SUBSTANCE PBR GENERAL WORKFLOW FOR SIMPLIFIED

TECHNICAL ART DIRECTOR | LEE.JUNGPYO

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WHO I AM

TECHNICAL ART DIRECTOR AT GIANT INTERACTIVE (PRESENT).
TECHNICAL ART DIRECTOR AT NETEASE PANGU GAME STUDIO.
LEAD TECHNICAL ARTIST / EVANGELIST AT ALLEGORITHMIC.
TECHNICAL ART DIRECTOR AT PLAYNERY.
PRODUCER / TECHNICAL DIRECTOR AT DEVCLEN (NVIDIA PARTNER)
AND I STILL NOW WORKING FOR GAME INDUSTRY DURING 19 YEARS…

INTERESTING.
RENDERING WITH SHADER IMPROVEMENTS
APPROACHING OF PROCEDURAL MODELING.
CODE OPTIMIZING

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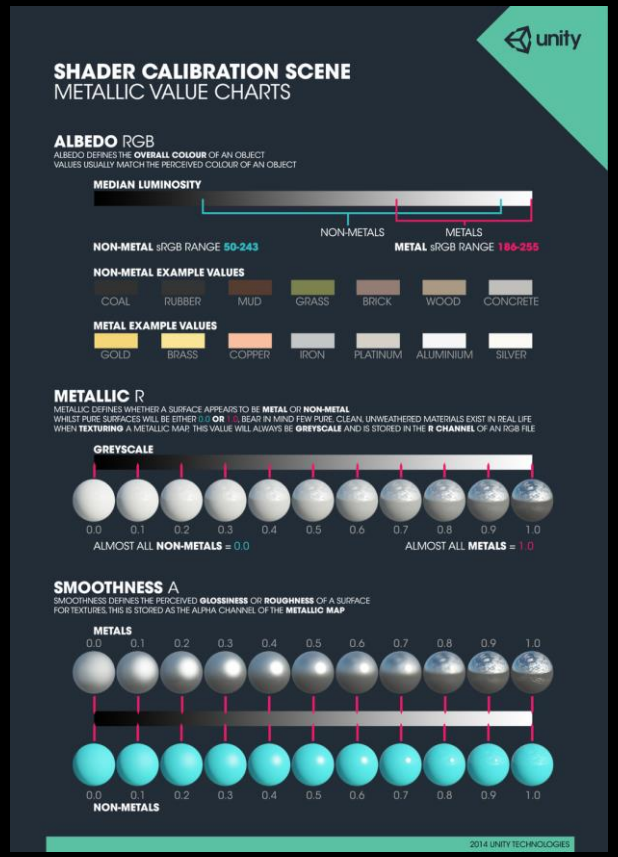
PRESENTATION SUMMARY
BRIEF OF PBR
BUILD UP TEMPLATE OF COLOR MASK
MATCHING PBR LOOKDEV

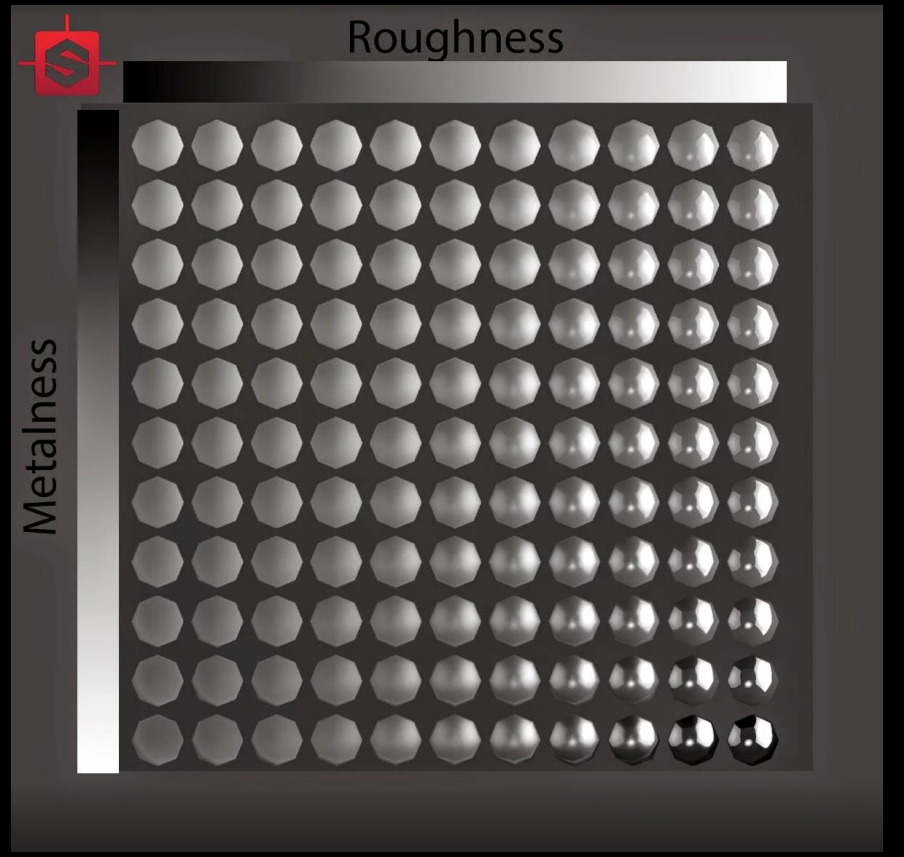
PRESENTATION SUMMARY

INSPIRATIONS
NOT AN A TO Z

- 今天不会讲一个完整的制作过程。
- 会举一个案例说明怎么把自己的想法应用到项目里。
- 国外开发商已经在实际项目里使用类似工程了。

BRIEF OF PBR





- 近几年我们看了很多有关 PBR 的资料。
- 通常用的是游戏行业使用的粗糙度和金属度 PBR 。
- 这次分享就不深入说 PBR 的微表面（ Micro Facet ）相关光照模型了。

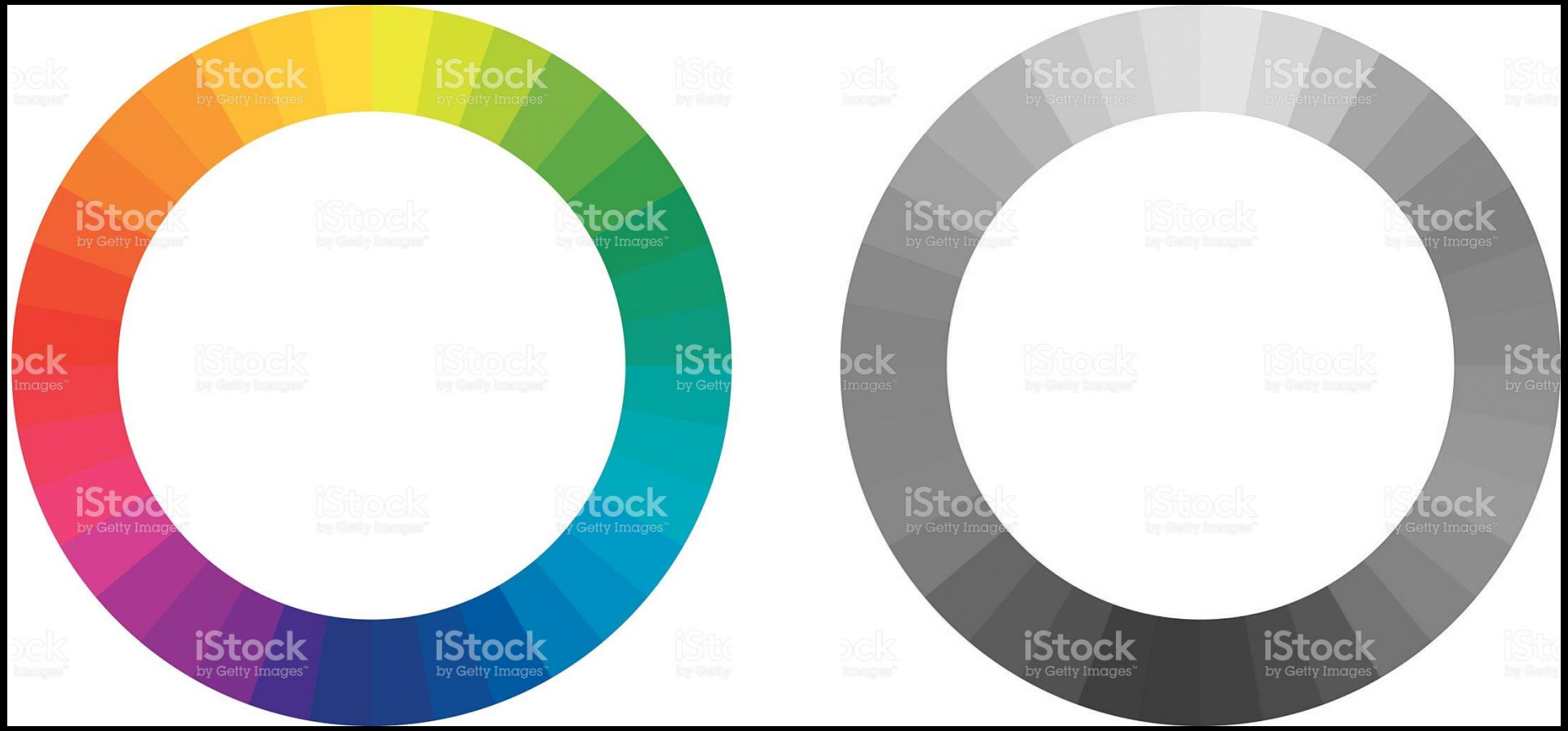
“IDEA APPROACHING”

1. UNIFIED.
2. SIMPLIFIED.

BUILD UP COLOR MASK

- 色彩图通常是用于 **COLOR ID** 。对吧?
- 看左图，变成灰色的时候基本上是一样的值。
- 这不符合我的想法!
- 要怎么做呢? 从这里开始就是创意!

BUILD UP COLOR MASK



- 创意从‘色环’的使用开始。
- 观察补色关系。
- 把‘粗糙度’简化成10个阶段。
- ‘金属度’会自动分类。

BUILD UP COLOR MASK

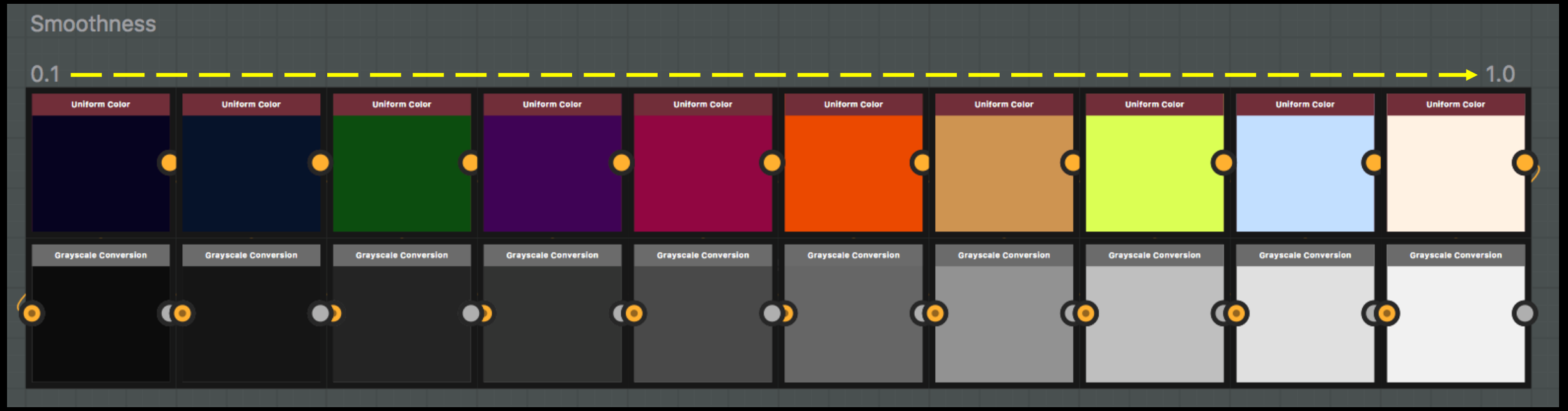
- 实际操作的时候，分明的质感用简化的10个阶段表示也多了。
- 简化成 5个阶段就够了。

BUILD UP COLOR MASK

- 这种写实风格的游戏也不会在一种物件上有5种以上的材质分类。
- 那是不是我们也能‘简化’，所有美术共用标准质感呢？

BUILD UP COLOR MASK

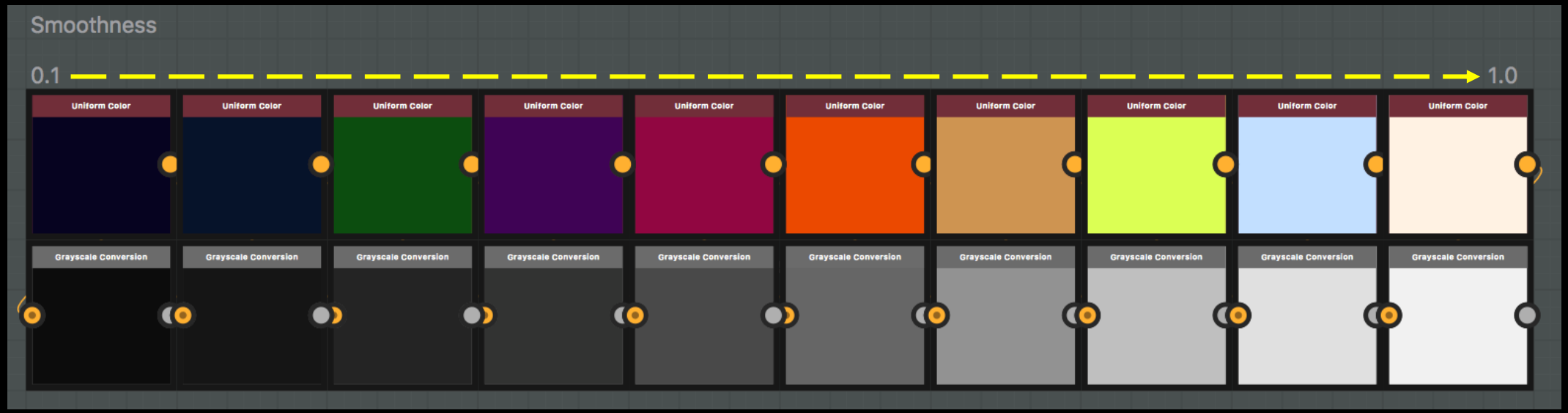
从‘色环’分类出补色，变换成灰色作对比。



粗糙度用 0.1 到 0.99 或者到 1.0 的系数。

总共把它分成了10个阶段。

BUILD UP COLOR MASK



总结来说，以选好的 COLOR ID 为主轴，做正规生产流程的 ‘**MATERAL PALETTE**’（材质调色板）就可以了。

所有美术要用同一种规格的 COLOR ID 。

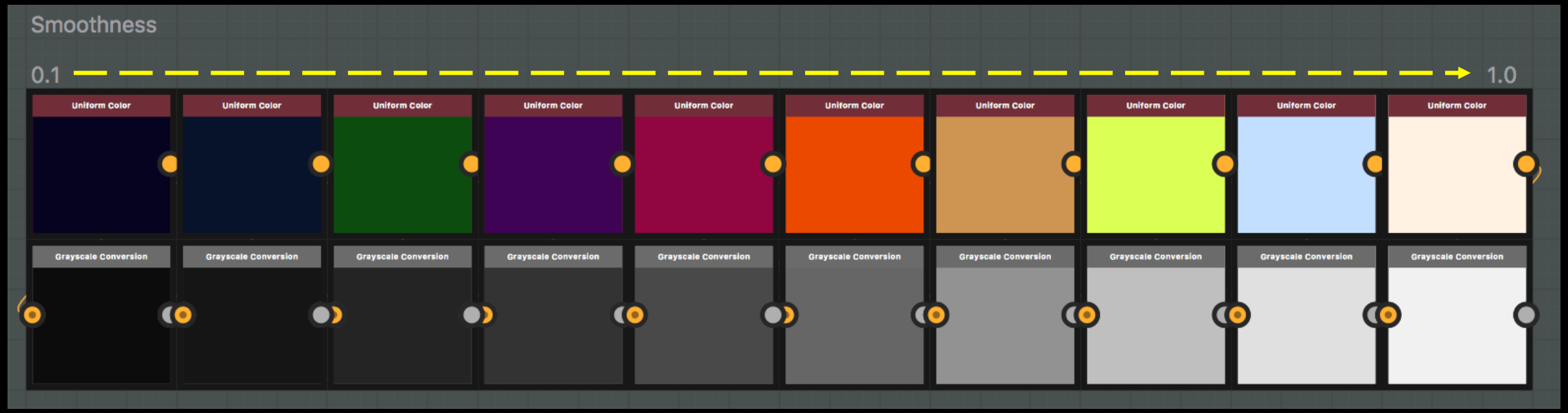
在个基础上自动增加粗糙度。

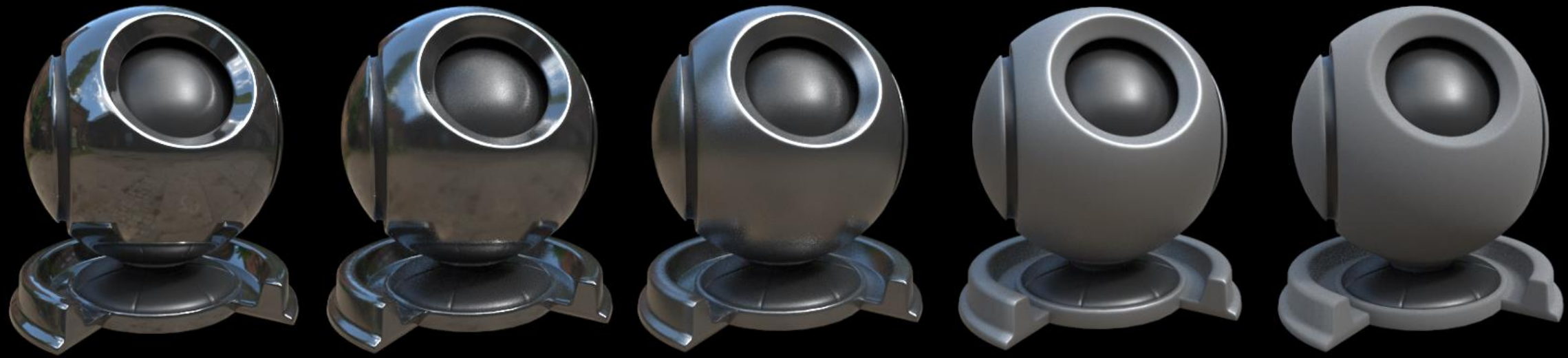
BUILD UP COLOR MASK

- 开发阶段的功能目的。
- 量产的便捷性。
- 外包管理的便捷性。
- 不重要的物件可以快速制作。
- 开发功能时不能忘了目的。
- 所有东西都要添加的话就是走向了灭亡。
- 美术是什么？省略和夸张~~~ 什么都要表现就直接照个相吧~
  大家应该都听过这种话吧？

BUILD UP COLOR MASK

基本材质测试。





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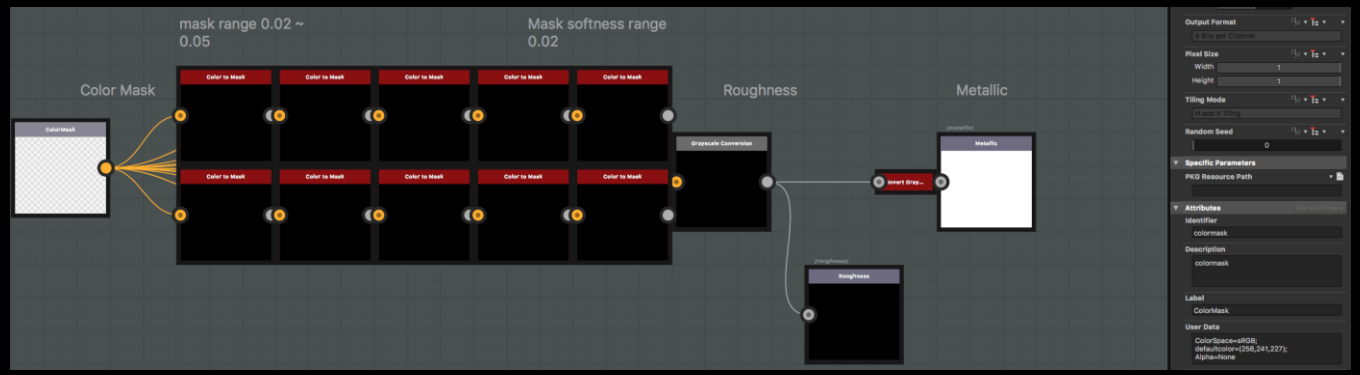
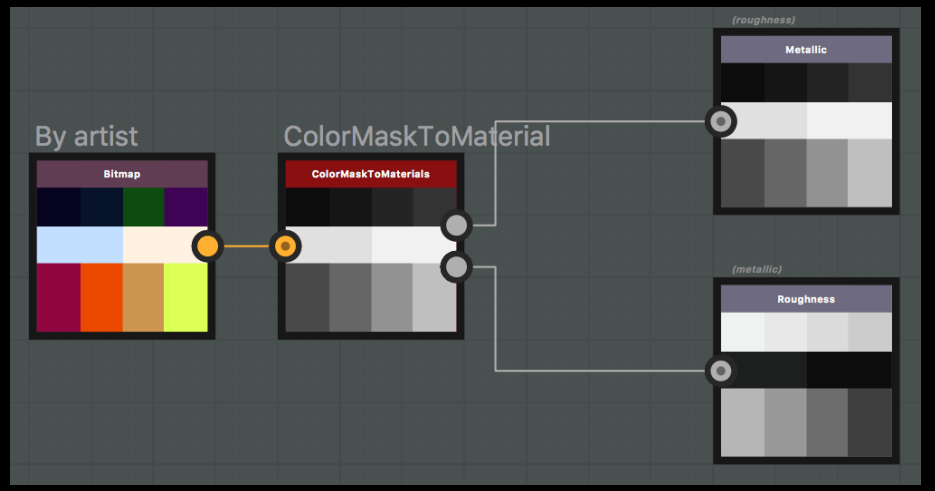
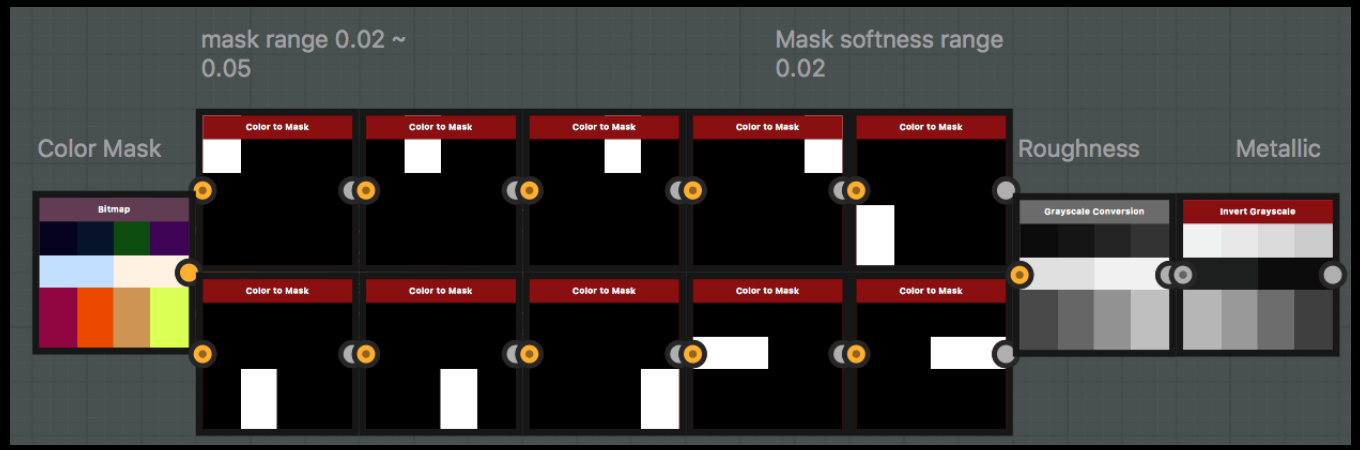
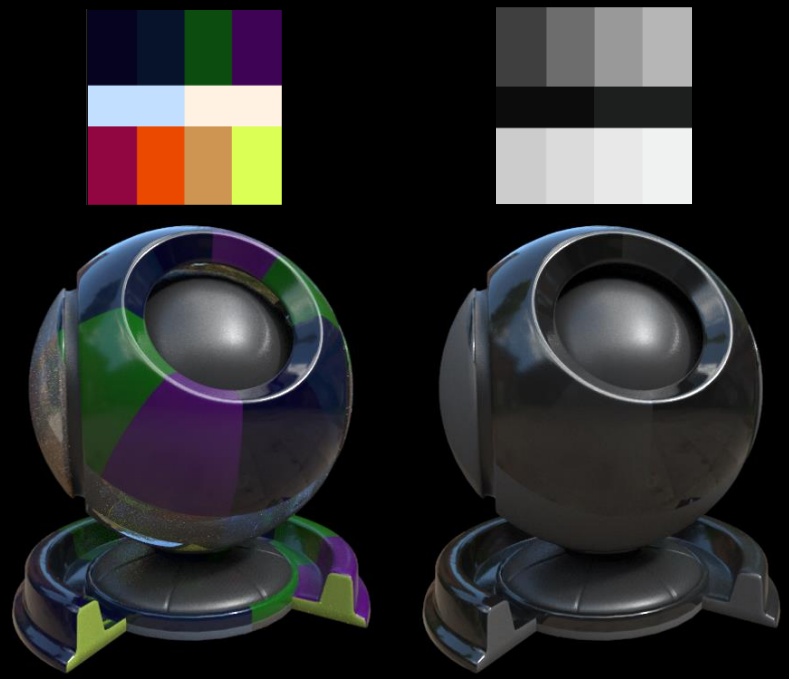
BUILD UP COLOR MASK

完成测试版本的节点图表演示









根据 COLOR ID 自动形成 MASK 。

再把这个自动变换成材质数据。

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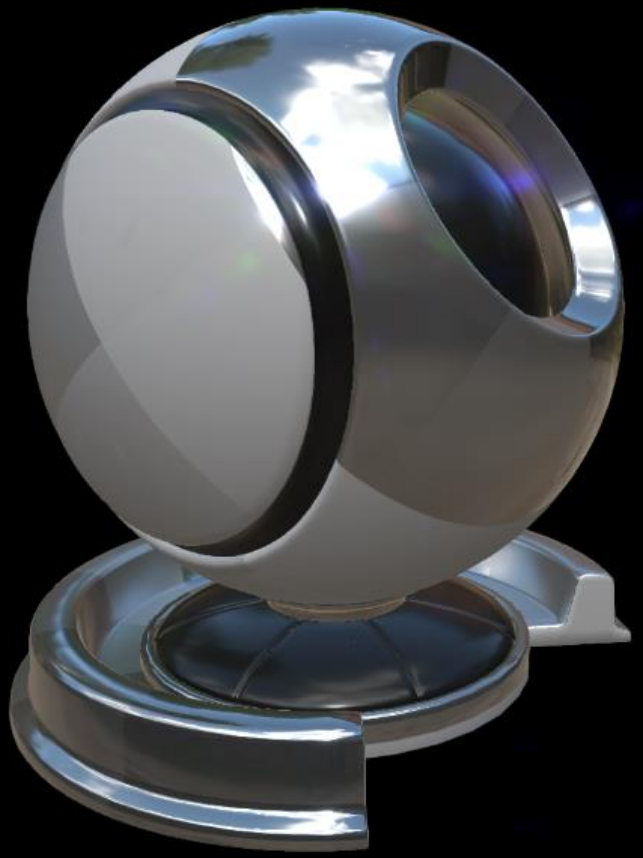
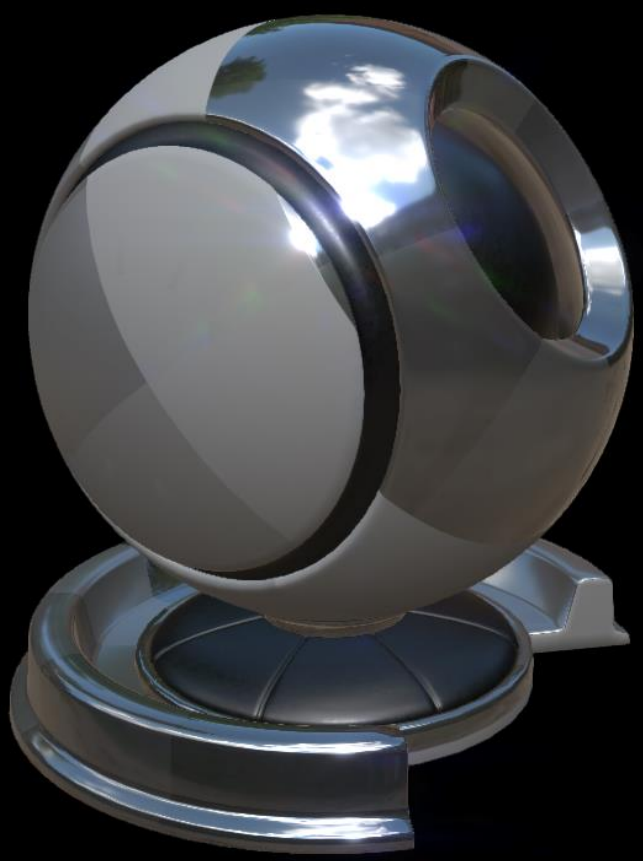
BUILD UP COLOR MASK

对比使用专用滤镜变换后，在 Substance painter 自动处理的结果。



Designer



Painter

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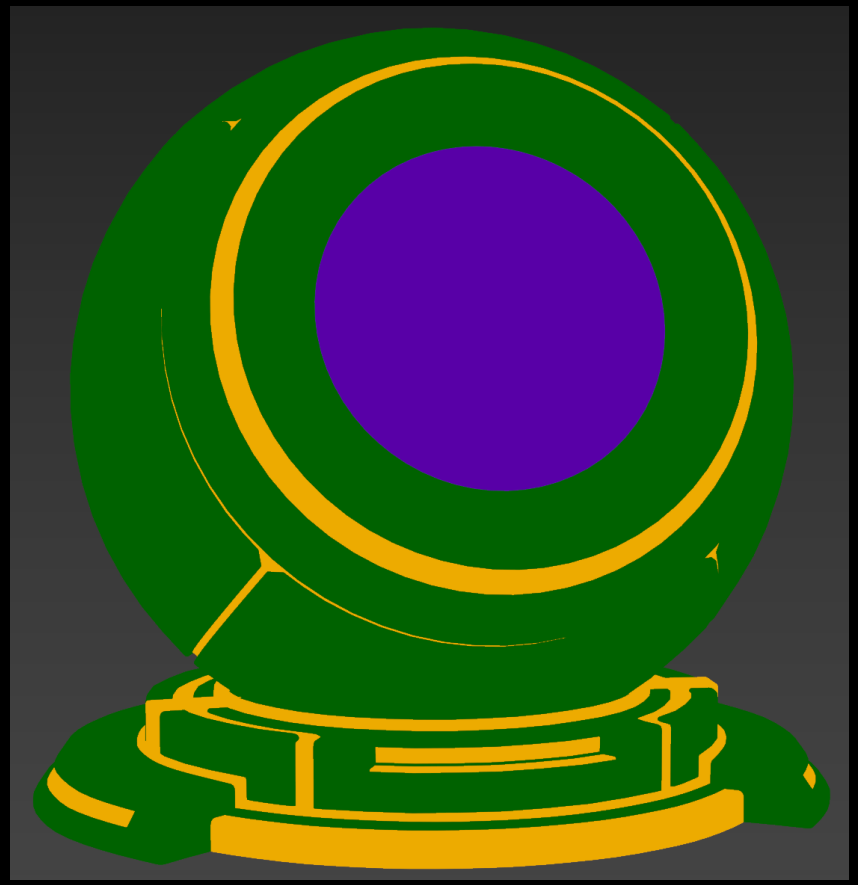
BUILD UP COLOR MASK

SRP 上的 SHADER PREVIEW



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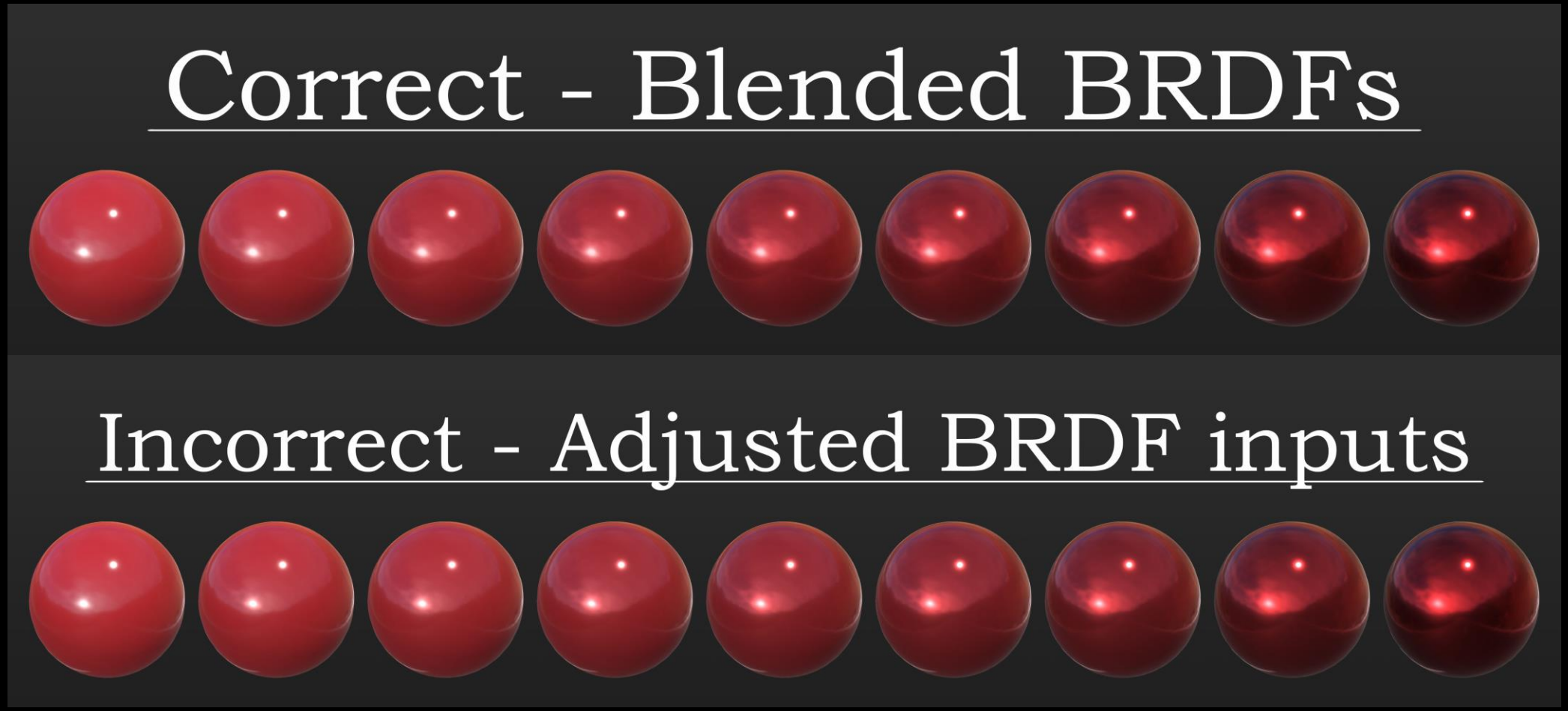
BUILD UP COLOR MASK

金属度下次再讲。



BUILD UP COLOR MASK

导体和绝缘体在一个图层上处理的话会跟下图一样很不自然。

如果在加工好的锡器上喷上无光泽的喷雾就会有这样的下效果。但不能只修改金属度 贴图。

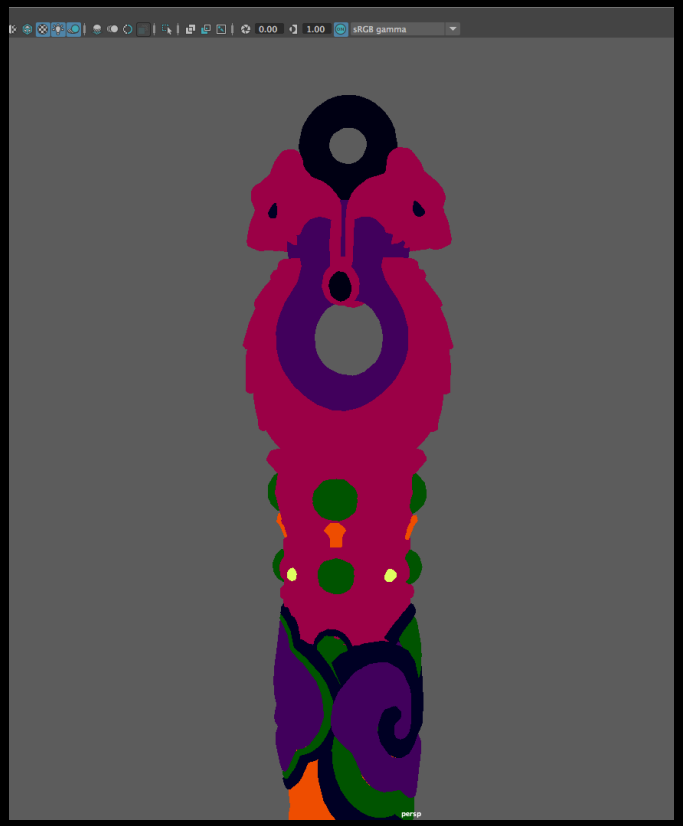
Wrong of Molecular Structure Binding Properties.

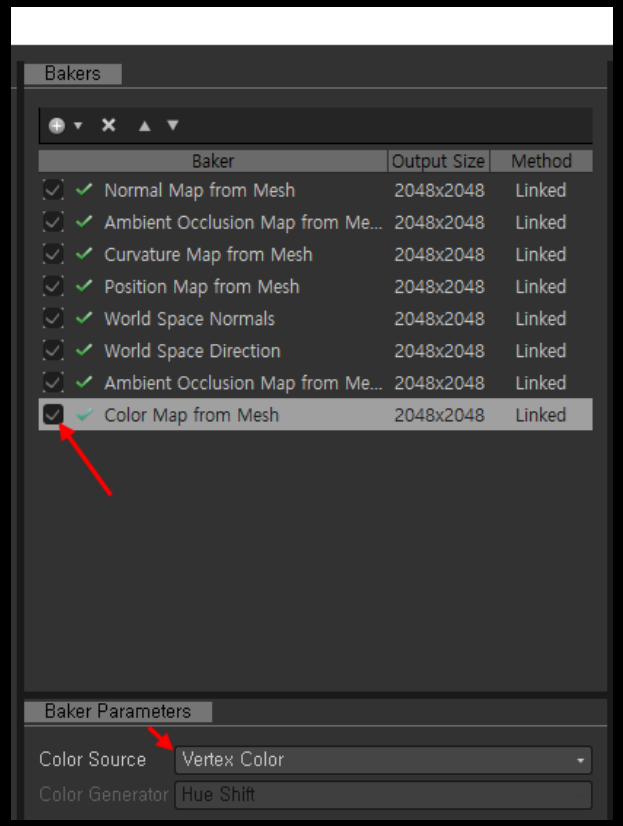
Glass + Metal= Exactly it become other substance

Recommend using Layer shader.

BUILD UP COLOR MASK

Simple review of example





- 这是为了学功能演示的案例。
- 这是在 3DSMAX 或 MAYA 设好的 Vertex Color 导出成 COLOR ID 的过程。
- COLOR ID 在其他工具也能导出，MAYA 跟MAX也能自己导出。

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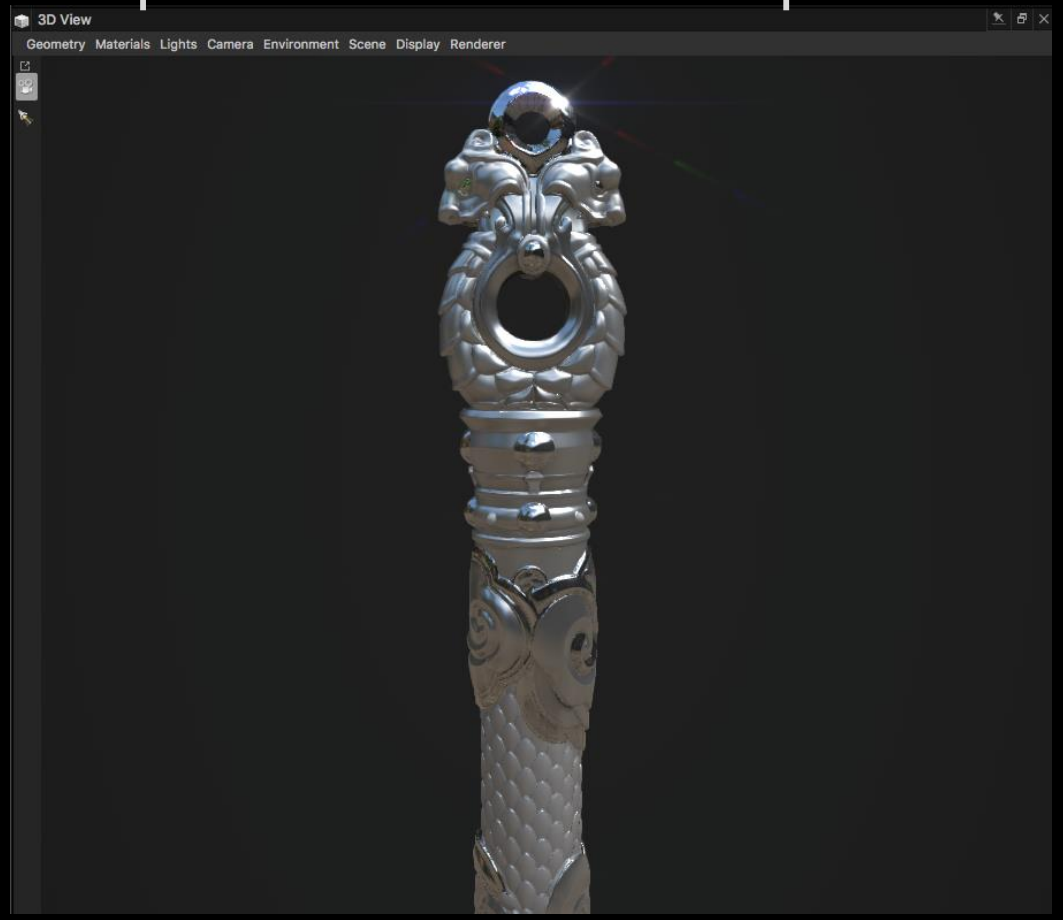
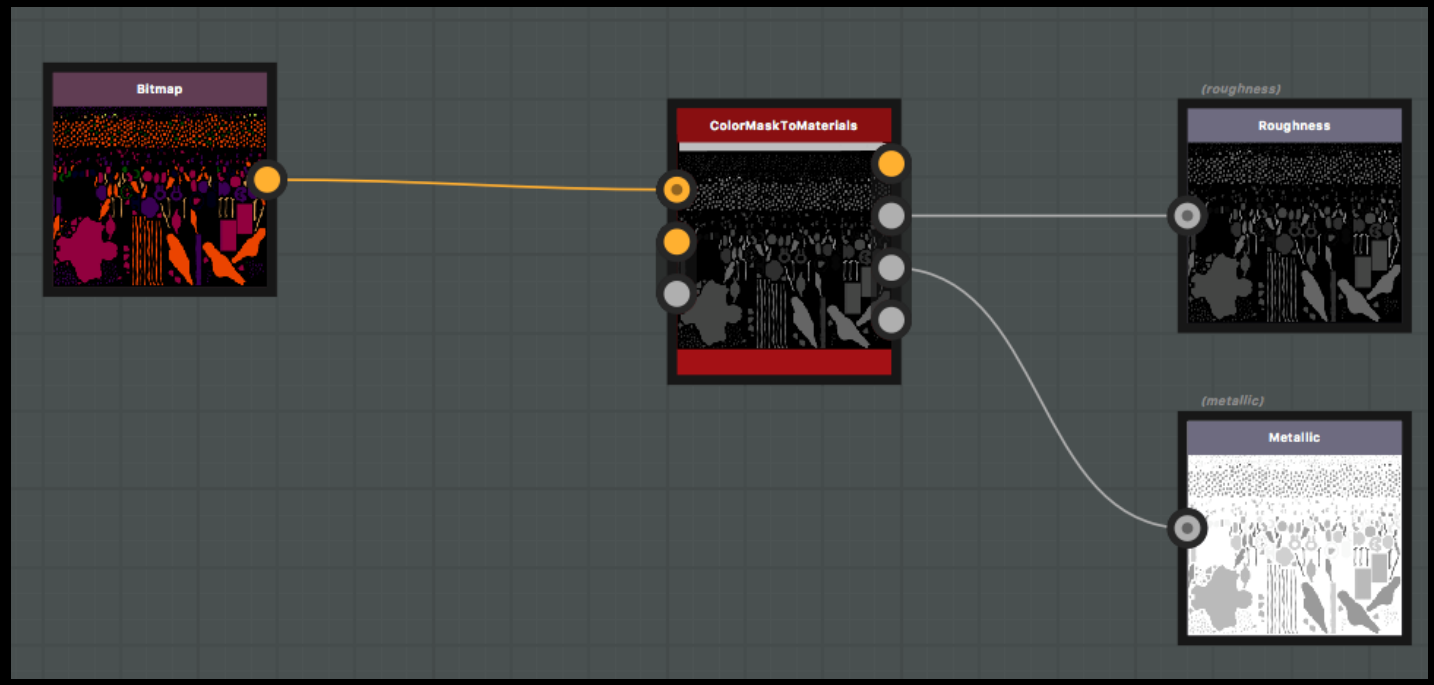
BUILD UP COLOR MASK

Simple review of example





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- 在SD测试 COLOR ID 和自动生成材质粗糙度值的滤镜。
- 已经函数化的滤镜有它内部的图层。

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BUILD UP COLOR MASK

Material setup via your color mask.

- 用 SUBSTANCE PAINTER 的时候。
- 材质以图层为基础制作。
- 不要在一个图层混用很多个材质。

BUILD UP COLOR MASK

Basic structure of substance designer side.

ID Color Input
From Mask table

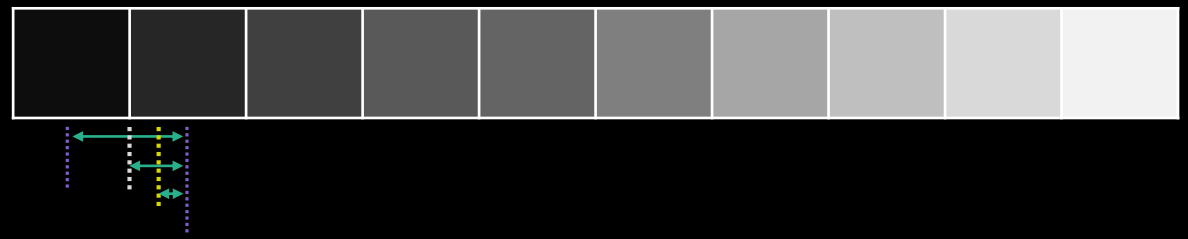
Color mask Gen

Roughness/Metallic

Original material Colour

Weight float value multiplier as function

- Weight float multiplier limitation : ±0.025



- For example if currently roughness value is 0.2 When you could be according to adjustment about from Positive 0.025 to negative 0.025.

Extend structure of substance painter side.

One fill layer
Custom color mask filter

Base pbr setting done

Wearing and scratching

Final your color adjust colour

Final adjust R/M value

Add paint for painting layer
If those painted.

Mask gen with add fill

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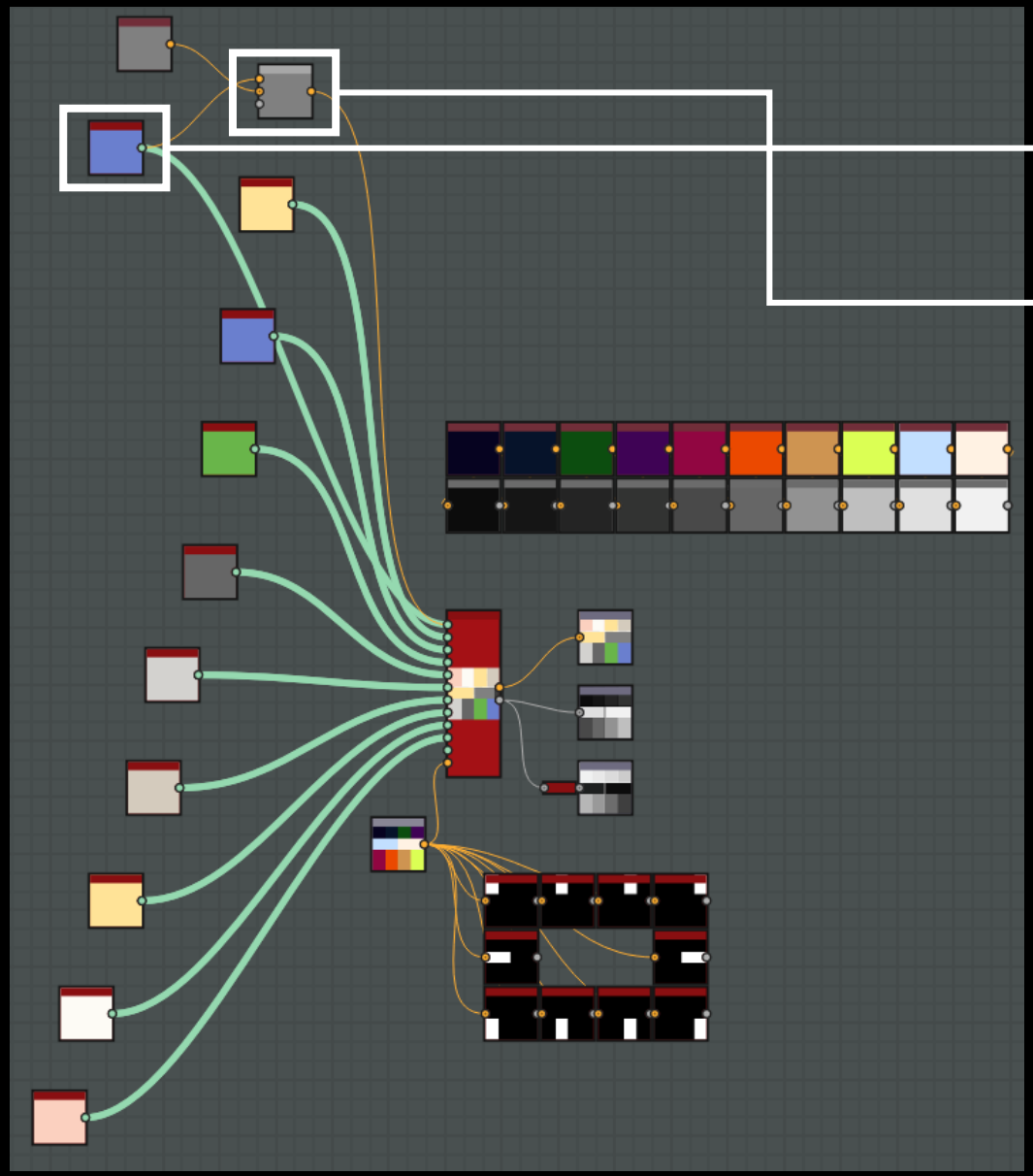
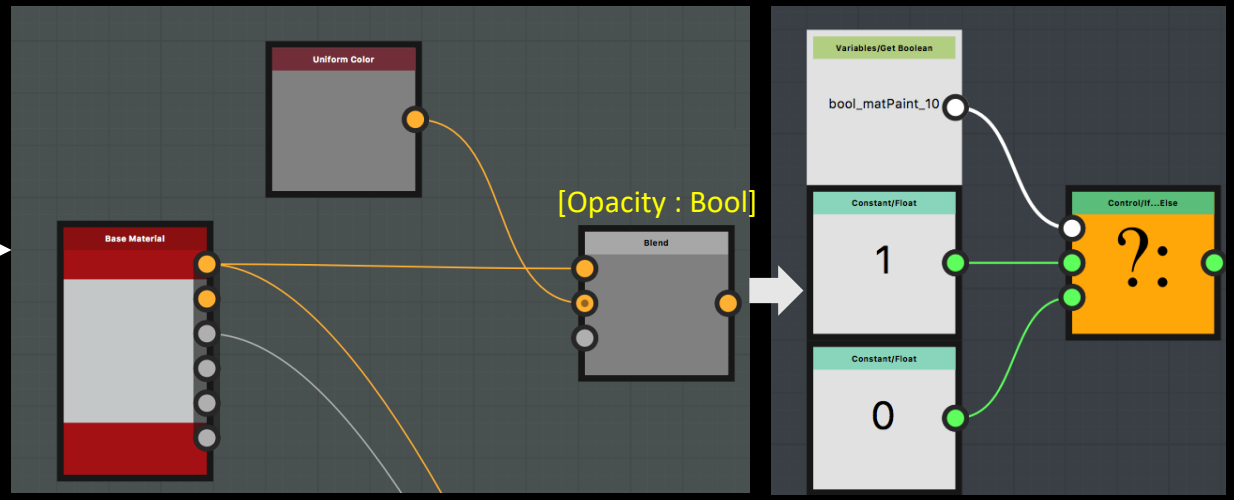
BUILD UP COLOR MASK

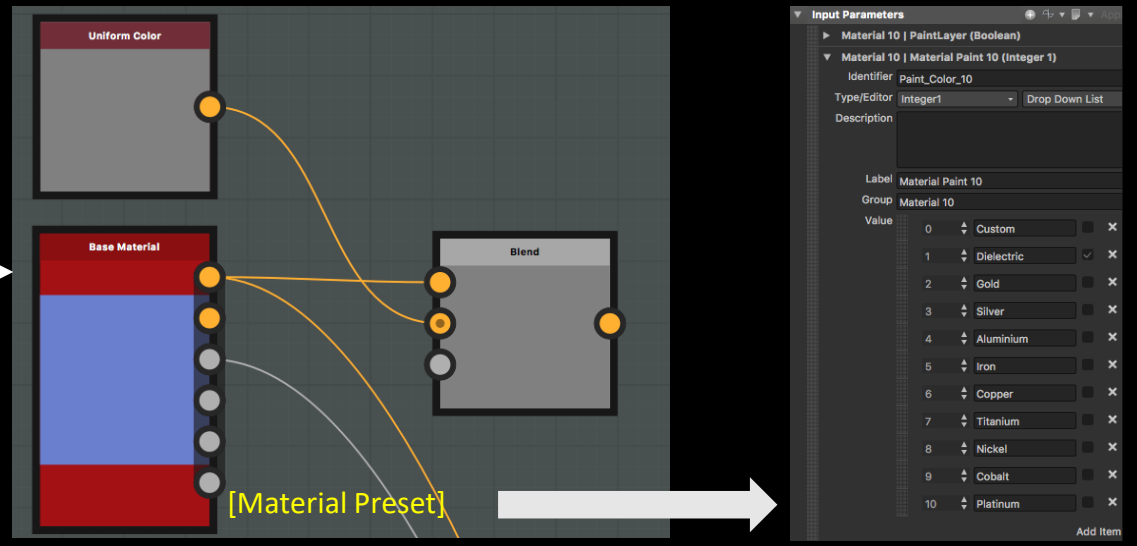
Color ID 2 Material full node view.



Layer Blending Customizing.



Expose to colour presets from base materials.



- Adding to your custom filter lists.
- I am using to Tags and Author as jp.lee.

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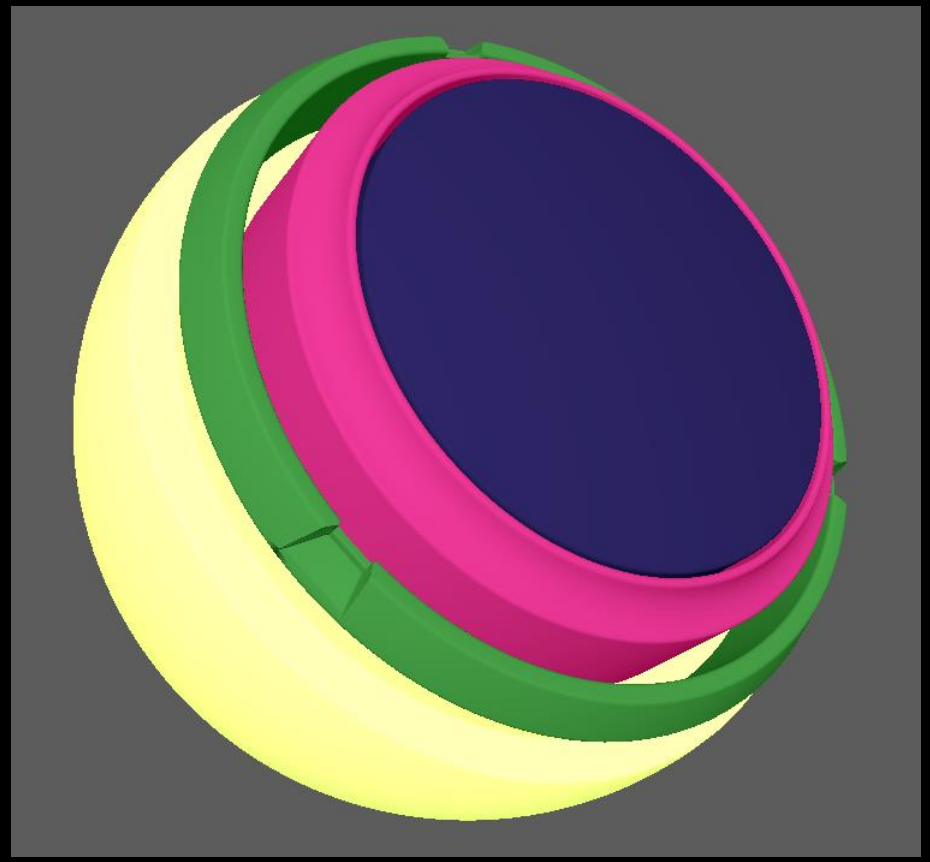
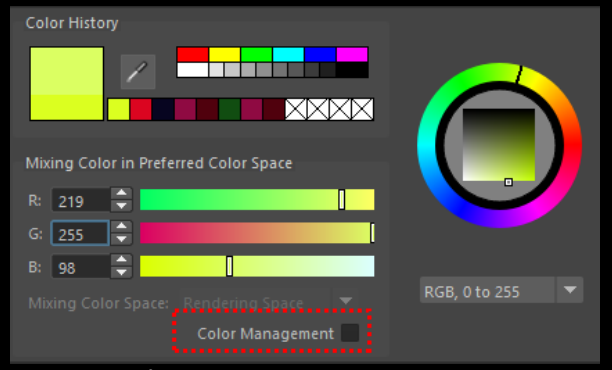
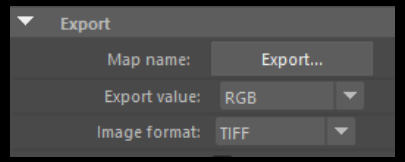
BUILD UP COLOR MASK

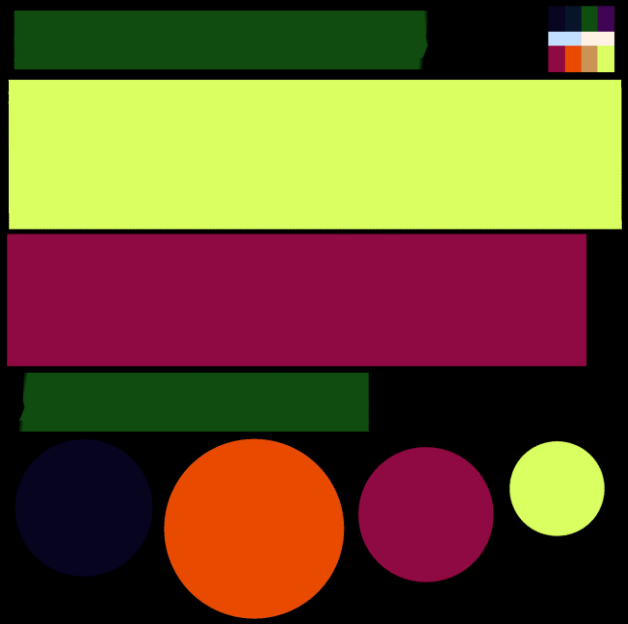
Basic structure of substance designer side.

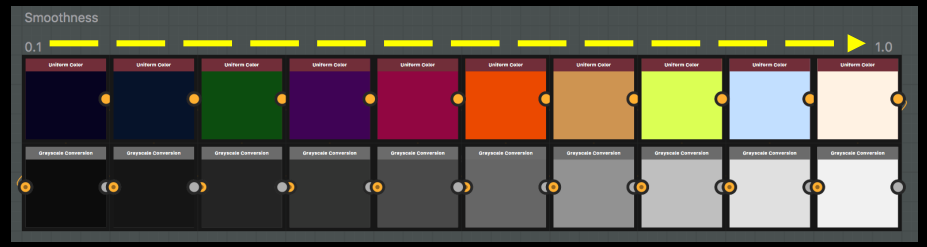


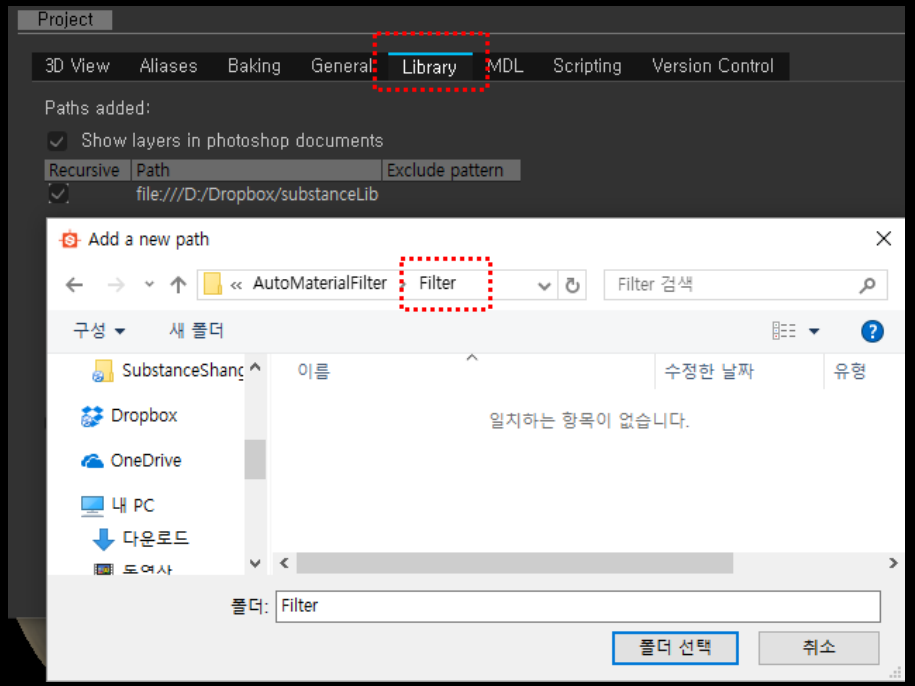


- Attribute export
- Turn off the color management









- Adding to your custom filter path into your substance designer.

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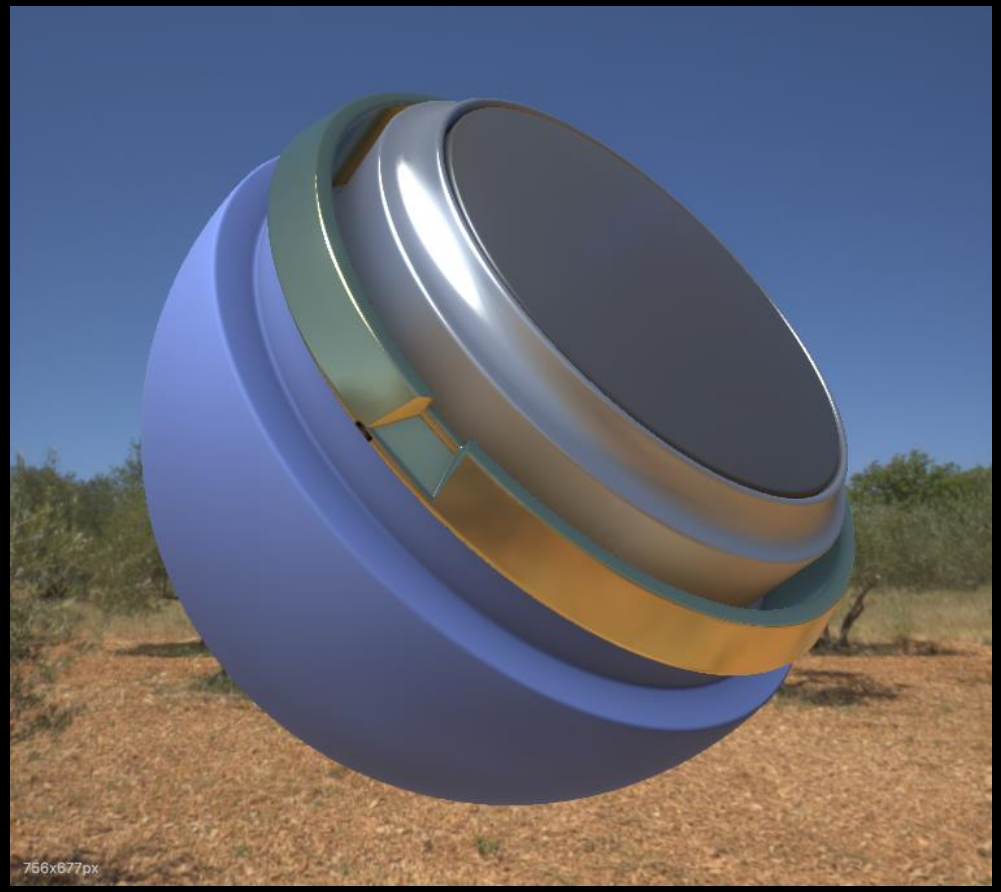
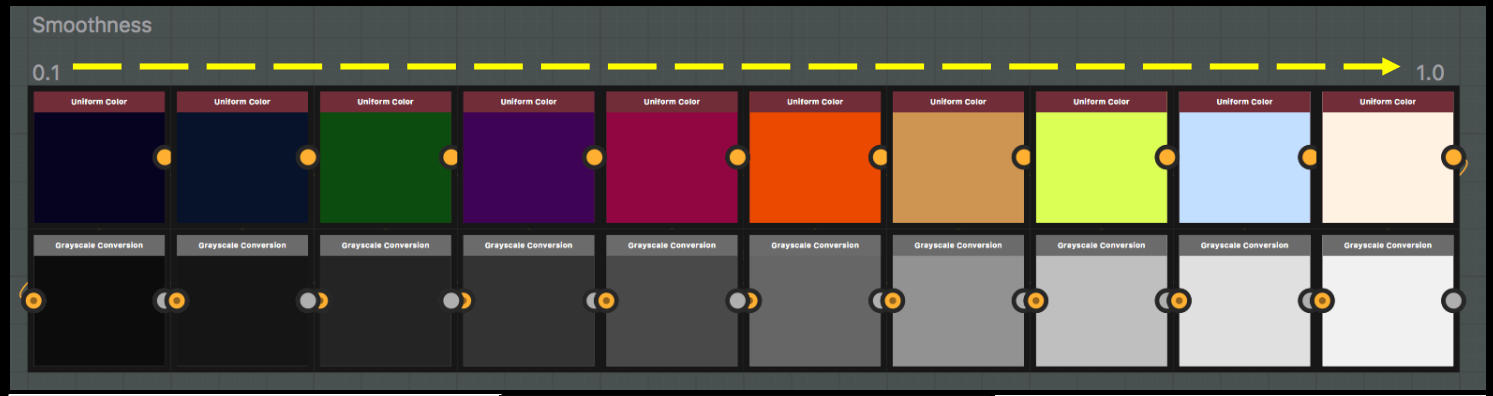
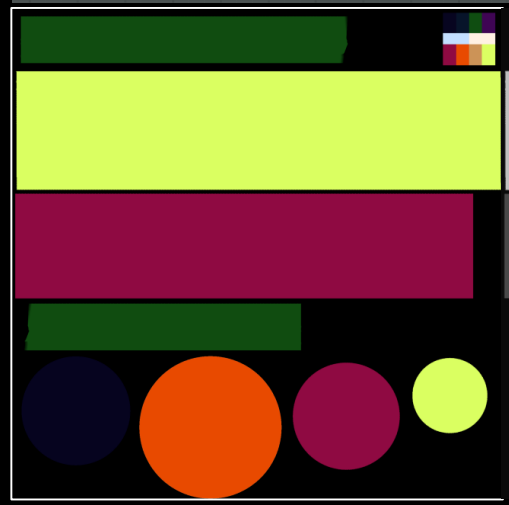
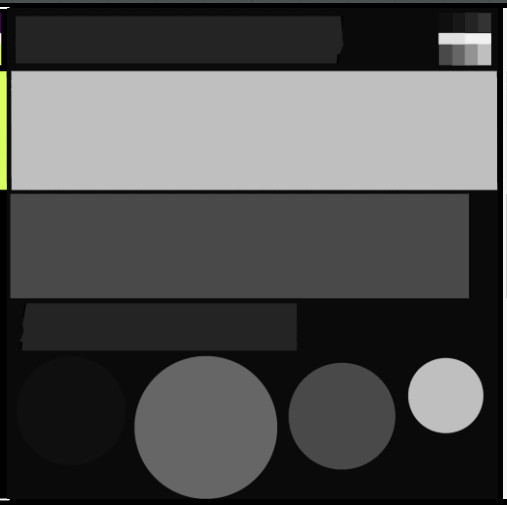
BUILD UP COLOR MASK

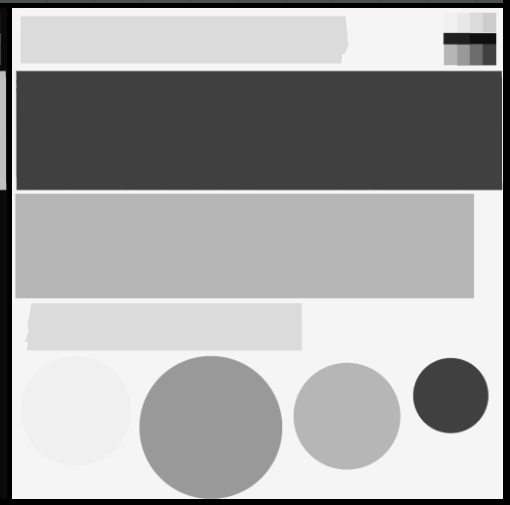
Basic structure of substance designer side.











- General automatic conversions of result
- ID Source
- Roughness
- Metallic

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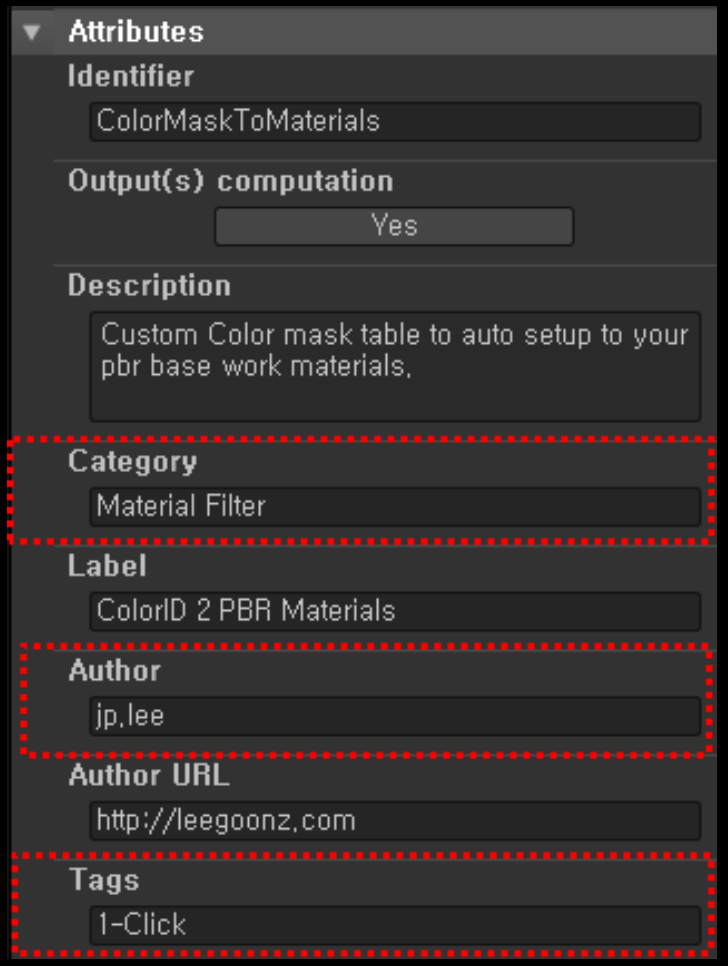
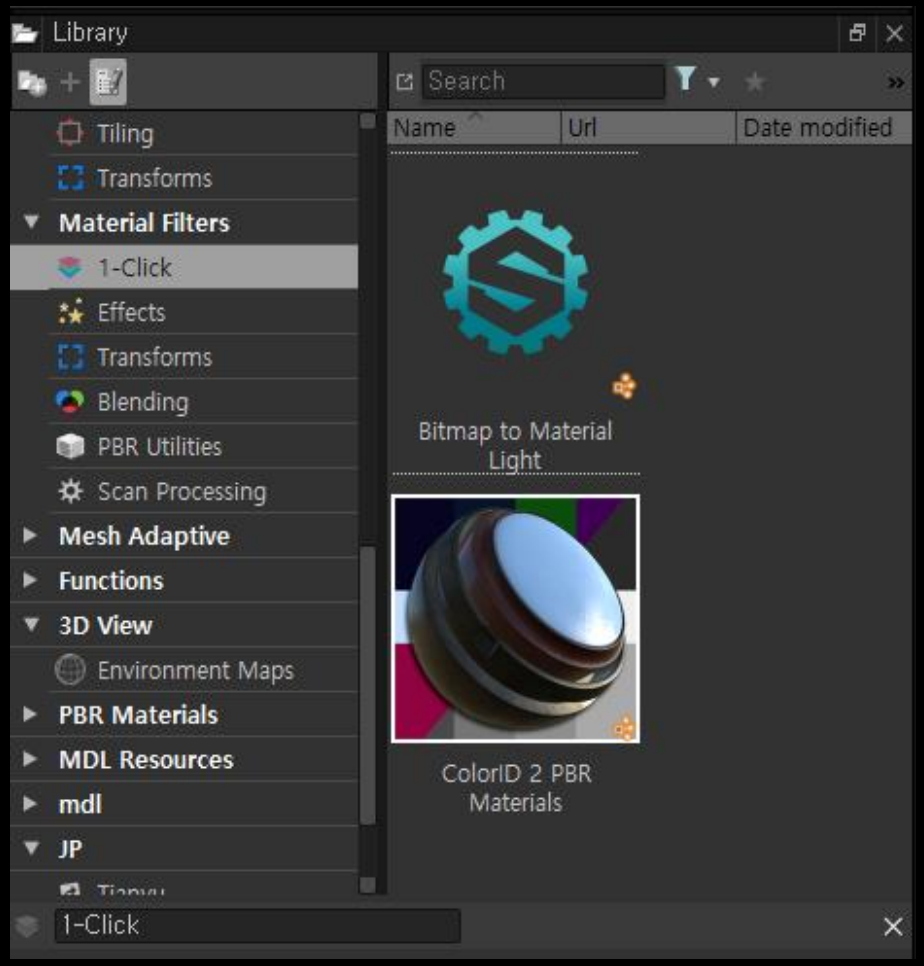
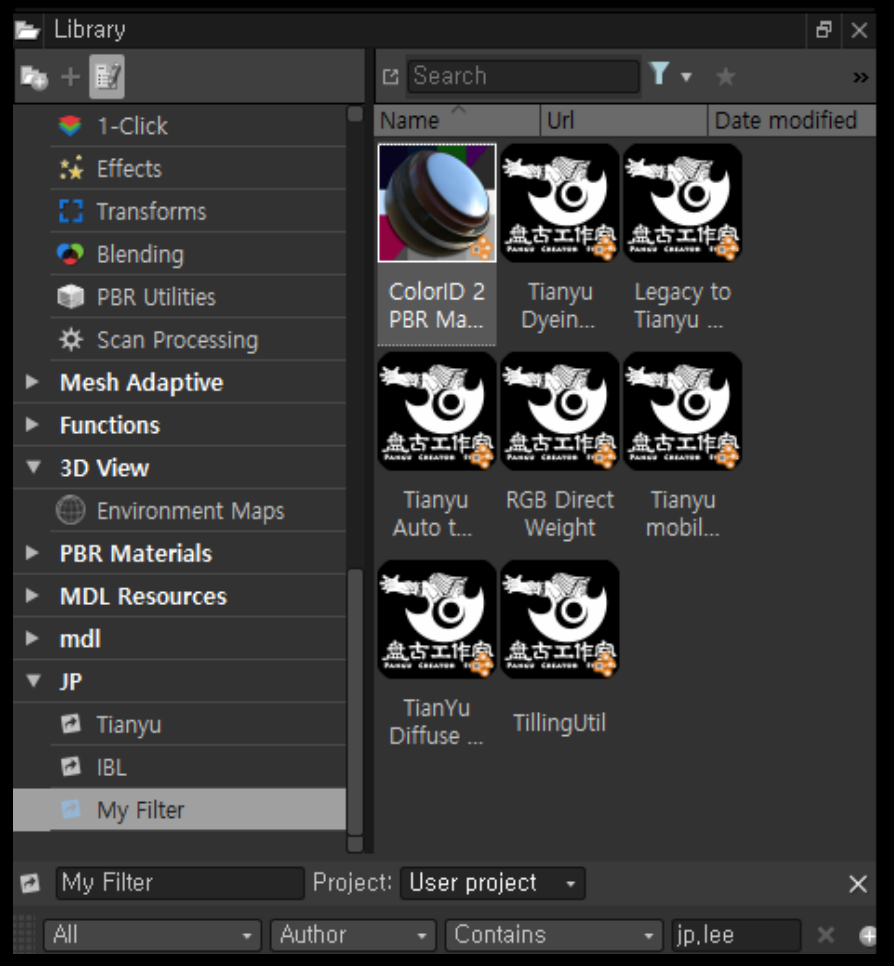
BUILD UP COLOR MASK

Basic structure of substance designer side.







在SP测试表面属性后，树立智能材质的开发结构。
TA 跟美术协商，选择表面效果需要的滤镜。

以上功能确实有缺点。在效果加某种限制时需要用，工作量大的时候用起来也方便。
更重要的工作是，要按照我们项目的标准制作根据 COLOR ID 使用的智能材质库 。

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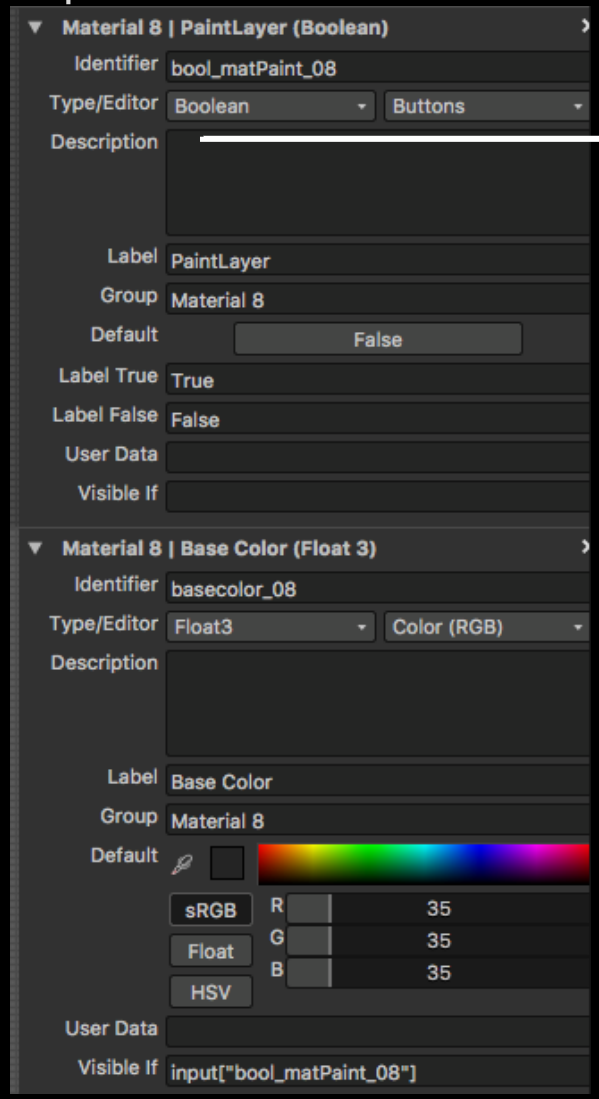
BUILD UP COLOR MASK

Exposed custom function tips.



[Bool value]

[Condition input]

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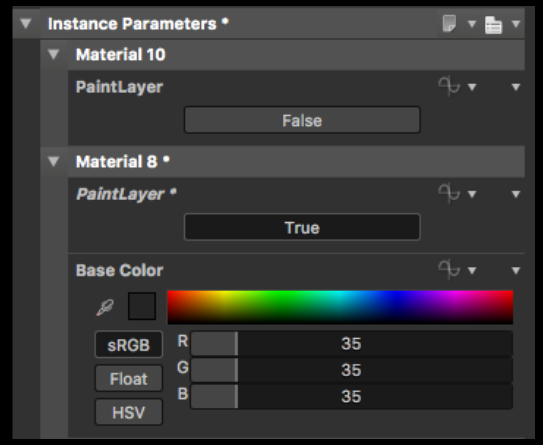
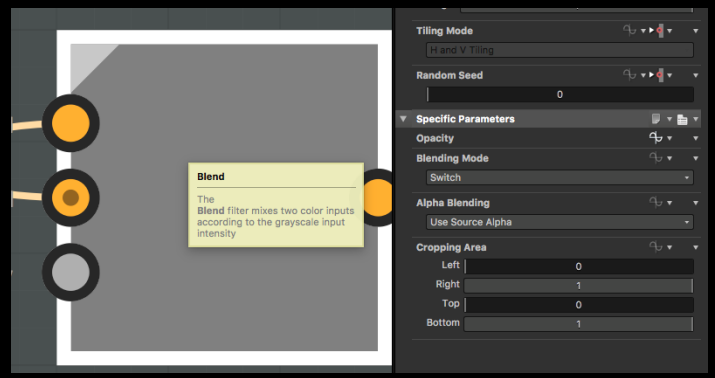
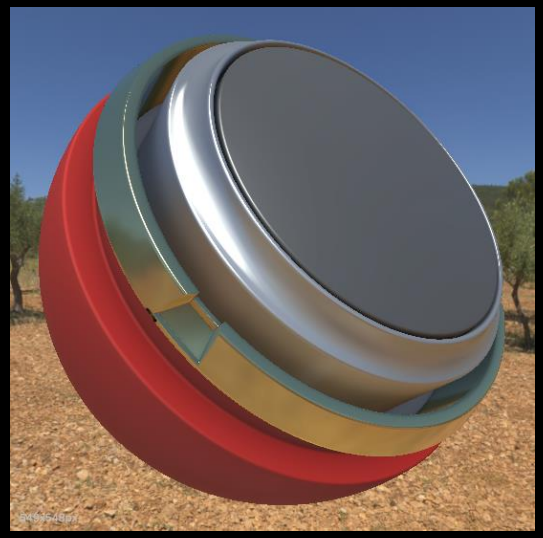


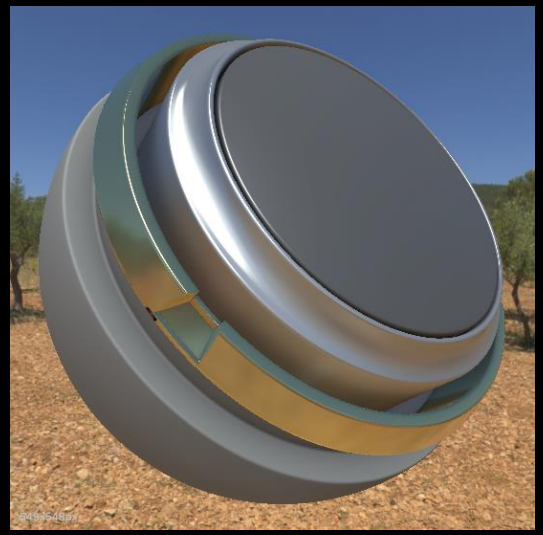
- If you want to change such visible and invisible When you guys using custom state of option you could do use this.



- Blend mode = Switch



- true



- false

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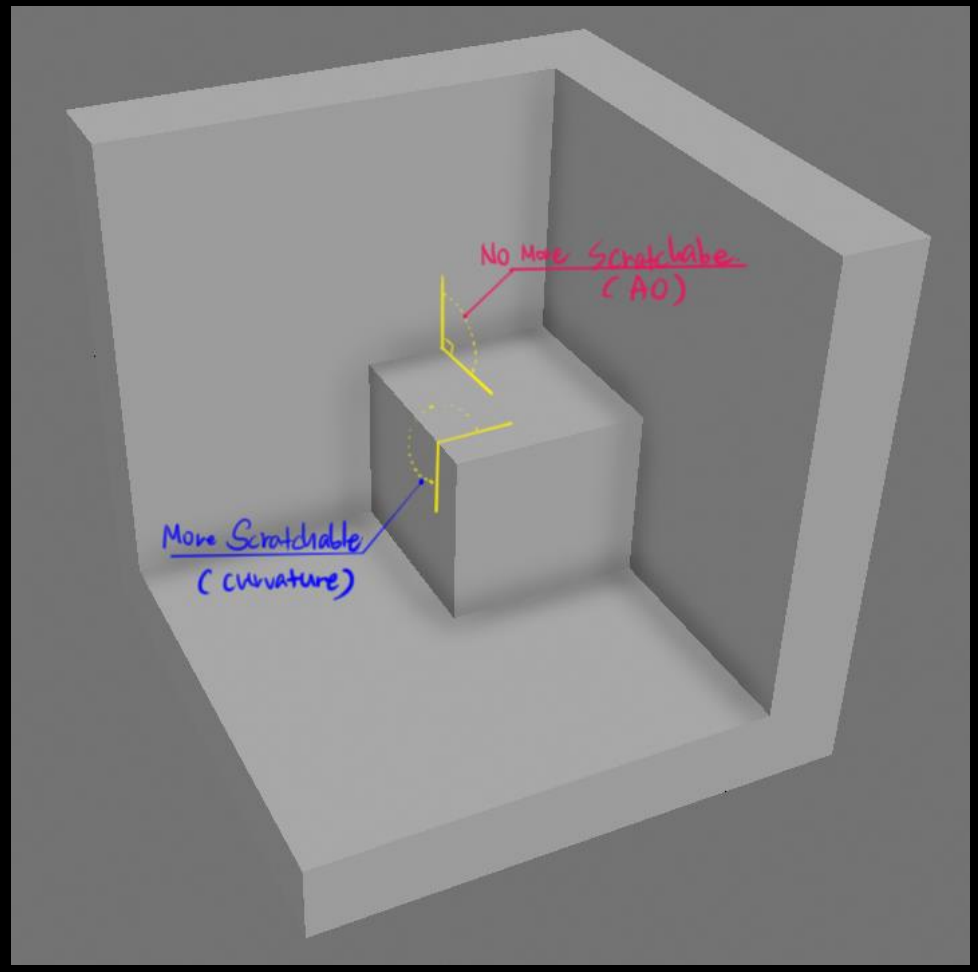
BUILD UP COLOR MASK

Understanding Why We need AO map and Curvature map for filter works.

- Substance most filter those necessary AO mask or Curvature map indeed.
- Why…
- It most related about corner such as inner or outer.



- Inner corner area those not affect from some scratchable objects.
- We can use to AO map that good of choice as dark area.

- Outer corner area those too much exposed about affect from some scratchable objects.
- We can use to Curvature map that is good of choice as White area for the damage.

Scratch? Curvature?

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MATCHING PBR LOOK.DEV

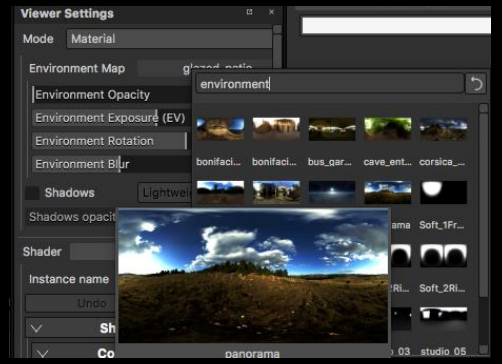
- We would be apply to unity3D with standard pbr shader(metallic/roughness) used by exported textures from substance painter.
- In some case just looking around about several options of export textures presets those it How to customizing.
- Some doing work for calibration about such as substance painter and unity3D scene environments for result compare.

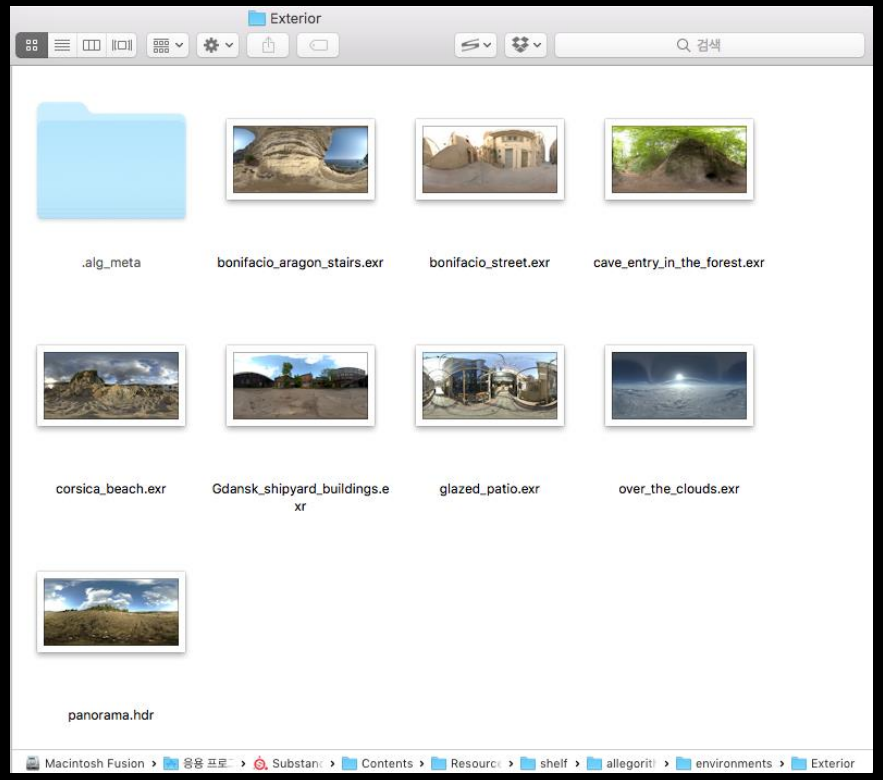
MATCHING PBR LOOK.DEV

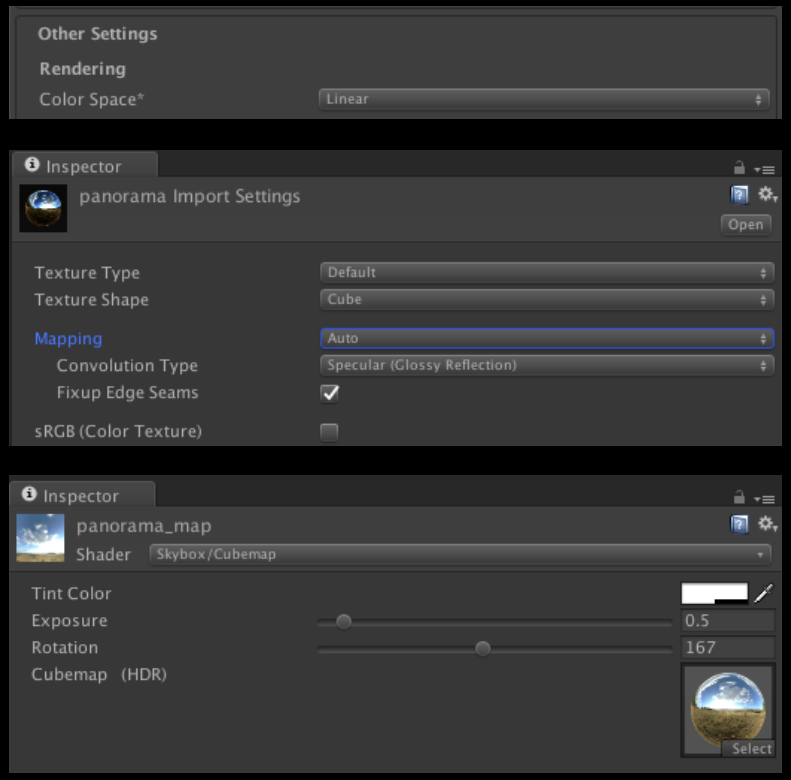
- 这是通用的 PBR LOOK DEV 。
- 我们游戏不会通过高精度 HDR 图片生成 SH 使用。
  (目前是的 :: 需要研究。)

MATCHING PBR LOOK.DEV

- 通常把 SP 提供的 HDR IBL 贴图，储存到开发中的 UNITY3D 工程，用 IBL CUBE 来使用。
- 需要用白平衡调好的 HDR IBL 。
- 这时主要用的是 XRITE CHART ， 晴天的6300色温下白平衡相对是正确的。

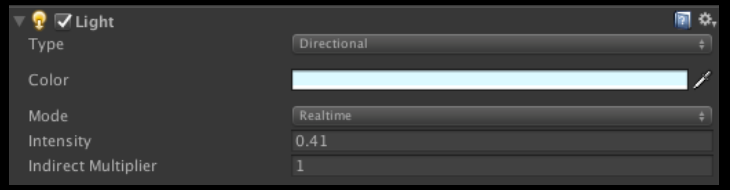






MATCHING PBR LOOK.DEV

- Some different of stuff : Unity3D have affective directional light So You should check to IBL light source direction with adjust to your directional light as similarly match of direction.
- Little different of IBL rendering method but result have an approximately.



MATCHING PBR LOOK.DEV

Using unity3D 5.6 LOOK DEV

- Unity HDRI Pack
  - Removed sun light in IBL source supported.
  - Unity3D those very good experimental lookdev tool provide you.

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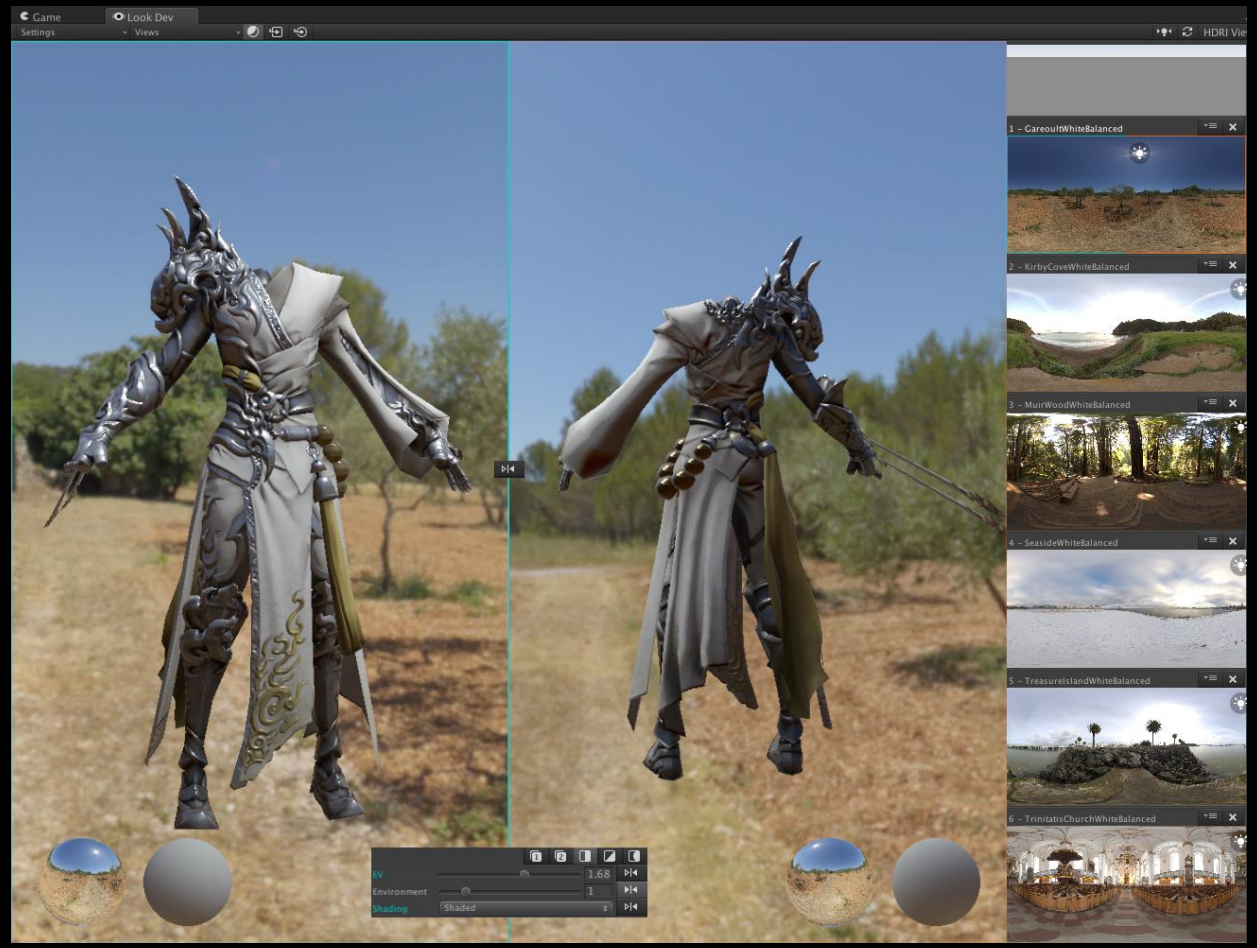
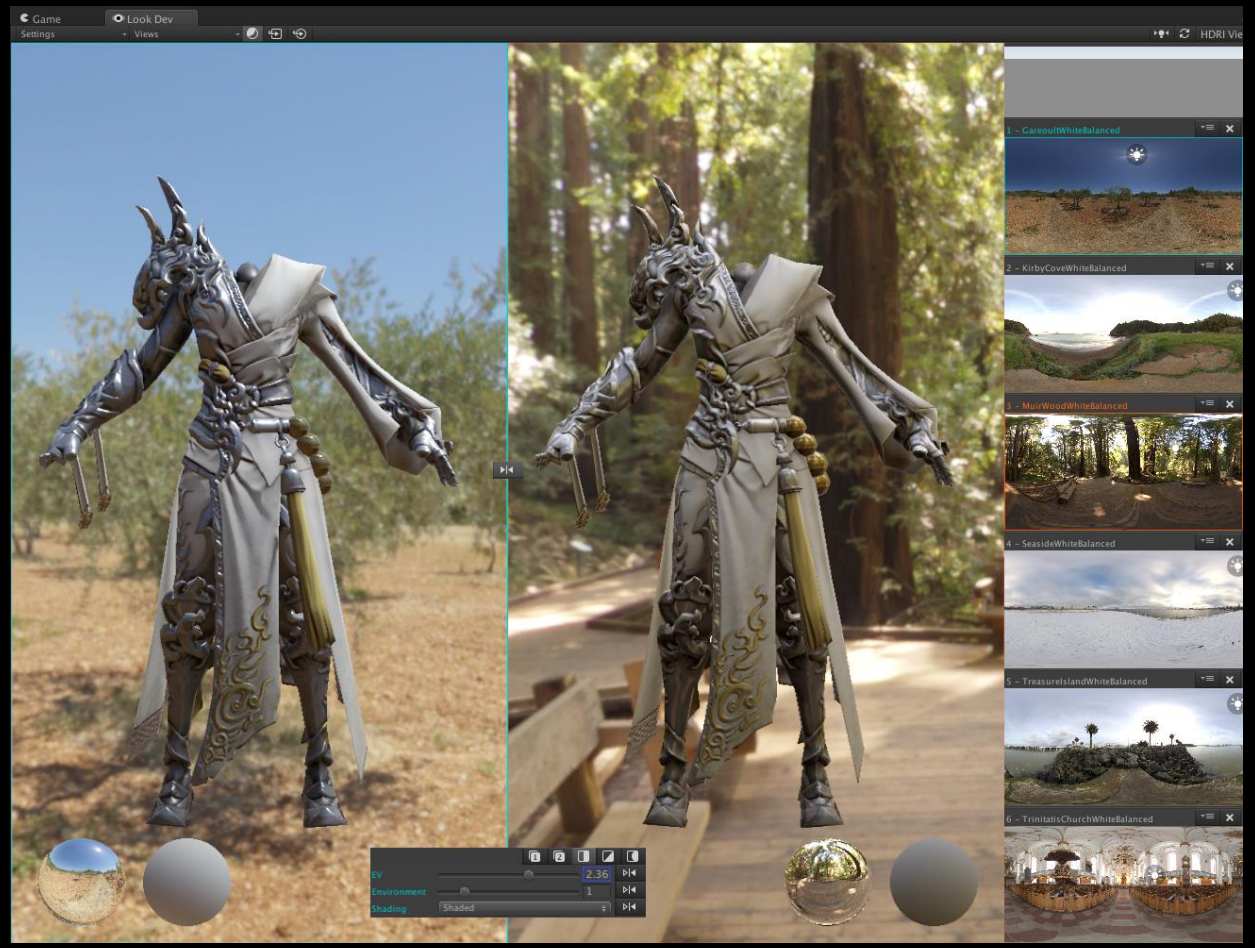
MATCHING PBR LOOK.DEV

Using unity3D 5.6 LOOK DEV

- Same IBL with same exposure value.
- Back and Front lighting compare with single IBL.



- Different IBL with same exposure value.
- Different IBL with Different exposure value.



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MATCHING PBR LOOK.DEV

Using unity3D 5.6 LOOK DEV

- Unity HDRI Pack
  - White point balanced look-dev IBL from Unity3D.
  - Copy to your substance painter resources directory or preset directory it very useful for your pbr match works indeed.

- OSX : documents/substance painter 2/shelf/environments

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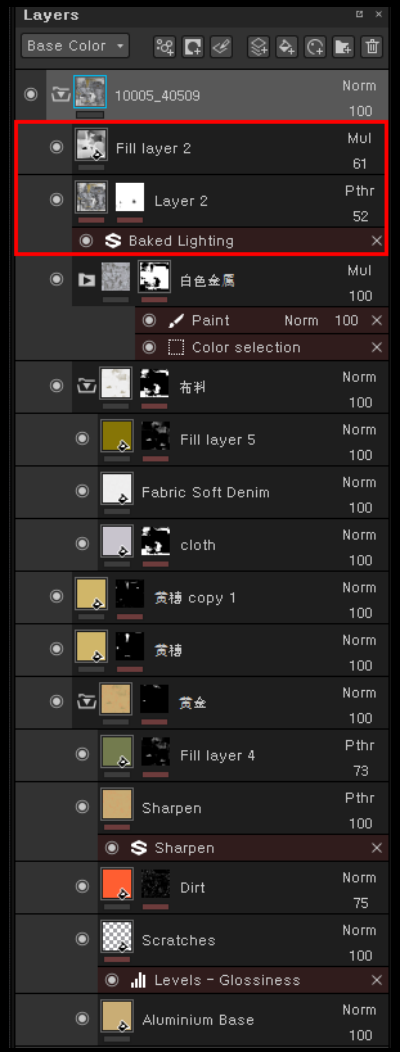
MATCHING PBR LOOK.DEV

Custom tweak of art result

- 使用 SP导出贴图后储存的资源， 在 Unity 适用 PBR 。
- 我们看下几种贴图的导出 。
- 再查看SP和Unity PBR 测量（Calibration） 环境。

TWEAKING

Bake Lighting filter for mobile game workflow.

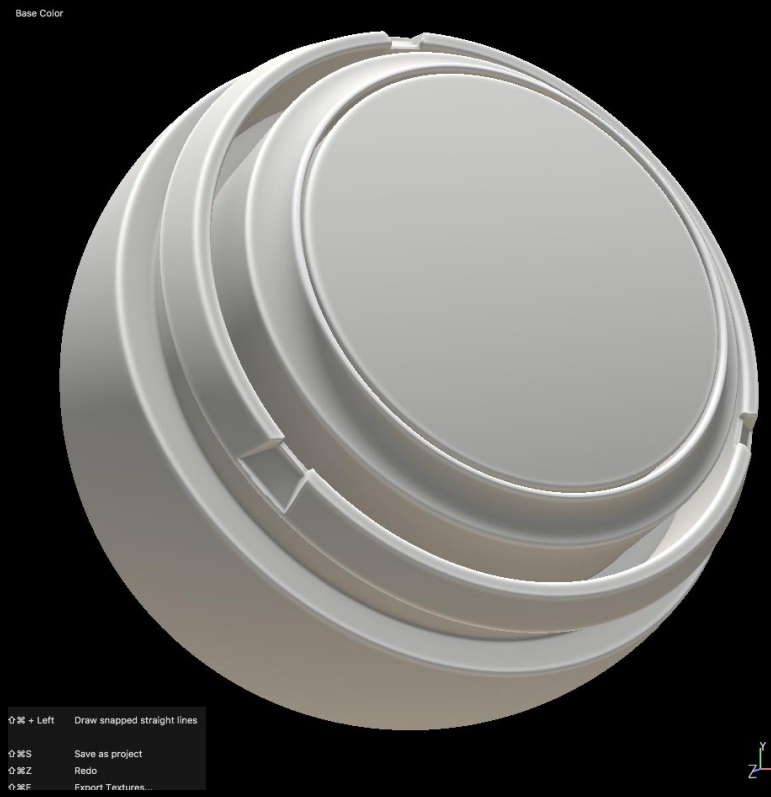


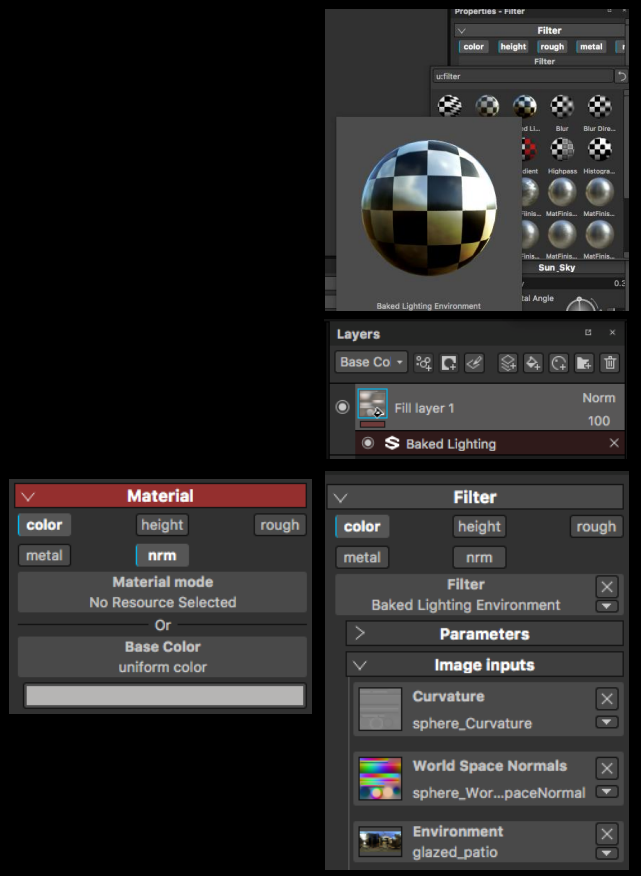
- 原理上是不对的，但实在是没办法提升立体感时也可以在手游偶尔使用。

TWEAKING

Bake Lighting filter for mobile game workflow.

- This is new feature of baked lighting.
- Just turn on to color that will be use to composite layer or some stuff if you useable.





- 比较下更极端的情况。
- 左侧是适用前。
- 右侧是适用 SKY LIGHT BAKE 后。

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COLOR ID WITH SMART MATERIAL

- 我们要在项目内部做决定和制作。
  - 会选出可以主导制作的人员。