Figure 3.5. A modern console decorated with traditional mother-of-pearl mosaics

Figure 3.6. A modern table decorated with traditional mother-of-pearl mosaics

Some opinions are concerned that the "industrialization" of mother-of-pearl mosaic materials will reduce its value. However, it can be analyzed to show that mother-of-pearl mosaic products are always artistic and unique because the beauty of the mother-of-pearl mosaic technique takes advantage of the unique uniqueness of colors and nacre patterns. on snail shells, mussel shells... It can be seen that, on the same product or on many products of the same type, there are no products that are 100% identical. That is a special characteristic of handmade products and is even more evident with mother-of-pearl mosaic art. Thus, the unique value of mother-of-pearl inlay depends on the nature of the pattern (uniqueness of non-duplication) of the mother-of-pearl pattern rather than on the manufacturing technique.

From the above characteristics of mother-of-pearl, in addition to mass production, it is possible to exploit the unique element focusing on luxury customers, design new decorative motifs, create unique shapes according to customer requirements. Natural patterns are never duplicated, the inherent uniqueness of mother-of-pearl patterns along with the design create a unique beauty from each piece of material.

Conclusions: In recent years, emphasis has been placed on exploiting tradition in modern interior design, so mother-of-pearl inlaid materials have high and effective applicability. In particular, the application of mother-of-pearl inlay to interiors by innovating material technology and production processes makes mother-of-pearl inlay more user-friendly, easier to construct, and minimizes production steps. Furthermore, this approach will certainly contribute to creating jobs for workers in craft villages, promoting economic efficiency for the country as well as promoting the traditional cultural values of craft villages that are facing many difficulties./.

References

1. *Henri Gourdon (Trương Quốc Toàn dịch), Nghệ thuật xứ An Nam, Nxb Thế giới & Nhã Nam, 2017.*
2. *Sylvie Fanchette, Nicholas Stedman, Khám phá các làng nghề, 2020.*
3. *Chu Quang Trứ, Tìm hiểu các nghề thủ công điêu khắc cổ truyền, Nxb Mỹ thuật, 2000.*
4. *Bộ Khoa học và Công nghệ, Tiêu chuẩn Việt Nam TCVN 10772-1:2015 – Tiêu chuẩn quốc gia về Đồ nội thất, 2015.*
5. *Bộ Khoa học và Công nghệ, Tiêu chuẩn Việt Nam TCVN5373:2020 – Tiêu chuẩn quốc gia về Đồ gỗ nội thất, 2020.*
6. *PGS.TS.KTS. Vũ Hồng Cương, Chất cảm vật liệu trong nội thất nhà ở (2018), Tạp chí kiến trúc, Số 08-2018, Tr 36-40.*
7. *James E Patterson, Pearl Inlay: An instruction manual for inlaying abalone and mother-of-pearl, published by Stewart-MacDonald, 2014.*
8. *Ken Horner, Basic Marquetry and Beyond: Expert Techniques for Crafting Beautiful Images with Veneer and Inlay, Linden Publishing, 2015.*

History and ways to carry out the process of monotype

Le Thi Thanh

Abstract

Monotype (monoprint) is a unique print made by pressing paper against a painted or inked surface have inks but the pigment on the plate is usually insufficient to make another print. A monotype is a single impression from a printing surface that cannot be reused, the monotype is an intriguing hybrid among printmaking techniques. It is nei ther a print nor a painting but a unique combination of both. The method is ap tly named because it is one image (mono), painted or drawn with oil paint, water-based paint, or printer's ink directly on a plate and then transferred to paper. The impression can be transferred by hand rubbing (with a rubbing tool or the hand), particularly if the work is painted on glass. Hand rubbing produces sensitive results on Vietnam Do paper. A monoprint, on the other hand, des ignates a special, often one-of-a-kind. This article is an overview of the development history and some monotype methods at printing factories from the past to present.

Key words: monotype/ monoprint, printing, plastic, technique, ink...

Dr. Le Thi Thanh
Department of Art Design
TEL: 0915468065
Email: lethanh0681@gmail.com

Date of receipt: 9/4/2024
Editing date: 17/6/2024
Post approval date: 04/11/2024

1. Ask a problem

The monotype can be classified as a work produced from transient and unprocessed surfaces such as glass, plastic, gel. Purpose the work produced is singular.

This technique follows the printmaking template of reproducing images from one surface to another using ink and more closely pressure the marks made and the associated with painting. Printmaking is traditionally va medium that allows the production of multiple copies or the edition of the image from the initial plate, block, stone, or screen. In contrast, the monotype allows pull of the original image

In order to counteract the natural bias of the dominant hand and create a surprise when the print is completed, classical painters introduced a way to print monocopies. They are studying the unfinished painting in a mirror. Because the unique style will create an inverted shape of the original image.

Monotype is the same as Fine Art, direct and flexible in the prints that you can get. The prints can be created with various things that can be found inside your house like toothbrush, wiper or anything else which you want the texture from it. There's a lot of ways to create the details on the printing surface and it can be done quickly or slowly, in detail. The drying speed will depend on the printing ink. Special impressions can be captured in a monoctype.

2. History of monotype

Monotype printing first appeared in the 15th century. Some people said that, Giovanni Benedetto Castiglione (1616 – 1670), a master artist, experienced with this technique. His remain artworks mostly refer to religion. He first put color on the piece of metal, then printed it onto a paper. Because monotype printing involves transferring ink from a plastic in to a piece of sheet, so any surface which has ink on it will transfer itself and create the unique technique. Rembrandt (1606 – 1669) also tried to make his own portrait with monotype technique.

Degas has used the monotype printing technique from 1875 to 1885, in "The

Self-portrait, monoprint, Benedetto Castiglione

Self-portrait, monoprint, Rembrandt

Hong y Family, monoprint, Degas

Self-portrait, monoprint McNeill Whistler

Monoprint, Mary Cassatt

Two women, monoprint, Gauguin

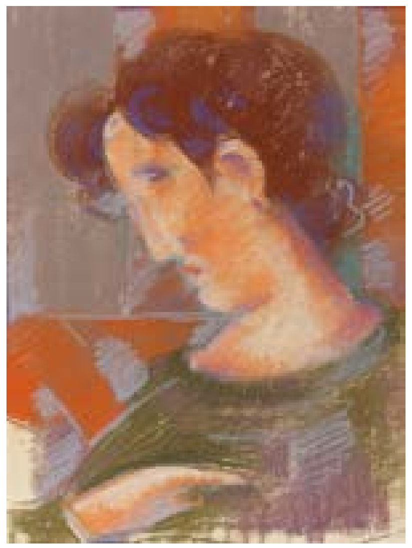
A woman washing her feet at the edge of the stream, monoprint, Pissarro

Cardinal Family", he used India ink to draw directly on the surface of plastic, paint thinly, handling the ink with a rag, brush or hand to create a rich picture of timbre and atmosphere.

Monotype printing in the world of art are said to be between Fine Art and Printing. Famous European and American artists such as Whistler (1834–1903), Mary Cassatt (1844–1926) and Gauguin (1848-1903) had many experiences with this art [1,tr.248-249].

There are many ways to create monotype prints. Mary Cassatt, Degas, Whistler and Pissarro (1831–1903), made several monoprints in 1894-1895 in their style, using rags

Monoprint, Matisse



Monoprint, Oskar Schelemmer

Self-portrait, monoprint, Frank Duveneck

and broad brushstrokes to adjust the pigments. Gauguin used watercolor on glass to create his unique works, as did Oskar Schlemmer (1888–1943), who created 25 freehand drawings on glass. Matisse made a series of monoprints in 1914 [2, tr.229].

Some American Artists has adopted monotype printing in the last 19th Centuries, Frank Duveneck (1848 – 1919) and Maurice Prendergast (1859 – 1924). The work of printing art from Japan affected a lot to Prendergast, so he create more than 200 monoprint scenario pictures with water color.

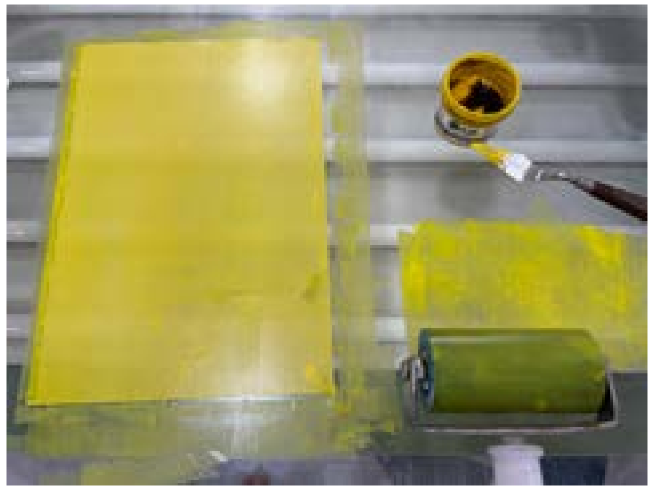
Stencil, collage, reliefs technique... are combined to create an interesting effect of monotype prints. The nature of monotype printing give the modern artist to be able to improvise in the creative process which are both versatile and expressive.

Monoprint, monoprint, Maurice Prendergast

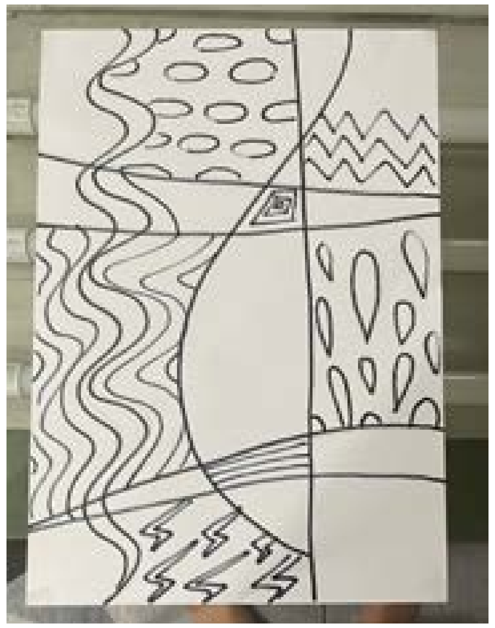
3. Ways to carry out the process of monotype

Step 1: Preparation printing

The first: Preparing the required amount of ink by rolling an even layer of color onto a sheet of plexiglass, plastic or flat glass. It is recommended to mix the slow-drying filler with squid to slow down the drying time [3, tr.372].



The first: Rolling an even layer of color onto a sheet of plexiglass, plastic or flat glass



The second:The main drawing of the image is attached to the drawing board with adhesive tape

The top plastic sheet has been coated with a thin yellow

The second color is bright red

The third and final plastic sheet is rolled color with cyan ink

The yellow ink that has transferred to the paper.

The second: The main drawing of the image is attached to the drawing board with adhesive tape, and it is necessary to reverse if the final print is required to be the same as the original drawing. Prepare 3 pieces of plastic cut to the same size glued on the drawing [3, tr.373].

Step 2: Brush ink color onto 3 plastic sheets

- The fist plastic sheet has been coated with a thin yellow layer, enough to easily reveal the sketch underneath. The ink is removed with wipes, cotton swabs, brushes... to create an array and ready for printing [3, tr.373].

- The second color is bright red which is rolled over the plastic sheet and produces the same print as the previous yellow color [3, tr.373].

- The third and final plastic sheet is rolled color with cyan ink, and shaped similarly to the above 2 colors with rags, paper towels, cotton swabs and brushes. Removed ink sections will produce empty arrays in the final print or will allow color to show up from the next two prints [3, tr.374].

Step 3: Print for monotype

- The moistened printing paper is carefully placed on top of the first plastic sheet, making sure to place the corner of the paper into the corner of the plastic sheet. Printing works best if there are two people to support each other [3, tr.374].

- The print and paper are rolled through the printer, then lifted up to reveal the gold ink that has transferred to the paper. Now you can remove the yellow plastic [3, tr.374].

- The red plate is folded next to overprint the paper to reveal the red top print on the yellow [3, tr.375].

- Finally, cyan plastic sheets are printed in the same way through a press. The cyan acetate plate is removed to reveal the finished print [3, tr.375].

There will be enough ink left on the plastic sheets to print them a second time, in the same order, on a freshly moistened sheet of craft paper. This will create a paler print, so it still be a standalone work because it cannot be the same as the first print. The second print should be done immediately after printing while the ink is still moist, which can do best with Akua's release agent. All prints after drying the ink must be pressed under the boards to flatten the printing.

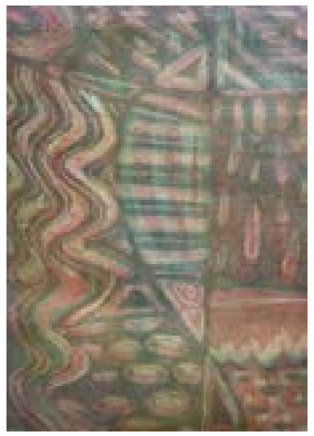
Note:

- Captioning conventions in prints: The international convention on prints is as follows: note in pencil a horizontal

The red plate to overprint the paper to reveal the red top print on the yellow

Finally, The cyan acetate plate is removed to reveal the finished print

The first monoprint



The second print

line, straight along the edges of the left and right edges of the monotype, items in order: number of prints (1/1 means yes only 1 print) material (monotype) size (..cm) title of monotype ("...") name and signature of artist and year of creation.

- Method of preserving and preserving the work: Storing in a closed room with an air conditioning system and a dehumidifier stable at 20-25 degrees (to prevent mold). After the printed dries, it should be placed in a frame glass (to prevent insect invasion) and hang it on the wall - a wall that is not exposed to direct sunlight or rain, is not an outside wall of

(xem tiếp trang 41)

Reflection, transmission of QP- wave at an imperfect interface between two transversly isotropic elastic half-spaces

Do Xuan Tung [(1)]

Abstract

This work is concerned with the reflection and transmission of quasi-P wave incident at an imperfect interface between two transversely isotropic elastic half-spaces. First, the characteristic equation in the transversely isotropic halfspace is derived. The form of the incident, reflected, and transmitted waves are given. The linear spring model is used to describe the imperfection of bonding behavior at the interface. Then, from the interface conditions for two cases (perfect and imperfect interface), the displacement and stress are required to be satisfied. Reflection, transmission coefficients (RTC) have been derived analytically for when a longitudinal displacement wave strikes an imperfect interface. Finally, numerical examples are provided to show the effect of the imperfect interface and incident angle on the reflection and transmission coefficients.

Key words: reflection, transmission, imperfect interface, transversely isotropic

[(1)] Assoc.Prof.Dr, Lecturer, faculty of civil engineering, Hanoi Architectural University,
Email: <Tungdx@hau.edu.vn>
Tel: 0984468136

Date of receipt: 25/9/2024
Editing date: 4/11/2024
Post approval date: 04/11/2024

1. Introduction

Reflection and transmission of a plane wave at the interface between two dissimilar media is a fundamental topic in many fields such as seismology, geophysics, earthquake engineering, nondestructive evaluation. As we know, when any of two dissimilar materials are bonded together, the interface cannot be perfectly bonded (imperfect interface) owing to various causes such as micro inhomogeneities, micro defects, micro debonding, etc. To the knowledge of the author, two models are usually proposed to describe the imperfect interface between the two solids. The one is spring model which is analyzed by Hashin [1]. In this model, the properties of the imperfect interface between the two solids can be characterized by the normal and tangential interfacial stiffnesses. The other is membrane model that is formulated by Rokhlin et al. [2]. A thin layer between two solids, where the thickness of the layer ($h \to 0$) denotes a certain magnitude related to imperfect equilibrium at the interface. The imperfect interface considered in these problems means that the stress components are continuous and small dis placement field is not. The values of the interface parameters depend upon the material properties of the medium. More precisely, jumps in the displacement components are assumed to be proportional (in terms of spring-factor-type interface parameters) to their respective interface components. The effects of interfacial imperfection on waves propagating in an isotropic elastic bimaterial have been analyzed by Rokhlin and Wang [2].

Generally speaking, in most of the above investigations, the research works involving the reflection, transmission of waves at imperfect interface have been rare in the published literature so far, to the best knowledge of the authors. Therefore, in this paper, the reflection and transmission problem at imperfect interface between two transversely isotropic elastic half-spaces is considered.

2. Basic equations

We consider homogeneous transversely isotropic elastic medium in such a way that planes of isotropy are perpendicular to x_3-axis. For a two-dimensional problem in which the plane wave is in the plane $x_1 x_3$, the components of strains $\varepsilon_{11}; \varepsilon_{13}; \varepsilon_{33}$ are related to the displacement field $u_1; u_3$ are given by

$$\varepsilon_{11} = u_{1,1}; \varepsilon_{33} = u_{3,3}; \varepsilon_{13} = \varepsilon_{31} = \left(u_{1,3} + u_{3,1}\right)/2 \qquad (1)$$

The constitutive relations can be written as [3]

$$\sigma_{11} = c_{11}\varepsilon_{11} + c_{13}\varepsilon_{33}; \sigma_{33} = c_{13}\varepsilon_{11} + c_{33}\varepsilon_{33}; \sigma_{13} = \sigma_{31} = 2c_{44}\varepsilon_{13} \qquad (2)$$

where $\sigma_{11}; \sigma_{13}; \sigma_{33}$ are the components of stress tensor and $c_{11}; c_{13}; c_{33}; c_{44}$ are characteristic constants of the transversely isotropic elastic material.

The motion equations in the absence of body force are simplified as [3]

$$\sigma_{11,1} + \sigma_{13,3} = \rho\ddot{u}_1; \sigma_{13,1} + \sigma_{33,3} = \rho\ddot{u}_3 \qquad (3)$$

where ρ is the mass density and superposed dot represents the temporal derivative and a comma in the subscript denotes the spatial derivative.

Substituting (2) into (4) and taking into account (1), we obtain the following field equations of a linear transversely isotropic elastic solid, namely

$$c_{11}u_{1,11} + c_{44}u_{1,33} + (c_{13} + c_{44})u_{3,13} = \rho\ddot{u}_1$$

where $\int_V D(\dot{\varepsilon})dV$ is the plastic dissipation power, the constraints (7) are the strain-displacement relations, kinematic boundary conditions, and the condition of positive external power.

We can restrict our attention to solutions with normalized external power by the condition

$$\int_V \bar{\mathbf{b}}\cdot\dot{\mathbf{u}}\,\mathrm{dV}+\int_V \bar{\mathbf{t}}\cdot\dot{\mathbf{u}}\,\mathrm{dS}=1 \qquad (8)$$

Then problem can be rewritten as

$$\alpha_{\lim}=\min\int_V D(\dot{\varepsilon})dV$$

$$\text{s.t.:}\begin{cases}\dot{\varepsilon}=(\nabla\dot{\mathbf{u}})_{sym} & \text{in} V\\ \dot{\mathbf{u}}=\mathbf{0} & \text{on } S_u\\ \int_V \bar{\mathbf{b}}\cdot\dot{\mathbf{u}}\,\mathrm{dV}+\int_V \bar{\mathbf{t}}\cdot\dot{\mathbf{u}}\,\mathrm{dS}=1\end{cases} \qquad (9)$$

3. FEM formulation and solving algorithm for limit analysis of beam

3.1. FEM formulation

The plastic disipation power of beam is as follows if we use the Von-Mises criteria:

$$D^p=\frac{2}{\sqrt{3}}\sigma_y\sqrt{\dot{\varepsilon}^{\mathrm{T}}\mathbf{D}\dot{\varepsilon}} \qquad (10)$$

Where

- σ_y is yield stress of material,
- vector of strain velocity $\dot{\varepsilon}=\left[\dot{\varepsilon}_{11}\ \dot{\varepsilon}_{22}\ \dot{\gamma}_{12}\right]^T$

$$\mathbf{D}=\begin{bmatrix}1 & 1 & 0\\ 1 & 1 & 0\\ 0 & 0 & 1/2\end{bmatrix} \qquad (11)$$

If the finite element method is used, the FEM discretized form of the deterministic formulation of the upper bound load factor α-

$$\alpha^+=\min\sum_{i=1}^{NG}\sqrt{\frac{2}{3}}\sigma_y\sqrt{\dot{\varepsilon}_i^T\mathbf{D}\dot{\varepsilon}_i}$$

$$\text{s.t.:}\begin{cases}\dot{\varepsilon}_i-\hat{\mathbf{B}}_i\dot{\mathbf{u}}=\mathbf{0} \quad i=1,..NG\\ \sum_{i=1}^{NG}\dot{\varepsilon}_i^T\sigma_i^E-1=0\end{cases} \qquad (12)$$

In which NG is the total number of Gauss points on the beam.

3.2. Upper bound algorithm for problem of limit analysis of beams

Problem (12) is a nonlinear optimization problem, we can use Lagrange multiplier method to convert problem (12) into an unconstrained programming problem. After that we solve Karush – Kuln – Tucker of unconstrained programming to obtain the optimal solution. The reader may found the detailed algorithm in [2].

4. Example

Consider the beam subjected to a concentrated force as shown in figure 3, Let us compute the limit load acting on the beam. The length of beam L=4m, plastic moment of beam M_p=4kNm.

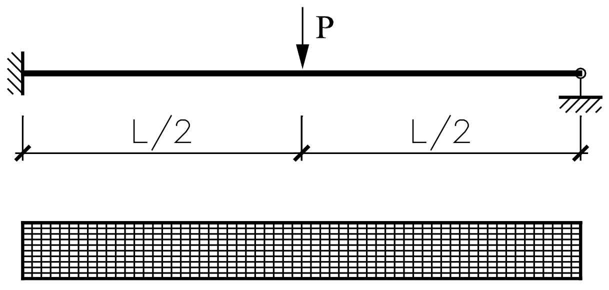


Figure 3. Beam subjected to a concentrate force and FE mesh

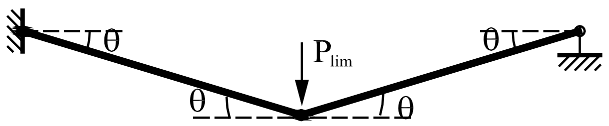


Figure 4. collapse mechanism of the beam

Analytical solution: At limit state as shown in figure 4, plastic dissipation energy is equal to external work, this lead to following equation:

$$\dot{W}_{in}=\dot{W}_{ext} \qquad (13)$$

In which:

$$\dot{W}_{in}=M_p.\theta+M_p.2\theta=3M_p.\theta\ ,\ \dot{W}_{ext}=\frac{P.L}{2}.\theta$$

From equation (13) we have

$$P=\frac{6M_p}{l}$$

Substituting the input numerical datas:

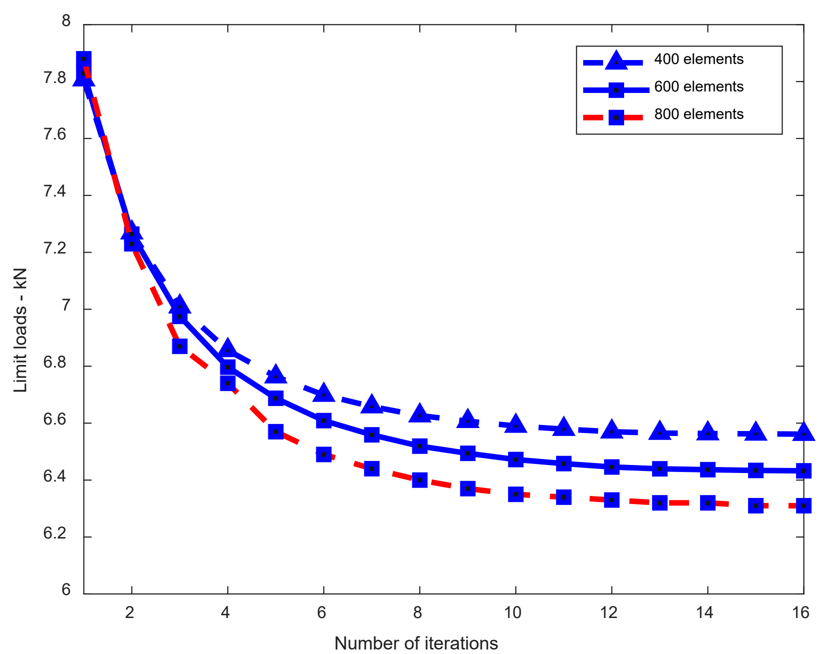


Figure 5. Convergence of limit loads

$$M_p=4kNm,\ l=4m \quad\rightarrow\quad P_{\lim}=6kN$$

FEM solutions: Beam is modeled by 400 rectangular finite elements, the algorithm which mentioned above give us limit load P =6.45 kN. If we increase the number of elements to 600 and 800 then the results are 6.36 kN and 6.25 kN, respectively. The results are listed in table 1.

Table 1. Results of analytical and numerical solutions.

Models	Limit load (kN)
Analytical	6
FEM - 400 elements	6.45
FEM - 600 elements	6.36
FEM - 800 elements	6.25

5. Conclusion

The paper presents direct methods to solve problem of limit analysis of beam which is made of elasto-plastic material. Upper bound method is illustrated with a problem of computing the limit load of beam. The numerical solutions shown that the result will reach to analytical solution when the number of elements are increased.

This approach can be extended to problem of limit analysis of frame, plate structures./.

References

1. *T.H.G. Megson, " Structural and Stress Analysis", third edition, Elservier 2014*
2. *Tran Ngoc Trinh, "Limit and Shakedown analysis of structures under stochastic conditions", PhD thesis, Technical University of Braunschweig, Germany*
3. *P.G. Hodge and T. Belytschko, "Numerical methods for the limit analysis of plates," ASME J Appl Mech, vol. 35, no. 4, pp. 796-802, 1968.*
4. *B.G. Neal, Limit load of a cantilever in plane stress. In: Engineering plasticity, J. Heyman and F. A. Leckkie, Eds., Cambridge University Press, pp. 473–488, 1968.*
5. *R. Casciaro and L. Cascini, "A mixed formulation and mixed finite elements for limit analysis," Int. J. Numer. Methods Eng., vol. 18, no. 2, pp. 211–243, 1982.*
6. *P. Morelle, "Structural shakedown analysis by dual finite-element formulations," Eng. Struct., vol. 6, no. 1, pp. 70–79, 1984.*
7. *D.E. Grierson, Collapse Load Analysis, in: Engineering Plasticity by Mathematical Programming, Cohn, M.Z., Maier, G., Grierson, D.E.. Eds., Proceedings of the NATO Advanced Study Institute, University of Waterloo, Canada, 1977.*
8. *E. Christiansen, "Limit analysis of collapse states," Handbook of Numerical Analysis, vol. 4. pp. 193–312, 1996.*
9. *E. Christiansen, "Computation of limit loads," Int. J. Numer. Methods Eng., vol. 17, no. 10, pp. 1547–1570, 1981.*
10. *K.D. Andersen and E. Christiansen, "Limit analysis with the dual affine scaling algorithm," J. Comput. Appl. Math., vol. 59, no. 2, pp. 233–243, 1995.*

History and ways to carry out the process...

(tiếp theo trang 34)

the bathroom (wet the print), and does not shine too bright a light on the print (avoid discoloration)..

- Cleaning the print after printing with clean water for water-based inks and with soap for oil-based inks.

4. Conclusion

Along with completing this research, the author had a wonderful time making prints using plastic and gel sheets. Beside using specialized ink for monotype printing, the author additionally use the acrylic paint with many different colors and materials available in nature, allowing artists to freely experiment to create unique images. Forms and patterns with high spontaneity give unexpected and unique beauty, it is truly interesting because the range of expression is very rich. Monoprinting provide flexible and entertain to approach to exploring and unleashing individual creativity. Whether experimenting with layered prints, with mixed media or monotype, the possibilities of expression are endless. Therefore, mastering the art of monoprinting helps to exploit our imagination deeply when creating beautiful paintings with fixed duplication./.

References

1. *John Ross, The Complete Printmaker, Press, ISBN-10: 0029273722; ISBN-13: 978-0029273722, 1991*
2. *Ray Smith The Artist's handbook, DK Third Edition, SBN-10: 0756657229; ISBN-13: 978-0756657222, 2009*
3. *Ann d'Arcy Hughes và Hebe Vernon-Morris, The printmaking bible, Chronicle books San Francisco, 2008.*
4. *Bill Fick và Beth Grabowski, Printmaking: A Complete Guide to Materials & Process, ISBN-10: 1780671946; ISBN-13: 978-1780671949, 2015*
5. *Carla Esposito Hayter, The Monotype: The History of a Pictorial Art, Skira, ISBN-10: 8861300944; ISBN-13: 978-8861300941, 2008*
6. *Frances Stanfield và Lucy McGeown, The Printmaking Ideas Book, Ilex Press, ISBN-10: 1781576181; ISBN-13: 978-1781576182, 2019.*
7. *Fritz Elchenberg, The Art of the Print Masterpieces History Techniques, Amazon Book, 1976.*
8. *Judy Martin, The encyclopedia of Printmaking Techniques, Search press, 2003.*
9. *Kurt Wisneski, Monotype/Monoprint: History and Techniques, Bullbrier Press, ISBN-10:0961261048; ISBN-13: 978-0961261047, 1995.*
10. *Ray Smith, Le Manuel de L'artiste, Bordas Editions, ISBN-10: 2040129715, ISBN-13: 978-2040129712*