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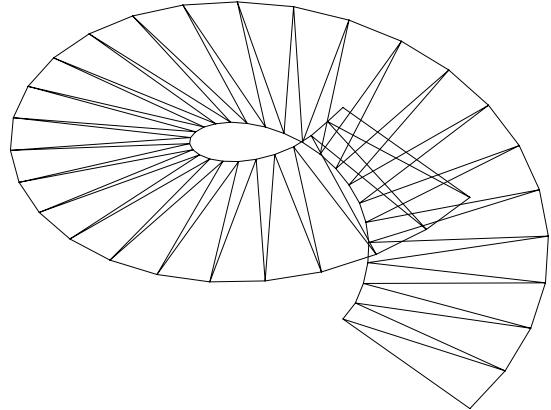


Ref: 9900-I-M3FS14

FastSHAPES® - SURFACE 32Bit

TYPICAL APPLICATIONS

In marine architecture, chined hulls
In general architecture, sculptures and art forms
In bulk materials handling, chutes, bins, hoppers
In fluids conveying, ducts, transitions, transformers
In structural fabrication, webs or flanges of curved and/or cambered trapezoidal plate box girders.
Generally, wherever the edges of a singly curved (ruled) surface or set of surfaces are defined.
(SURFACE does *not* handle doubly curved surfaces)



TECHNICAL DESCRIPTION

SURFACE uses the triangulation method to develop surfaces defined by two curves in general 3 dimensional space. A series of up to twenty adjacent surfaces with common curves between them may be developed. Each curve may be open or closed. In marine architecture, these curves are known as 'chines'. More generally, they are circumferential or transverse seams or edges.

It is assumed that the curves represent the mid-thickness of the plates, hence plate thickness does not specifically enter into the development of the surfaces.

Point coordinates along each curve, as provided by the user, may be accepted as given. Alternatively, the curves may be regenerated by splining through the given points, or by forcing use of circular space arcs. When splining is specified, an untensioned cubic spline is used. This may be cyclic, anti-cyclic, free-ended, or clamped (ends set to specified directions)

Further, when splining is used, the user may opt to retain all specified points and break the curves into a specified number of intervals between given points, or may elect to forego all given points, and break each curve into the same specified number of total intervals. (The splined curve remains passing through the original points, but the original points are no longer accessible.) The user is responsible to ensure that an adequate number of intervals is defined along each curve, so as to ensure that differences between chord lengths used in development by triangulation, and actual arc lengths, are at an acceptably small level for the intended purpose.

Each of the surfaces may be dissected into segments by insertion of longitudinal seams through any specified point pair. Green may be added to any edge. A plate list showing bounding rectangular sizes is provided.

All substantive data required by SURFACE may be prepared externally to the program (e.g. within a 3D CAD program, or otherwise by a program such as BASIC, PASCAL, etc.), and imported on request of the user.

A scaling factor may be applied to convert between data systems.

A data generator is provided to demonstrate several data structures, and as a general utility for surfaces of revolution.

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DATA REQUIREMENTS

Size of point coordinate table (Number of curves, Number of points per curve) to be defined.

Splining parameters

Scaling factor.

Green for each edge

Table of point coordinates (Points/curve x number of curves, in X,Y,Z space)

Table of curve end vectors(X,Y,Z direction at end of each curve.)

OUTPUT

Patterns in any of the following forms ...

FastCAM file

2D DXF file, 3D DXF File

NC Program

Coordinate Table

PROGRAM REFERENCE

M3FS14 : SURFACE

OTHER REFERENCES

M3FS7 : RECTIRCLE (General shape transitions at

M3FS11 : BEND (General gored bends)

