

Pölynimurirobotiprojekti

Openscad koodia imuria varten, puolivalmis

```
mm = 1;
cm = 10*mm;
tau = 6.28318531;
$fa=1;
fan();
module fan(diameter      = 20*cm,
           height        = 8*cm,
           wallThickness  = 2*mm,
           impellerBaseThickness = 10*mm,
           impellerTopThickness = 5*mm,
           clearance      = 5*mm,
           bladeCount     = 10,
           inletDiameter  = 6*cm,
           bladeThickness  = 15*mm) {
%hull(diameter, height);
impeller(diameter * 0.8,
         height * 0.8,
         impellerBaseThickness,
         impellerTopThickness,
         clearance,
         bladeCount,
         inletDiameter,
         bladeThickness);
}
module impeller(diam, height, impellerBaseThickness, impellerTopThickness,
               clearance, bladeCount, inletDiameter,
               bladeThickness,
               bladeAngle = 45,
               curviness = -8,
               curvePos = 0.15,
               bladeStart = 1.1,
               bladeLenScale = 1.05) {
angleStep = 360 / bladeCount;
bladeLen = (diam / 2 - inletDiameter / 2) * bladeLenScale;
bladeHeight = height - impellerBaseThickness - impellerTopThickness;
topLidBase = height - impellerTopThickness;

color([1,0.5,0]) {
  translate([0,0,clearance]) {
intersection() {
difference() {
union() {
// Top lid
translate([0,0,topLidBase]) cylinder(r=diam/2, h = impellerTopThickness);
// Bottom lid
translate([0,0,0]) cylinder(r=diam/2, h = impellerBaseThickness);

// Fins
translate([0,0,impellerBaseThickness]) union() {
```

```

    for(i = [1:bladeCount]) {
        rotate([0,0,i * angleStep]) {
            translate([bladeStart*(inletDiameter/2),0,0])
                fin(bladeLen, bladeHeight, bladeThickness, curviness, curvePos, bladeAngle);
        }
    }
}

// Air intake cutout
translate([0,0,impellerBaseThickness]) cylinder(r=inletDiameter/2, h=height);
}
// Max fin volume
cylinder(r=diam/2, h = height);
}
}
}
function foil(x, curviness, curvePos) = -sin((x+curvePos)*360/2+curvePos)*curviness;
function profile(x) = sin(x*360/2)*0.25;
module fin(length, height, thickness, curviness = 1, curvePos=0, bladeAngle = -50, steps = 20) {
    step = 1.0 / steps;
    color([1,0.3,0]) linear_extrude(height=height, convexity=10, twist=0) {
        for (i = [0:step:1-step]) {
            rotate([0, 0, bladeAngle]) {
                polygon([[ i *length, foil(i, curviness, curvePos) - profile(i) * thickness],
                    [(i+step)*length, foil(i+step, curviness, curvePos) - profile(i+step) * thickness],
                    [(i+step)*length, foil(i+step, curviness, curvePos) + profile(i+step) * thickness],
                    [ i *length, foil(i, curviness, curvePos) + profile(i) * thickness]]);
            }
        }
    }
}
module hull(diam=100, height=100) {
    cylinder(r=diam/2, h = height);
}

```