NOTE: Candidates must have basic machining skills prior to attempting this CAR. These skills and standards include:

General Machining - NIMS Level I Machining Standards

- o Benchwork
- o Job Planning
- o Layout
- o Milling (Vertical Mill, Manual Operations)
- o Surface Grinding
- o Turning – Between Centers & Chucking

For information about these standards, log onto www.nims-skills.org or contact:

The National Institute for Metalworking Skills

10565 Fairfax Boulevard, Suit e203
Fairfax, VA 22030
(703) 352-4971
(703) 352-4991 fax

LEVEL II SKILL STANDARDS, DUTY AREAS 1-6

Critical Work Activities	Date Completed	Supervisor Initials	Trainer Initials	Trainee Initials
Diemaking Level II Work History & Competency Statements		or		
Candidate successfully completed all required safety training/courses as specified by the facility or required by OSHA. Candidate has working knowledge of applicable OSHA and ANSI regulations and guidelines.				
Candidate met the attendance policy of the facility for the last 12 consecutive months.				
Candidate has no company documented safety violations within the last 12 consecutive months.				
Candidate has no disciplinary reports or reprimands within the last 12 consecutive months.				

Continued on next page



LEVEL II SKILL STANDARDS, DUTY AREAS 1-6

Critical Work Activities	Date Completed	Supervisor Initials	Trainer Initials	Trainee Initials
Diemaking Level II				
Candidate has demonstrated the ability to maintain a safe, clean and orderly work area in compliance with housekeeping policies and has no reported violations for a period of 12 consecutive months.				
Candidate has demonstrated appropriate social skills and personal qualities when working with others and contributed to group efforts with ideas and positive feedback in the performance of major duties.				
Candidate can communicate that the die design will meet customer quality standards and production requirements and explain why.				
Candidate can participate in the development of a Process Plan (die building plan) to meet customer (on-time) delivery requirements.				
Candidate can layout details for machining and toolroom operations.				
Candidate can perform required machining & benchwork to die design print specifications and tolerances.				
Candidate can prepare details for a CNC milling and/or turning operations.				
Candidate can prepare for wire burn/EDM and/or jig grinding operations.				
Candidate can use hand tools to remove cutter marks.				
Candidate can complete final sizing after heat-treating.				
Candidate can mount appropriate steels, pads and nitrogen units needed for trim lines and forming.				
Candidate can assemble a die and dry run the die to stop blocks.				
Candidate can install nitrogen cylinders, die springs and nitrogen manifold then confirm the development process.				
Candidate can setup die assembly for first tryout and run (or monitor) first part samples.				

Continued on next page



LEVEL II SKILL STANDARDS, DUTY AREAS 1-6

Critical Work Activities	Date Completed	Supervisor Initials	Trainer Initials	Trainee Initials
Diemaking Level II				
Candidate can make adjustments to die as determined from first tryout.				
Candidate can develop/rework draws, radii and forms to eliminate tears, wrinkles, burrs and spring-back.				
Candidate can develop trim lines and establish proper size and configuration of a blank or part.				
Candidate can spot form steels and form pads to achieve the specified surface finish, tolerance and station timing.				
Candidate can validate a tryout part to print specifications using appropriate tooling and measuring devices.				
Candidate can mount remaining die details to the die set for final assembly and test for function.				
Candidate can confirm the production readiness of the die or tool prior to final/production runoff.				
Candidate can participate with engineering in the setting up of the die for final runoff and make adjustments as needed.				
Candidate can perform troubleshooting and corrective actions necessary to maintain the functionality and reliability of machine room/toolroom equipment.				



CAR SKILL CHECK 1 of 2 – Sections 1 and 2

Candidate:	Date: 200
Examiner:	(For examiner use only) Results: Pass <input type="checkbox"/> Yes <input type="checkbox"/> No Date:

Duty Area(s) **), Layout, General Machining & Bench Work**

Performance Conditions

Settings: At workbench and in machine/tool room. Candidate will verify that a die design will meet customer and quality requirements, participate in developing a process plan, verify the calibration of measuring and quality control instruments, layout details for machining and toolroom operations and machine selected details, punches, and/or parts to die design and print requirements.

Safety Equipment:

PPE when on shop floor (based on equipment and process requirements).

Tools, Equipment & Materials:

- Bill of Materials/Stocklist
- Calibrations Standards
- Cleaning, Cutting/Tapping & Lubrication Agents/Devices
- Common Hand Tools
- Drill Press w/ Accessories & Attachments (including center punch and drills, countersink, counterbores, drill sets, taps and reamers)
- Files, Stone, Hones, Emory Cloth & Deburring Tools
- Lathe w/ Accessories & Attachments, CNC or Non-CNC (taper attachments, boring bar & tooling, chamfer tooling, drills, chucks, undercut tools, turning tools, live/dead centers)
- Layout Ink/Layout Dye/Bluing
- Materials Handling Equipment
- Mill w/ Accessories & Attachments, CNC or Non-CNC (including boring tools, center punch & drills, countersink, counterbores, combination sets, taps & reamers, mill ends & vises)
- MSDS Documents
- Part/Detail Washer (if needed)
- Power/Band Saw w/ Attachments, Accessories & Welder
- Prints/Drawings (part, die & detail)
- Raw Material Specifications
- Scribes, Etchers, Engravers and/or Chalk
- Shop Wipes/Rags (lint-free)

Tools, Equipment & Materials:

- Surface Grinder w/ Accessories & Attachments (includes wheel, diamond dresser, wheel balancer, counterweights & demagnetizer)
- Surface Plate (clean)
- Surface Finish Comparison Charts
- Vises and Clamps
- Work Order/PO/Job Packet

Measuring Instruments:

- Angle Plate
- Checking Fixtures
- Dial Indicator
- Edge Finders
- Hand Held Precision Measuring Instruments (various calipers, micrometers, rules, scales, etc.)
- Height & Depth Gauges w/ Indicator
- Optical Comparator (or CMM)
- Pin, Plug, Go & No-go Gauges
- Protractor w/ Blade
- Radius Gauges
- Sine Plate/Sine Bar
- Surface Gauges
- Squares (various)
- Telescoping Gauges
- Thread Gauges



Attainment Standards

100% of all applicable procedural steps and *Process-Product Standards* (Work Elements), without assistance and within company-specific time limit, following all safety, environmental and plant procedures.
100% conformance with all Final Product Standards, Quality Control and Process Plan/print and GD&T criteria, OHSA/ANSI/ISO/TS requirements, and plant-specific documentation/recordkeeping practices.

Candidate Directions

The referenced documents, tools, equipment, materials and supplies may be used to verify that die design will meet customer and quality requirements, participate in developing a process plan, verify the calibration of precision measuring and quality control instruments, layout details for machining/turning and grinding operations, and machine selected details and punches to die design and print requirements. All safety and plant procedures must be followed. The examiner will evaluate both the *process* used while the work is being done and the final result (or **product**) after the jobs have been completed. Work Element Process Steps should be performed in the logical sequence, and all work elements must meet the standards for successful completion.

The Skill Check you are about to take is a hands-on performance assessment designed to test your ability by practical demonstration. This assessment will enable you to verify your experience and show your competency by completing practical job tasks or projects (called Work Elements). The Skill Check will cover areas that you should know and problems you should be able to solve. If you need any additional materials or experience any problems with the equipment during the assessment, notify the examiner immediately.

Examiner Instructions

For successful completion of this Skill Check, the candidate must demonstrate the ability to successfully complete the Work Elements, unassisted and to standards under controlled assessment conditions. Every attempt has been made to sequence Process Steps – Work Elements (or performance jobs) in a logical order. However, individual Work Elements or Process Steps should be administered in segments and in any order as determined by the plant, facility or trainer. This is an on-going assessment process and will take some time to complete. All work must be completed to the standards of performance as interpreted by the shop, plant or facility.


Before administering the Skill Check or any portion thereof:

Be sure all equipment, tools, materials and supplies (inventories) are available, verified for safety and functionality, and are applicable to the process or work activity to be demonstrated.

Read/review the skill check directions with the candidate. Allow trainee the opportunity to review the *Examiner's Checklist* prior to administration. The examiner may answer any questions about the assessment process.



Do not provide assistance during the Skill Check. Monitor work in-progress and evaluate for **Process-Product Standard**. Assess the completed Skill Check for conformance with **Final Product Standards**. Mark NA if a *Process-Product Standard* is not appropriate or not applicable at your facility.

 **Stop** the Skill Check immediately if the candidate violates a safety/environmental regulation or procedure or if there is any possibility of personal injury or damage to equipment.

Before assessment, the examiner may discuss appropriate safety and loss issues (*i.e., Lockout-Tagout/zero energy requirements, HAZMAT handling and use, personal protection and permitting, pinch and sharp points, compressed air/fluid/gas, high/residual voltage/pressure, E-Stops/critical alarms, etc.*).

When the candidate indicates that he/she has completed a job task/project on the Skill Check or when maximum time allowed has run out, assess any Final Product Standards and complete all appropriate comments and signature sections upon completion of the entire Skill Check.



Checklist

Scoring Procedures: Observe the candidate's performance for each Process Step (Work Element) and mark on the *Examiner's CHECKLIST* whether or not the *Process-Product Standards* were attained (*Do not rely on your memory*). *Process-Product Standards* are checked-off as each Work Element (or Process Step) is being performed. Final Product Standards are marked after the Skill Check has been completed.

Critical. Failure to meet the standard will result in immediate Skill Check termination.

The evaluator will terminate the assessment and schedule the individual for further training.



Examiner's CHECKLIST – CAR SKILL CHECK 1
Job Planning, General Machining & Bench Work

Section One: Job Planning

Process Steps	Process-Product Standards			
Work Element	[Unit Standards of Performance]	Yes	No	NA
Review Die Design, Print & Customer Quality Standards	Candidate demonstrated knowledge of drawing/print scales, line construction and dimensioning systems. (C)	θ	θ	θ
Type of Die (Check One) <input type="checkbox"/> Single Hit <input type="checkbox"/> Compound	Candidate demonstrated ability to interpret revision box/revision symbols and information.	θ	θ	θ
Progressive <input type="checkbox"/> Sensored <input type="checkbox"/> Non-Sensored	Candidate demonstrated ability to identify geometric tolerancing systems and symbols.	θ	θ	θ
<input type="checkbox"/> Transfer	Candidate was able to identify critical dimensions, tolerances, GD&T and reference points. (C)	θ	θ	θ
Deep Draw <input type="checkbox"/> Single Deep-Draw <input type="checkbox"/> Double Deep Draw <input type="checkbox"/> Reverse Deep-Draw	Candidate demonstrated ability to identify matching processes that determine finish. (C)	θ	θ	θ
<input type="checkbox"/> Other:	Candidate demonstrated knowledge of print views and projections (1 st , 3 rd angle and/or standard orthographic).	θ	θ	θ
	Candidate was able to visualize the finished part/product.	θ	θ	θ
	Candidate demonstrated knowledge of the locations, positions and functions of die components (details).	θ	θ	θ
	Candidate demonstrated ability to determine and match tolerances of die details in relation to part specifications. (C)	θ	θ	θ
	Candidate demonstrated knowledge of the types, properties and characteristics of metals.	θ	θ	θ
	Candidate was able to select/verify materials (metals, ceramics, etc.) by codes or markings and assess their machinability and/or suitability. (C)	θ	θ	θ

Continued on next page

Section One: Job Planning *Continued*

Process Steps	Process-Product Standards	☺	☹	NA
Work Element	[Unit Standards of Performance]	Yes	No	NA
Review Die Design, Print and Customer Quality Standards <i>Continued</i>	Candidate was able to select layout tools and required inspection devices and gauges.	θ	θ	θ
	Candidate demonstrated ability to match inspection equipment calibrations to specified tolerance requirements.	θ	θ	θ
	Candidate demonstrated knowledge of inspection tools and their uses and develop an initial inspection plan.	θ	θ	θ
2. Determine Initial Process Plan to Complete Die/Tool	Candidate understood die design specifications, timelines, costs & process application(s).	θ	θ	θ
	Candidate reviewed stocklist/Bill of Materials and initiated the process to obtain materials (i.e., raw material, supplier details, etc.).	θ	θ	θ
	Candidate obtained/completed necessary work orders, routing sheets and/or purchase orders.	θ	θ	θ
	Candidate re-checked all critical attributes, features, dimensions and tolerances. (C)	θ	θ	θ
	Candidate re-checked metallurgy of materials, finishes or coatings, hardware and any non-metallic materials or items.	θ	θ	θ
	Candidate determined layout dimensions & reference points. (C)	θ	θ	θ
	Candidate identified machining requirements (milling, turning, grinding, wire burning, duplicating, etc.) and machinability specifications and tolerances. (C)	θ	θ	θ
	Process Plan or flow chart developed for die making activities with critical milestone dates.	θ	θ	θ
	Candidate communicated raw material specifications, lubrication requirements and inspection plan criteria to toolroom.	θ	θ	θ
	Communicated CNC and/or non-CNC operations and schedule.	θ	θ	θ
	Communicated EDM, welding, wire burning, grinding and other operations and timelines.	θ	θ	θ
	Candidate communicated heat-treating, coating and surface finish requirements and timelines.	θ	θ	θ
	Records, reports and prints properly stored, routed and controlled to ISO/TS standards.	θ	θ	θ

Section Two of this Skill Check begins on the next page

Section Two: Layout, General Machining & Benchwork

Process Steps	Process-Product Standards	☺	☹	
Work Element	[Unit Standards of Performance]	Yes	No	NA
1. Layout and Mark/Scribe Die Details & Features	Candidate demonstrated knowledge of layout dimensions and reference points and able to calculate those measurements and locations (including angles, arcs and holes).	θ	θ	θ
	Offset determined and added to print dimensions.	θ	θ	θ
	y-axis dimensions accurately marked first.	θ	θ	θ
	The workpiece was clearly marked to denote drill sizes and metal to be removed. (C)	θ	θ	θ
	Print dimensions, reference points & detail locations were accurately indicated on workpiece to a minimum tolerance of ± 0.005”.	θ	θ	θ
	All holes are (center) punched and milled areas indicated. (C)	θ	θ	θ
	Block neat in appearance, lines struck once, intersections clean and clear, and punch marks centered.	θ	θ	θ
The block is marked “front” for orientation (especially if non-symmetrical).	θ	θ	θ	
2. Setup Power Saw & Cut Material/Workpiece to Size	Candidate demonstrated knowledge of setup procedures, saw types and saw operation.	θ	θ	θ
	Candidate had knowledge of the characteristics of the material to be cut.	θ	θ	θ
	Candidate showed ability to prepare blade for welding and set welder to suit width of blade.	θ	θ	θ
	Blade properly threaded onto saw – Blade was not damaged and weld (if applicable) did not break. (C)	θ	θ	θ
	Candidate demonstrated knowledge of blade sizes, composition and tooth pitch in relation to their effects on the saw, material, cutting rate, tool life, finish and accuracy.	θ	θ	θ
	Candidate laid-out and rough cut workpiece, raw details and/or peripheral shapes.	θ	θ	θ
	No heavy burr or sharp corners/edges appeared on workpiece or within details.	θ	θ	θ
Overall length/width and features/details met all specifications (location, size, geometry, finish, etc.).	θ	θ	θ	

Continued on next page



Section Two: Layout, General Machining & Benchwork *Continued*

Process Steps	Process-Product Standards	☺	☹	
Work Element	[Unit Standards of Performance]	Yes	No	NA
Setup up Power Saw & Cut Material to Size <i>Continued</i>	Candidate established proper size and configuration of the workpiece to make the die part or ready it for secondary operations (i.e., milling, finish grinding, etc.).	θ	θ	θ
	Sharp edges and excessive burr removed from workpiece (including within details). Workpiece clean and dry.	θ	θ	θ
	Candidate demonstrated ability to cut straight lines, contours, angles and profiles using correct feeds and speeds.	θ	θ	θ
	Candidate was able to diagnose incorrect saw settings, blades or faulty sawing operations.	θ	θ	θ

NOTE: If Candidate is NIMS certified and has received a Level I Machining Credential in Drill Press Operation, this Work Element Section does NOT have to be completed. Please provide a copy of the Credential when submitting the CAR.

Process Steps	Process-Product Standards	☺	☹	
Work Element	[Unit Standards of Performance]	Yes	No	NA
3. Setup Drill Press, Sharpen Drills & Drill Holes Check Type of Machine Used: <input type="checkbox"/> Std. Manual Drill Press <input type="checkbox"/> Radial <input type="checkbox"/> Gang <input type="checkbox"/> CNC Machining Center <input type="checkbox"/> Other _____	Part matched print requirements and specifications. (C) Part may be in a semi-finished state having already been squared up and the outer surfaces completed with center drilled locations. Required part or print selected should include the following features, specifications & minimum tolerances: 3 to 5 holes Reamed w/ C-Sink Drilled w/ C- Bore and/or Spotface Drilled & Tapped w/ C-Sink Reamed holes: $\varnothing + .001/-0.000$ <u>or</u> $+0.0005/-000$ Location of holes: $\pm 1/64''$ or $\pm .015$ or less \varnothing drilled holes: $+0.006/-0.000$, $\varnothing 3/4$ spotface x 1/8 deep $\pm 1/64''$ \varnothing counterbores $\pm 1/64''$ Holes \perp to datum within .005 TIR Surface finish at least 250 micoinches	θ	θ	θ
	Sharp edges broken 1/64" max.	θ	θ	θ
	Mouth of holes lightly countersunk.	θ	θ	θ
	Candidate adhered to all housekeeping and safety practices and procedures.	θ	θ	θ
	Tools were returned to their proper storage locations.	θ	θ	θ
	Equipment was returned to an appropriate condition and setting.	θ	θ	θ



Section Two: Layout, General Machining & Benchwork *Continued*

NOTE: If Candidate is NIMS certified and has received a Level II Machining Credential in Grinding Flats & Angles, or Cylindrical Grinding, this Work Element Section does NOT have to be completed. Please provide a copy of the Credential when submitting the CAR.

Process Steps	Process-Product Standards	Yes	No	NA
Work Element	[Unit Standards of Performance]			
6. Setup Grinder, Mount, Balance & Dress Wheel, and Surface Grind Flats and Angles	Part matched print requirements and specifications. (C)	θ	θ	θ
	Required part or print selected should include the following specifications & minimum tolerances: ± .0005 on all decimals unless otherwise specified on print.			
	Slot depth/width: ± .001 or less			
	Square within .001 over 4" or .0001 over 1"			
	Angles: ± 15'			
	Radii: ± .001 or less			
	Surface finish of 16 micrometers or finer (32 micrometers preferred).			
	Correct wheel securely mounted to clean hub then mounted to surface grinder. (C)	θ	θ	θ
	Wheel dressed and face of wheel "trued."	θ	θ	θ
	All wheel positions correctly balanced. (C)	θ	θ	θ
	Wheel re-dressed (if necessary), parallel & perpendicular to magnetic check.	θ	θ	θ
	Workpiece(s) properly setup and mounted to grinding fixture/chuck. (C)	θ	θ	θ
	Grinding solution at proper level. (C)	θ	θ	θ
	Candidate demonstrated even grinding passes and rhythm. Wheel re-dressed as necessary.	θ	θ	θ
	Candidate monitored grinding sound and solution flow.	θ	θ	θ
No edge damage, chatter and/or burning.	θ	θ	θ	
No milling marks found on ground surfaces.	θ	θ	θ	
Flat, radii and angled surfaces finished to process plan or print specifications.	θ	θ	θ	
Workpiece demagnetized (will not pull slugs) and clean (no residue, solution, fine-dust or burrs present).	θ	θ	θ	
Grinder shut down and cleaned after job (spindle in safe position).	θ	θ	θ	
Workbench clean, tools/materials put away, and all housekeeping, environmental and safety procedures were followed.	θ	θ	θ	

End of Skill Check One – Complete Final Product Evaluations and Signoffs



CAR SKILL CHECK 2 of 2 – Sections 3 and 4

Candidate:	Date:	200
Examiner:	(For examiner use only)	
	Results:	Pass <input type="checkbox"/> Yes <input type="checkbox"/> No
	Date:	

Duty Area(s) ably and Dry Run & Die Development and First/Final Tryout

Performance Conditions

Settings: At workbench, in machining room/toolroom and at tryout press. Candidate will assess die building/process plan, perform sub-assembly of die details and fit upper/lower die details for dry run, dry run die to stop blocks, assemble die for tryout (die development required), setup die in tryout press and conduct first/final tryout (additional die development may be required).

Safety Equipment:

PPE when on shop floor, press room or in machine/toolroom.
Lockout/Tagout (as needed)

Tools, Equipment & Materials:

- Assorted Hand Tools
- Clamps, Fasteners & Joiners
- Cleaning Agents/Supplies
- Die Cart or Bench
- Die Setting Tools
- Die Steels, Form Pads, Details, Nitrogen Units, Springs/Chutes, Piercing/Punching Stations, etc.
- Files, Stones, Emory Cloth, Polisher
- Foist, Crane or Sling
- Machining/Toolroom Equipment (as needed)
- Magnifying Glass or Eye Loupe
- Mirror
- Parallels
- Parts Cleaner (if needed)
- Pilot Positioning Tools
- Process/Die Building Plan, Part Print, Die Detail Prints/Drawings & Bill of Materials
- Press (hand or power) or Impact Gun
- Try Bar/Lift Bar
- Punches, Reamers, Taps/Dies
- Scribes/Markers & Alignment/Layout Paper or Ink/Bluing
- Sensors & Wiring Diagrams (i.e., short feed, part-out, discrete, in-die measuring, die protection)

Tools, Equipment & Materials:

- Shims/Shim Stock
- Shop Wipes/Rags
- Solder Gun, Welder, Adhesives & Joiners/Fasteners as needed
- Spacers
- Surface Finish Charts/Specifications
- Surface Plate (clean)
- Transfer Punches & Screws and/or Blind Hole Spotters or Punches (as needed)
- Tryout Press (w/ Tryout Stock)

Measuring Instruments:

- Attribute Gauges
- Checking Fixtures
- Dial Indicator
- Die Light
- Feeler Gauges (if needed)
- Hand Held Precision Measuring Instruments (various calipers, micrometers, rules, scales, etc.)
- Height/Depth Gauges
- Optical Comparator/CMM
- Squares & Straight Edge



Attainment Standards

100% of all applicable procedural steps and *Process-Product Standards*, without assistance and within company-specific time limit, following all safety, environmental and plant procedures.
100% conformance with all Final Product Standards, Quality Control and Process Plan criteria, OSHA/ANSI/ISO-TS guidelines, and plant-specific documentation/recordkeeping practices.

Candidate Directions

The referenced documents, tools, equipment, materials and supplies may be used to assess die building/process plan, perform sub-assembly of die details and fit upper/lower die details for dry run, dry run die to stop blocks, assemble and develop die for first and/or final tryout (die development required), setup die in tryout press and conduct first or final tryout (additional die development may be required). All safety and plant procedures must be followed. The examiner will evaluate both the *process* used while the work is being done and the final result (or **product**) after the job has been completed. Work Element Process Steps should be performed in the logical sequence, and all work elements must meet the standards for successful completion.

The Skill Check you are about to take is a hands-on performance assessment designed to test your ability by practical demonstration. This assessment will enable you to verify your experience and show your competency by completing practical job tasks or projects (Work Elements). The Skill Check will cover areas that you should know and problems you should be able to solve. If you need any additional materials or experience any problems with the equipment during the assessment, notify the examiner immediately.

Examiner Instructions


For successful completion of this Skill Check, the candidate must demonstrate the ability to successfully complete each Work Element, unassisted and to standard under controlled assessment conditions. All work must be completed to the standards of performance as interpreted by the shop, plant or facility. Every attempt has been made to sequence Process Steps, Work Elements (or performance jobs) in a logical order. However, individual Work Elements or Process Steps should be administered in segments and in any order as determined by the plant, facility or trainer. This is an on-going assessment process and will take some time to complete.

Before administering the Skill Check or any portion thereof:

Be sure all equipment, tools, materials and supplies (inventories) are available, verified for safety and functionality, and are applicable to the process or work activity to be demonstrated.

Read/review the skill check directions with the candidate. Allow trainee the opportunity to review the *Examiner's Checklist* prior to administration. The examiner may answer any questions about the assessment process.

Do not provide assistance during the Skill Check. Monitor work in-progress and evaluate for **Process-Product Standard**. Assess the completed work for conformance with **Final Product Standards**. Mark *NA* if a *Process-Product Standard* is not appropriate or not applicable at your facility.

 **Stop** the Skill Check immediately if the candidate violates a safety/environmental regulation or procedure or if there is any possibility of personal injury or damage to equipment.

Before assessment, the examiner may discuss appropriate safety and loss issues (i.e., *Lockout-Tagout/zero energy requirements, HAZMAT handling and use, personal protection and permitting, pinch and sharp points, compressed air/fluid/gas, high/residual voltage/pressure, E-Stops/critical alarms, etc.*).

When the candidate indicates that he/she has completed the Work Element or when maximum time allowed has run out, assess any Final Product Standards and complete all appropriate comments and signature sections upon completion of the entire Skill Check.



Checklist

Scoring Procedures: Observe the candidate’s performance for each Process Step and mark on the *Examiner’s CHECKLIST* whether or not the *Process-Product Standards* were attained (*Do not rely on your memory*). *Process-Product Standards* are to be marked as each Work Element (Process Step) is being performed. *Final Product Standards* are checked-off after the Skill Check has been completed.

Critical. Failure to meet the standard will result in immediate Skill Check termination.

The evaluator will terminate the assessment and schedule the individual for further training.

Examiner's CHECKLIST – CAR SKILL CHECK 2

Die Assembly, Conduct First Tryout & Begin Development Process

Section Three: Die Assembly, Development & Dry Run

Process Steps	Process-Product Standards	☺	☹	☐
Work Element	[Unit Standards of Performance]	Yes	No	NA
1. Identify & Explain Tooling Types, Functions & Positions on Die Building Plan or Die Print	Located/described all draw and/or forming stations. (C)	θ	θ	θ
	Located/explained all lancing/piercing stations.	θ	θ	θ
	Located/described all blanking stations.	θ	θ	θ
	Located/explained all cutoff/scrap stations.	θ	θ	θ
	Located/explained all pierce punches and/or bushings.	θ	θ	θ
	Located/explained all lancing punches and dies.	θ	θ	θ
	Located/explained all forming/trim tools and/or die components. (C)	θ	θ	θ
	Located/explained all blanking punches or dies.	θ	θ	θ
	Located and explained cutoff punch/tooling.	θ	θ	θ
	Candidate successfully described the function and application of each station. (C)	θ	θ	θ
Candidate understood the die tooling/details and function by position and application.	θ	θ	θ	
2. Perform Sub-Assembly of Details Type of Die (Check One) <input type="checkbox"/> Single Hit <input type="checkbox"/> Compound Progressive <input type="checkbox"/> Sensored <input type="checkbox"/> Non-Sensored <input type="checkbox"/> Transfer Deep Draw <input type="checkbox"/> Single Deep-Draw <input type="checkbox"/> Double Deep Draw <input type="checkbox"/> Reverse Deep-Draw <input type="checkbox"/> Other: _____	Candidate demonstrated knowledge of the types and functions of fasteners/joiners and torque requirements.	θ	θ	θ
	Candidate was able to assess die sub-assembly requirements, label, mate and fasten parts to specified clearances, fits and limits.	θ	θ	θ
	All details/components are clean, smooth/safe to handle, demagnetized & showing no damage.	θ	θ	θ
	All sub-sections are mounted and moving parts will travel without resistance or interference. No missing parts or components. (C)	θ	θ	θ
	All exposed edges are smooth and wear surfaces cleaned, lubricated and safe to handle.	θ	θ	θ
	Candidate had knowledge of the construction of the die, its sub-assemblies & their relationship to the die building plan & process for which the die is intended to perform.	θ	θ	θ
Candidate showed ability using tools such as drills, reamers, taps, taper reamers, transfer punches and joining presses.	θ	θ	θ	

Section Three: Die Assembly, Development & Dry Run *Continued*

Process Steps	Process-Product Standards			
Work Element	[Unit Standards of Performance]	Yes	No	NA
3. Mount Form Steels, Form Pads, Trim Details & Piercing Stations (Spot form steels & pads as needed. Die development required)	Die components/details checked against Bill of Materials & properly labeled (e.g., front/back, left/right, top/bottom). (C)	θ	θ	θ
	Hole or bore types, clearances & specifications acknowledged to print or building plan (including C-sink & C-bore requirements).	θ	θ	θ
	Die blocks successfully mounted to die set.	θ	θ	θ
	Die block inserts assembled, mounted and aligned. Checked for fit & location.	θ	θ	θ
	Trim punches and/or perforating punches installed and properly oriented.	θ	θ	θ
	Form steels, pads & punches installed.	θ	θ	θ
	Initial punch & tooling clearances established.	θ	θ	θ
	Nitrogen units installed (not filled).	θ	θ	θ
	Candidate demonstrated ability locating, positioning, sizing, aligning & making holes (drilling, boring, tapping, reaming, etc.). (C)	θ	θ	θ
	Candidate demonstrated ability performing “blue-off” grinding, stoning & polishing.	θ	θ	θ
	Candidate demonstrated ability and good judgment when establishing initial clearances.	θ	θ	θ
	Candidate demonstrated ability in fastening and joining techniques & methods.	θ	θ	θ
	Candidate successfully performed initial trim-line development and/or form & bend development processes.	θ	θ	θ
	Candidate adhered to all dimensional and tolerance requirements (Accuracy: ±.010 to ±.0005” depending on the requirement of the detail).	θ	θ	θ
4. Align Upper & Lower Forms and Details (Die development may be required)	Lubrication applied to proper die components and plumbing & passages checked for function.	θ	θ	θ
	Die clearance established between form steel & blots secured. Tooling height verified and kiss blocks set to shut height.	θ	θ	θ
	Aligned/set clearance, fits and limits between upper details/form and lower form/die shoe. (C)	θ	θ	θ
	All screws, blots or fasteners tight and secure.	θ	θ	θ
	Upper/lower form details aligned and keyed for back up. Inserts bolted to keyed block.	θ	θ	θ
	Die set ready for tryout press shimming activities to get the correct form, fit and/or clearance.	θ	θ	θ
	Die assembly ready for dry run.	θ	θ	θ

Section Four: Final Die Assembly, Die Development & Final Tryout

Process Steps	Process-Product Standards	☑	☒	☐
Work Element	[Unit Standards of Performance]	Yes	No	NA
1. Perform Final Die Assembly (Continued die development required)	Die development needs acknowledged after dry run.	θ	θ	θ
	Dry run assessed for effectiveness.	θ	θ	θ
	Tryout stock and lubrication evaluated for appropriateness and functionality	θ	θ	θ
	Tryout press assessed for pressure and tonnage capabilities.	θ	θ	θ
	Trim lines and/or radii re-developed as needed.	θ	θ	θ
	Forms/pads, tooling/punches and upper/lower steels adjusted or redeveloped as needed.	θ	θ	θ
	Die springs, parallels and nitrogen cylinders assembled and installed (nitrogen manifolds filled).	θ	θ	θ
	(C) In-die and on-die sensors bench tested for function, sensitivity, target range and reliability.	θ	θ	θ
	Sensors installed and set for clearance.	θ	θ	θ
	Remaining details developed for fit, size, position, alignment and clearance.	θ	θ	θ
Upper/lower details and die shoes/die blocks checked and adjusted for clearance.	θ	θ	θ	
Plumbing and passages checked for function.	θ	θ	θ	
Die weighed and readied for final tryout.	θ	θ	θ	
2. Setup Press & Die(s) for Tryout Accuracy Level: .010" to .060 off stop blocks	Inspection plan & methods checked for completeness and verified for accuracy, tolerances and GD&T requirements.	θ	θ	θ
	Tools, materials, supplies, prints and QC instruments staged and job site. Precision measuring devices verified for calibration.	θ	θ	θ
	Die set safely staged at job site by tryout press. Die was not damaged during transport.	θ	θ	θ
	Die assembly properly installed on the bolster/ram. Candidate demonstrated ability operating shut height adjustment mechanism.	θ	θ	θ
	Die (upper/lower) securely clamped in place, shut height and knockout bar set, and air counterbalance determined. (C)	θ	θ	θ
	Press auxiliaries, input and/or output devices setup with trial stock and ready for final tryout (coil fed operations only).	θ	θ	θ
	Candidate demonstrated knowledge press settings, bend allowance/draw calculations, cutting clearances and material flow characteristics.	θ	θ	θ
		θ	θ	θ
		θ	θ	θ
		θ	θ	θ

Section Four: Final Die Assembly, Die Development & Final Tryout *Continued*



Process Steps	Process-Product Standards			
Work Element	[Unit Standards of Performance]	Yes	No	NA
3. Make Trial Parts to Confirm Production Readiness to Die/Tool	Helped stage press setup tools and equipment. Press started and cycled.	0	0	0
	Trial run started. Candidate monitored material reaction to process and alignment.	0	0	0
	Candidate monitored shut height, timing, pressures, feed/speed and tonnage.	0	0	0
	Candidate assessed the function of die protection devices and sensors.	0	0	0
	Trial parts inspected for quality, geometry, feature/attribute compliance and cosmetics.	0	0	0
	Candidate demonstrated ability taking measurements to an accuracy of +/- .0005" or as specified by the smallest tolerance on print	0	0	0
	Tryout process adjusted to meet part compliance requirements (Process improvements & troubleshooting required).	0	0	0
	Die developed (as needed) to meet part compliance requirements (Continued die development and rework required). (C)	0	0	0
	Parts made matched print, quality control and customer requirements and specifications. Parts fell freely from die in cutoff station.	0	0	0
	Candidate demonstrated ability to position and secure die on press platens, troubleshoot material flow or form failures, correct stock feeding problems and produce final parts.	0	0	0
	Candidate demonstrated understanding of material flow requirements, die form modification techniques, troubleshooting, fitting & alignment procedures, and press operations.	0	0	0
	Candidate showed ability to gather and organize information/data while noticing cause-and-effect relationships to make a rational, objective, unbiased decision prior to taking action.	0	0	0
	Candidate clearly communicated to production and engineering (verbally or in writing) die final runoff requirements and final adjustments.	0	0	0

End of Skill Check Two – Complete Final Product Evaluations and Signoffs



Affidavit of Successful Performance
NIMS Level II Diemaking Credentialing Program
↳ Credentialing Achievement Record ↳

Directions: This page is a compilation of all performance requirements for the Diemaking Level II Credential. This affidavit documents that the candidate has successfully completed all performance requirements; that is:

- The Work History & Competency Statements (Critical Work Activities report) have been met, and
- Both Skill Checks (performance assessments) have been completed and standards attained.

All parties involved in assuring that the documentation contained in this CAR is accurate, honest and complete must sign and date the affidavit. When this affidavit is complete, it should be sent in its entirety to NIMS at the indicated address.

Please print

Candidate Name	NIMS Reg. No.	Date of Completion: 200
-----------------------	----------------------	---------------------------------------

The credentialing candidate named above has completed all necessary CAR requirements for NIMS Level II (OJT/performance) diemaking recognition.

Site Name & Address:	Site Number and/or Phone Number
---------------------------------	--

Indicate the Skill Checks administered, the date of successful performance for each Skill Check and the dates for each Work Element completed. Acknowledge that all applicable Critical Work Activities have been completed, co-initialed and dated.

NIMS <i>Diemaking Level II</i>	Completed Yes/No	Date Completed xx/xx/xx
Skill Check #1 – Job Planning, General Machining & Bench Work	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section One, Work Element 1: Review Die Design, Prints & Customer Quality Standards	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section One, Work Element 2: Determine Process Plan to Complete Die/Tool	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Two, Work Element 1: Layout and Mark/Scribe Die Details & Features	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Two, Work Element 2: Setup Power Saw and Cut Material to Size	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Two, Work Element 3: Setup Drill Press, Sharpen Drills and Drill Holes	<input type="checkbox"/> Yes <input type="checkbox"/> No *	
Section Two, Work Element 4: Setup Mill & Machine a Part/Detail to Print Specifications	<input type="checkbox"/> Yes <input type="checkbox"/> No *	
Section Two, Work Element 5: Setup Lathe & Turn ID and OD Tapers Using Attachments	<input type="checkbox"/> Yes <input type="checkbox"/> No *	
Section Two, Work Element 6: Setup Grinder, Setup Wheel and Grind Flats & Angles	<input type="checkbox"/> Yes <input type="checkbox"/> No *	
Skill Check #2 – Die Assembly, Dry Run, Die Development & Tryout	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Three, Work Element 1: Identify Tooling Types, Functions and Positions	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Three, Work Element 2: Perform Sub-Assembly of Details	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Three, Work Element 3: Mount Form Steels/Pads, Trim Details & Piercing Stations	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Three, Work Element 4: Align Upper/Lower Forms & Details	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Three, Work Element 5: Dry Run Die to Stop Block(s)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Four, Work Element 1: Perform Final Die Assembly	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Four, Work Element 2: Setup Press & Die(s) for Tryout	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Section Four, Work Element 3: Make Trial Parts – Confirm Readiness of Die/Tool	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Critical Work Activities: All Work History & Competency Statements have been completed, dated and co-initialed.	<input type="checkbox"/> Yes <input type="checkbox"/> No	

* NIMS certification may be substituted for this Work Element. Please acknowledge on next page and enclose a copy of the credential.



** If the candidate has received one or more applicable NIMS machining credentials, please acknowledge below and provide a copy of the credential(s).*

Name of Credential	Level

We do hereby attest with our signatures that the candidate named above has successfully completed all necessary CAR requirements for NIMS Level II Diemaking and is hereby eligible to take the written exam for the NIMS Level II Diemaking Credential.

Site Coordinator or Department/Plant Manager *Signature*

_____ 20____
Date

Supervisor or Evaluator/Trainer *Signature*

_____ 20____
Date

Candidate *Signature*

_____ 20____
Date

