

We know that the CNS and BRAIN is composed of millions and millions of REFLEXES. Other neuroscientists say that an opening up of newer and newer reflexes in brain is summarized as mind.

Human brain is vast and the practice of NEUROSURGICAL maneuvers are ushering the newer and newer components of human brain.

It is often quoted the HUMAN BRAIN is 20% known to the NEUROSCIENTISTS. The other 80% remains unknown.

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Technology Update

New Definition of 3-D Printing: Additive Production

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Through the medium of nanotechnology the firm XJet wants to manufacture better quicker and cheaper metal and ceramic parts than all other competitors and rivals.

Discretion rings somehow otherwise, “We will newly define the additive production, not only in metal but also in ceramic field. Our 3-D printers are better quicker and more cost-effective cheaper and more flexible than the products of the competitors”, so says Dror Danai, Business Developer of the Israeli firm XJet.

Possibly it comes into existence through a new printing technique: by nanoparticle jetting. With this the densely compressed fluid with a piezoelectrical pressure head in construction space is taken off. We distribute about 220 million drops per second out of amount of 12000 says Danai. As for comparison: printing specialist comes with his much taken care multijet fusion

named technology of 30 million droplets. Each of our material droplets contains more than 1000 tiny particles. Their size clearly lies in submicron region. With ceramic these are as for example on an average 50nm, says Danai.

The expert does not advise on how it is possible to generate so tiny particulates wholesale and reliably. That will still for a couple of years remain our secret. Details for the transporting fluid do not mention cost. The viscosity must exactly conform to every material. Certainly the solution must be capable of flowing, it may in the construction space, however, not be too far extended. Behind it there is twelve years work in laboratory and over 100 million US \$ research expenses.

Immediately after the taking off of the droplets a radiator heats up the layer. The temperature is at 200°C to 290°C kept according to the material result. The transport medium immediately

evaporates. Moreover the particulates remain. These are held together through attraction power and a small quantity of binding material. .

The construction part generates this layer by layer. The strength of individual layer is adjustable and amounts to as per standard not only with metal but also with ceramic about 9 μm . At the beginning we worked with only 1nm to 2nm as said by Danai. A similar fine solution was, however, not demanded by the market. In addition of retards the construction progress. As comparison the best metal printers of the established manufacturers come scarcely under 20 μm . Also in ceramic area the one figure values are so far rare.

In spite of this fine solution, the big XJet printer "Carmel 1400" a construction rate of scanty 40mm³/second, then in any case when its construction space of the size of 50 cm x 28cm x 20cm is fully utilized. Also with this value the system must not be stopped. Only the highest efficiency four laser machines of big competitors in metal domain push forward in such areas.

Where necessary with about hanging over in construction part the system brings out on the press button a reinforcing gel. The half of all Jets is for this action reserved. On the exact design of the support structures no more thoughts must be made. These are from our software automatically laid on – as said by Danai. The material is later removed from a water based harmless solution.

After the removal of the supporting materials a green part remains superfluous. It can immediately be put in a sinter furnace. "The time intensive deliverer is obsolete as per our method, because we seldom use binding material" says

Danai. The shrinking is accordingly is smaller. It amounts to 15% with us contracted in every direction; therefore about half so much as with competitors in ceramic area. In comparison to the metallic powder injection casting only $\frac{1}{8}$ of the binder filler put into action. This is significant in regard to accuracy. In theory every contraction can be taken into account in practice, this appears, however, often otherwise. Additionally particularly the fine structures do not get reliably realized when the fresh new matter contracts 30% in all directions.

In order to cover the precision of Carmel Plant-Danai refers to 8mm borer. On the first overview he sums to as comes out of construction market. However the tools are made of ceramic with a thickness of over 99.9%. One who looks however, can anticipate on its surface in total 2341 holes with a diameter of each one 190nm and with this not sufficient all the holes are bound within through the cooling canals.

The price of Carmel-1400 plant is about 750,000€ as per experts' opinion inclusive of basic outfit of materials. These are as per Danai, scarcely costlier than the metal powder or ceramic suspensions which the competitors use. The technology is however, 40% cheaper.

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