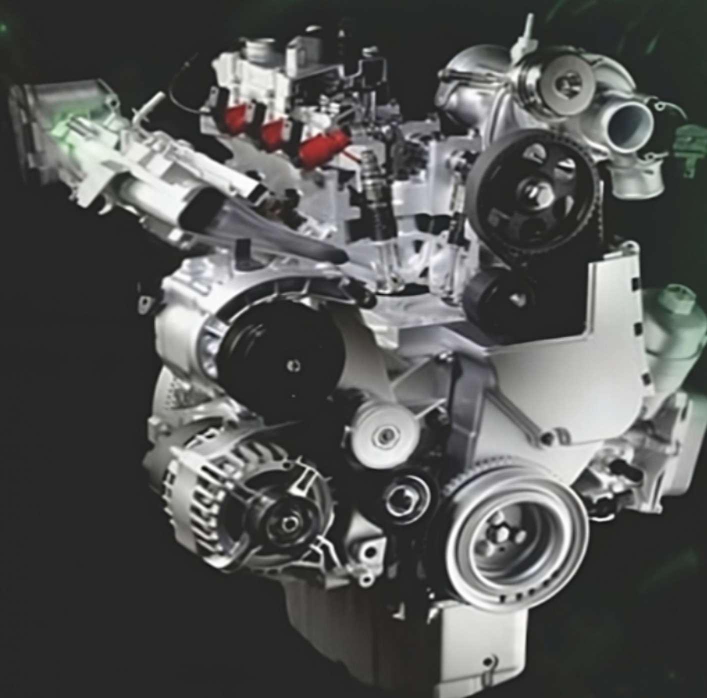
ISSN Print: 0976-6340 ISSN Online: 0976-6359

INTERNATIONAL JOURNAL OF MECHANICAL ENGINEERING & TECHNOLOGY (IJMET)

https://iaeme.com/Home/journal/IJMET

High Quality Peer Reviewed Refereed Scientific, Engineering & Technology, Medicine and Management International Journals



PUBLISHED BY

IAEME Publication
Chennai, Tamilnadu, India
Mobile: +91-9884798314, 7358208318
E-mail: iaemedu@gmail.com, editor@iaeme.com

International Journal of Mechanical Engineering and Technology (IJMET)
Volume 16, Issue 4, July-August 2025, pp. 27-51, Article ID: IJMET_16_04_003
Available online at https://iaeme.com/Home/issue/IJMET?Volume=16&Issue=4
ISSN Print: 0976-6340; ISSN Online: 0976-6359; Journal ID: 4544-4179
Impact Factor (2025): 20.99 (Based on Google Scholar Citation)
DOI: https://doi.org/10.34218/IJMET_16_04_003

DESIGN AND SIMULATION OF PRESS TOOL FOR MANUFACTURING BRACKET SUPPORTS

Abdullah Al Hossain Newaz[1], Refat Jahan[2]
[1]Department of Mechanical Engineering, University of Bridgeport, Bridgeport, CT-06604, USA.
[2]Department of Mechanical Engineering, University of New Haven, CT-06516, USA.

***Corresponding Author: Abdullah Al Hossain Newaz**

ABSTRACT

Press tools are indispensable in manufacturing, enabling the efficient and precise production of sheet metal components. This project aims to design and develop a fully functional model of a mechanical press tool for producing sheet metal parts. With the integration of SolidWorks software, the models of every component of the press tool will be designed in 3-dimensions with the precision desired. Finite Element Analysis will be carried out stress analysis and simulations for the major components of the machine to determine their resilience, durability and ensure that the designed components fully meet the desired operational and functional requirements. The final design assembly will incorporate the required features like Punch holder, backing plate, Punch plate, Stripper plate, Die Plate Puch and a Die holder. The press tool is required to be functional, manufacturable, maintainable and consistently produces the desired target with great precision and without failing. It must also be safe for use without any risk of causing accidents due to application of force. With the use of SolidWorks, the process of design will be optimized for efficiency and will ensure that the tool is cost effective and user friendly as these are the major goals the project tends to achieve.

Keywords: Press Tool, Sheet Metal, SolidWorks, 3D Modeling, FEA, Stress Analysis, Punch, Die, Stripper Plate, Design, Simulation, Durability, Precision, Safety, Cost-effective

Cite this Article: Abdullah Al Hossain Newaz, Refat Jahan. (2025). Design and Simulation of Press Tool for Manufacturing Bracket Supports. *International Journal of Mechanical Engineering and Technology (IJMET)*, 16(4), 27-51.

DOI: https://doi.org/10.34218/IJMET_16_04_003

1. Introduction

The rapid advancement of technology has significantly elevated the role of sheet metal components in the design and fabrication of modern equipment, underscoring the critical importance of press tools in manufacturing processes (Subrahmanyam & Mokhalingam, 2016). Press tools are uniquely designed to produce sheet metal parts of varying sizes and shapes using predetermined forces, enabling continuous mass production with exceptional precision. This process demands the use of high-strength materials capable of withstanding repeated heavy loads, as failure to do so can result in significant operational inefficiencies (Palmer, 2017). The adoption of Computer-Aided Design (CAD) software, such as SolidWorks, enhances this process by allowing for detailed modeling and precise analysis of tool components, which helps mitigate risks associated with improper material selection or flawed design procedures. For instance, issues such as distortion of parts or costly production delays can be effectively minimized through CAD-driven insights (Subrahmanyam & Mokhalingam, 2016). In this project, a press tool will be designed specifically for the production of sheet metal support brackets, employing operations such as punching and blanking to ensure accuracy and efficiency. By integrating advanced CAD techniques, this project aims to address the challenges of modern manufacturing while optimizing both performance and reliability in mass production settings.

2. Literature Review

2.1 Background of Press Tools

Press tools have played a pivotal role in manufacturing, functioning as essential equipment for shaping and forming sheet metal into precise shapes and sizes. Their widespread application spans industries such as automotive, aerospace, and electronics, where precision and efficiency are critical to mass production (Prasada et al., 2019). By applying controlled forces to sheet metal, press tools enable various operations, including cutting, punching, bending, and drawing, facilitating the production of components with consistent quality and high throughput. The evolution of press tools has been closely tied to advancements in material science, with the development of high-strength alloys and composites enhancing their ability to withstand repeated heavy loads, thereby improving durability and reliability (Palanisamy, 2022). As manufacturing demands have grown, the adaptability and versatility of press tools have solidified their position as indispensable in achieving competitive production standards.

Building on this foundational importance, modern advancements have transformed press tools into even more sophisticated systems, largely due to the integration of CAD and Finite Element Analysis (FEA). These technologies allow for detailed modeling and optimization, addressing challenges such as material selection and stress distribution with unparalleled precision (Mastanamma, 2012). By enabling the analysis of critical components during the design phase, CAD and FEA mitigate issues like deformation and production inefficiencies, ensuring higher reliability. Furthermore, contemporary press tools incorporate ergonomic designs and enhanced safety features, reducing operator risks while maintaining operational efficiency. These innovations have not only improved the functionality and lifespan of press tools but also significantly lowered production costs and downtime, reinforcing their indispensable role in modern manufacturing. Together, these advancements reflect the seamless progression of press tools from traditional to technologically advanced systems, meeting the increasing demands of industrial applications.

2.2 Fly Press

This is the simplest of all press tools and is manually operated by hand. The frame of the machine which supports all other components is C shaped and is very rigid. The shape of the frame allows for the open front which gives space for the feeding of the sheet metal below the ram from either side of the machine (Ong et al., 1997). The two heavy cast iron balls mounted at the two ends of the arm, bolted to the screw so that when the handle is turned, it causes the screw to rotate within the nut which in turn raises the guide punch vertically and either lowers to press the sheet metal and releases it after the desired shape is achieved. Fig 1[9]

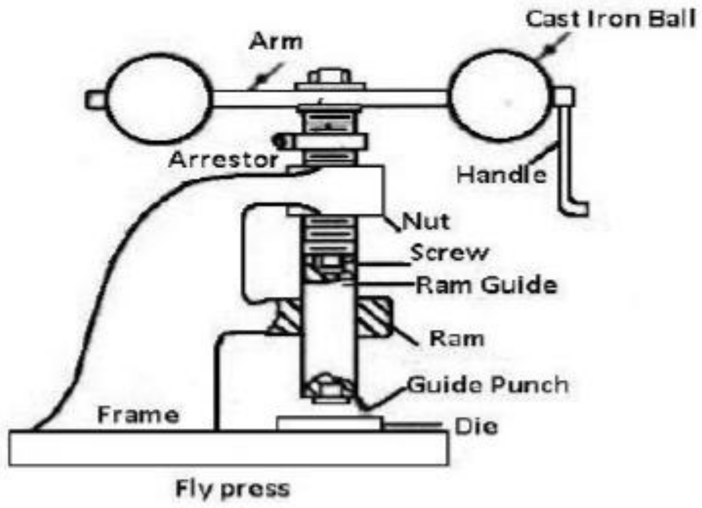


Fig1: Fly Press

2.3 Horn Press

This press has a cylindrical horn like projection from the machine frame that serves as the die support. The horns are interchangeable for the different workpiece sizes and is intended for cylindrical work pieces. Fig 2[10]

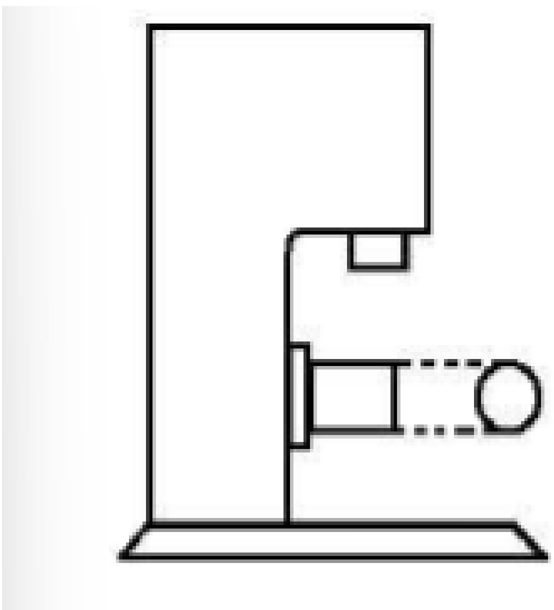


Fig2: Horn Press

2.4 Adjustable Bed Press

This type of press is not as rigid as other presses but has a mechanical arrangement for raising or lowering the table on which the die is fitted. This enables the setting of different work piece sizes and dies on the machine. Fig 3 [10]

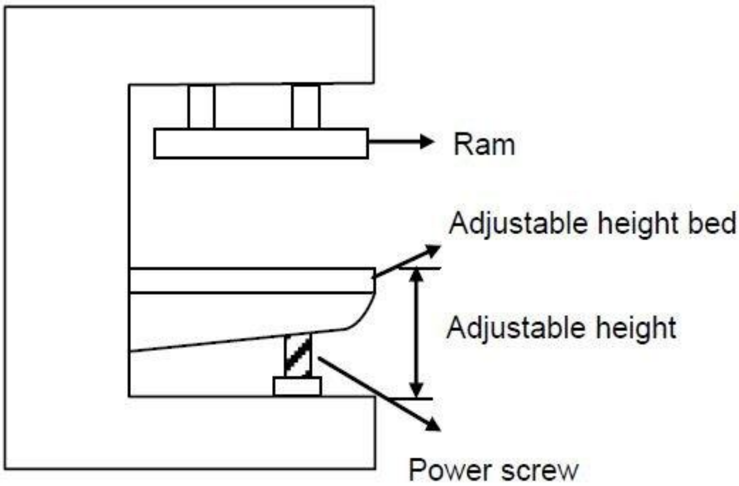


Fig 3: Adjustable Bed Press

2.5 Power Press

This is widely used press machine in mechanical workshops. Although its design is similar to the hand press, it is driven by power rather than by hand. It is characterized as hydraulic or mechanical according to the type of working mechanism of power transmission to the ram. The punch is fitted on the end of the ram and die is attached on the bolster plate. The flywheel is mounted at the end of the crankshaft stores up the energy for maintaining a constant downward speed of the ram when the sheet metal is pressed between the punch and die. Fig 4[10]

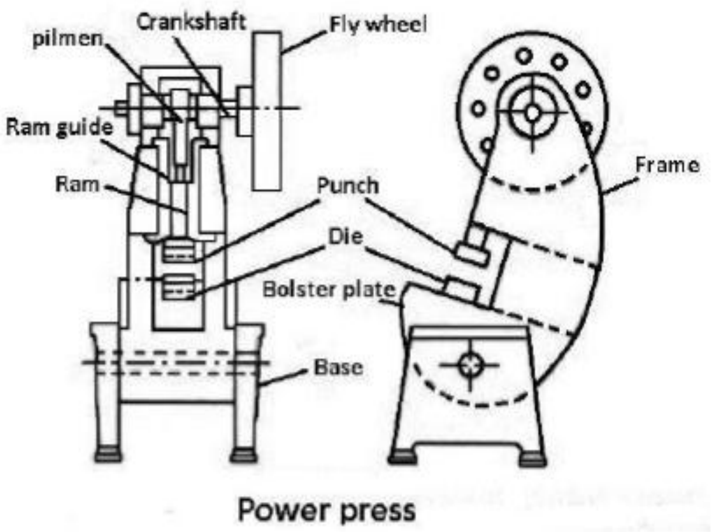


Fig 4: Power Press

3.Methodology

3.1 Designing and Developing a High-Precision Press Tool

The methodology employed in this project was meticulously designed to ensure the development of a press tool that met the desired standards of precision, durability, and operational efficiency. The process began with the selection of suitable tool materials for the press tool components, prioritizing durability, safety, and cost-effectiveness to withstand repeated operational loads without failure. Using SolidWorks software, detailed 3D models of the components were created to ensure dimensional accuracy and compatibility. Components such as the punch holder, die plate, and stripper plate were designed to optimize their geometry and functionality. The models were iteratively refined to meet the required specifications for punching, sorting, and blanking operations with high precision. Following the design phase, the development of a press tool prototype was undertaken to evaluate its capacity to handle heavy loads and metals of allowable thickness without structural compromise.

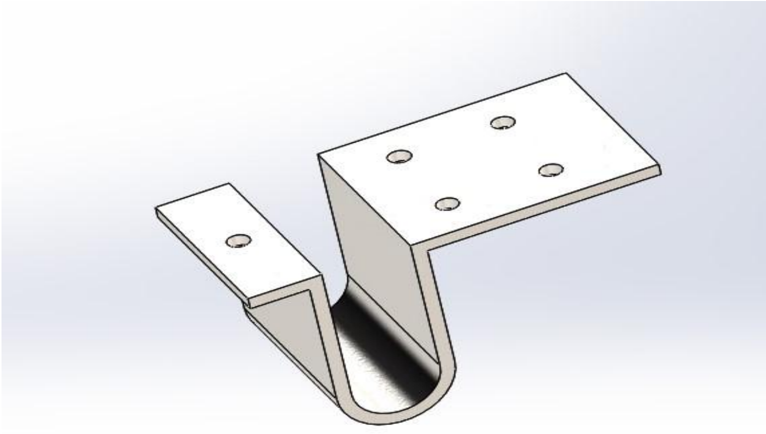


Fig 5: Support Bracket

Fig5 designed by SolidWorks Cad.

FEA was then conducted to assess the stress, strain, and deformation on critical components under simulated operational conditions. These analyses were instrumental in identifying and rectifying potential failure points. After FEA validation, a model machine was constructed to replicate the actual operational environment. Rigorous testing was carried out under varying forces and operating conditions to evaluate the model's performance, focusing on its efficiency, precision, and durability. The results of these tests informed necessary design adjustments to address any shortcomings. The process concluded with the assembly of the final press tool, which was equipped with safety features such as ergonomic handles and force-limit controls. This structured methodology ensured the press tool was reliable, capable of handling industrial requirements, and delivered consistent, precise results.

3.2 Design components

The design of the press tool for manufacturing consisted of:

3.2.1 Punch and die holder

They are not only for fixing the die onto the press but also supports the rigidity of the die. They also allow for the adjustment of the die height, providing the space for the sheet metal work pieces. The material used for the manufacture of this component is SKS3 or cast iron FC250. This is majorly to support high rigidity and high-volume production.

3.2.2 Base Plate

Two backing plates are used in this design. They are used for the purpose of backing up so as to prevent components like the small diameter punch from getting too deep inside the holder as a result of the force of the press operation. They also prevent stripper backing plate from detaching and for die height adjustments. For this part, SKS material is used as high rigidity is required.

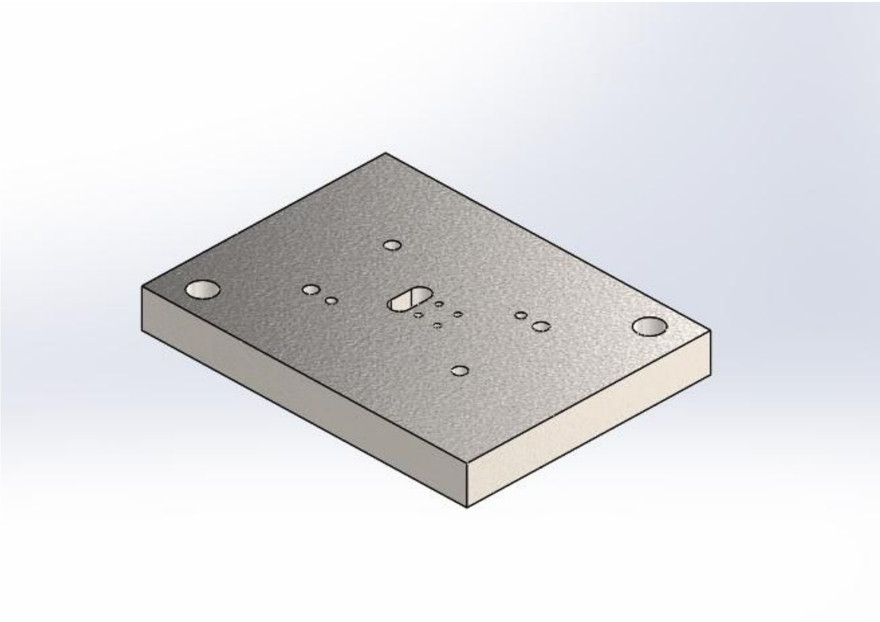


Fig6: Base Plate
Fig6 designed by SolidWorks Cad.

3.2.3 Punch plate

This is used to hold, position and strengthen the small diameter punch. Mounting holes on the punch plate are made with drills, reamers, counterbores or single point boring tools. Assuming high volume production, heat treated SKS3 material is used.

3.2.4 Pilot Punch

The primary function of the pilot punch is to position the stock strip with precision, ensuring proper alignment for subsequent blanking and piercing operations. It operates under the assumption that the workpiece is mechanically fed. Typically, the feeding process involves underfeeding followed by forward pulling in the direction of the feeding motion. This is facilitated by pilots, as many mechanical feeding mechanisms incorporate a unidirectional locking device that prevents the workpiece from moving backward. The design employs an indirect pilot system, which is engineered to engage with pre-pierced holes in the strip located at a distance from the blanking punches. This approach enhances support beneath the workpiece, effectively minimizing the risk of distortion during operations.

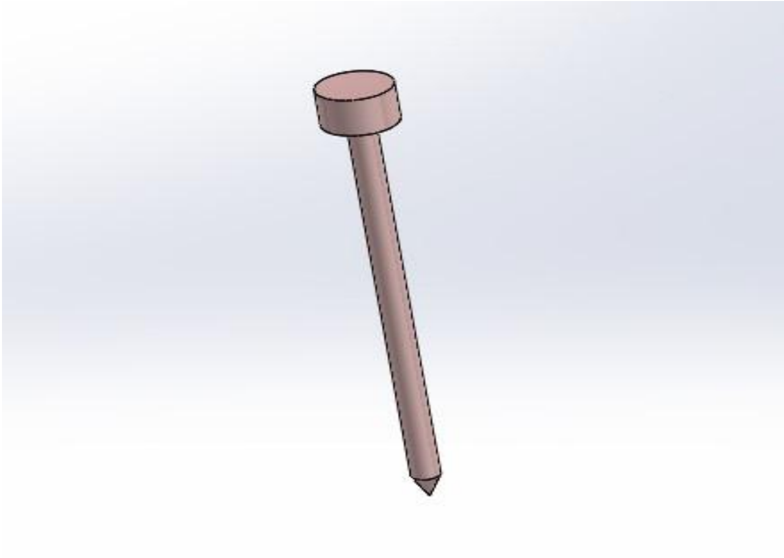


Fig 7: Pilot Punch
Fig 7 designed by SolidWorks Cad.

3.2.5 Bending Punch

This design primarily depends on the area to be pierced or blanked, as well as the pressure needed to penetrate the sheet metal. The punch is securely bolted directly to the punch holder of the die set, and it is specifically designed to endure the maximum blanking pressure. A pedestal punch is utilized in this design, fixed in place using screws and dowels. The key advantage of this die lies in its simplicity and cost-effectiveness in construction. It is designed with a sufficiently large surface area to accommodate the screws and dowels, which are positioned at a distance twice the diameter of the dowel from the cutting edge, ensuring stability and precision during operations.

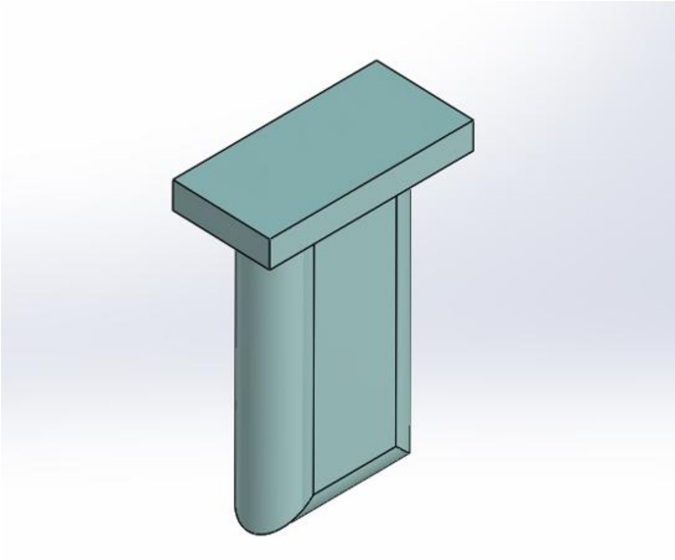


Fig 8: Bending Punch

Fig 8 Designed by SolidWorks Cad.

3.2.6 Stripper plate

The primary function of this component is to remove scrap from the punch after a blanking operation while also guiding the punch or assisting with the sheet metal pressing. In this design, a channel stripper is incorporated, featuring a groove milled through which the strip is passed. The stripper consists of a rectangular plate mounted on top of the die block. Considering the requirements of high-volume production, S50C material is selected for its durability and suitability for the demanding operational conditions.

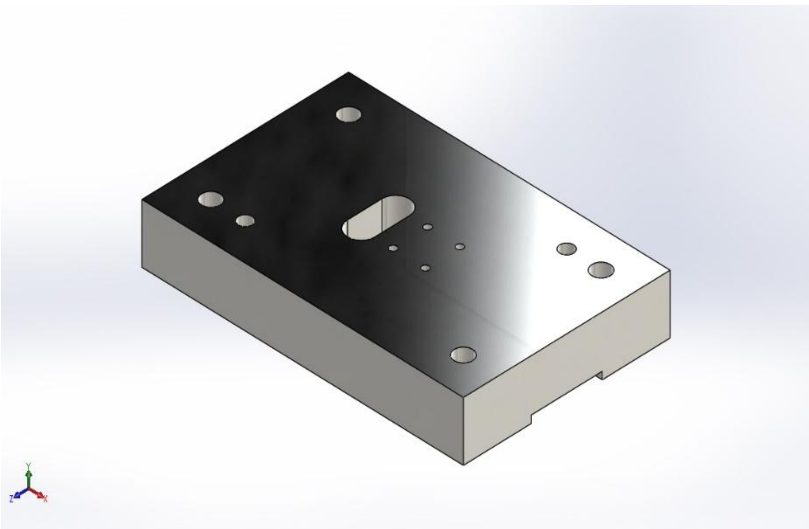


Fig 9: Stripper Plate

Fig 9 designed by SolidWorks Cad.

3.2.7 Assembly

The assembled parts constitute the press tool for production of steel brackets for GI pipes and electrical cabling supports as shown in the figure below.

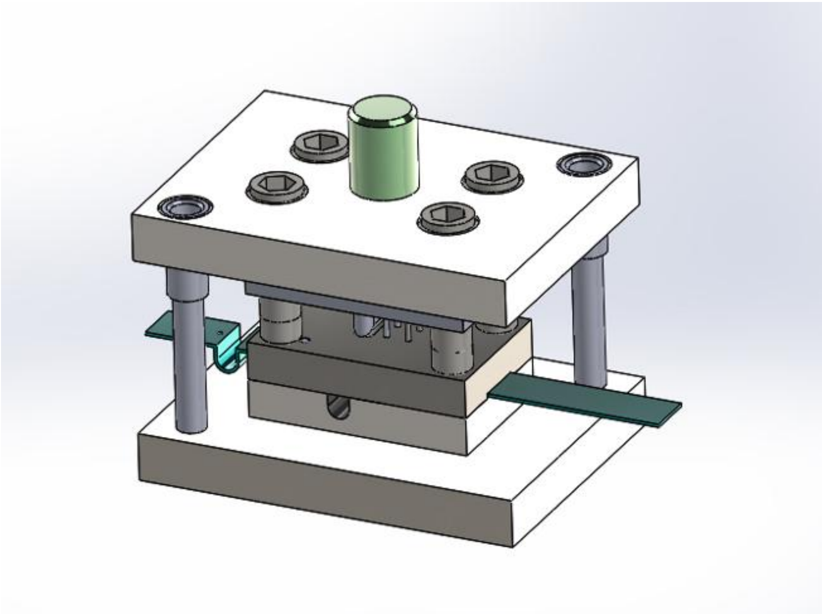


Fig 10: Overall Assembly

Fig 10 designed by SolidWorks Assemble.

3.3 Calculations

3.3.1 Bending Forces

This is dependent on the thickness of the strip layout.

$$F_B = \frac{c\ x\ W\ x\ S_u x\ t^2}{L}$$

$$Where\ c = 0.33$$

$$L = Width\ of\ the\ die\ opening\ (mm)$$

$$W = width\ of\ the\ strip\ layout\ (mm)$$

$$S_u = Tensile\ strength\ of\ the\ steel\ (Kgmm^{-2})$$

$$= \frac{0.33\ x\ 510\ x\ 31\ x\ 2^2}{7} = 2981.3143N$$

3.3.2 Press Tonnage

$$= 2981.3143 + 18900 = 191981.3143N$$

$$= \frac{191981.3143}{9964.016} x\ 1T = 19.2675\ Tone\ \approx 20\ Tone$$

3.3.3 Die Plate

$$Land\ of\ the\ die = 2t$$

$$= 1.5\ x\ 2 = 3mm$$

3.3.4 Thickness of the die block

$$T_d = \sqrt[3]{F_s}$$

$$T_d = Thickness\ of\ die$$

$$F_S = Shear\ force\ (Kg) = 2700\ kg$$

$$T_d = \sqrt[3]{27000} = 30\ mm$$

3.3.5 Deflection and stresses

Assuming that the die plate is a fixed beam, the deflection should therefore be less than 0.025.

$$\delta = \frac{FL^3}{192EI}$$

$$I = \frac{bh^3}{12}$$

$$Where\ \delta = Deflection$$

$$F = 80\%\ of\ the\ cutting\ force\ in\ the\ vertical\ direction$$

$$E = Elastic\ modulus\ of\ steel = 210000\frac{N}{mm^2}$$

$$I = Moment\ of\ inertia\ of\ the\ block$$

$$b = breadth = 180\ mm$$

$$h = height = 30\ mm$$

3.3.6 For the block:

$$F = \frac{80}{100}\ x\ 27000 = 21600N$$

$$I = \frac{180\ x\ 30^2}{12} = 405000\ mm^4$$

$$\delta = \frac{21600\ x\ 240^3}{192x210000\ x\ 405000} = 0.018\ mm$$

0.018
$< 0.025\ and\ that\ is\ within\ the\ allowable\ deflection\ limit\ therefore\ the\ block\ is\ fail\ safe.$

3.3.7 Stress Calculations:

$$\sigma = \frac{F}{A}$$

$$F = Force\ applied = 21600N$$

$$= \frac{21600}{110\ x\ 30} = 6.54 \frac{N}{mm^2}$$

3.3.8 Backing Plate

Thickness of the backing plate, $T_b = 1.5T_d$

$$Where\ T_d = Thickness\ of\ the\ die$$

$$T_b = 1.5\ x\ 30mm = 45\ mm$$

$$Deflection, \delta = \frac{5FL^3}{354EI}$$

$$I = \frac{bh^3}{12}$$

$$F = \frac{80}{100} x\ 189000 = 151200N$$

$$L = Distance\ between\ the\ screw = 110\ mm$$

$$b = 240\ mm$$

$$h = 45\ mm$$

$$I = \frac{240\ x\ 45^3}{12} = 1822500\ mm^4$$

$$\delta = \frac{5\ x\ 151200\ x\ 110^3}{354\ x\ 210000\ x\ 1822500} = 0.0072\ mm$$

$$0.0072 < 0.025\ thus\ fail\ safe$$

$$\sigma = \frac{F}{A} = \frac{151200N}{110\ x\ 45} = 30.545 \frac{N}{mm^2} < 210000 \frac{N}{mm^2}$$

3.3.9 Top Plate

Thickness of the top plate, $T_t = 1.25T_d$

$$T_t = 1.25\ x\ 30 = 37.5 = 38\ mm$$

3.3.10 Punch plate

Thickness of the punch plate,

$T_p = 0.5\ T_d$

$$T_p = 0.5\ x\ 30 = 15\ mm$$

3.3.11 Stripper Plate

Thickness of the stripper plate:

$$T_s = 0.75\ x\ T_d$$

$$T_s = 0.75\ x\ 30 = 22.5\ mm = 23\ mm$$

3.3.12 Top Half of the die block

$$\delta = \frac{FL^3}{48EI}$$

$$F = \frac{80}{100} x\ 189000N = 151200\ N$$

$$L = 110\ mm; b = 240\ mm; h = 30\ mm$$

$$I = \frac{240\ x\ 30^3}{12} = 540000\ mm^4$$

$$\delta = \frac{151200\ x\ 110^3}{48\ x\ 210000\ x\ 540000} = 0.037\ mm > 0.025\ mm$$

The deflection is greater than 0.025 mm and thus the height should be increased to make it fail safe. If the height is increased by 5mm to 35mm then:

$$I = \frac{240\ x\ 35^3}{12} = 857500\ mm^4$$

$$\delta = \frac{151200\ x\ 110^3}{48\ x\ 210000\ x\ 857500} = 0.023\ mm < 0.025\ mm$$

$$\sigma = \frac{F}{A} = \frac{151200N}{110\ x\ 35} = \frac{39.27N}{mm^2} < 210000\frac{N}{mm^2}$$

3.3.13 Guide pillar

$$Strength\ of\ dteel = 330\frac{N}{mm^2}$$

$$E = 210000\frac{N}{mm^2}$$

$$L_e = Equivalent\ length = 2L = 2\ x\ 120\ mm = 240\ mm$$

$$I = \frac{\pi D^4}{64} = \frac{\pi\ x\ 20^4}{64} = 7853.98\ mm^4$$

$$\gamma_g = \sqrt{\frac{I}{A}}$$

$$\gamma_g = Radius\ of\ gyration$$

$$= \frac{\sqrt{7853.98}}{\frac{\pi\ x\ 20^4}{4}} = 4.999 = 5mm$$

$$S_R = \frac{L_e}{\gamma_g}$$

$$SR = Slenderness\ ratio$$

$$= \frac{240}{5} = 48\ mm$$

$$TSR = \sqrt{\frac{2\pi^2 E}{240}}$$

$$TSR = Transition\ slenderness\ Ratio$$

$$= \sqrt{\frac{2\pi^2 X\ 210000}{240}} = 131.422$$

3.3.14 Critical Buckling load

$$F_{CR} = A\left(S_y - \frac{S_y^2}{4\pi^2 E}\left(\frac{L_y}{\gamma_y}\right)2\right)$$

$$A = \frac{\pi\ x\ 20^2}{4} = 314.16\ mm^2$$

$$F_{CR} = 314.16\left(240 - \frac{240^2}{4\pi^2 E}(5)(2)\right) = 75376.57N$$

$$75376.57N < 189000\ N\ thus\ fail\ safe$$

3.3.15 Punch

$$F_{CR} = 2\pi^2 E L_{\min}$$

$$L_{\max} = \sqrt{\frac{2\pi^2 E L_{\min}}{P}}$$

$$= \sqrt{\frac{2\ x\ \pi^2\ x\ 210000\ x\ 30}{3000}} = 203.60\ mm$$

$$I = \frac{\pi D^4}{64}$$

$$I = \frac{\pi\ x\ 3^4}{64} = 3.9761\ mm^4$$

Buckling load

$$\gamma_g = \sqrt{\frac{I}{A}} = \sqrt{\frac{3.9761}{7.0685}} = 0.75\ mm$$

$$SR = \frac{L_e}{\gamma_g} = \frac{58\ x\ 2}{0.75} = 154.6667$$

$$TSR = \sqrt{\frac{2\ x\ \pi^2\ x\ 210000}{240}} = 131.422$$

Using Euler's equation for the critical force:

$$F_{cri} = \frac{\pi^2 EI}{L^2}$$

$$= \frac{\pi^2\ x\ 210000\ x\ 3.9761}{58^2} = 2445.9837N < 189000N$$

The critical force is much less than 18,900 N and thus the punch is fail safe.

3.4 Working Mechanism

The press tool is driven by a reciprocating stamping press mechanism that moves up and down allowing the top die to move with it and the work piece, strip layout to feed. The strip layout, in this case the stainless-steel workpiece is fed in to the slot between the stripper plate and Die plate. The Shank is then activated and moves up and down to carry out the bending, blanking and punching operations. The Blanking punch, with each applied force in the vertical lowered position creates a bend that is as per the slot design and configurations. The Pilot punches do the punching according to the force and design requirement. In this case, 4 Pilot punches blank holes onto the workpiece and one bend is also created.

The press tool designed incorporates multiple stations each performing a certain operation with the same applied force, hence achieving high production efficiency with shorter testing and tool setup time, as well as reduced maintenance requirement. The press tool, as compared to other press tools performing the same task operate much faster by reducing material handling costs and as such more suitable for mass production of machine components.

4. Static structural analysis

The FEA method was used in CAD to assess the stresses, strain, displacement, and induced forces within the components. By subjecting the components to various forces and conditions, the analysis calculates the developed stresses and strains using structural analysis (A, 2011). This method was applied to the major components of the press tool, including the blanking punch, stripper plate, die plate, and the overall assembly, to evaluate their performance and ensure they can withstand the operational loads and conditions they will encounter.

4.1 Von Misses Stress

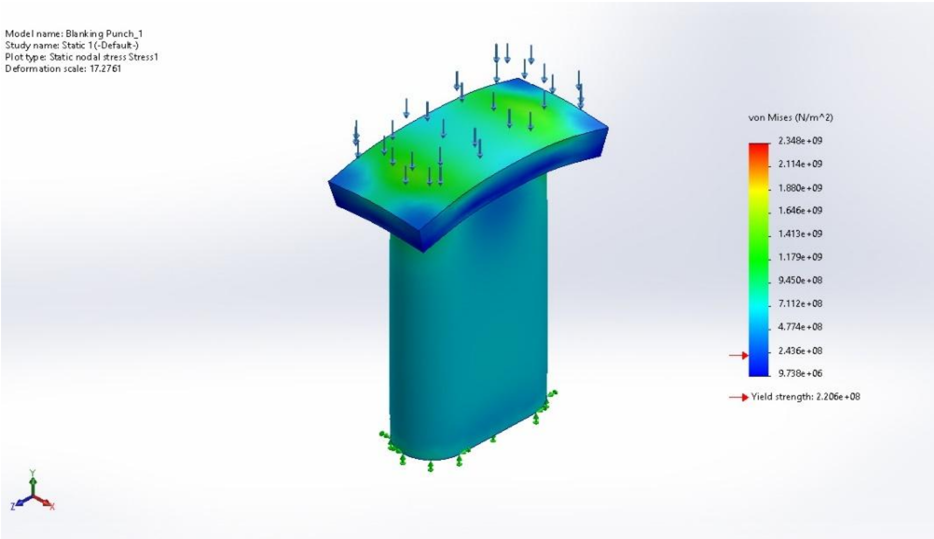


Fig 11: Bending Punch Von Mises Stress

Fig 11 done by SolidWorks simulation.

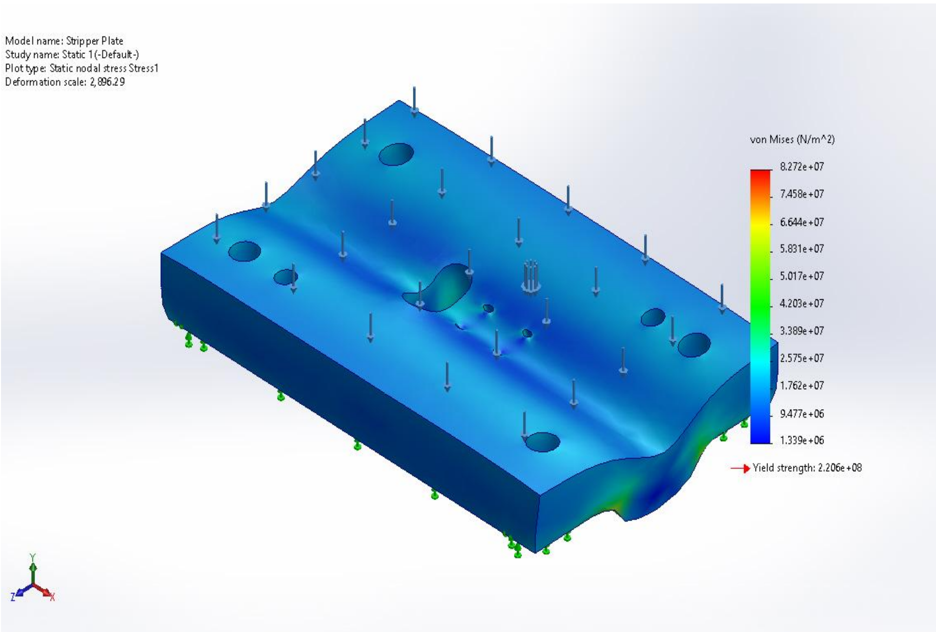


Fig 12: Die Plate Von Mises Stress

Fig 12 done by SolidWorks simulation.

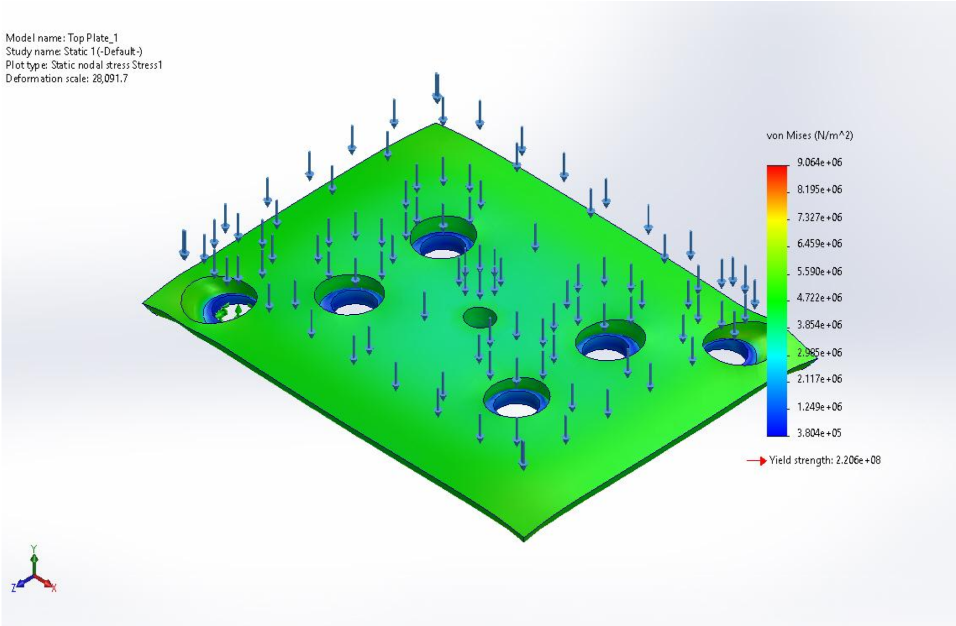


Fig 13: Top Plate Von Mises Stress

Fig 13 done by SolidWorks simulation.

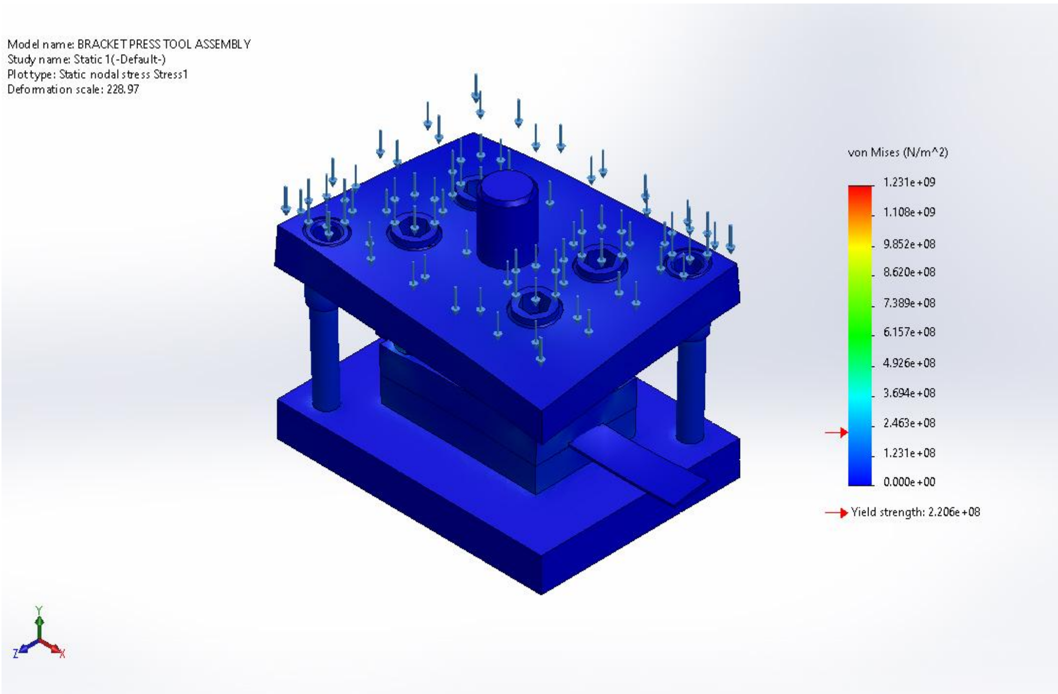


Fig 14: Press Tool Von Mises Stress

Fig 14 done by SolidWorks simulation.

4.2 Displacement

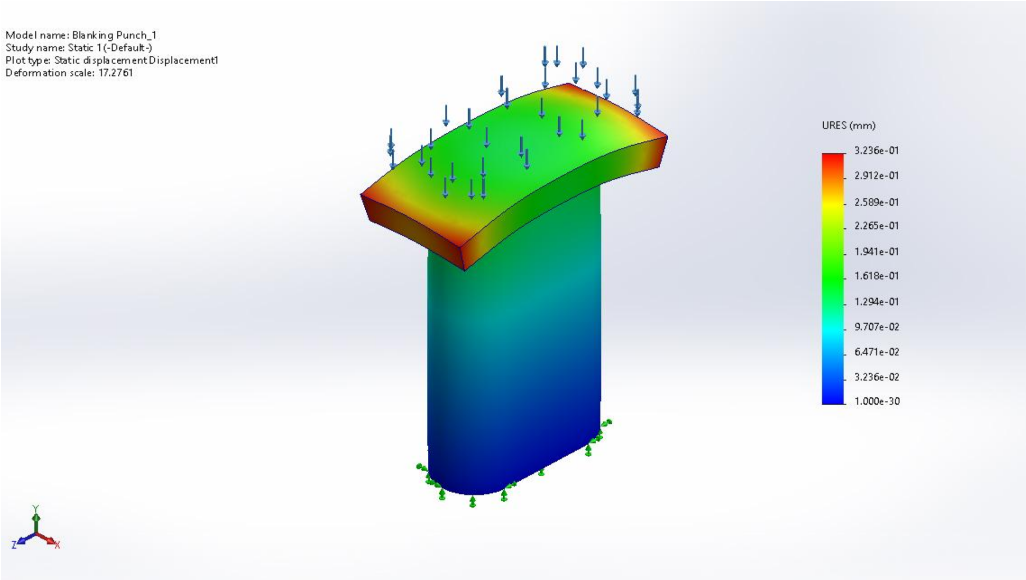


Fig 15: Bending Punch Displacement Result

Fig 15 done by SolidWorks simulation.

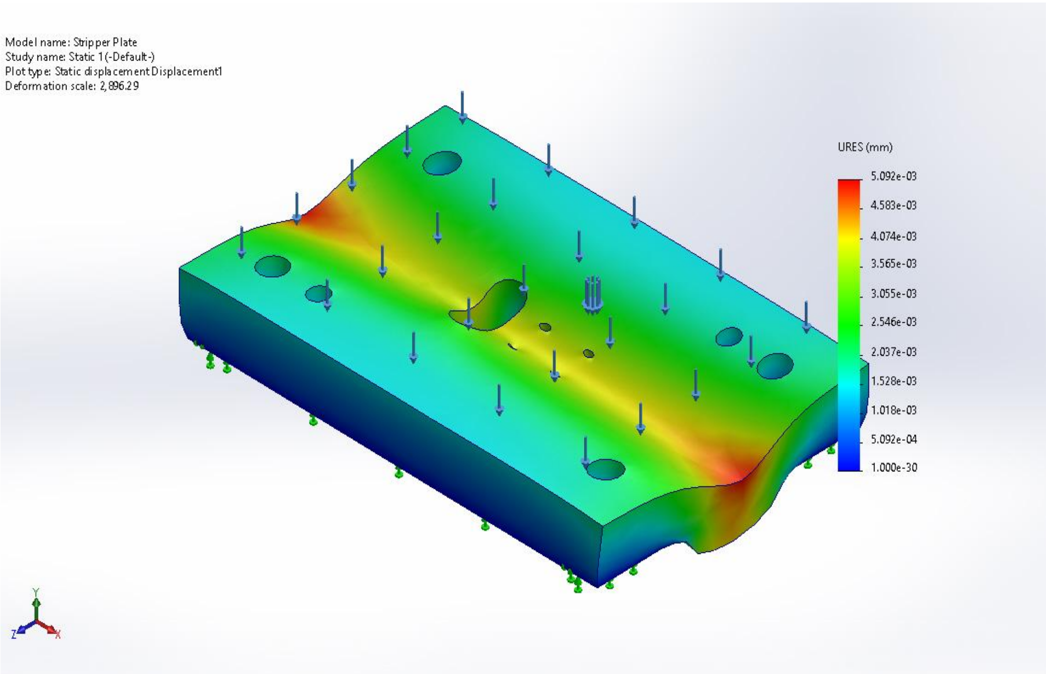


Fig 16: Die Plate Displacement Result

Fig 16 done by SolidWorks simulation.

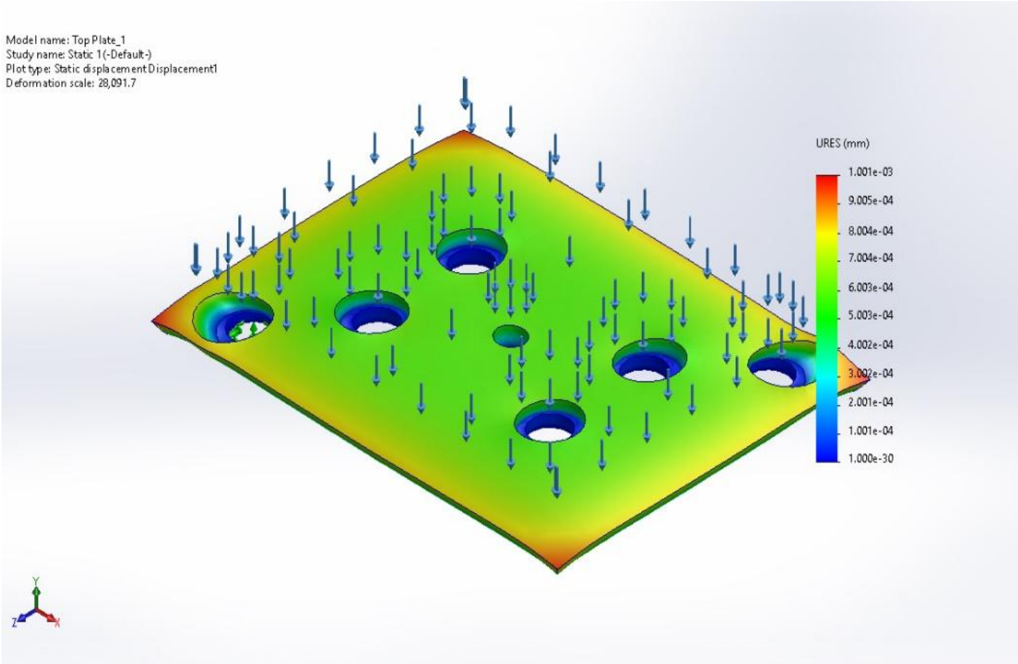


Fig 17: Top Plate Displacement Result

Fig 17 done by SolidWorks simulation.

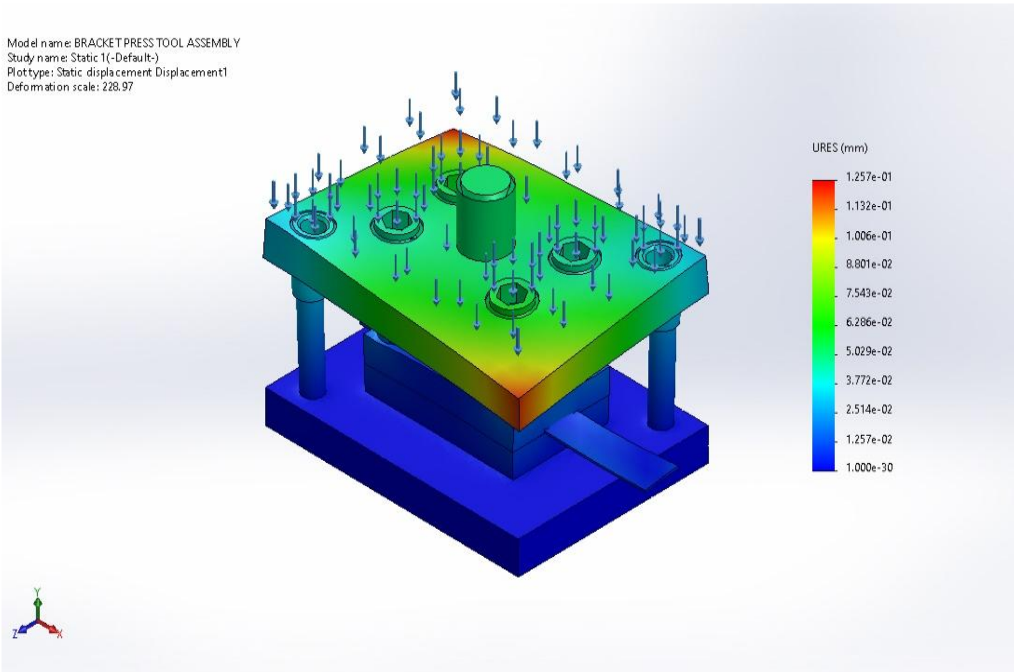


Fig 18: Press Tool Assembly Displacement Result

Fig 18 done by SolidWorks simulation.

4.3 Strain

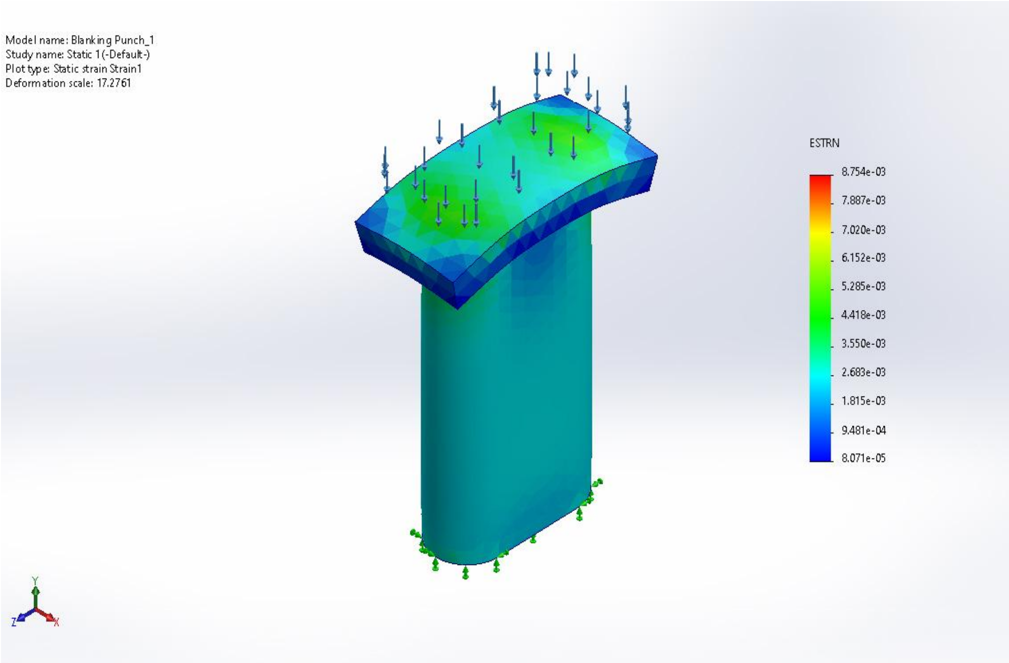


Fig 19: Bending Punch Strain Result

Fig 19 done by SolidWorks simulation.

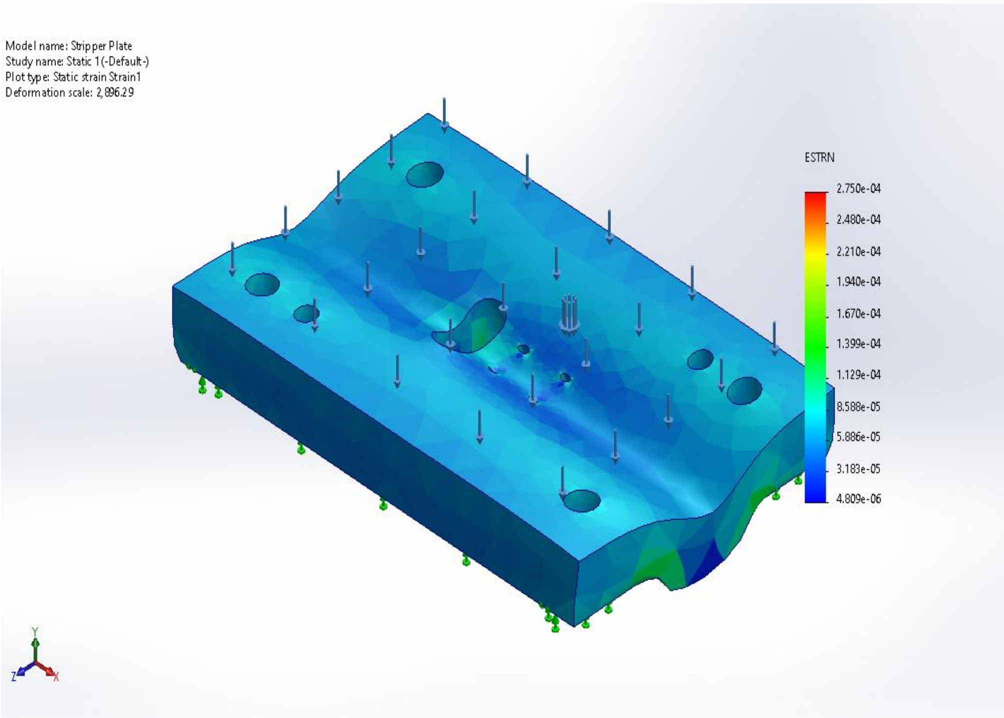


Fig 20: Die Plate Strain Result

Fig 20 done by SolidWorks simulation.

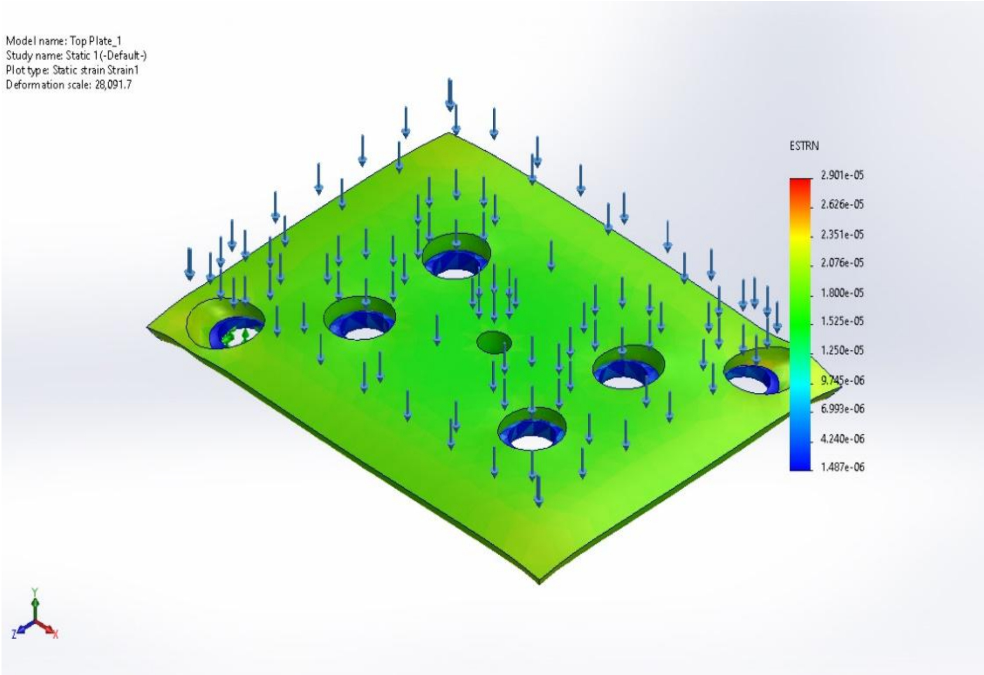


Fig 21: Top Plate Strain Result

Fig 21 done by SolidWorks simulation.

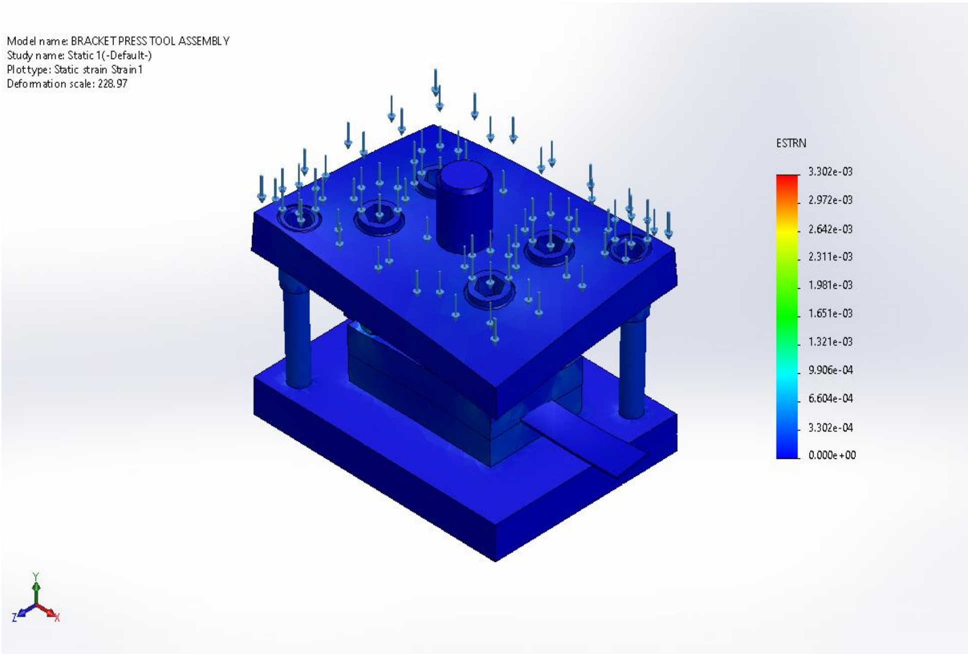


Fig 22: Press Tool Assembly Strain Result

Fig 22 done by SolidWorks simulation.

5.Results and discussion

The CAD model of the press tool prototype was one of the steps in the design process for producing support brackets. Additional critical steps included calculating the forces that the designed parts could withstand. This involved identifying the major components, such as the die, pilot punch, bending punch, and dies, which were responsible for transforming the 2 mm plate into the final product. Based on the calculations of each individual component, it was determined that all parts could withstand the applied forces, as the deflection in each component was significantly less than 0.025, ensuring that the press tool components were fail-safe.

Further calculations, including the buckling load, confirmed that the force required to cause buckling was much greater than the applied force, providing additional assurance that the tool was fail-safe and could endure significantly higher forces than anticipated. Additionally, the FEA performed in SolidWorks confirmed that neither the individual components nor the fully assembled tool would fail under operational conditions. This analysis was visually represented through color coding in the FEA, where red indicated areas experiencing the highest forces, and green highlighted regions that were least affected, clearly demonstrating the force distribution and confirming the tool's reliability.

6. Conclusion

The design of the press tool for the production of support brackets was successfully achieved, fulfilling the main objective of the project. The calculations and finite element analysis conducted in response to the applied forces demonstrated that the tool would be fail-safe. The structural analysis of the press tool revealed an overall deflection of 0.0125 mm and a maximum stress of 1.231 E+9 N/m², which is significantly higher than the 2E+5 N/m² stress limit for stainless steel, further confirming the tool's fail-safe design.

Compliance with Ethical Standards-

The author, Abdullah Al Hossain Newaz, University of Bridgeport, Mechanical Engineering, declares that there are no conflicts of interest related to this publication.

This research did not involve human participants or animals.

This study did not involve human participants, and therefore, informed consent is not applicable.

Declarations

Availability of data and material

The data and materials used in this study are available upon reasonable request from the corresponding author.

Funding

This research received no specific grant from any funding agency, commercial, or not-for-profit sectors.

Authors' contributions

Abdullah Al Hossain Newaz conceptualized and designed the study, performed the experiments, and analyzed the data. He also contributed to manuscript writing and revisions. The author has reviewed and approved the final manuscript.

Acknowledgements

The author would like to express gratitude to Prof. Zheng li for his support and guidance during this research.

The author, Abdullah Al Hossain Newaz, University of Bridgeport, Mechanical Engineering, declares that there are no conflicts of interest related to this publication.

This research did not involve human participants or animals.

This study did not involve human participants, and therefore, informed consent is not applicable.

References

[1] Mastanamma, C. (2012). Design and analysis of progressive tool. *IJERT*. https://doi.org/10.17577/IJERTV1IS6067

[2] Eugene, O. (2017). Design, Analysis and Manufacturing of a Set of Stage Tools for sheet metal component for a Panel Back Outer Rear Back Floor. *Irjet*. https://www.academia.edu/34644250/Design_Analysis_and_Manufacturing_of_a_Set_of_Stage_Tools_for_sheet_metal_component_for_a_Panel_Back_Outer_Rear_Back_Floor

[3] Konnerth, U. (2001). A hydraulic high-speed tryout press for the simulation of mechanical forming processes. *Journal of Materials Processing Technology*, *111*(1–3), 159–163. https://doi.org/10.1016/s0924-0136(01)00502-7

[4] Ong, S., De Vin, L., Nee, A., & Kals, H. (1997). Fuzzy set theory applied to bend sequencing for sheet metal bending. *Journal of Materials Processing Technology*, *69*(1–3), 29–36. https://doi.org/10.1016/s0924-0136(96)00035-0

[5] Palanisamy, P. (2022). *Design and fabrication of multiple press tools for sheet metal operation*. Unknown. https://www.researchgate.net/publication/365208528_Design_and_fabrication_of_multiple_press_tools_for_sheet_metal_operation

[6] Parmar, A. (2017). *A Review on Process of Press Tool Design and its Manufacturing*. Unknown. https://www.researchgate.net/publication/327529861_A_Review_on_Process_of_Press_Tool_Design_and_its_Manufacturing

[7] Prasada, R, and Dr M. Venkateswara, R. (2019). *IRJET- Design and Analysis of Progressive Tool for U-Bracket of Power Meter Cabinet* [Slide show]. SlideShare. https://www.slideshare.net/irjetjournal/irjet-design-and-analysis-of-progressive-tool-for-ubracket-of-power-meter-cabinet

[8] Subrahmanyam, N. M., & Mokhalingam, N. A. (2016). Design and analysis of press tool to produce radiator stay bracket. *International Journal of Engineering Research And*, *V5*(06). https://doi.org/10.17577/ijertv5is060802

[9] What is Press Machine - 8 Different Types of Press Machines

[10] https://rajeshpowerpressindia.com/what-are-the-types-of-press-machines/

Citation: Abdullah Al Hossain Newaz, Refat Jahan. (2025). Design and Simulation of Press Tool for Manufacturing Bracket Supports. International Journal of Mechanical Engineering and Technology (IJMET), 16(4), 27-51.

Abstract Link: https://iaeme.com/Home/article_id/IJMET_16_04_003

Article Link:
https://iaeme.com/MasterAdmin/Journal_uploads/IJMET/VOLUME_16_ISSUE_4/IJMET_16_04_003.pdf

editor@iaeme.com