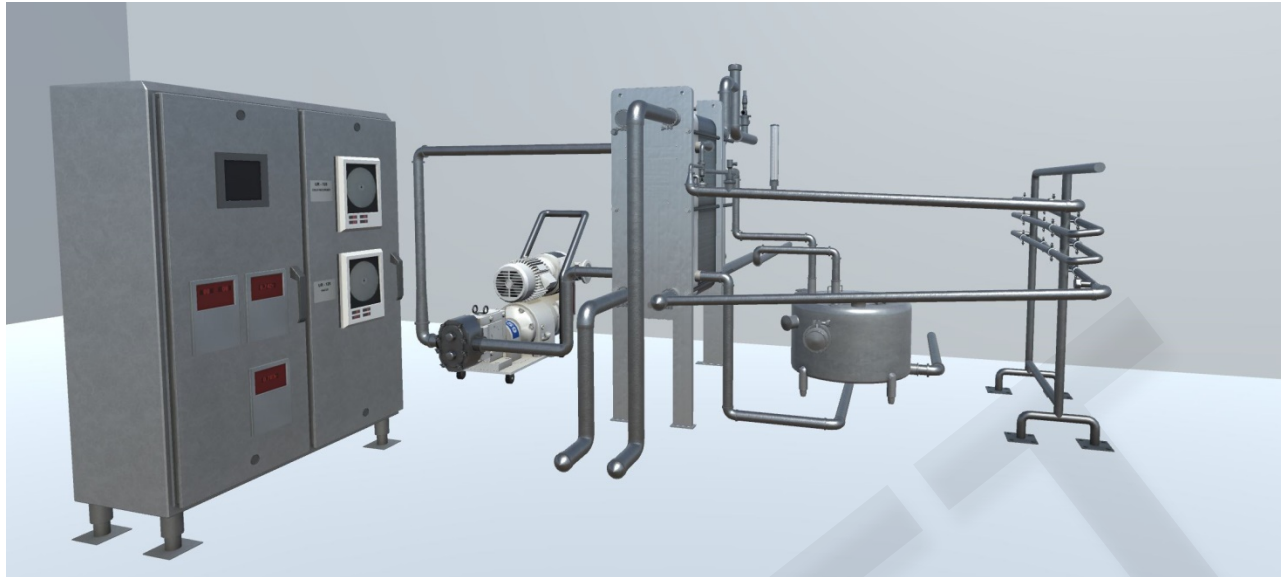


HTST SYSTEM DRAFT

MODEL DESCRIPTION DOCUMENT (MDD)

Version – DRAFT v0.1



AUGUST 15, 2016

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DOCUMENT REVISION HISTORY

Version	Description	Date
0.1	Draft	08/15/16

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1 MODEL OVERVIEW

1.1 DESCRIPTION

- High Temperature Short Time (HTST)
- Pasteurization Process used to heat and cool milk.

1.2 REQUIREMENTS

Requirements for each model are gathered based off of the needs of the customer. Reference images are then found and used to accurately build 3D models. The required components for this model include:

- Holding Tubes
- Flow Diversion Device (FDD)
- Plate Heat Exchanger (PHE)
- Vacuum Breaker
- Open Air Valve
- Control Panel
- Constant Level Tank (CLT)
- Timing Pump



Figure 1 Full HTST System Reference Image

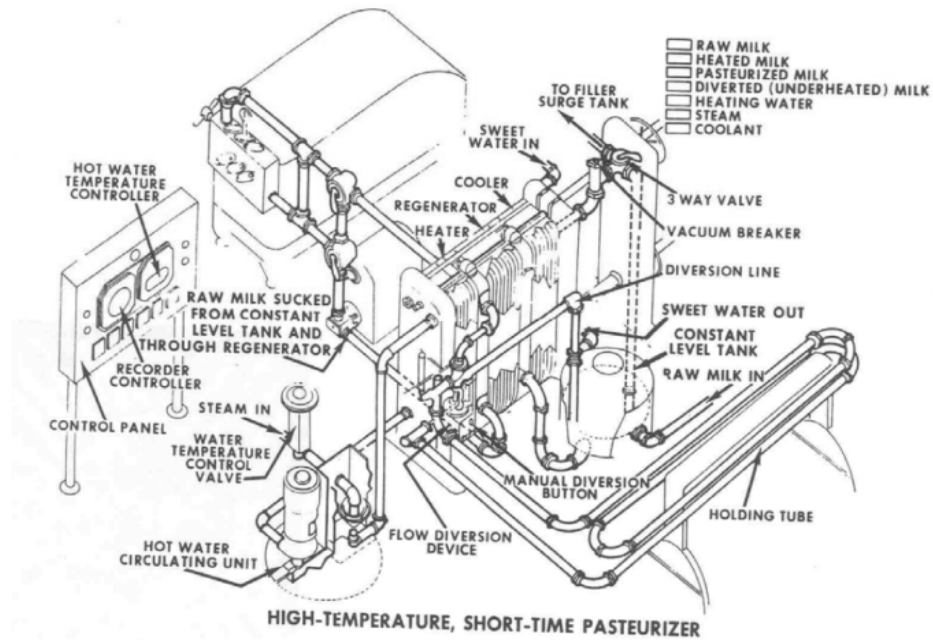


Figure 2 Full HTST System Diagram Reference Image



Figure 3 Constant Level Tank Reference Image



Figure 4 Holding Tubes Reference Image



Figure 5 Flow Diversion Device Reference Image



Figure 6 Control Panel Reference Image



Figure 7 Plate Heat Exchanger Reference Image

1.3 REFERENCES

- 3D_Model_Development_Process.docx
 - o The 3D model development process details Dignitas Technologies' procedure for building 3D models.

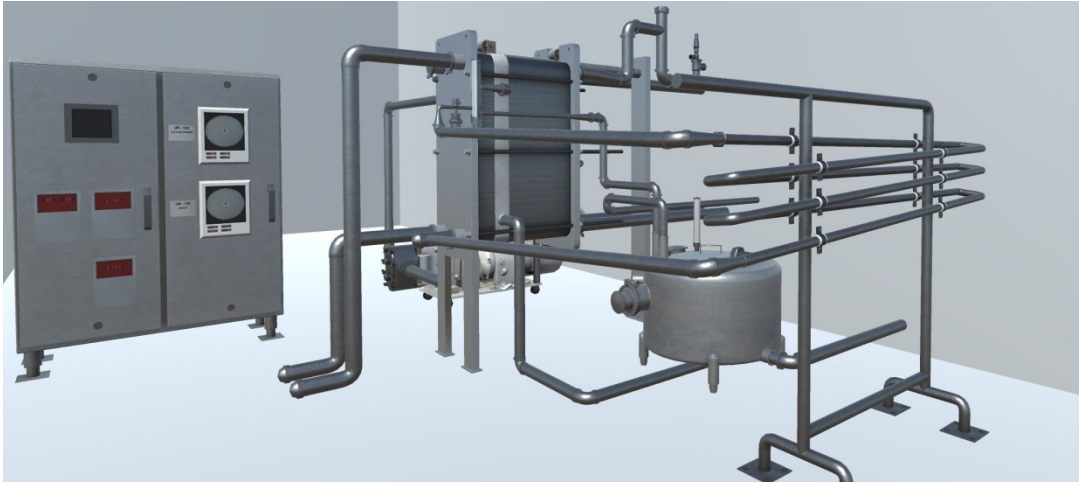


Figure 8 HTST System Model (Unity Render)

1.4 MODEL VERSION AND HISTORY

Information about the model version can be found in the “Model_Version.txt” file located in the model’s directory (same directory the model’s .fbx file is located).

Table 1 Model Revision History

Version	Description	Date
0.1	Initial release of the HTST_System.fbx	08/15/16

1.5 MODEL SUMMARY

Table 2 Model Summary

Model Name	HTST_System.fbx
Model Units	Meters
Coordinate System	Cartesian X, Y, Z (see Figure 2 below)
Model Origin	Origin is located at center mass. (0, 0, 0) (See figure 2 below)
Model Orientation Runtime	Forward: Positive Y Up: Positive Z
Model Orientation Maya	Forward: Positive Z Up: Positive Y

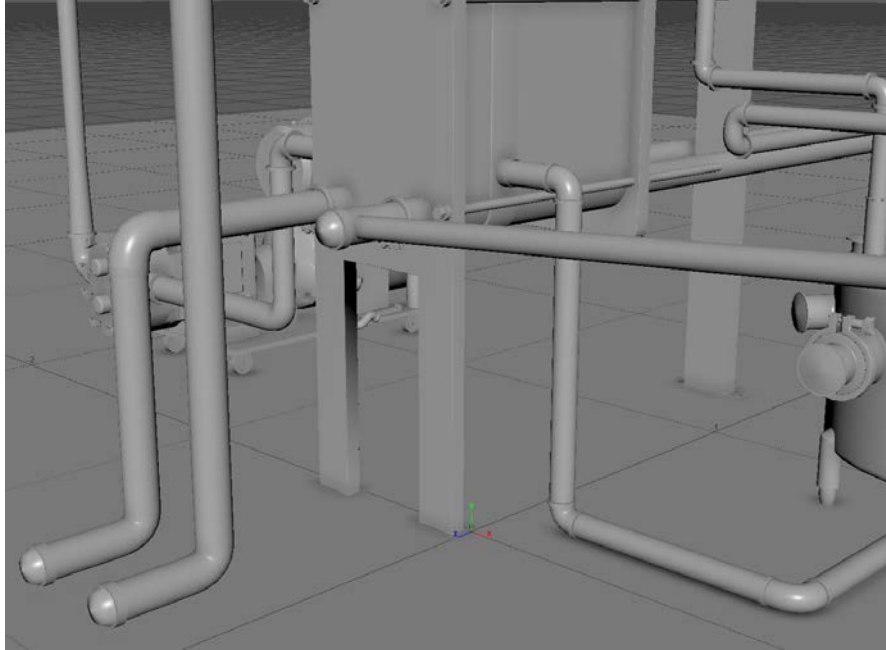


Figure 9 HTST System Origin on Cartesian X, Y, Z Coordinate System (Maya Software Render)

This model was imported into Unity 5.3 to verify the model (see Figure 10 below).

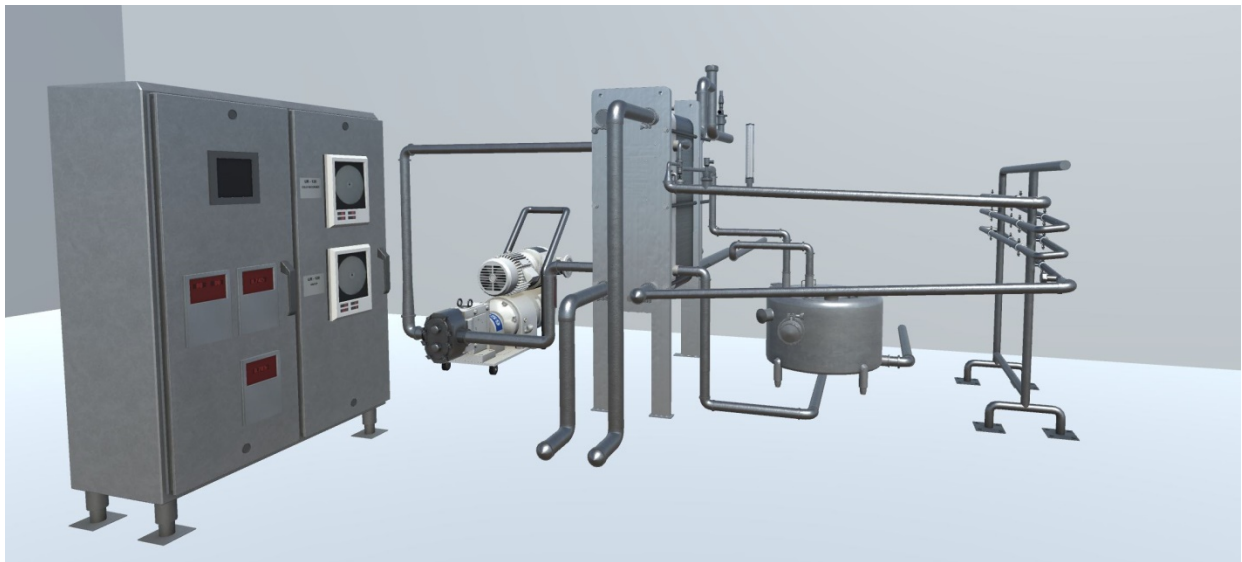


Figure 10 HTST System (Unity View)

2 UNITY PACKAGE

2.1 IMPORTING THE UNITY PACKAGE

1. Download the “HTST_System.unpackage” file from Google Drive
2. Open the “Milk Factory” Unity Project in Unity 5
3. In the top menu bar go to “Assets → Import Package → Custom Package...”
4. A window should pop up showing you the contents of the Unity Package being imported
 - a. This Unity Package should look like this:

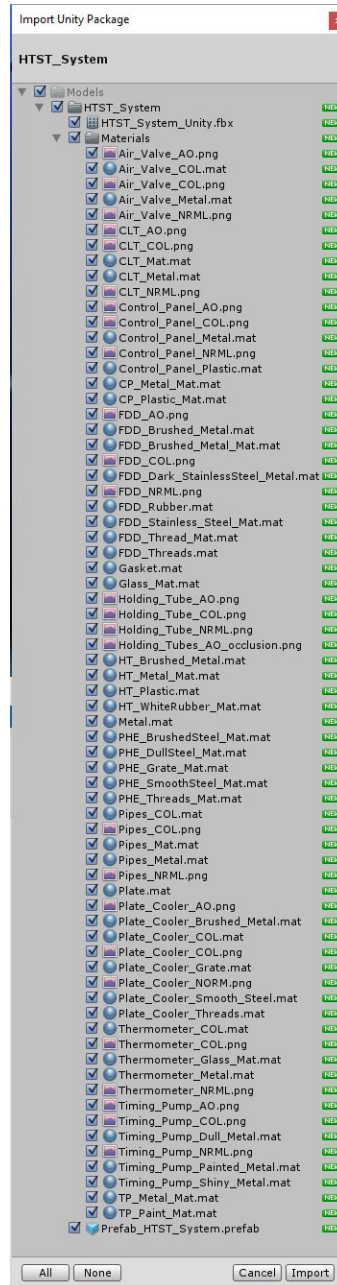


Figure 11 Unity Import Package

5. Press “Import” and the model and materials will be placed into the Assets section.
6. Make sure that when dragging the model into the scene that you select the “Prefab_HTST_System.prefab” instead of the FBX as the prefab has the materials stored on it correctly.

3 MODEL ATTRIBUTES

3.1 POLYGON ALLOCATION

Polygon allocation is the number of triangles and vertices for a given state and Level of Detail (LODs) in the model. The method for calculating the number of polygons is to gather each model state then count the polygons present in each representation. Animations are not included in the polygon allocation. The HTST System model has a single LOD which is labeled LOD0.

Table 3 Polygon Allocation

Model	# of Triangles	# of Vertices
HTST System	109245	58319

3.2 LEVEL OF DETAIL (LODS)

TBD

3.3 TEXTURE MAPS

3.3.1 COLOR MAPS

- File name: Air_Valve_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

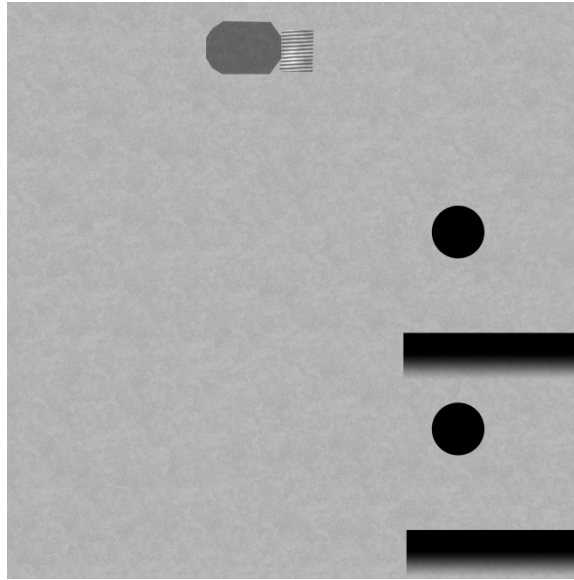


Figure 12 Air Valve Color Map

- File name: CLT_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0



Figure 13 CLT Color Map

- File name: Control_Panel_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

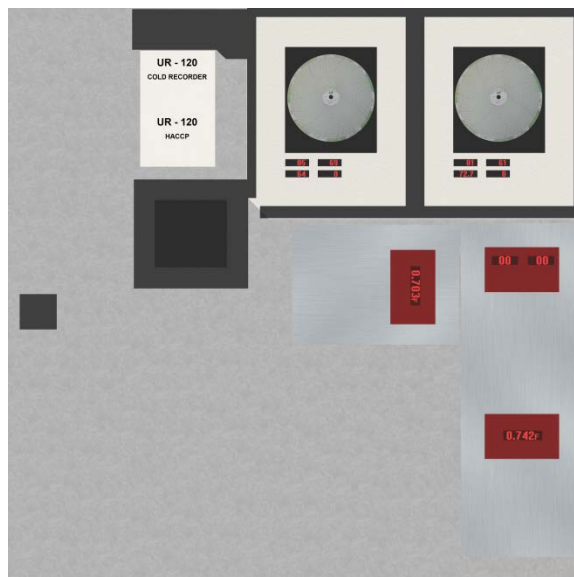


Figure 14 Control Panel Color Map

- File name: FDD_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

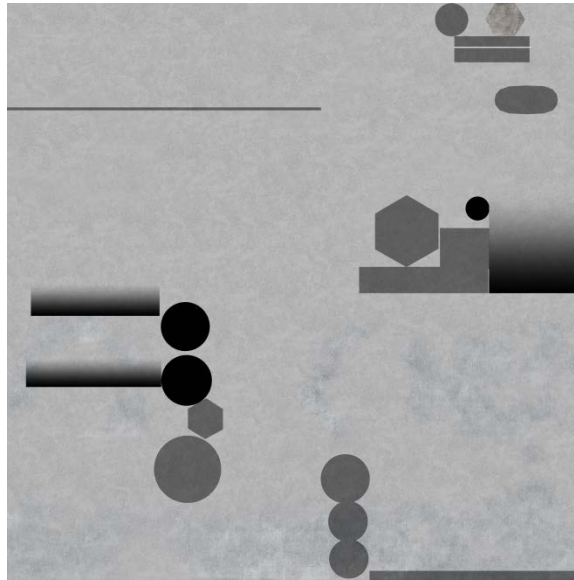


Figure 15 FDD Color Map

- File name: Holding_Tube_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0



Figure 16 Holding Tube Color Map

- File name: Pipes_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

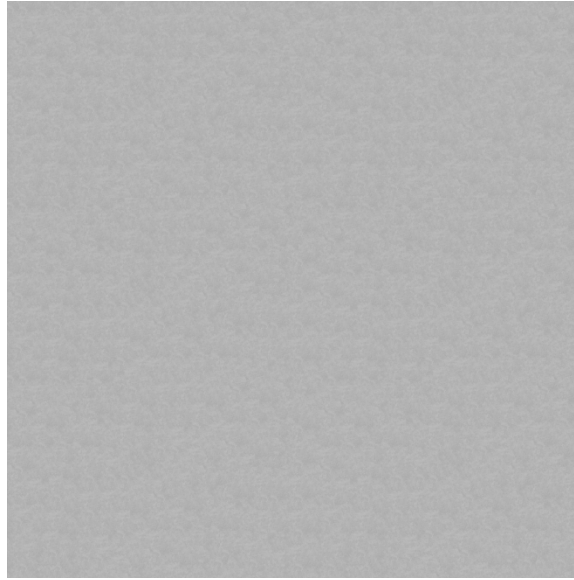


Figure 17 Pipes Color Map

- File name: Plate_Cooler_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0



Figure 18 Plate Cooler Color Map

- File name: Thermometer_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

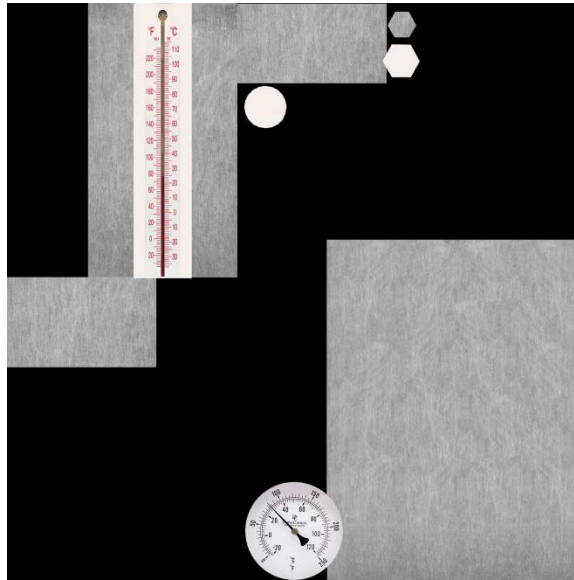


Figure 19 Thermometer Color Map

- File name: Timing_Pump_COL.png (Diffuse)
- Resolution: 4096 x 4096 pixels
- Version: 1.0

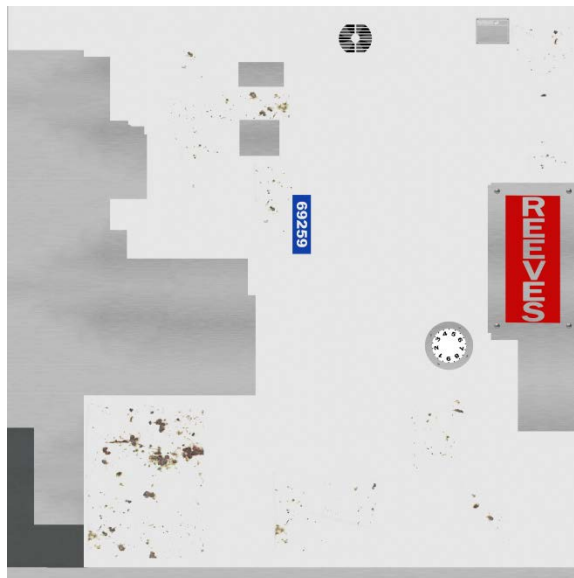


Figure 20 Timing Pump Color Map

3.3.2 NORMAL MAPS

- File name: Air_Valve_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0



Figure 21 Air Valve Normal Map

- File name: CLT_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0



Figure 22 CLT Normal Map

- File name: Control_Panel_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

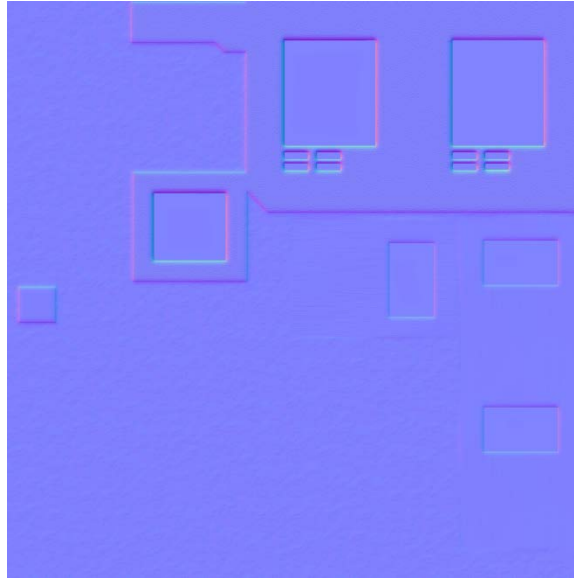


Figure 23 Control Panel Normal Map

- File name: FDD_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

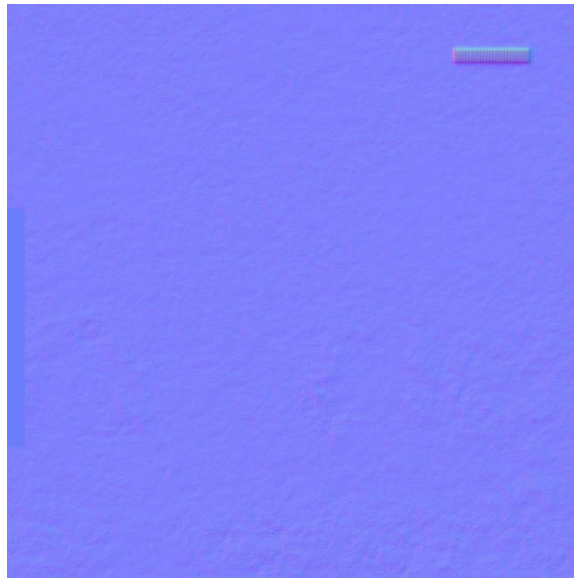


Figure 24 FDD Normal Map

- File name: Holding_Tube_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0



Figure 25 Holding Tube Normal Map

- File name: Pipes_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

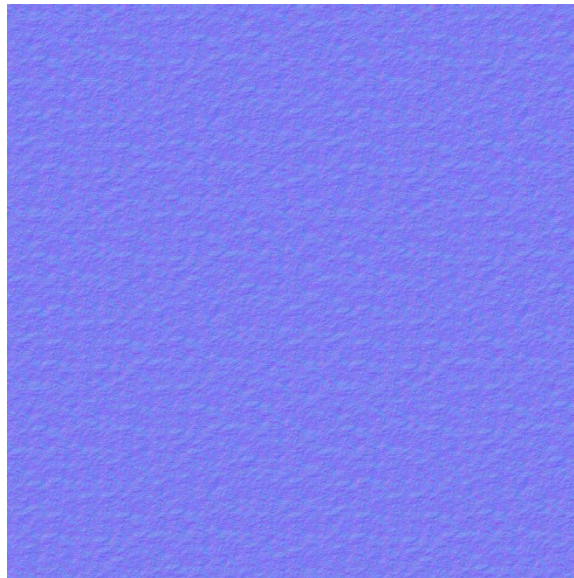


Figure 26 Pipes Normal Map

- File name: Plate_Cooler_NORM.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

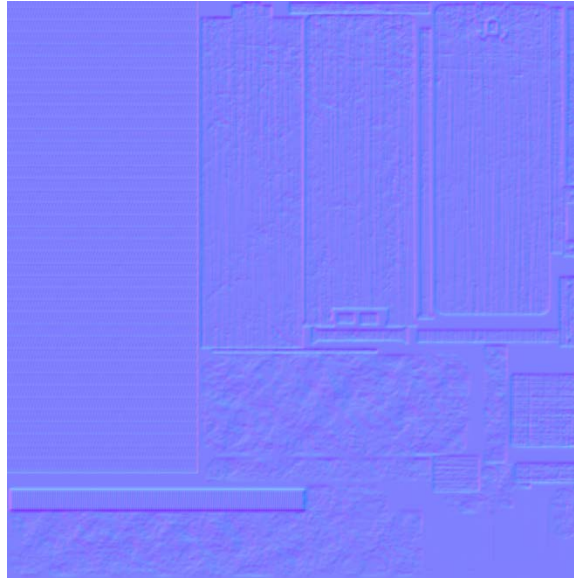


Figure 27 Plate Cooler Normal Map

- File name: Thermometer_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

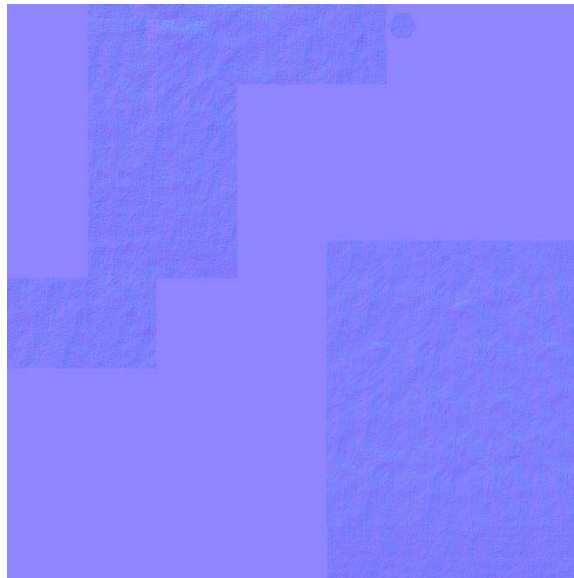


Figure 28 Thermometer Normal Map

- File name: Timing_Pump_NRML.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0



Figure 29 Timing Pump Normal Map

3.3.3 AMBIENT OCCLUSION MAPS

- File name: Air_Valve_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

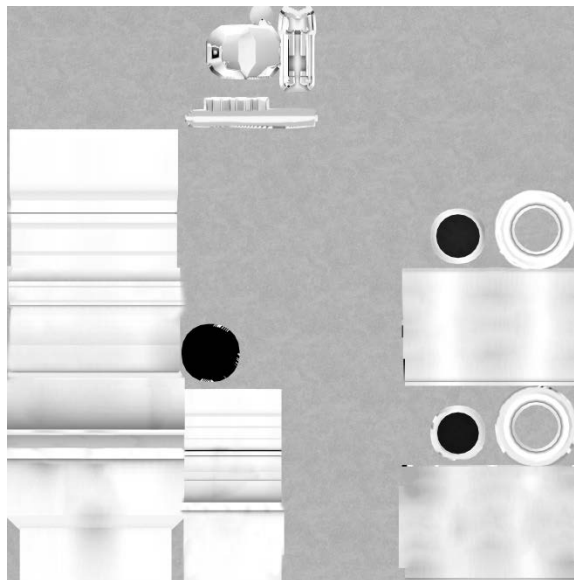


Figure 30 Air Valve Ambient Occlusion Map

- File name: CLT_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

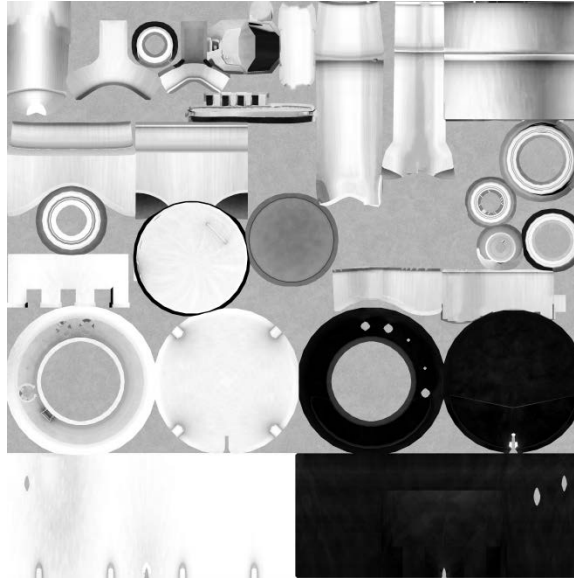


Figure 31 CLT Ambient Occlusion Map

- File name: Control_Panel_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

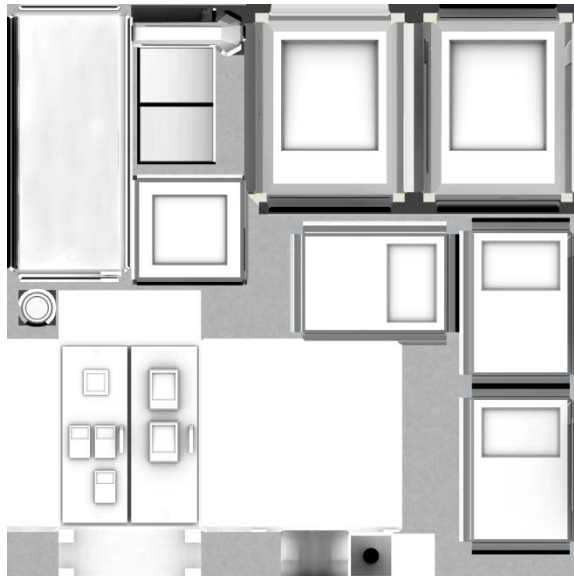


Figure 32 Control Panel Ambient Occlusion Map

- File name: FDD_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

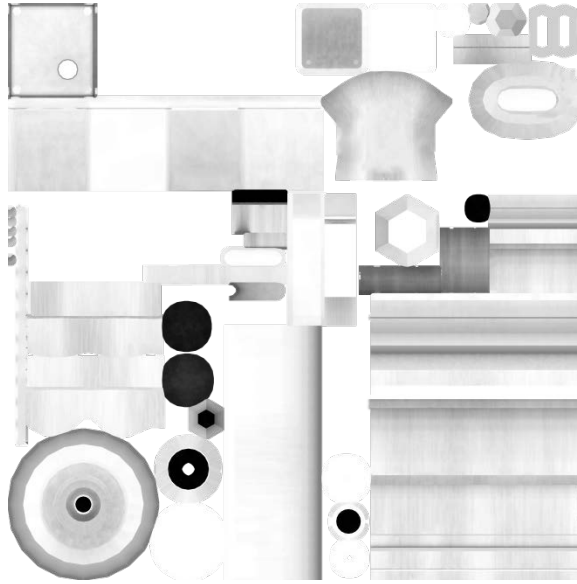


Figure 33 FDD Ambient Occlusion Map

- File name: Holding_Tube_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

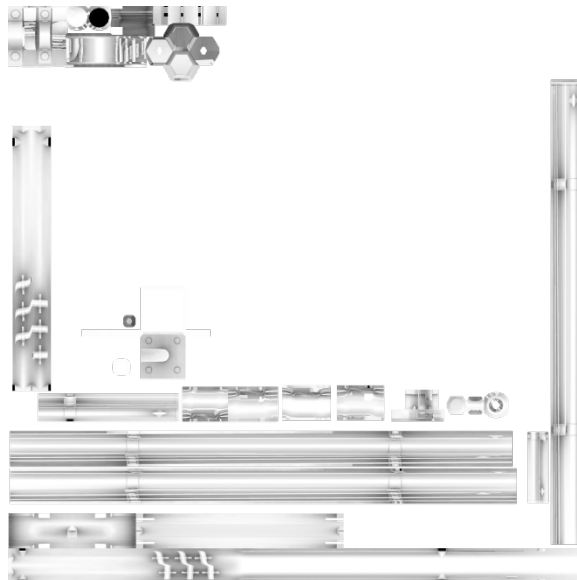


Figure 34 Holding Tube Ambient Occlusion Map

- File name: Plate_Cooler_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

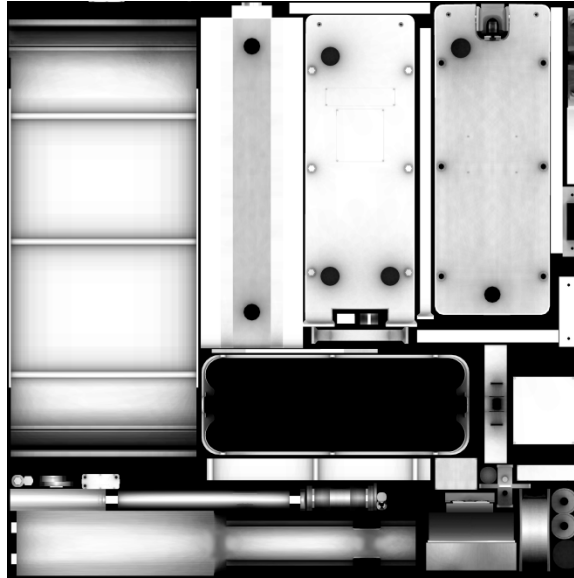


Figure 35 Plate Cooler Ambient Occlusion Map

- File name: Timing_Pump_AO.png
- Resolution: 4096 x 4096 pixels
- Version: 1.0

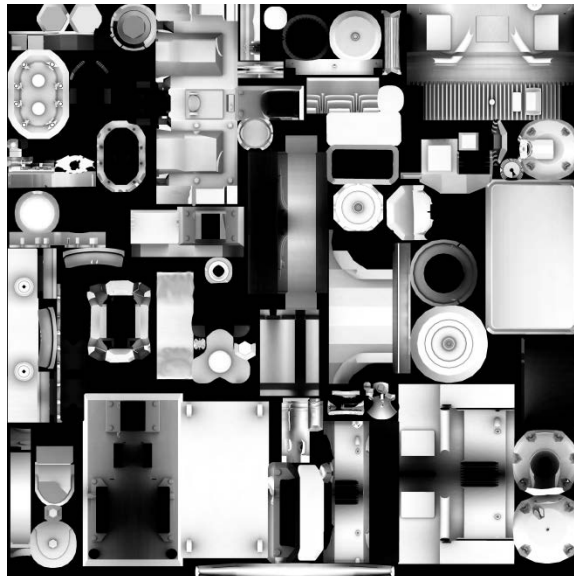


Figure 36 Timing Pump Ambient Occlusion Map

3.4 SENSOR VIEWS

N/A

3.5 MODEL STATES

N/A

3.6 SKELETAL STRUCTURE

N/A

4 ANIMATIONS

N/A

5 VERIFICATION APPROACH

5.1 RUNTIME SYSTEMS

The 3D model was tested using the following tools:

- FBX Viewer 2013.3
- Maya Mental Ray 2016
- Unity 5.3

6 LIMITATIONS

N/A

7 CONTACT INFORMATION

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