PRODUCTIONS AND APPLICATIONS OF 400MPa HOT ROLLED RIBBED BARS

Xu Yin

(Department of Scien – tech Environment Protection of China Association of Iron and Steel Industry)

1 Productions and Applications of 400MPa Hot – Rolled Ribbed Bars Over the Past Years

Great achievements have been made in economic constructions since the opening and reforming policy coming into practice, especially in 1990s, investments in engineering constructions grow year by year, which makes the demands for screwed bars scaling mountainously, since screwed bars are the necessary material for concrete structure. The following table 1 shows the outputs imports and exports as well as consumption since 1995. Yet practical outputs of 2002 is not available, but according to evaluations based on the proportions of historic screwed bars, it might be around 45 millions tons.

Table 1 Outputs, imports, exports and consumption of screwed bars in 1995 ~ 2001 millions tons

Year	Outputs	Imports	Exporls	Net consumption
1995	1 460.348	267.13	45.21	1 682.268
1996	1 456.661	185.07	34.21	1 607.51
1997	1 667.2	144.95	34.72	1 177.43
1998	2 104.731	141.22	37.5	2 208.451
1999	2 455.068	76.51	36.9	2 494.678
2000	2 844.25	3.84	33.33	2 814.76
2001	3 735.2	5.948	53.209	3 687.939
2002	4 400 ~ 4 500			

However, the screwed bars used in the concrete structure are all hot rolled bars of 335 MPa, i.e. the so called Grade II bars. While in Europe and America, they are using bars of high strength and performances that are of 400 MPa, 500 MPa. In order to change this improper situations, the former Ministry of metallurgical Industry and the National Scien – tech Commission have jointly listed "400 MPa hot – rolled ribbed steel bar" as one of the key scientech projects for 6th and 7th national plans. Through nearly 10 years' works and endeavors by scientech research personnel from relative metallurgical and construction industries, success was made in producing the 400 MPa hot – rolled ribbed steel bar. Trial application through the period of 8th five – years have proved that 400 MPa hot – rolled ribbed steel bars have the following advantages compared to 335 MPa steel bar:

(1) High strength, stable performance, adaptive to various construction processes

(2) Fine weldability due to low carbon equivalent

(3) Yield strength ratio σ_b / σ_s not less than 1.25, adaptive for aseismatic building construction

(4) Due to strength figure for buildings in the design standards is increased from 310 MPa to 360MPa, in normal concrete structures, compared to using Grade II steel bar, 12% ~ 14% steel bars can be saved due to uses of new Grade III steel bar, additionally, building safety, social and economic benefits are obvious.

In order to speed up the restructuring of met-