



### **Award Winning!**

**“Director General Prize of Agency of Natural Resources and Energy” has been awarded from the Japan Machinery Federation in 2005.**

# ***DNX Model***

## **● Overview**

Advanced Descaling Nozzle DNX was co-developed by JFE Steel Corporation and Everloy, Kyoritsu Gokin Co., Ltd. This DNX model not only offer improved performance in removing scale sticking to steel surfaces but also a potentially large saving of high pressure water consumption. By installing DNX in a descaling system, surface defect ratio from scale can be significantly reduced. In addition, high pressure water consumption can be cut by maximum 40%, and pump’s electricity consumption by 10 to 15%.

## **● Effect of Introduction**

The new Descaling Nozzles were installed at JFE Steel Corporation’s Hot Strip Mills in the following sequence :

1. Kurashiki: Hot Strip Mill, Plate Mill, Sections, Shapes
2. Fukuyama: Hot Strip Mill No. 1 & 2
3. Keihin: Hot Strip Mill, Plate Mill
4. Chita: Seamless Pipe Mill

The improvement in steel surface quality as well as a reduction in water consumption of up to 40% can contribute to an electricity saving of about 1 kWh/t per consumption unit. The reduction in water consumption means that the temperature drop in the steel can be limited. Therefore the temperature requirement for re-heating steel before rolling can be reduced by 10° to 20°C, with savings of about 20MJ/t per furnace heating fuel consumption units. As a result, emissions to the environment can be greatly reduced.

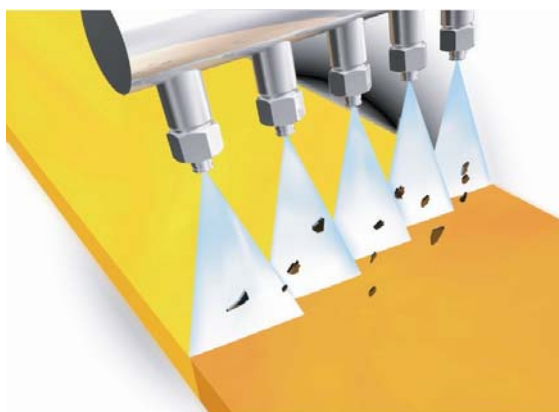
● **Effect of DNX on JFE rolling line  
(compared with conventional nozzle)**

	Scale defect on Steel:	Descaling high pressure water:	Descal pump:	Heating furnace:
	Outbreak ratio	Reduction	Electricity consumption unit	Fuel consumption unit
			Reduction	Reduction
<b>Effect</b>	<b>50% less</b>	<b>Max. 40%</b>	<b>1kWh/t</b>	<b>20MJ/t</b>

JFE Steel Corp committed to installing DNX in of all their Hot Strip, Plate, and Seamless Mills. As Hot Strip Mills start to use DNX, JFE Steel Corp proud to make this great contribution to CO<sub>2</sub> reduction along with the added savings in electricity fuel consumption.

● **Energy-savings results when all nozzles are replaced with DNX.**

	Steel Production per year	Descal pump electrical saving per year			Reheat furnace fuel saving per year			Total savings per year	
		Energy saved	CO <sub>2</sub> reduced	Cost Saved	Energy saved	CO <sub>2</sub> reduced	Cost Saved	Co <sub>2</sub> reduced	Cost Saved
In all JFE Steel Mills	24 mln t /year	24 GWh /year	11,000 t /year	US\$ 2.2 mln /year	480 TJ /year	44,000 t /year	2 mln /year	54,000t /year	4.5 mln /year
In all Japanese Steel Mills	101 mln t /year	10GWh /year	44,000 t /year	US\$ 9.2 mln /year	2,020 TJ /year	184,000 t /year	8.7 mln /year	229,000t /year	18 mln /year
In all Global Steel Mills	948 mln t /year	948 GWh /year	417,000 t /year	US\$ 86 mln /year	18,960 TJ /year	1,728,000 t /year	82 mln /year	2,145,000t /year	168 mln /year



**KYORITSU GOKIN CO., LTD.**